THE ARCHITECTURAL REVIEW, OCTOBER, 1905, VOLUME XVIII. NO. 107.

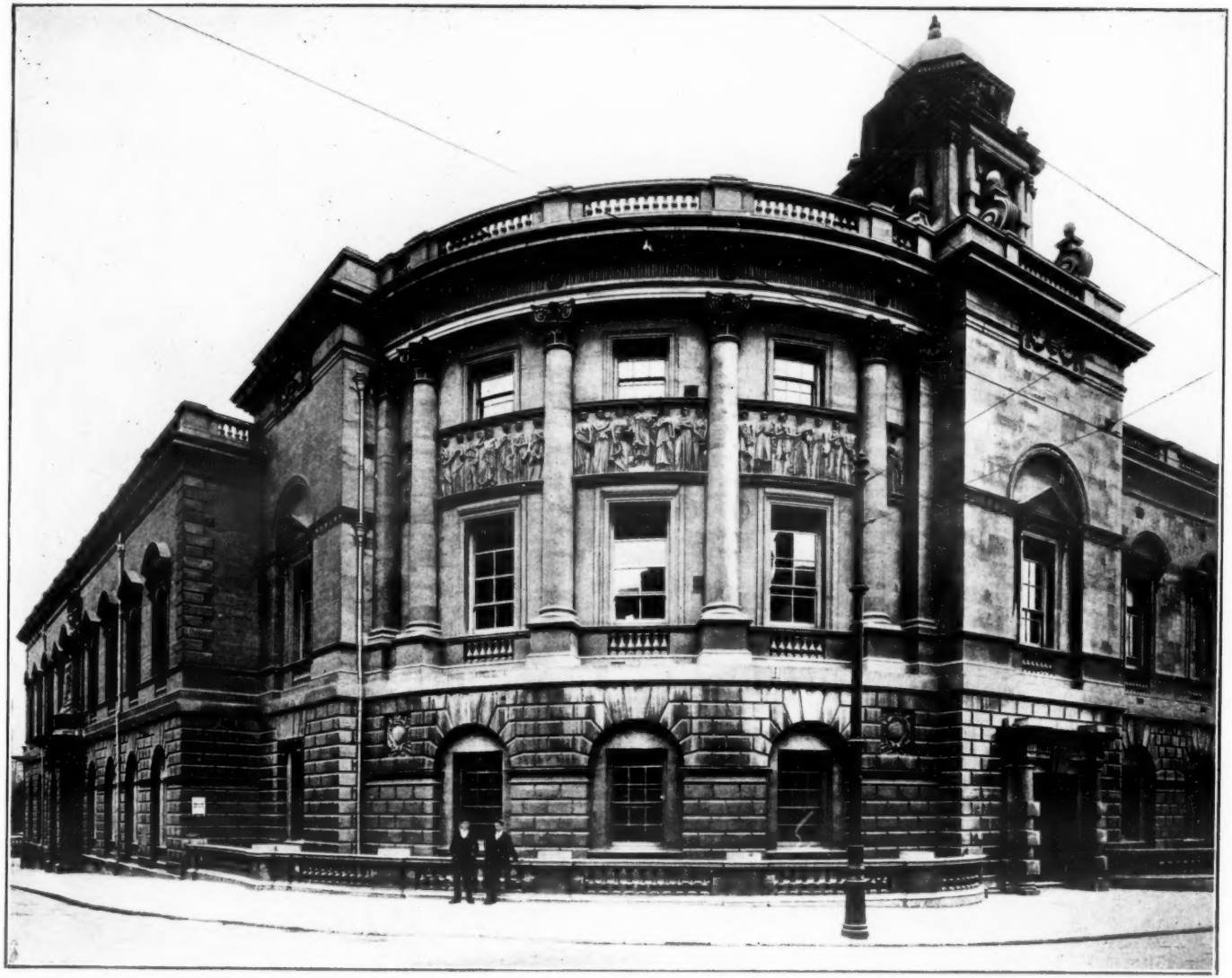


Photo: E. Dockree.

THE TECHNICAL SCHOOLS, BATH.

THE LATE J. M. BRYDON, ARCHITECT.

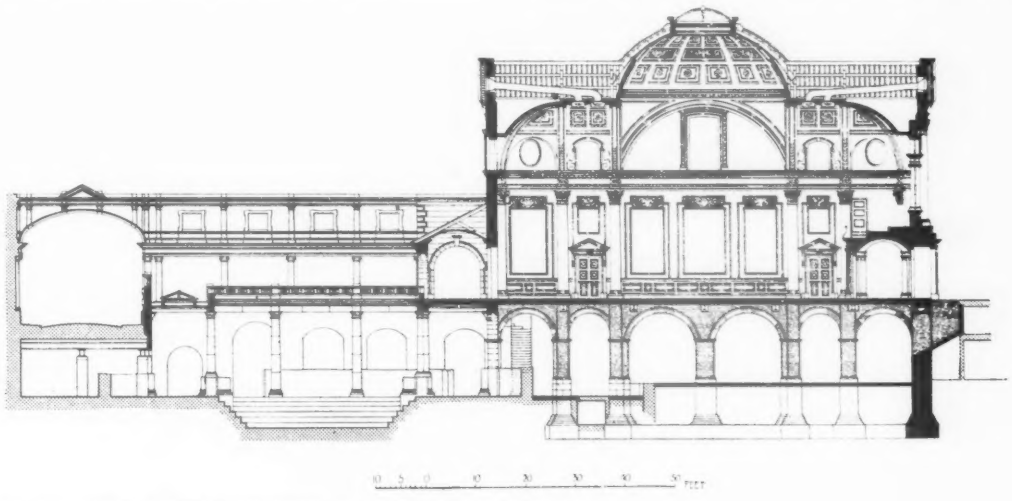
Brydon at Bath.—III.

Conclusion.

THE so-called Diamond Jubilee of Queen Victoria was marked by a public subscription for the erection of a picture gallery and library of reference. Mrs. Roxburgh represented the loyal feelings of the citizens of Bath by a munificent donation of £9,000 towards the expenses, and the remaining £4,000 was speedily forthcoming. Brydon was called upon to add to the science and art class-rooms which formed the northern wing of his municipal buildings. These buildings came up to the corner of High Street and Bridge Street, and terminated in a turret answering to that which faces the north transept of the abbey church, at the southern end of the Guildhall. Facing into Bridge Street, which leads down to Adam's Pulteney Bridge, the whole space on the south side is occupied by the new building, some 175 ft. in length. At the extreme eastern end is the principal entrance close to the river. It is well shown on p. 153. Another entrance under the centre of the north front admits to the library, and is flanked by plain windows on the lower storey. The upper storey, which is skylighted, has a series of niches, the centre one being filled by a statue of the late Queen. The whole building in its simplicity shows its purpose in every detail, and while it differs wholly from the municipal front in High Street, has a monumental character very appropriate to the historical event which it is intended to commemorate.

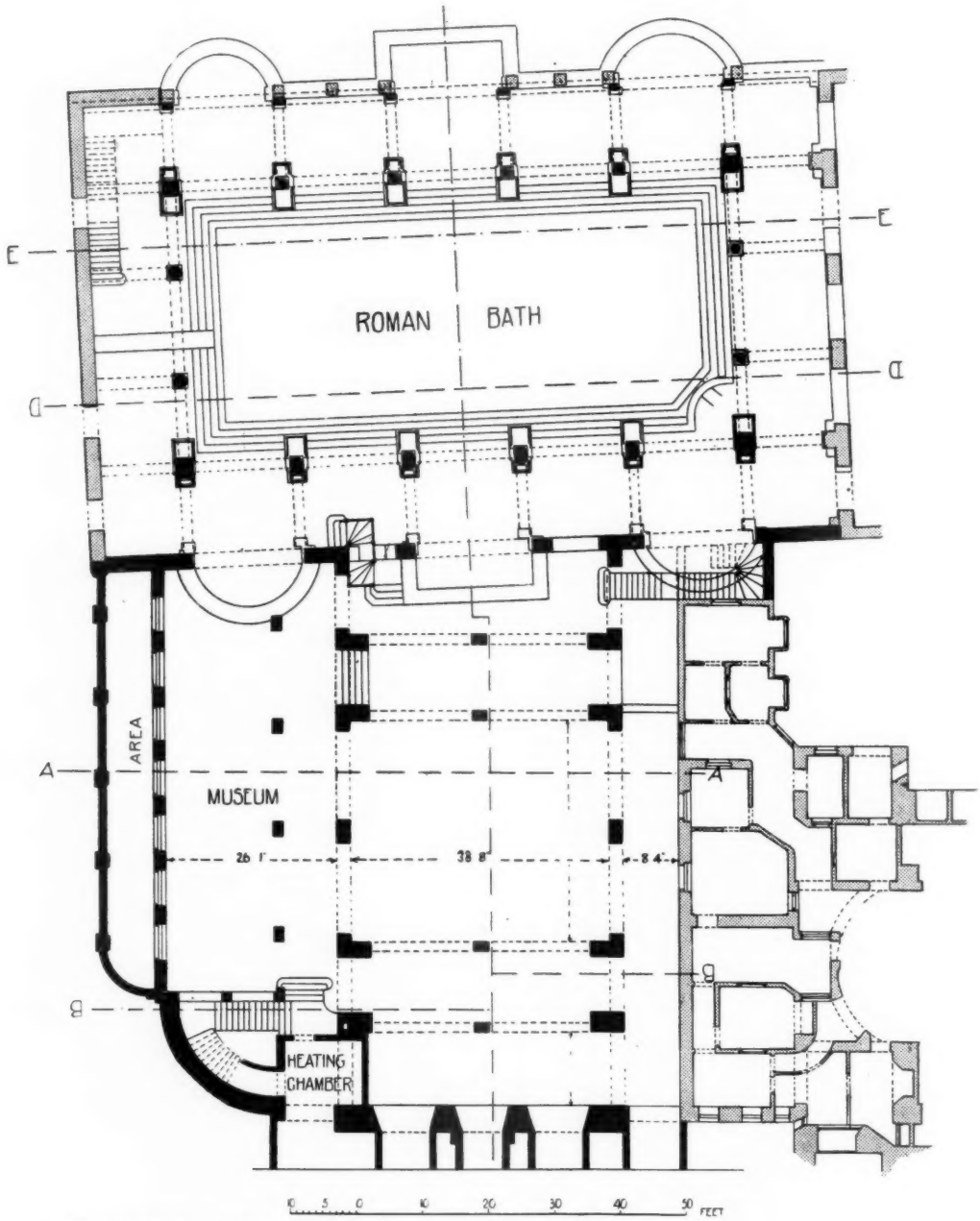
The library occupies part of the ground floor. It is 50 ft. long by 32 ft. in width. It contains an extensive and very valuable collection of books on the history and topography of Bath, together with a series of engravings and plans of the chief features of the ancient city. A print-room adjoins it on the east side and also opens into the vestibule of the eastern entrance mentioned above. This chamber measures 36 ft. by 32 ft., and, like the library, is 17 ft. 3 in. in height. It is furnished with cases containing rare objects of local interest, including old books and bindings, pottery, porcelain, and silver: while the walls are decorated with paintings. The principal entrance to the staircase and gallery is by the corner doorway just named, which admits to a circular hall or vestibule of great beauty, 22 ft. in diameter, from which a door opens at one side on the so-called print-room, where some books and other objects of local interest are exhibited. There is an archway on the south side to the staircase, and a vestibule above from which entrance is had to the gallery. The whole composition, including the two circular vestibules and the rectangular building which contains the staircase, merits close examination. The picture gallery is perfectly plain within except for the management of the lighting, which is very good. The gallery is 90 ft. long by 32 ft. wide, and at the sides measures 25 ft.; the centre, where are the windows, being 35 ft. in height.

From the examples described and figured in these articles it is easy to distinguish the characteristics of Brydon's work. We can, in fact, do more, for we can see why the little we have of it is so pleasing to the eye, why it appeals so directly to the judgment. With simple materials, the details which we recognise as "classical," those

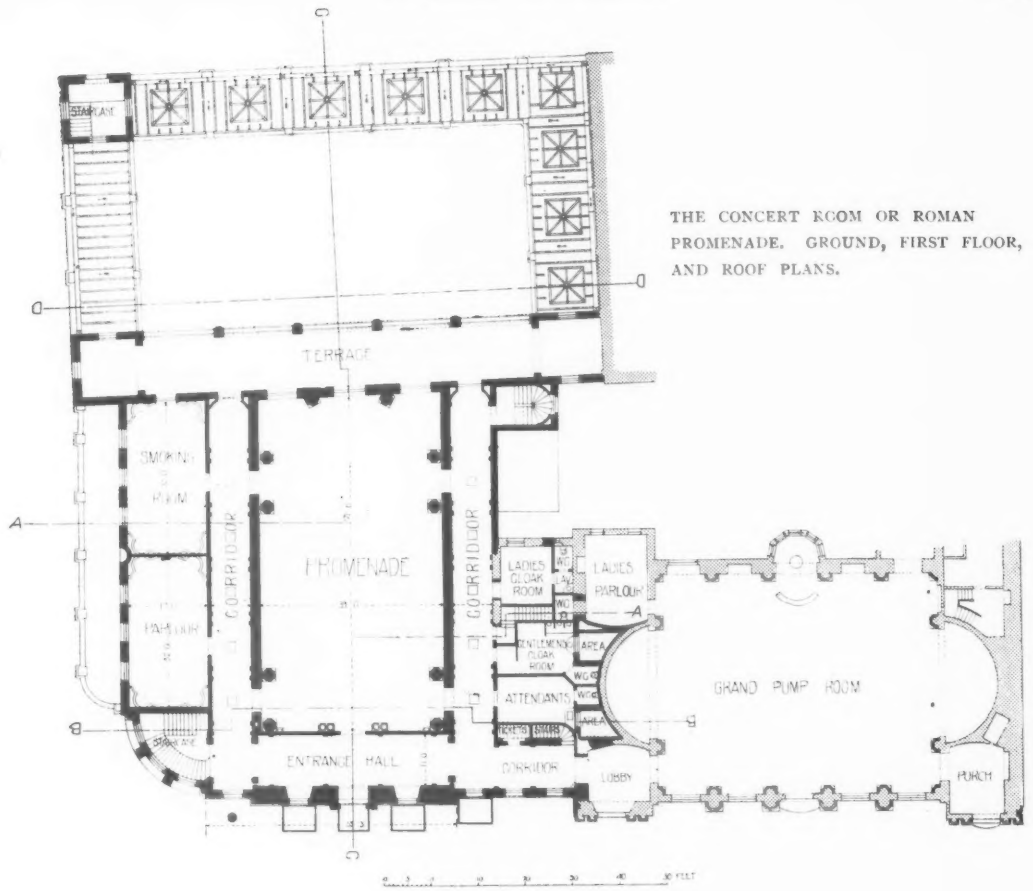


LONGITUDINAL SECTION THROUGH THE CONCERT ROOM AND CROSS SECTION OF THE ROMAN BATH.

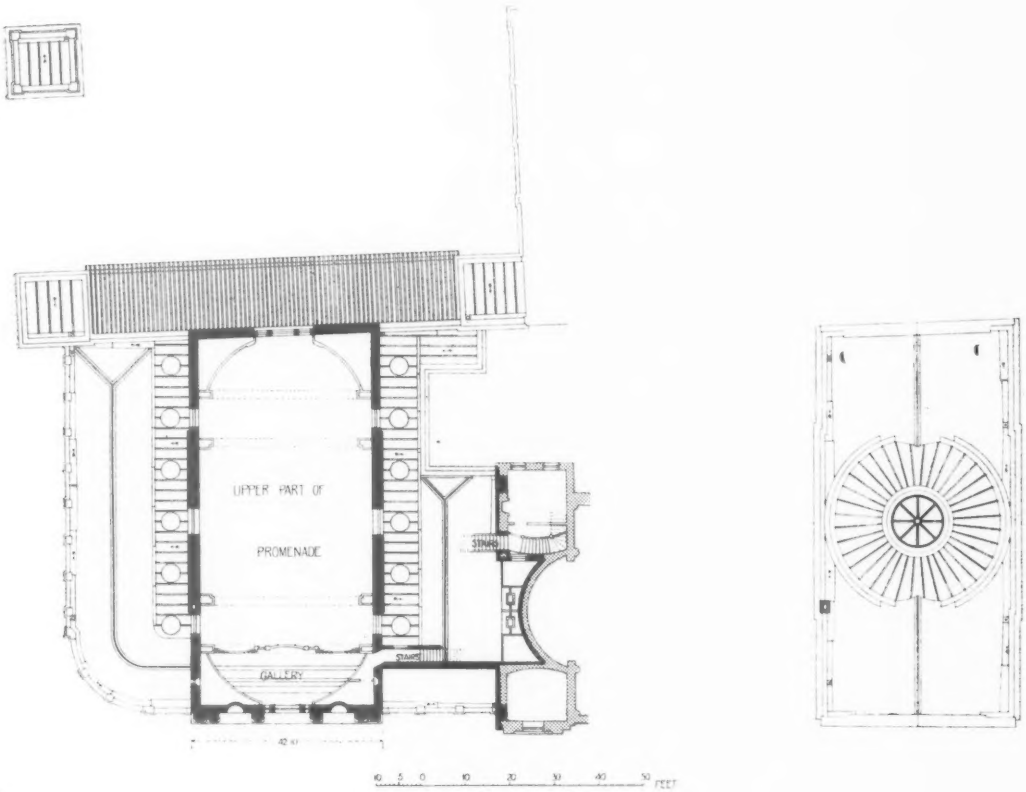
of Inigo Jones and Wren, he evolved buildings of no great size or importance, depending not at all upon ornament, yet complete in design, fitness, proportion, and suitability in a way unfortunately but too rare among modern architects. How would some of the eminent persons responsible in the last two or three generations for, say, the railway stations of London, have fared without every possible help in building construction, and without the most lavish ornament, not only to hide their deficiencies, but as an integral part of their design? What, for instance, would the Albert Memorial be without its carving and gilding and coloured stones? To Brydon ornament was a very desirable addition, occasionally a very sensible accentuation of the designer's intention, or what the Italians call *motivo*, to borrow a term from the sister art of music. The building did not require them. It might have been constructed of wood, clay, iron—anything, but no doubt the architect would have preferred gold and marble and mahogany. It is when you put the "ornamental architect" to build with mean materials that he fails, but it is when you put genius like, say, Wren's to work under the most adverse circumstances that he excels. Brydon, indeed,

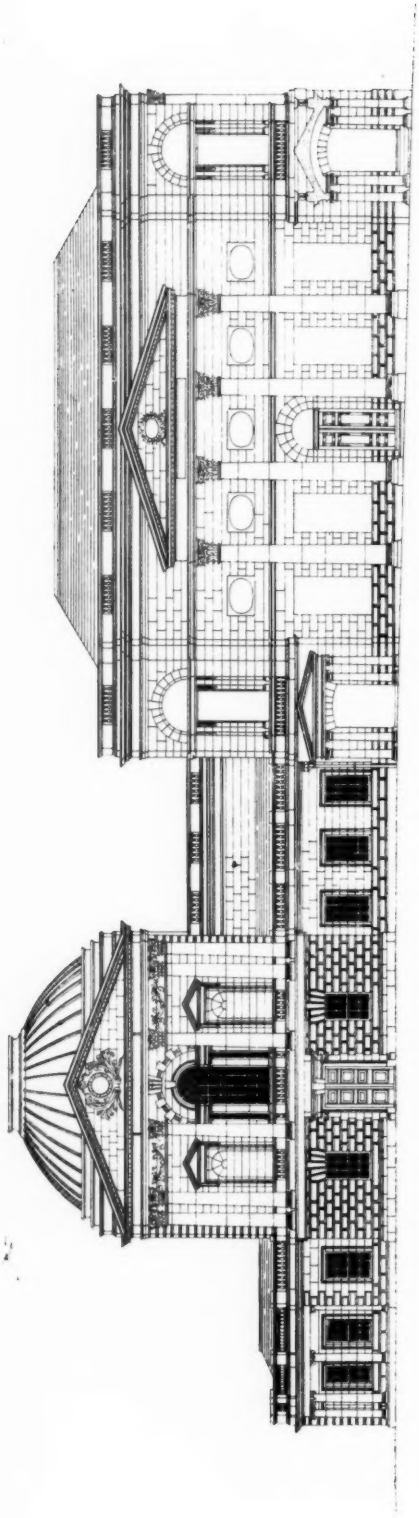


THE CONCERT ROOM OR ROMAN PROMENADE. BASEMENT PLAN.

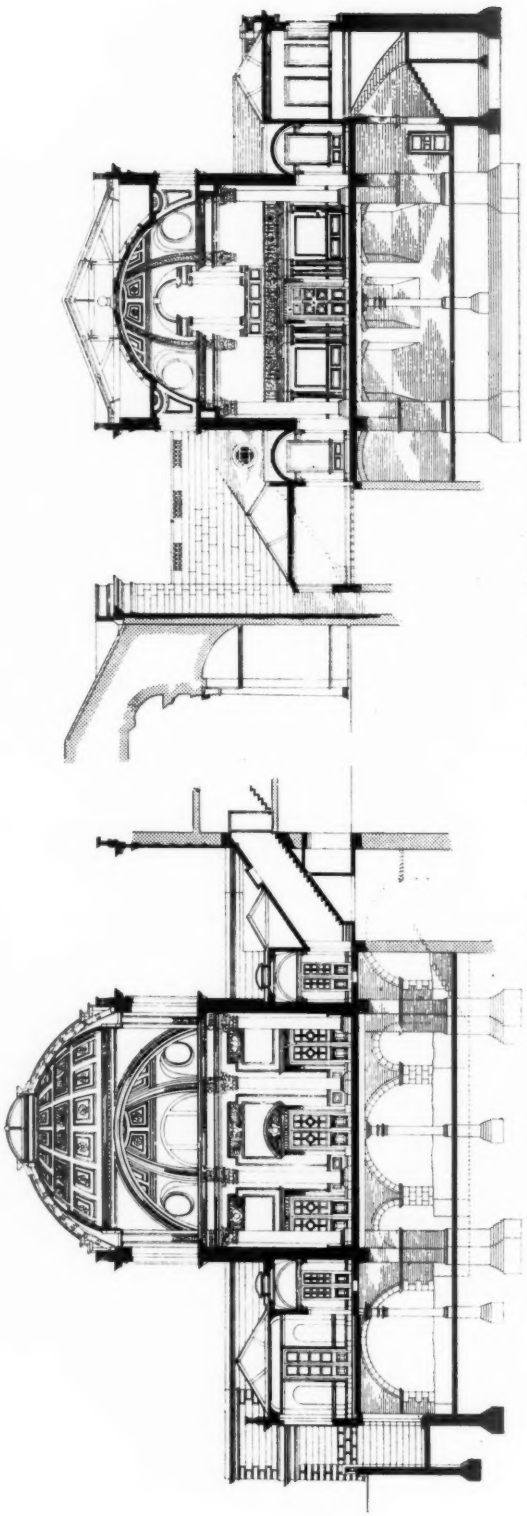


THE CONCERT ROOM OR ROMAN PROMENADE. GROUND, FIRST FLOOR, AND ROOF PLANS.





ELEVATION: THE CONCERT ROOM.



CROSS SECTIONS: THE CONCERT ROOM OR ROMAN PROMENADE, THE GRAND PUMP ROOM (OLD).

Photo: E. Dockree.

CONCERT ROOM. NORTHERN END.

had much to contend with, no one can now know how much, and those who supported him can have no greater cause of satisfaction than that which arises from being able to point out to the citizens of Bath how greatly he loved their city, and how greatly he added to its beauty. It is no light thing to say this. Prior to experience it might have been thought that no modern architect could add to the attractions offered by the beautiful work of the eighteenth century which the western city already possessed. So far in the nineteenth century, that is to say before Brydon appeared on the scene, no worthy addition had been made to the work of the two Woods and Baldwin. Gothic had made no progress, for, though it is very much in evidence near the railway station, the spear-like spike of St. John's Chapel can hardly be reckoned a favourable example. The first and

Photo: E. Dockree.

CONCERT ROOM SOUTHERN END.

best of the two big hotels stands near the Pump Room, and is heavy and absolutely without beauty, though inoffensive. This cannot be said of the second, which offends the eye in every view of the city. There were other buildings, chiefly of very little importance, and not one showing any ambition to emulate the older work, while the very interesting house in Orange Grove, always locally attributed to Lord Burlington, was destroyed to improve a bad approach to one of the hotels. Mr. Mowbray Green has shown that it was not designed by Burlington, but that it was one of the oldest examples of the style remaining, and could ill be spared. It would be easy to go about noting here and there a shop front or a doorway in which glimmerings of architectural taste, Gothic or classical, showed themselves; but it is certain that nothing of the slightest importance

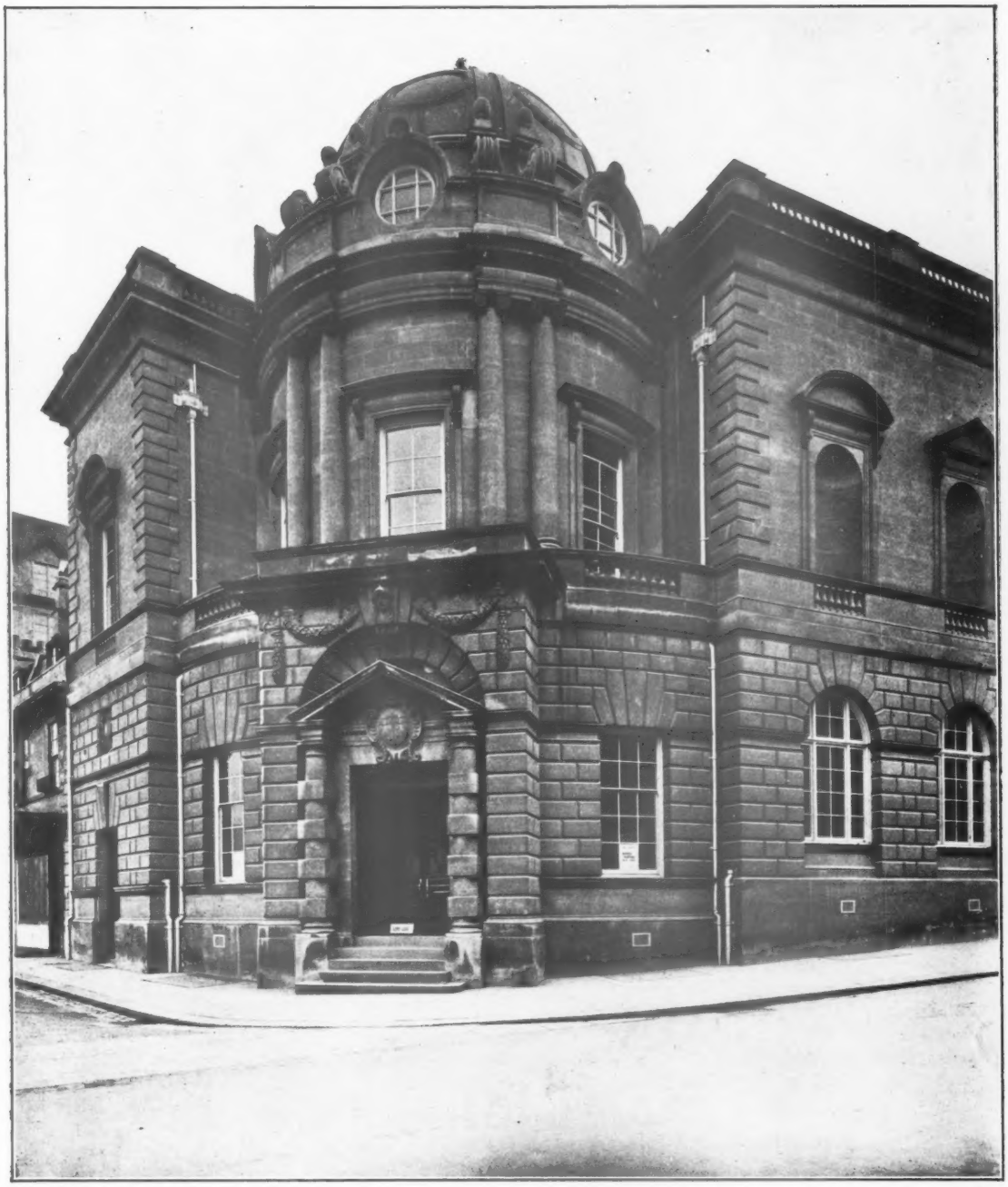


Photo: E. Dockree

ENTRANCE TO PICTURE GALLERY.

calls for notice before the appearance of Brydon. Of the narrow escape Bath had when he first offered himself for the favour of the citizens, I have endeavoured in one of the foregoing chapters to tell the tale. I have now only to sum up and to endeavour to impress upon the citizens of Bath the fact that in Brydon's work they have a series, far too short it is true, of buildings well worthy to rank with the Circus, the Crescent, or the north side of Queen Square, as examples not only of architecture, but of pure art in the abstract, and to point out, as one looking on disinterestedly, how valuable are the treasures which have been confided to their care. Theirs is a precious charge to keep uninjured, and hand on to posterity. Very few provincial towns in England can boast of civic buildings to rival in attraction the beautiful cathedrals and churches bequeathed to us by mediæval devotion; but it is satisfactory to note that

already an improvement in taste is apparent, and that works now in progress show signs of an influence which we cannot be wrong in tracing to Brydon, and to the high standard in architectural art which he set up in Bath. That this is the case should be recorded, the more so as it forms an example to all England. Great works are everywhere in progress, and now that the good taste exhibited at Bath can be seen and known of all, there is no longer so much fear as there used to be of a relapse. The improvement has made itself known, especially in Liverpool, in Dublin, and in Glasgow. Birmingham and Belfast have still to show their quality, and there is much to hope for in London, to which indeed many are looking for the last manifestation of Brydon's genius. How far the work now approaching the first stage of completion at Westminster will represent his great and final conception it would be too soon yet to say. We are only to have certain portions of the great design. Like Inigo Jones's palace for part of the same site, on which it was ostensibly founded, only a fragment is now being carried out—how much we can scarcely yet judge. Half the circular court will be better than none, and poor Inigo's great work did not attain even half. So we must be content with small mercies, and hope meanwhile that the architect's drawings will have been followed with nothing short of servility. We have been assured over and over again that in carrying out the designs for the new Government offices in Parliament Street, which are soon to be unveiled, the authorities of the Office of Works have been actuated by a single-minded desire to fulfil the deceased architect's wishes and adhere to his ideas. It is with a view to showing how lofty those aims were that the example of what he did at Bath has been adduced in the foregoing chapters. With the building last described, namely, the Picture Gallery, Brydon's work at Bath came to an end. The last touches had not been put to the Bridge Street building when their designer's death occurred in May 1901.

Cheap Cottages and the Exhibition at Letchworth.–II.

MOST of the cottages in this exhibition at Letchworth belong to the second division into which I have classified the planning, namely those with three bedrooms. This division admits of sub-division into (*a*) bungalows or cottages on one floor, and (*b*) cottages of two floors.

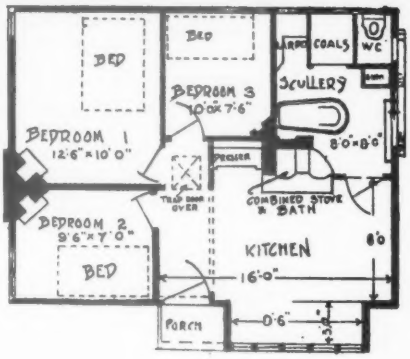
In the first sub-division there are practically only two types of plan; Figs. 5 and 6 belong to one, and Fig. 7 to the other type. Fig. 5 illustrates the cottage erected by the British Uralite Company (No. 53); it will be seen that the living-room or kitchen and a bedroom occupy the front, while behind these are placed two other bedrooms side by side, and a scullery. Fig. 6, a bungalow by Messrs. J. A. King & Co. (No. 48*a*), has the same arrangement, but is distinctly better in that the bedrooms are not in direct communication with the living-room, as in Fig. 5, because occasionally this room may be required to be occupied by persons who are not members of the family when some of the tenants have retired to rest: moreover, to have to wander out into the open to the w.c., especially at night, is not a very happy arrangement, while the provision of the roof over the bay window in Fig. 5 is needlessly expensive, although picturesque. Neither bungalow is roofed with a simple roof, and the plans might just as well have been squared up. The cottages built for the Marquis of Salisbury and designed by Mr. W. Marshall (No. 83) conform to this same arrangement, but have one bedroom leading out of another, and the latter out of the kitchen—hardly satisfactory—while the w.c. is in an outhouse separate from the cottage.

The second type of plan, Fig. 7 (No. 35), it will be seen differs only from the first in having the scullery sandwiched between bedrooms. By this arrangement only one chimney is required, which gains in economy over the two in the other type of bungalow, while it gives warmth in the house by being in the centre. The simple roof is a commendable feature, but the fact that two of the bedrooms are entered from the living-room is most objectionable, and as the communication of sleeping-rooms with living-rooms seems inseparable from this type of plan, it must be ranked inferior on the whole to Fig. 6. It will be noticed that to make the bungalow plan efficient a passage is necessary, which increases the area of floor and roof, and though a staircase is saved the space required for this latter would be no more than the extra passage room in the bungalow, considering that the space under and over the stairs can be partially utilised. To this type of plan belongs the cottage by Messrs. Clare & Ross (No. 59), and that by the Darlington Construc-

FIG. 5.—BUNGALOW BY THE BRITISH URALITE COMPANY, LTD.

WHEELER & SON, ARCHITECTS.

Constructed of 4 in. by 3 in. studding covered with "Uralite Kent Board" both sides, painted and sanded externally and whitened internally. Roof rough-boarded and covered with red "Uralite Kent Board" tiles.



tion Company (No. 72). The other bungalows in the exhibition are inferior and expensive variants.

Coming to the second sub-division (*b*) under which most of the cottages in the exhibition group themselves, there are two main types, namely those without and those with sitting-rooms. Figs. 8–17 belong to the first, and Figs. 18–25 to the second type. In these again there are sub-types.

The most elementary plan is to place the living-room and scullery on the ground floor, similarly to Fig. 2 (published in the first part of this article), with three bedrooms on the first floor. This is the arrangement in Fig. 8 (No. 62). Good points in this plan are the entrance hall that prevents visitors seeing into the living-room, and the small amount of passage room on the first floor. The entrance being at the side prevents the erection of more than two in a block. It would have been better to have made the scullery door to open from the entrance hall, and the bedrooms are awkward in shape. The w.c. is again not under cover as it should be. The overhanging top storey is easily possible in a weather-boarded upper floor, and gains extra space for the bedroom floor. Fig. 9 (No. 14) is a very similar arrangement to the last, but distinctly superior. The inclusion of the offices within the main walls has given on the first floor the area necessary for bedrooms of good size. There is little waste of space on this floor with passages. The w.c. is reached under cover, and yet excluded from contaminating the air in the house. The plan is a very good one, and it is difficult to see how it could be improved with the same requirements; but the fact of two chimneys being rendered necessary, the front entrance lobby being taken out of the living-room when there is already wasted space adjoining the stairs and upon the landing on the first floor, and the copper being inside so that the steam cannot escape, suggests the possibility of a better arrangement if remodelled. The plan is nearly square, the most economical shape. The design permits of being built in blocks or rows, but has the longest side to the front. It will be noted that no bath or bathroom is provided. The cost of this cottage is stated at £150 without extras, and thus conforms to the spirit of the competition. Messrs. Green Brothers, who I

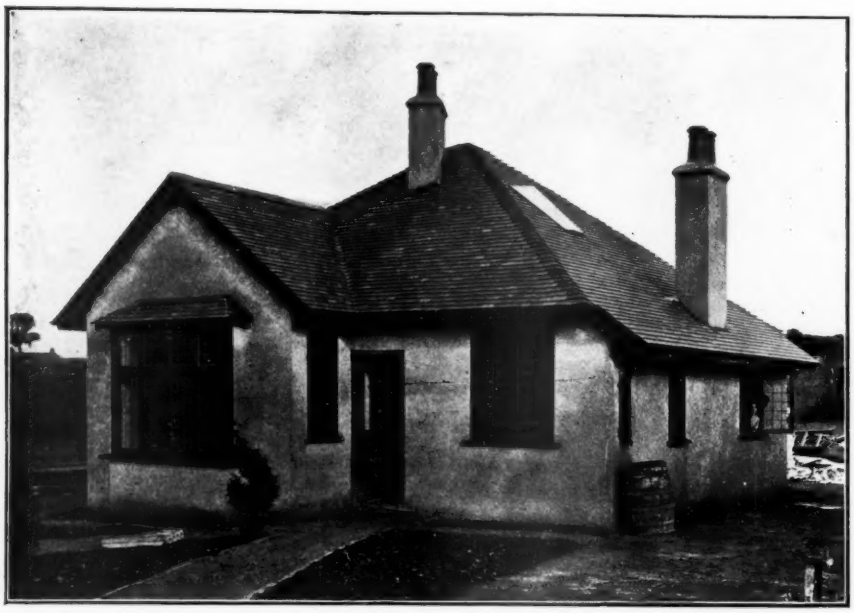
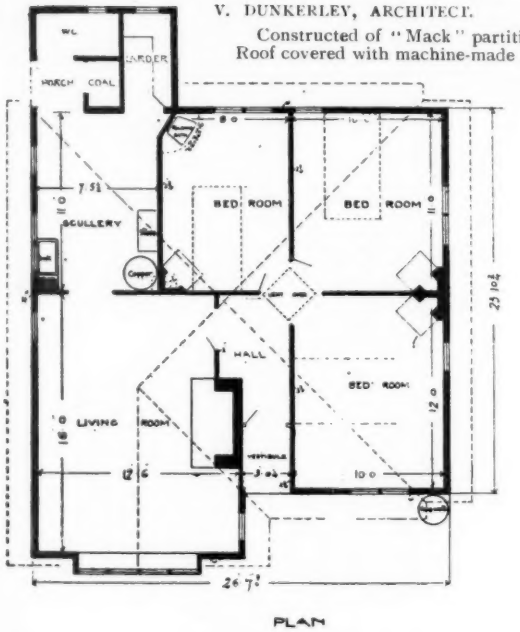


FIG. 6.—BUNGALOW BY J. A. KING & CO.
V. DUNKERLEY, ARCHITECT.
Constructed of "Mack" partition slabs, 4 in. thick, rough-casted.
Roof covered with machine-made tiles.



PLAN

understand have erected similar cottages before, express in the catalogue their preparedness to undertake to duplicate the cottage for £175, including builder's profit, architect's fees, and men's travelling expenses, and state that 3½ per cent. would be saved by erecting two together, and 5 per cent. by erecting four. When the size, accommodation, and materials of this and Mr. Clough's cottage (Fig. 23) are examined, it shows how much can be done with care. The walls are 9 in., built of local Arlesey bricks costing 20s. a thousand delivered on the site, cement rough-casted, and the roof covered with local red tiles. Fig. 10 (Nos. 67 and 68) is very much the same in plan as Fig. 9, except that the roof is complicated, the arrangement of offices not nearly so convenient, and more space is unutilised. The plans of Figs. 11 (No. 34) and 12 (No. 31) are not reproduced, as they are merely modifications in detail of Fig. 10. Mr. Agate's plan is square and compact, and saves one chimney over Mr. Houfton's design, and includes a bath. He places the cost at £140 nett. Mr. Curtis Green does not provide a larder, and has the w.c. entered from the house. He has used only 9 in. walls, whitewashed inside and out, and match-boarded partitions, and comparison with Mr. Houfton's or Mr. Clough's cottages leads to the conclusion that the stated cost of £175 each is excessive and could be lessened. Fig. 13 (No. 43) it will be seen is a further development of Fig. 10. There are a number of cottages being erected to this plan. It is apparent that the irregular form of the plan, the cutting-up of the roof, and the wasted space in hall and landing would make this plan more expensive than a simpler one, while there is more probability of repairs, the possibility of which must be taken into account by landlords. The buttresses introduced for effect do no work and are needless extravagances, for, being illogical construction, they are bad art. The scullery is a fair size, but as the oven is in the living-room most of the cooking must be done in the latter, although the name "kitchen-scullery" is given to the former. Messrs. Bennett and Bidwell's cottage (No. 23) has a similar arrangement of plan.

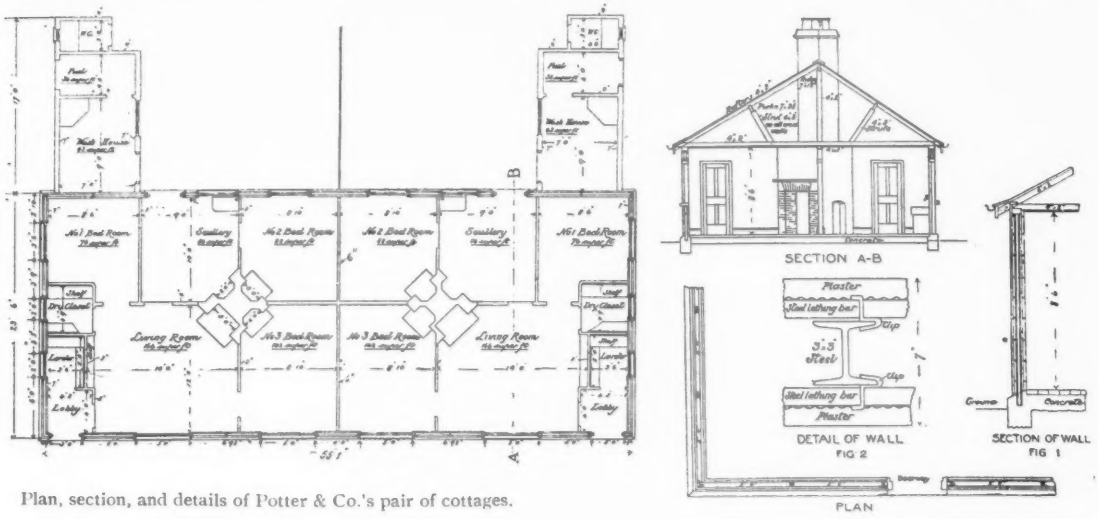
Fig. 14 (No. 47), while belonging to another subtype, in having a back addition, shows itself as a development of the square type by reason of the smallness of this back addition. There are good points about this plan, and it could be modified to be built in rows or larger blocks. In Fig. 15 (No. 81) we see the back addition fully developed until it becomes an L plan, which, as has already been explained, is not so economical as the square.

FIG. 7.—A PAIR OF BUNGALOWS AND A SINGLE ONE BY POTTER AND CO.

Walls of pair are hollow and constructed of expanded metal plastered.
Walls of single bungalow constructed of concrete *in situ*, 7 in. thick.

FIG. 11.—BRICK COTTAGE BY C. G. AGATE.

FIG. 12.—PAIR OF BRICK COTTAGES BY CURTIS GREEN.



Plan, section, and details of Potter & Co.'s pair of cottages.

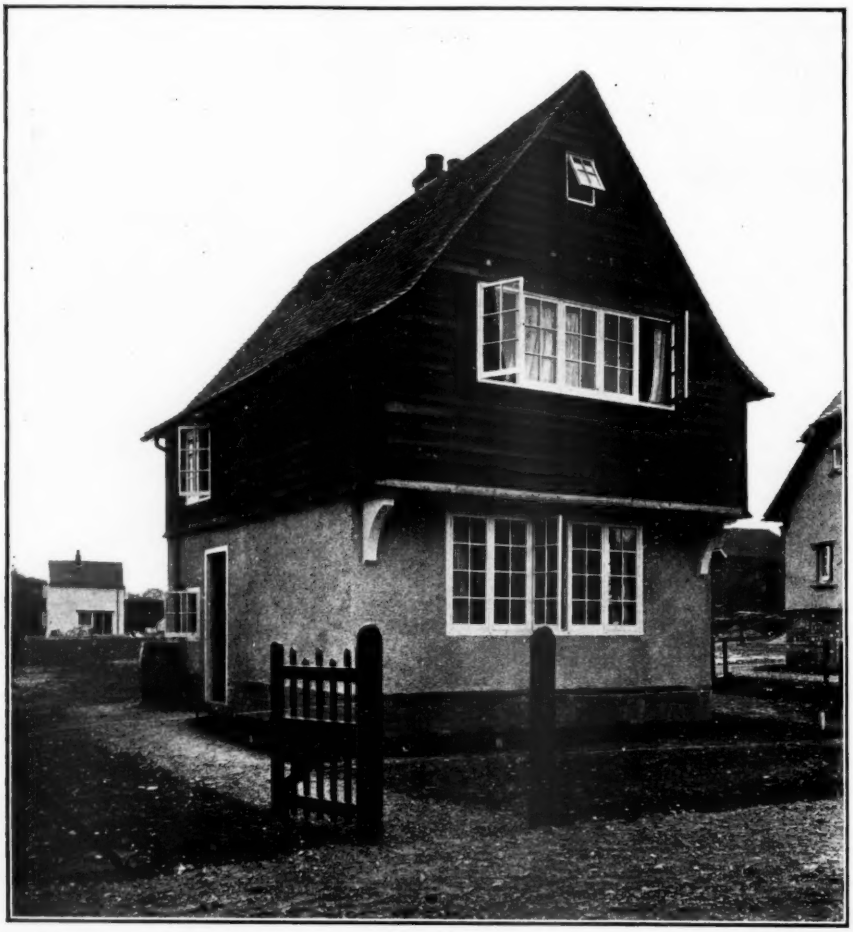
By starting the stairs two or three steps further back the smaller front bedroom could be improved, as headroom would not have to be taken out of it.

Fig. 16 (No. 19) belongs to another sub-type, namely, the oblong, with three bedrooms side by side. But this particular plan, although all very well as a single cottage, would need alteration for erection in blocks. This cottage contains some modern furniture by Messrs. Heal & Son, evidently intended for week-enders of the better class.

Fig. 17 (No. 80) is another sub-type, and is a very interesting departure from the ordinary plan which is offered as a solution by several exhibitors. More space is required for bedrooms than on the ground floor, where only living-room and scullery with offices are provided; one solution offered is to overhang the first floor, but Mr. Troup and others propose to place one bedroom on the ground floor. This provides a means of obtaining three bedrooms on the first floor, but Mr. Troup only provides two. To this sub-type belongs the pair of cottages by Mr. A. H. Clough (No. 70), and his single cottage (No. 71) costing £120.

The second main type of a cottage with sitting-room or parlour may now be considered. In Fig. 18 (No. 20) this is provided at the expense of a scullery—which will hardly commend itself to most persons, I think, as an improvement. Fig. 4, illustrated in last month's ARCHITECTURAL REVIEW, is a square plan, with parlour, living-room, and scullery, and three fair-sized bedrooms. The cutting-off of the parlour by the hall is fatuous, while there is far too much landing. Fig. 19 (No. 27) is approximately a square plan, and would have been more cheaply covered by a simple roof. The plan is well arranged, with almost a minimum of space in passages.

Fig. 20 (No. 01) is another good plan that may be reckoned another sub-type. Two larger blocks of cottages on practically the same plan were illustrated on pp. 14 and 15 of THE ARCHITECTURAL REVIEW for July. The front room is large, but the "mocked" party wall does not seem to offer



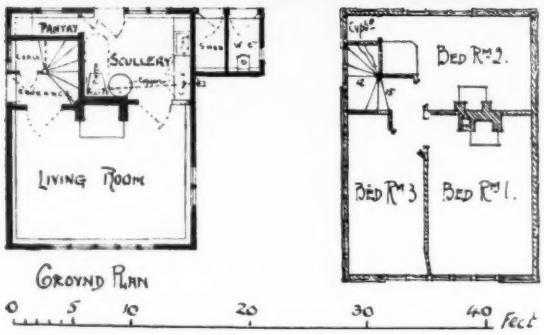


FIG. 8.—BRICK, ROUGH-CAST, AND WEATHER-BOARDED COTTAGE. OSWALD P. MILNE, ARCHITECT.

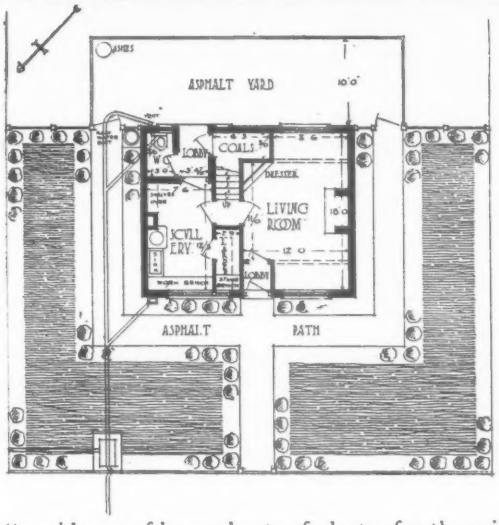
any particular advantages. The staircase would be better at the front, as on the left-hand plan, and if it began without winders where the fourth step now is, and the winders were relegated to the top of the staircase, the front bedroom would be given more room and a small entrance hall could be provided instead of the front door opening straight into the room and giving visitors a sight of the interior. The back addition, too, should have been narrower, so as to allow the back room more light. Fig. 21 (No. 65) conforms to the same general arrangement, except as regards the elevation made to face the road. This plan is also a good one, and would do well for a week-end cottage; it is quite outside the problem of the agricultural labourer's cottage. Mr. Scott is honest in his claims, and the cottage is a charming one.

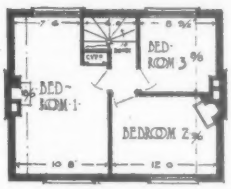
Fig. 22 (Nos. 41 and 42) illustrates another sub-type of plan which is a development of Fig. 21, the parlour and living-room being placed the same way, facing the road; but the scullery in this case is put at the back, and a small bedroom stands over a small back addition.

In Fig. 23 (No. 69) we come to another variant that compares with Fig. 16. This is the oblong type, in which the building is one-room deep. Mr. Clough's plan is a very practical one; he has had great experience now, having erected about one hundred cottages. It contains a remarkable amount of accommodation for the money. It would have been slightly cheaper, perhaps, if the kitchen and parlour fireplaces had backed on to each other, so economising one chimney, and it would, in my opinion, be preferable to reach the coal and earth-closet under cover by altering the door from the scullery. The dormers also add to the cost, and if brickwork had been used for the upper floors, especially 4½ in. thick and rough-casted, there would have been a slight saving over the mansard roof.

Fig. 24 (No. 79) follows this same style of plan, being, however, larger. There are many absurdities in this design, and the cost was greatly underestimated. There seems little object in having rounded angle-bricks at the corners; all such additions to the cost, however small, should be eschewed. The joists are about 9 in. by 3 in., which is excessive, but being this size there would be no deflection to crack the plastering, and the architect's remark in the catalogue about the

FIG. 9.—BRICK, ROUGH-CAST COTTAGE WITH TILED ROOF, BY GREEN BROTHERS. PERCY HOUFTON, ARCHITECT.





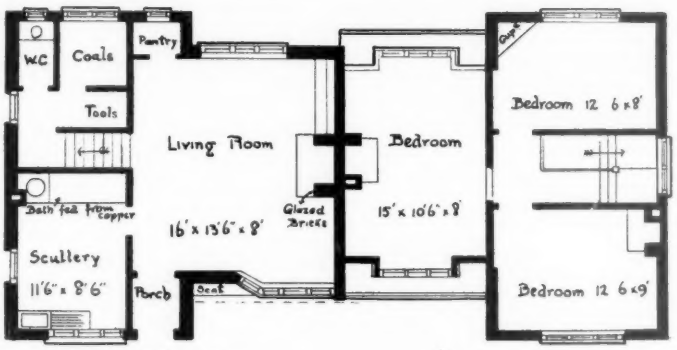
BEDROOM PLAN.

"avoidance of large sheets of plaster for the ceiling on account of their becoming cracked and broken from the spring of the joists" is uncalled for, while he counteracts his own argument by plastering between the joists on laths nailed to the underside of the floor boards, which, of course, give, and would let moisture through the floor when scrubbed, as may be expected to be done often in a cottage of this class. The staircase is open to the roof, and occupies the highest part of the bedroom floor, the roof coming down so that it cuts off the sides of the rooms. There is no provision for cupboards over the stairs, and therefore a good amount of the cubical contents of the building is wasted. I cannot see the object of placing the bathroom directly under the scullery-window for passers-by to look in or be able to see shadows on the blinds. Also, why the majority of the partitions should have been of brick is incomprehensible, nor is it clear why the coal-house is plastered. The casement windows, too, are hung the wrong way about, so that rain can run down the face of the window and penetrate inside without any provision being made to prevent it. The glass is puttied on the inside, so that in the course of time when it comes away there will be only the brads to keep the glass from blowing in when there is a strong wind. I am very sceptical as to the brick fireplaces being as cheap as ordinary cast-iron cottage-grates. It is difficult to see any beauty in hanging the ledged and braced door of the linen-cupboard in one of the bedrooms, so that the plain side is exposed to the cupboard and the ledges and braces to the room. Fig. 25 (No. 58) is another development of this same type of plan, the scullery, however, being here placed in the centre and the offices relegated to a small back addition. The building is, of course, hopelessly extravagant for an agricultural labourer.

Materials.—This is a very important branch of the subject, because these form such a large

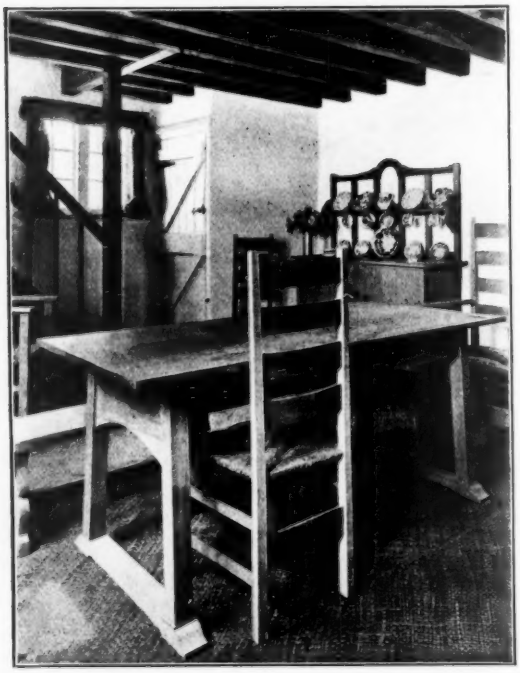
proportion of the final cost, and affect the amount of labour required in the erection of a cottage. Of course it is necessary to purchase materials in the cheapest market, and the advantages of buying in quantities need not be enlarged upon. The importance of having the drawings thoroughly worked out from the start and accurate quantities taken off is obvious. Plenty of working drawings of details of construction are also necessary, as this will enable joinery to be prepared beforehand at the factories, and there seems no reason why carpenters' work might not be prepared in the same way, the joists and roof timbers being cut to exact sizes. The staircases can be fitted at the shops. The purchase of stock doors, ironmongery, grates, etc., should, of course, be carefully gone into, and worked in wherever possible.

It is difficult to compare the cost of various materials, as the conditions of each problem are so different and so largely influence the price. What is cheaper in certain circumstances may be dearer in others. The cost of every material naturally depends upon the amount of labour expended on its production, and in a building the final cost upon the labour to be expended in fixing, and its lasting qualities and freedom from repair. In considering the cost of any material it is well to inquire into the actual process through which it has gone during manufacture, how much work is put into it, the cost of labour, of carriage, and finally the amount of work necessary to make it efficient for service in a building.



Ground-floor Plan. First-floor Plan.

FIG. 10.—PAIR OF COTTAGES BY CO-PARTNERSHIP TENANTS' HOUSING COUNCIL, LTD. V. DUNKERLEY, ARCHITECT.



LIVING-ROOM IN COTTAGE. LIONEL CRANE, ARCHITECT. FURNITURE BY HEAL AND SON.

The following is an attempt to roughly ascertain the cost of various materials at present in use for building cottages, compared under equally favourable conditions and to the same unit, namely, per square foot of surface :—

Brickwork costs about 10*d.* per foot, 9 in. thick, inclusive of labour and materials; 4½ in. thick it costs about 6*d.* If the patent system of the Fireproof Partition and Spandrel Wall Company, as adopted in cottages No. 40 and 60 at Letchworth, be used, the cost of a 4½ in. wall would be slightly increased by the hoop-iron construction which has to be adopted to strengthen the wall. A 4½ in. wall may be regarded, even if constructed in cement, as unsatisfactory, unless rough-casted, which will cost about 1½*d.* per foot. Some persons will no doubt ask for the brickwork to be plastered inside. This will cost about 2*d.*

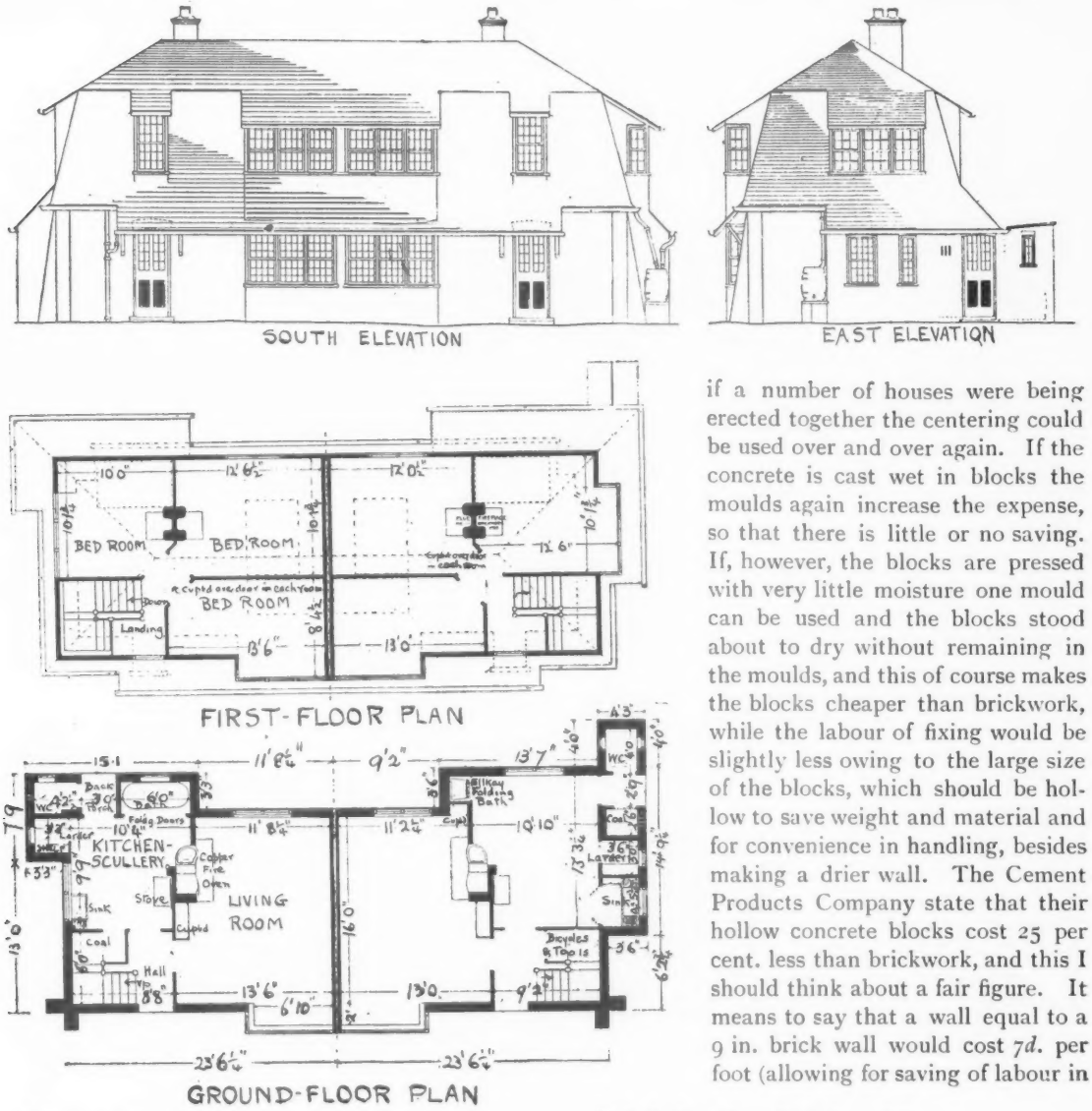


FIG. 13.—PAIR OF BRICK COTTAGES FOR THE LETCHWORTH BUILDING SYNDICATE.
V. DUNKERLEY, ARCHITECT.

per square foot. Thus a 4½ in. brick wall, rough-casted on the outside and plastered internally, would cost about 9½*d.*, and a 9½ in. brick wall, plastered internally, about 1*s.* per foot super. Hollow bricks or blocks are now made, which would enable a wall to be constructed that would be drier than a 4½ in. solid, but the cost would be as much as ordinary solid brickwork.

When bricks are unavailable in the locality, rough random rubble might be used, and would cost about the same as a 9 in. wall for equal efficiency.

Concrete is another material, and if used *in situ* the cost of the centering has to be added to the materials, and this sets off any saving in the case of the raw materials for isolated cottages, although if a number of houses were being erected together the centering could be used over and over again. If the concrete is cast wet in blocks the moulds again increase the expense, so that there is little or no saving. If, however, the blocks are pressed with very little moisture one mould can be used and the blocks stood about to dry without remaining in the moulds, and this of course makes the blocks cheaper than brickwork, while the labour of fixing would be slightly less owing to the large size of the blocks, which should be hollow to save weight and material and for convenience in handling, besides making a drier wall. The Cement Products Company state that their hollow concrete blocks cost 25 per cent. less than brickwork, and this I should think about a fair figure. It means to say that a wall equal to a 9 in. brick wall would cost 7*d.* per foot (allowing for saving of labour in

FIG 15.—WEATHER-BOARDED COTTAGE.
SMITH & BREWER, ARCHITECTS.

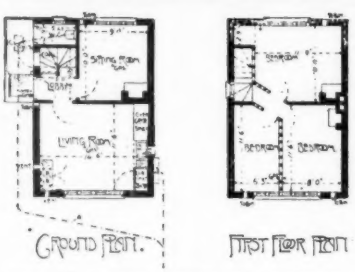


FIG. 18.—BRICK COTTAGE BY THE BOURNVILLE VILLAGE TRUST.
H. BEDFORD TAYLOR, ARCHITECT.

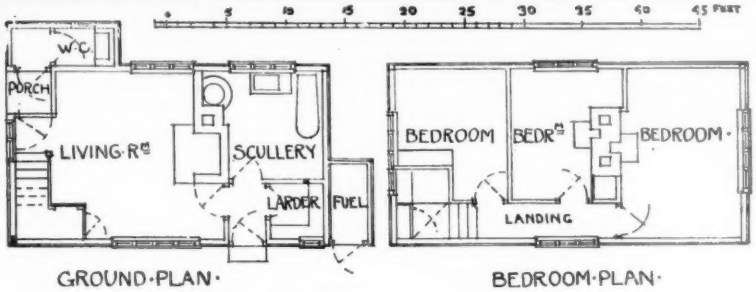


FIG. 16.—WEATHER-BOARDED COTTAGE.
LIONEL F. CRANE, ARCHITECT.

erection). But concrete is cold and condenses moisture, and this is unhealthy and prevents a wall-paper remaining on a wall, for which reasons it has been largely forsaken by the Germans, who have had more than thirty years' experience of it. The same difficulty is being experienced in America, where concrete blocks have been largely boomed, and it seems therefore that plaster must be used. This would bring the cost up to about 9*d.* per square foot. Reinforced concrete does

A BEDROOM IN COTTAGE BY LIONEL CRANE. FURNITURE BY HEAL AND SON.

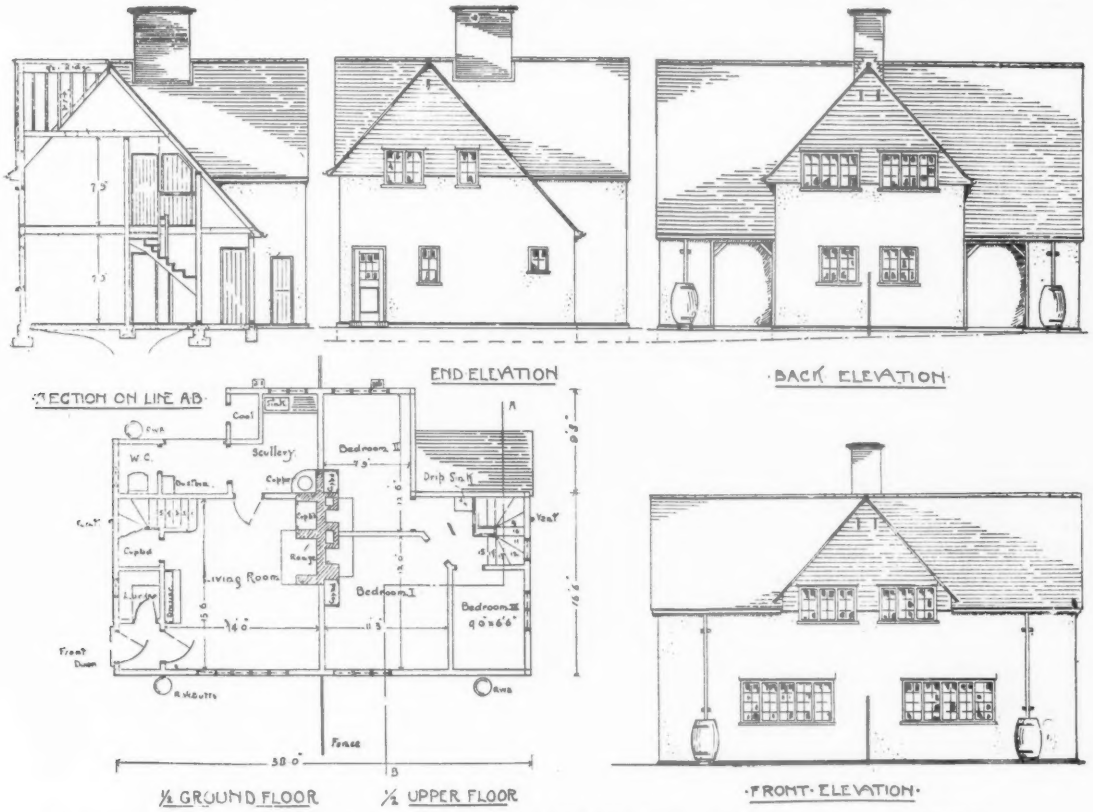


FIG. 14.—SINGLE COTTAGE AND PAIR OF COTTAGES BY THE NEW EXPANDED METAL COMPANY, LIMITED. OLDRID SCOTT & SON, ARCHITECTS

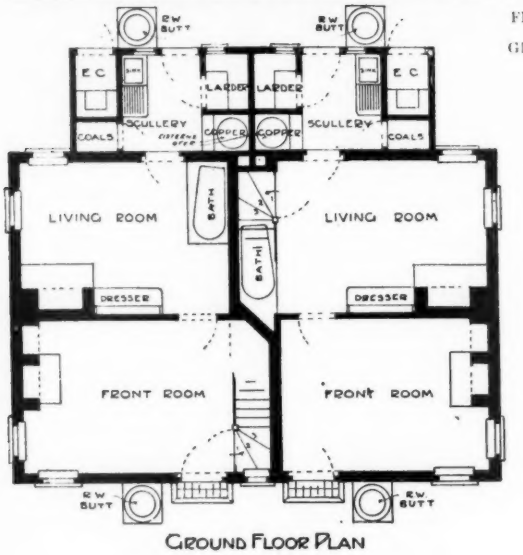
Walls constructed of expanded metal lathing and plaster on timber framing, giving 4 in. hollow space. Internal partitions of expanded metal and plastering 2 in. thick; similar lathing used for ceilings. Roofs covered with "Asbeslate"

FIG. 19.—BRICK COTTAGE. ALLEN FOXLEY, ARCHITECT.

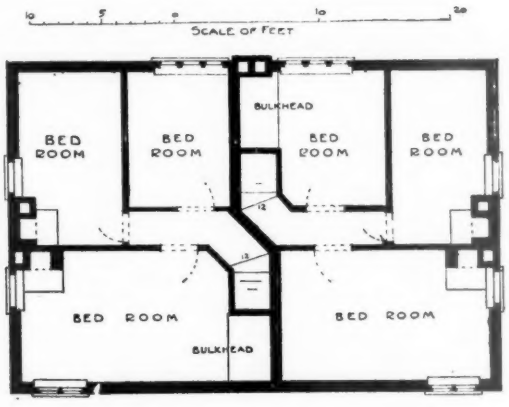
not appear to offer any advantages; the metal reinforcement would only add to the cost. Concrete slabs require a timber framework and plastering internally, which renders them as expensive as a brick wall 9 in. thick.

There are the "Kulm" pumice-stone concrete partition blocks and the "Mack" and other plaster partition slabs which offer advantages. They need rough-casting outside and two coats of plastering inside, and

FIG. 20.—PAIR OF BRICK COTTAGES.
GEOFFRY LUCAS, ARCHITECT.



GROUND FLOOR PLAN



FIRST FLOOR PLAN

the cost would work out at 7*d*. to 9*d*. per square foot.

The old lath-and-plaster cottages have been spoken much about, but they are a continual source of repairs, and they harbour rodents and smaller vermin. Expanded metal lathing is proposed as a remedy, and cottages erected by the Expanded Metal Company (No. 47) and Messrs. Potter & Co. (No. 35) are interesting. The cost of the framing, two thicknesses of expanded metal, plastering and rough-casting externally and internally, etc., would bring the cost up to about 9*d*. per square foot.

There are several timber cottages in the exhibition constructed externally with weather boarding on framing, and plastered internally, or of large boards plastered internally. The cost of such would amount to about 7*d*. per square foot, but the danger from fire and the encouragement

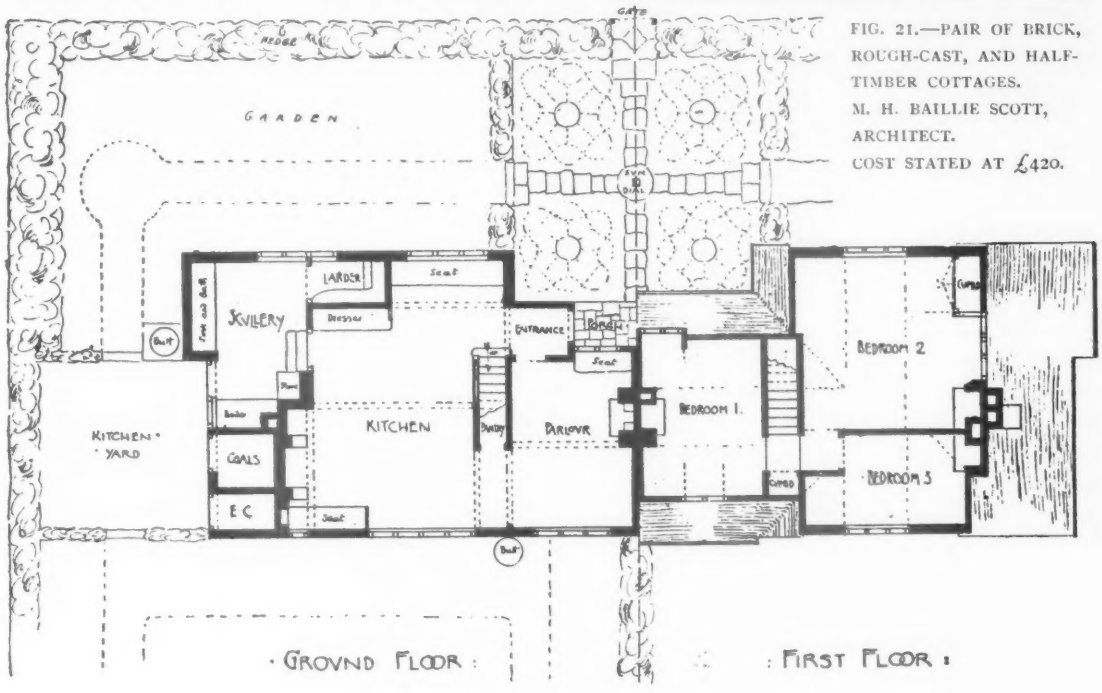


FIG. 21.—PAIR OF BRICK, ROUGH-CAST, AND HALF-TIMBER COTTAGES.
M. H. BAILLIE SCOTT, ARCHITECT.
COST STATED AT £420.

given to fungus and vermin will always place timber in the position of an inferior material.

Galvanised iron does not last for many years, and the cost of the timber framing renders it more expensive than timber, namely, about 8*d*. per square foot, while it is not more efficient, and can only be regarded as a temporary construction.

Vertical tiling and slating seem to have been overlooked by competitors. They are both very good materials. If tiles are used I would advise a sheet of "Ruberoid" or similar material being fastened underneath; the cost of these, together with internal plastering, would amount to about 11*d*. per square foot. If slating were adopted without "Ruberoid" the cost would be about 9*d*. "Uralite," "Asbeslate," and other similar materials approximating to slating, but made in larger sizes and thicker and able to be cut with a saw, have

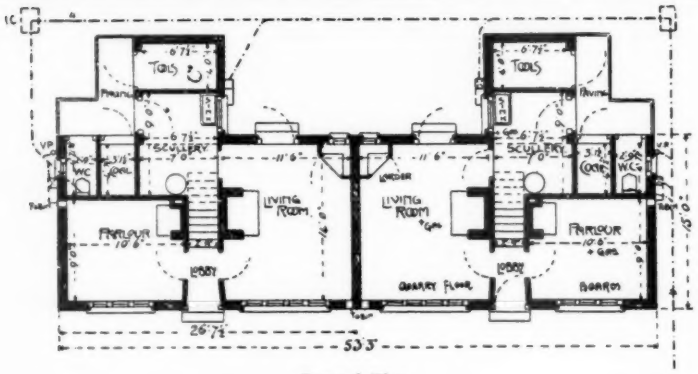
their uses, but their cost is difficult to ascertain. It would probably be about 10*d.* or 11*d.* per square foot inclusive of internal plastering.

The efficiency of the many new materials after a few years' wear is often questionable, and it would be well if the cottages at the exhibition had been allowed to stand over the winter before judgment were passed on them.

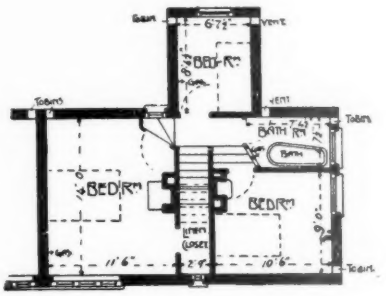
Concrete cannot be beaten for foundations. For walls there are available several materials referred to above. The chimneys must be of brick. Partitions are best of plaster, pumice-concrete or terra-cotta blocks, or expanded metal and plaster. The last is perhaps the cheapest, though the blocks run it close and economise space. I do not favour matchboarding for partitions. For roofs, slates and tiles cannot be bettered for durability and price, the former being the cheaper. Thatch is inadvisable, and oak shingles, etc., are generally dearer or liable to catch fire. A flat roof offers no economy over one of low pitch, is often dearer, and not carrying the water off so well is productive of repairs. As to floors, timber cannot be beaten for the upper floor, while boards nailed direct on the concrete, tiles, and bricks save a small height in the walls and are most economical for the ground floor; wood blocks wear unevenly, swell when not properly seasoned and wetted, and cost more, so that they are not advisable. Ceilings should be plastered, and whitewashed boards are objectionable, as they shrink and let dust or water through.

Fittings.—Under this heading come a variety of necessary things which affect the cost materially. The doors and windows, it has been stated above, should be of stock sizes or standardised throughout, so that a quantity can be made to one design. Swedish joinery is cheap, though English machine-made joinery is only a little dearer. The ironmongery should be simple, and Norfolk or Suffolk latches are sufficient for all interior doors. Ranges and stoves should be of the most everyday pattern; merchants' catalogues will afford plenty of information as to cost. The large discounts will need to be ascertained for comparison.

The "Larbert" range is a very cheap one, and "oven and sham" is better than with boiler, as the latter wears out or gets cracked after a few years and is a source of trouble and annoyance. A fair-sized range costs little extra and is much more appreciated, but it must not be too large, as the agricultural labourer cannot afford much fuel. Small grates for bedrooms are so cheap that the construction of specially designed brick fireplaces with or without specially wrought iron bars, although ingenious, is not so economical. A small portable copper with flue pipe is cheapest, unless it adjoins a chimney flue. The advisability



Ground Plan.



First-floor Plan.

FIG. 22.—PAIR OF BRICK COTTAGES BY THE BOURNVILLE VILLAGE TRUST.
H. BEDFORD TAYLOR, ARCHITECT.

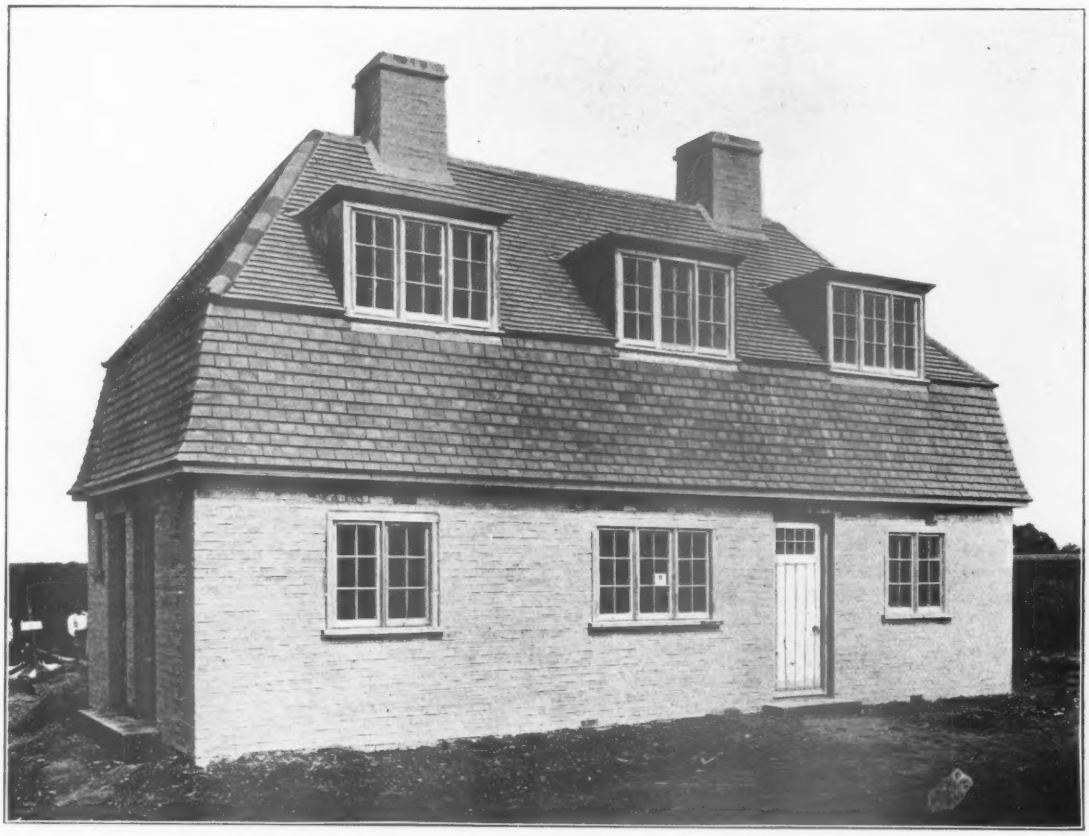
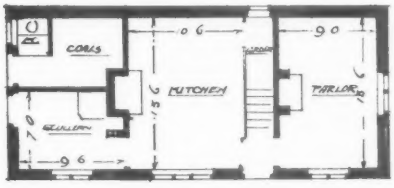
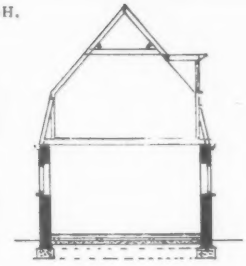
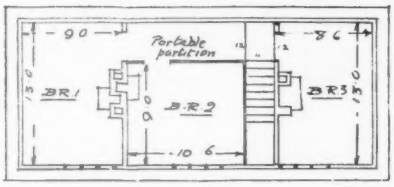


FIG. 23.—BRICK COTTAGE BY A. H. CLOUGH. COST STATED AT £135.

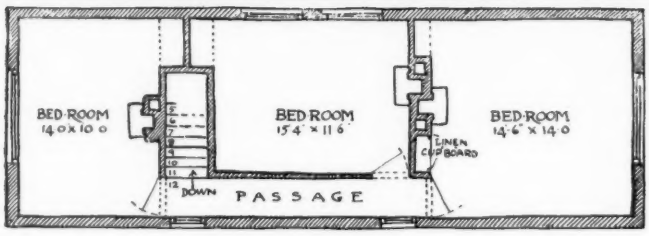




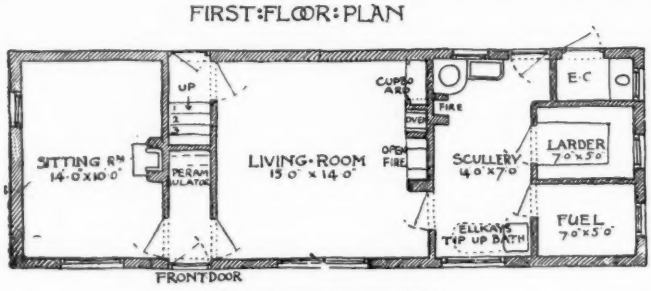


of providing a bath has been already considered. The combined baths, boilers, ranges, etc., are admirably ingenious and no doubt are useful, but their cost is comparatively great and cannot often be afforded. A sink has been adversely criticised by some as insanitary, and an open gully advised instead, but I do not agree with this. The plumbing and drainage should be simple, and the planning should be studied in this respect. Pipes should be short in length, and taps, etc., can often be better fitted on lead pipes at large shops and fixed without the expense of engaging a plumber on a job. When building in rows, if a sewer is carried down a back passage the drains need not pass under the houses, and this also saves in the opening-up of roads. The simplicity and saving of gutters and down-pipes should also be studied closely. Where w.c.'s are not possible, earth closets can be easily constructed and are better than cesspools; there is sometimes a difficulty of obtaining dry earth. Occasionally a dresser seems to be reckoned in the furniture; it is, however, always expected to be provided, and should be.

Cartage.—The carriage of materials is often a very important item. Railway and canal rates need not be dealt with here. It is well to order materials in quantities all at one time, so as to save money. In the country sites are frequently far from railways and centres of supply, and long cartages are necessary. This affects the choice of materials, and local ones, such as rubble or timber, may be best. It is here where concrete blocks may be advantageous. The machinery is small and can be easily taken on to the site, and the blocks there manufactured. In the winter, carts, horses, and men are often idle, and then is the best time to undertake cartage. The objections usually raised to doing work in the winter are

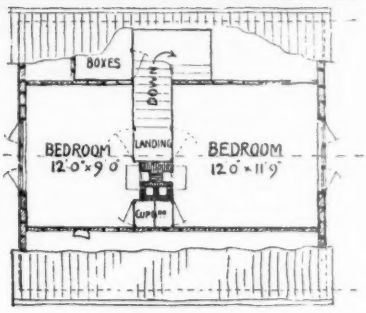


FIRST FLOOR PLAN

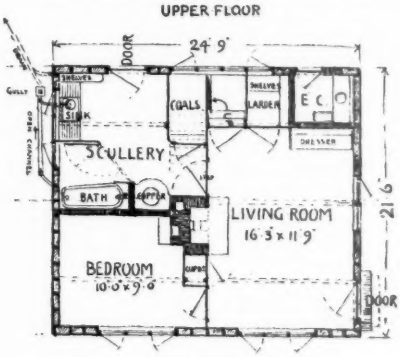


GROUND FLOOR PLAN

FIG. 24.—BRICK COTTAGE. A. RANDALL WELLS, ARCHITECT.



UPPER FLOOR



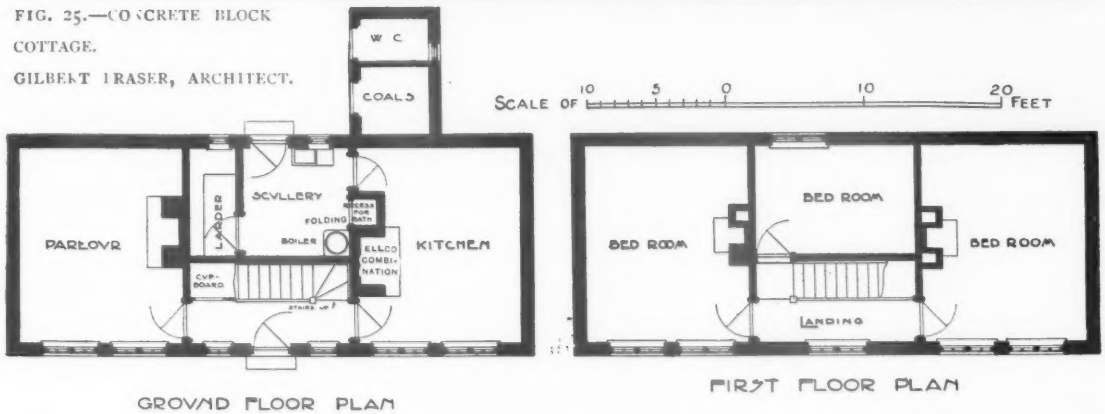
GROUND FLOOR

FIG. 17.—WEATHER-BOARDED COTTAGE.
F. W. TROUP, ARCHITECT.

unreal. The frost is not long continuous, and only affects the erection of walls, which can be built with freshly-slaked lime, as in Norway and Sweden, without danger. Labour, too, is plentiful and cheap in the winter.

Labour.—This is probably the most important question in the whole subject, and is not sufficiently considered. There is not the slightest doubt that workmen do not work well on a time payment basis. It is only natural to expect a workman in the country, especially in the winter, to last a job out as long as possible, as he does not know where or when his next is coming. The minimum wage as a standard discourages men, and is flying in the face of nature, for the best must win. The better workman should get the better pay. Small builders are largely dependent upon their workmen, and find it advisable to pay on the time basis; they overlook a certain amount of "ca'canny," and often both builder and men are combined in an endeavour to fleece the public. The former are very often unlettered and ignorant men and they waste money. The better plan for a landowner is to buy materials himself, and engage labour direct under the supervision of his estate agent and estate clerk of works, or a good foreman. Speculative builders who have a continuity of work keep good men in regular employment, often paying them more than the minimum rate of wages, and this policy is not objected to by the trade unions, who will often assist by recommending good men. I have found the following piecework system to work well, and

FIG. 25.—CONCRETE BLOCK COTTAGE.
GILBERT FRASER, ARCHITECT.



GROUND FLOOR PLAN

FIRST FLOOR PLAN

I cannot see that it is open to any real economical or ethical objection. Standardised plans having been prepared, careful and full quantities are taken out, materials purchased, and men for the different trades to undertake the labour piecework are advertised for in the local papers. Plenty apply, submit bids, and sign an agreement with a time limit binding them to accept payment of a weekly wage amounting to the wages usually received under the trade union minimum rate during the continuance of the job, no matter what the value of the work done, or if they do not execute a due proportionate amount of the whole the value to be deducted. The men are thus bound to no special limit of hours, and need not be at it all the week if they work hard, and at the end of the job they have a nice lump sum to take. Each man will have his mates, and a gang can be got together that will give every satisfaction. A rough check is to insist on one cottage being completed per week, before payment is made. This may often be the starting of a workman as a master man.

It would be easy to go on elaborating the subject further, with multitudinous hints upon constructional and decorative details, but exigencies of space forbid me touching upon other than general and more important features. The official report and awards of the judges are printed elsewhere in this number, and confirm many of the criticisms made in this article. H. KEMPTON DYSON.

Two Papers on Architectural Education.

Architecture, and its place in a Liberal Education. A paper read before the University Extension Guild. By Banister F. Fletcher, F.R.I.B.A. Price 1*s.* net. London: B. T. Batsford, 94, High Holborn.

The Training of Architects. By Professor C. H. Reilly. *The University Review*, Vol. I., No. 3. London: Sherratt and Hughes, 6*d.*, July, 1905.

MR. FLETCHER'S paper, which is divided into two parts, "Architecture, showing its connection with history," and Part II., "Its place in the educational scheme of to-day," is, doubtless owing to the circumstances which called it forth, and in consideration of the audience to whom it was addressed, an appeal to the cultivated amateur to recognise and acknowledge architecture. "Is it not therefore time, in these days of enlightenment and in the interest of true as against superficial education, to provide for the study of architecture and its history in the curriculum of the education necessary for every man and woman?" To an audience of architects, the intellectual and historical apprehension of architecture has in past time carried its limitations with it. To the artist it is a part of the necessary platform or base from which he rises into the *art* of architecture, from which he designs and creates; but to the amateur, the man who apprehends by the intellect rather than by the heart, it becomes his shelter and his weighing-house. From it he measures what is being done in the world outside, by the storied elements of its industrious contexture he estimates the differences and discrepancies out of doors, and in the comfort of the familiar pictures of the past he looks coldly on the alien novelty of the worker who is grappling with the problems and the necessities of to-day. And the proposal to largely extend the annual output of such amateur carries with it only a restricted enthusiasm. Treated as a sidelight on history, in conjunction with it and illustrative of it, a masterpiece of architecture has its prime uses, as have poetry, literature, music and painting, etc., and may stand in their front as being the collective—whereas the other arts are the individual—voice of their time. It shows the aims and feelings of a people, deliberately and slowly realised; the daguerreotype of its character rather than an emotional snapshot, where the time element comes in to synthethise the shades of feeling that pass over the face of the sitter and the rest that comes from the deliberate control of the opposing tensions of the muscles. Treated thus as an adjunct to "the proper study of mankind" Mr. Fletcher's advocacy is sound, well timed; and as it carries conviction to its hearers, so, let us hope, it will prevail.

Professor Reilly's article is an important contribution to the question now much in the air, and much on the conscience of architects at the present time—the question how an architect should be trained for his work; and then, rising out of the answer to this problem, how the various teaching bodies, now at work to this end, can be co-ordinated and brought into line, so that full advantage can be got of the powers that are being expended, by causing them to work, if not actually identically, at least harmoniously. Professor Reilly begins by pointing out the leading features of the Report of the Board of Architectural Education lately constituted by the Royal Institute of British Architects and other bodies represented, and explaining the reforms and alterations from present methods that are involved in them. He then proceeds to discuss the formation of architectural schools within the Universities. For the scheme of training advocated by the Board, so far as it had been laid down, he has nothing but praise, and sees no reason why it should not receive universal acceptance in this country; "the important question at once arises as to the part the Universities are to play in relation to it." Professor Reilly hopes to see the Fine Arts included in the recognised courses, not only at our newer Universities, but also at Oxford and Cambridge. "For such Universities, then, as already possess architectural schools, the question is the amount of general and liberal study that can be infused into a technical curriculum." He advocates that a student reading for a degree in architecture should graduate with a B.A. degree first. "Such a course, though involving five years at the University, three for the B.A. and not less than two for the technical curriculum, even if best in the long run, will mean too great an expense for the average student. To meet such, it might be possible to permit a portion of their technical subjects to count, according to their nature, towards either a B.A. or B.Sc. degree, so that their purely technical course afterwards, whether leading to a degree in architecture or to the proposed certificate of the Board, could be of less duration. Beyond these, again, there will always be the students who . . . . cannot tackle a B.A. or B.Sc. course, but who may yet make excellent artists, and who must be provided for in the schools. These are the students who will start at once on the technical course for degree or certificate, which degree or certificate, under

proper safeguards, the Board should recognise in the case of properly equipped Universities in lieu of their own. The Board then, in this suggested arrangement, would throughout the land settle the minimum of training to be required from each student, while the various Universities would offer courses in slight variation or in excess of it, according to their local needs and opportunities. In this way the architectural degrees or certificates of the Universities would each attain its own standing and weight, as the various medical degrees have done long ago." This breathes a hearty spirit of co-operation, and if it can be taken as a general index of the attitude of the Universities, the Board will have the comfortable testimony that its existence is justified and accepted, and that both its aims—that of instruction and the accepted standard of instruction—will receive helpful furtherance from them. And, indeed, it is time for these reforms. Building was never more plentiful than it is now, and the educated public's view of an architect, as a constructor, never lower. The world knows, if only in a dim way, that an engineer's education is a very real and thorough thing, that the student works like a real apprentice at the shops as well as in the schools, and that by the time he emerges into the employable state he has learnt his business, and that he has got both training and knowledge as a background to his own abilities. But the craft of architecture—to the public—is more of a mystery in one sense, and in the other less. He gets his training in a vague way—behind the scenes; he is gifted with "taste," about which the old adage says there can be no dispute, and about which the occasions of dispute are without end. The engineer's strong position—"it must be so, by mere force of mathematics at lowest"—is not his; "it must be so, from the nature and capabilities of the materials," is no longer his. The ignorant questioning the architect has to confront is different from that so easily vanquished by the engineer in this, that it is not conscious of its ignorance—nay, more, it is very sure that it possesses more knowledge than the bare fact justifies. On the ground of "taste" the public does not hesitate to pronounce, brave in its conviction that in these catholic days each man is entitled to his own, without being at the pains to weigh what may be its worth; and the architect, having preached and taught the canons and formulæ of his art, *urbi et orbi*, finds at the critical hour that these engines which were for his defence and scientific victory are bent on him and ignorantly fired to his disaster. New materials and new processes start up around him, and find him unprepared, whilst specialists spring up, ready to handle the novelties and to take them away from his management. In the minds of many, an architect appears as a kind of luxury—one of those things that add to the cost and difficulties of life. He is not needed "for practical purposes," but to give a kind of bloom to the building, like gilding in the hands of the decorator, and an aroma of culture—for that is still a matter of concern for those who consider they have a reputation to conserve and are earnest about their building. "Where there's smoke, there's fire." The architect has, in some measure, himself to blame for this impression of his functions in the public's mind. He took to talking about "the styles," "orders," "proportion," "mouldings"—and to talking very well too—subjects about which any amount might be said, and any amount was said—inconclusive subjects that have a fascination for all and sundry. And his audience failed to estimate the due importance the architect really gave to these topics. It naturally over-estimated them. It supposed and supposes that the architect is concerned only with the outer vesture of his art, and lets the organic structure underneath, and that supports it, grow as it may. The analysis of construction would fall dumbly on the ears of his auditors—the exposition would be a one-sided affair; for what could his hearers contribute, and what use could they make of instruction that has to depend so much on local and varying conditions? The knowledge that an architect has, and must have, got obscured by the light of his eloquence on comparative styles and rhythmical proportions; and the public, not seeing what lay in the shadow, thought it non-existent. And the lack of a visible education in these matters, so far as a negative can, gave substance to this impression. Moreover, something there is admittedly inadequate in these invisible and inordinated methods of education, which has precipitated the Board of Architectural Education—an admission which the public, if it chose, might plead in part justification of its attitude, if it only would be so good as to remember that this shortcoming is now in a fair way of being abolished. There is a great deal of architectural education going on throughout the country, and beyond this there is a very considerable equipment of technical appliance and instruction available—not at present being as much used by the students as should be, owing to the want of co-ordination and some sort of standardisation. It is pleasant to be able to hope that for the future this waste of time and force is not to be permitted, and the co-operation of the Universities will form a notable lever in the welding of the scheme of architectural education into efficiency.

HALSEY RICARDO.

The London Traffic Commission Report.

I.—LONDON UNDER THE PLOUGH: SOME THOUGHTS SUGGESTED BY THE REPORT OF THE TRAFFIC COMMISSION.

STRANGE reflections occur to the mind on reading the report of the Traffic Commission (or the able abstract which was given in *The Times* engineering supplement) or even on endeavouring to grasp some of its principal recommendations, and their probable effect upon the artistic or architectural aspects of our traffic-choked city.

Indeed, it would seem that London is in process of being throttled by the pressure of its own business. Its very means of locomotion and transport have brought it to a standstill, as it literally continually does so. It is a strange paradoxical position for a practical people to find themselves in. The efforts being made to extricate London from the consequences of its own extraordinary growth and development suggest the curious analogy of primitive man making clearances for living and breathing space in the primæval forest, and thus presents another instance of extremes meeting. The human forests of capitalistic commercial civilisation superimposed upon the results of the social and civic development of centuries, expressed and encased in the forms of brick and stone and mortar, present difficulties and economic complexities far more than meet the eye upon an apparently simple question of street improvement. Far beyond the scope of the pioneer's axe as a pathfinder, they furnish engineers, surveyors, and builders, borough and county councils, lawyers and financiers, with continual employment.

The very pressing question of how to relieve the congestion of the daily traffic in London led to the appointment of the Royal Commission, with an advisory board of eminent engineers, which has just concluded its labours, and embodied the results of their inquiries and recommendations in eight solid volumes.

One does not observe that the Commission included any eminent architects, and, presumably, the question was regarded as purely, or rather immediately, a practical one, to be dealt with by specialists, and solely from the engineering point of view, narrowed down to the by no means simple problem of how to relieve and facilitate the traffic of London. But it is hardly possible to consider a question like this, which involves the construction of new streets, subways, viaducts, and a whole system of tramways, without also touching questions seriously affecting the history, appearance, and architectural beauty of London.

Æsthetic considerations seem to be, as usual with public bodies in this country, ignored.

The Commission recommend a permanent board to deal with the problem of London traffic. So far, so good; but since this problem cannot be dealt with as wholly detached from the artistic aspects of London, which also have a definite value to its inhabitants, some provision should surely be made to secure the best architectural advice, just as it is considered necessary to have an advisory board of engineers. There ought to be co-operation from different points of view in these matters to ensure success in the carrying out of any "improvement" schemes.

The "improvements" which we have already with us are not always such as to inspire unmixed confidence that the new recommendations, if carried out, will be entirely successful, or even that they will be certain to accomplish their avowed objects of relieving the traffic.

We remember that when the Victoria Embankment was planned it was confidently asserted—and it was considered one of its chief recommendations—that it would immensely relieve the traffic in the Strand. But the Strand is as crowded, or more so, than ever, and the Embankment is only used by vehicles taking the direct stage from Charing Cross to Blackfriars.

The destruction of Decimus Burton's design at Hyde Park Corner, and the uncomfortable lopsided platz (presided over by Mr. Boehm's Duke of Wellington, and his four representatives of the British army) recently enlarged by a slice cut off the Green Park, has caused a bad block further on at the corner of Hamilton Place, where the tangle of cross-traffic is only prevented by a row of policemen—who ought really to be cast in bronze, and permanently stationed on that dangerous spot. Then the wide stream of mixed traffic flows on beyond the Green Park until it is brought up with a jerk in the narrow channel of Piccadilly. This is only one instance of what might be termed the bottle and neck principle of street improvement; but it does not seem very practical to widen a street in one place and leave it narrow in another, since traffic cannot be poured through a street like a liquid through a bottle! At St. James's Street the report states that the number of vehicles passing in a day of twelve hours amounts to no less than 20,474. At Piccadilly Circus (or what was once a circus) 27,050 pass. At the Marble Arch 29,320, at Hyde Park Corner 29,286. Charing Cross is not far behind with 27,768, the Strand (at Wellington Street) 19,743, Ludgate Circus 22,956, and the Bank 27,523.

The pressure is obviously at the chief crossing places where certain streets intersect. The Commissioners propose to relieve this by subways in

some places and viaducts in others; for instance, they propose "a viaduct at Blackfriars Bridge beginning at the centre arch and carried north down the centre of New Bridge Street and Farringdon Street, giving a roadway of 33 ft."! Also "a bridge across the Strand from the hill of Wellington Street on the north, to the north end of Waterloo Bridge on the south, to relieve the excessive congestion of traffic at that point"! Truly London traffic is appalling, but such suggested remedies as these seem equally so. Would not the remedy be worse than the disease, and could we be certain the bridges would really be used? What would become of the view of St. Paul's, already obscured by *one* viaduct?

The most important recommendations are, however, at least from the point of view of probable cost, the construction of two main avenues through London, 140 ft. wide, one from west to east connecting Bayswater Road with Whitechapel, passing through the city in the neighbourhood of London Wall, and the other from north to south to connect Holloway with the Elephant and Castle, passing by a new bridge across the Thames (another bridge!) near the western boundary of the city.

Well, it hardly needs an engineering mind to be convinced that the main thoroughfares of London ought to be about three times their present width for merely traffic purposes; but then the whole character of London would be changed. It is a question whether in some cases its prosperity is not connected in some curious way with its variety and smallness of scale. One thinks of the traffic in Bond Street, narrower in its middle than even a secondary street in a small country town. It is a fashionable, prosperous business street of small shops, art galleries, and tea-houses, principally; but what could be done with Bond Street? If (at unthinkable cost) its width were doubled or trebled it would lose its identity, and might become a broad but unfrequented street, while some new Bond Street or a more or less sufficient substitute would probably be found in the neighbourhood—so long at least as May insists on shopping near Mayfair.

The same thing might easily occur elsewhere. In regard to the proposed new streets or traffic furrows, for instance, one imagines that Bayswater on its way to Whitechapel, or *vice versa*, will want to stop in Oxford Street or Holborn, while it is scarcely probable that the Elephant and Castle would ever want to go straight to Holloway.

You can lead a horse to the water, but it does not follow that you can make him drink. You can by more complicated and expensive methods make openings for traffic, but you cannot compel people to use them.

A city like London has grown hitherto in a muddling and planless sort of way in response to the wants of its inhabitants in the main. The best engineering schemes cannot afford to ignore the trend of local and social custom and habit, and habit even in traffic is something to be reckoned with. London, unlike some other large cities of the country, has never taken kindly to tramways, except in the outskirts they may be said to be hardly practicable, and it must be confessed a tramway spoils the road for all other kinds of wheeled traffic, unless, indeed, the road is so wide as to practically isolate the tramway: but in any case the architectural effect is injured. No existing street or road through London is wide enough to hold a tram line, and, except Trafalgar Square (which is practically a flagged ornamental garden), there are no open squares or places to speak of which might form centres of communication for tramways.

A great tramway system for London is one of the principal items in the recommendations of the Traffic Commission, although it would seem that, long before such a system could be completed, the tube-railways will do the work of tramways far more efficiently for London, even if tramways are not in danger of being superseded by the motor omnibus.

The main plea for a tramway system is that it would afford cheap and easy means of transport for the army of workers pouring into the industrial parts of London in the morning, and out again in the evening to the residential suburbs, which with the extension of the tramways might still spread indefinitely in all directions. To those whose hope of healthier and pleasanter city developments is rather in the direction of decentralisation and limitation of size, such a development has no attractions, and can only be regarded as an encouragement to the continuance of the present industrial and commercial system with all its drawbacks and dangers. One must be careful to distinguish between schemes to meet immediate popular necessities and those which have in view the permanent welfare of the people.

The wants of popular transport in London have hitherto been supplied by the omnibus. The 'bus is the connecting link between many borough boundaries. It is the city of 'buses. Their routes as well as their numbers have extraordinarily increased; mainly, too, as the result of the increase in underground railways and the opening of new stations and termini necessitating cross connections. In fact it is hardly possible to doubt that traffic increases by reason of the very means adopted to relieve it; and this is another point to bear in mind in projecting new streets and means of locomotion and transport, together with the social fact of the increase of travel with the

facilities of moving from place to place. It appears that the average journeys per head of population have increased in 25 years from about 56 to, as the Commission estimates, 170 journeys. These are the figures for London, which it seems do not reach the standards in New York, Berlin, and Paris.

Other remarkable figures are given. For instance, about 360,000 persons actually spend the day in the city of London alone, and this number, it is assumed, must be taken to and fro six days a week, while 1,250,000 persons and 100,000 vehicles enter and leave the city of London daily, not to speak of the central or other districts.

The only answer of the practical man as to the best ways of facilitating the transport and locomotion of these appalling numbers, it appears, is (1) a tramway system (which depends upon local consent, and street widening to an enormous extent to make it possible); (2) cheap trains from new suburbs extending in every direction, with tube-railways coming in to serve as overflow pipes and distributors over short distances.

The idea behind all this is that of London as a vast warehouse where the main consideration is the delivery of goods on the shortest notice, and in the most expeditious manner. That human beings must be considered, from the transport point of view, as sacks of coal. Fill your wagons, put them on the rails, provide the locomotive power, set the machinery going, and—all will be well.

It is assumed that London is going on as she is now going for ever and ever, and that certain tendencies towards decentralisation may be ignored. Still, the works which such recommendations as those of the Traffic Commission involve, would necessarily take a considerable time, and possibly in the process of completion still further impede the impeded traffic of London.

To the ordinary observer there are many small causes which, though local, partial, and temporary in their action, yet, constantly felt in one place or another, in the aggregate seriously impede the traffic of London, and in fact may be said to be quite as much the cause of the blocks as the narrow streets and crossing routes. I mean the street works which constantly tear up the roadway and squeeze the traffic suddenly into a narrow channel in the midst of a wide thoroughfare. The incessant holes made to examine or relay gas or water pipes, drains, or telephones, are a continual source of stoppage in the traffic of London.

Why not municipal and continuous subways to carry all these subterranean ganglia, at least in all the principal streets? By these means London traffic would be certainly enormously facilitated, and a frequent and constantly recurring cause of its congestion done away with, at probably far less cost than widening streets, since it would not involve the destruction of house property. It might be worth the attention of engineers and borough councils.

Another felt want in London is that of large open public places, piazzas, or circuses, at the main crossing points of the traffic, such as those above mentioned, at the Marble Arch, Hyde Park Corner, Piccadilly at St. James's Street, Piccadilly Circus, Charing Cross, Strand at Wellington Street, Ludgate Circus, and Bank. The lines of traffic could then be diverted and made to circulate around the sides of such circuses, which would, in addition to relieving the traffic, afford good opportunities for artistic architectural effect, not only in the buildings around them, but by a central fountain, clock house, or statue upon an island of refuge for pedestrians. The value of such circuses as methods of relieving traffic does not appear to have appealed to the Commission.

From the architectural point of view one would like to go further and clear noble spaces or piazzas in front of our great public buildings: the British Museum, for instance, and before the west front of St. Paul's, as well as the principal railway termini. Anyone who has driven through and about London must have been struck with the unnecessarily obstructive character of much of the vehicular traffic. The bane of drivers of passenger vehicles is the van-demon. The huge railway van piled with goods, which can so effectually block a narrow street, or, in the aggregate, even a wide one; the furniture van, the brewer's dray, the carrier's wagon, the tradesman's van, and the motor varieties of all these, either moving or stationary, together with the traction engine with its train of cars, again, are notorious and constant contributors to traffic congestion.

Could not the arm of the policeman, upon which the circulation of traffic now mainly depends, be lengthened and strengthened? I mean in the direction of the general regulation of London traffic. Would it not be well to regulate the passage of such huge vehicles as those mentioned above with all goods traffic in the streets within certain hours of the day, or even by certain routes?

Perhaps if we get a Traffic Board these things could be seen to, but in the meantime organisation and regulation would go far, even without street improvements, to remedy the congestion. It is a case of careful treatment as against surgical operation to bring the patient to health and normal condition—if, indeed, one may use the word normal in connection with London!

The plough of engineering enterprise may be driven through the length and breadth of London, and it may be only to sow the dragon's teeth of

future difficulties. For better or for worse, however, old London is disappearing and a new London is arising from its ruins. We are in the midst of the dust and confusion of change. It is, perhaps, at present rather the pick of the housebreaker than the plough of the engineer which is the implement most in evidence. We can only hope that harmony may arise out of discord, and form and design out of chaos; but to let the configuration of a city depend wholly upon the shifting necessities of traffic does not seem to offer any security for the preservation of its architectural beauty or permanent improvement in its truer and higher sense.

WALTER CRANE.

Notes.

Iona Cathedral—Engineers and Architects—A Suggestion for Street Decoration.

THE cathedral at Iona, as a ruin, appealed very strongly to the affections of those who knew it. Not only did it show many local peculiarities, in its carving and otherwise, but (largely owing to its repair for use in the seventeenth century) it gave the impression of having been not so very long disused; and it bore the marks of its history, even if these could not always be interpreted with ease or with certainty. The natural feeling, on hearing of its proposed restoration, was, "Can't you let it alone?" This course was rendered impossible by the terms of the trust—that it should be made available for Divine Service. But it might have been hoped that especial caution and reverence would have been shown by the successive architects and by the Trustees in dealing with a building which was not only beautiful but in many ways unique. This has certainly not been the case; it appears, for instance, that there has been no adequate supervision of the work, a clerk of works having (recently at least) not been employed.

In some parts no more injury has been done than one expects from the average "restoration." The south choir aisle had lost a large amount of the cut stone in its doors and windows; in its repair excessively large stones were at first used—this has now been altered. As restored, it is commonplace, and what is commonplace is in this church more or less incongruous; also one cannot help thinking that more of the very interesting east window in the aisle might have been preserved and not renewed. Similarly, instead of the church being completely refloored, such old stones as remained (and not merely those of special interest) might well have been retained and supplemented.

Near the corner where the presbytery joins the choir aisle there was a curious composite erection, believed to have supported the seventeenth-century pulpit. It was conspicuous in the old cathedral, and, as a part of the history of the building, should have been retained, somewhere within it at all events.

The tower has been strengthened by inserting iron girders supporting the floors. If these were necessary, they might at least have been less in evidence and the floors made to fit the corbels accurately. The roof has been covered with slates, which, except in one part on the south transept, are of the usual unpleasing colour; but there is one complete slate, preserved on the island, belonging to an old roof (possibly of the seventeenth century), which is similar. If such slates were to be used, they should have been as rough as possible, so that lichen might disguise them with all speed. As it is, the roof gives a melancholy appearance to the building.

That the choir and north transept (at all events) had flat ceilings, with rooms above them, is clear from the old corbels, the plaster, and other indications. The new roofs are open to the top; whether the old walls will stand the thrust of the new construction remains to be seen. But in any case this is emphatically not restoration; neither is the stripping of the plaster from the greater part of the walls, in which process traces of fresco-painting have been to a large extent inadvertently destroyed. In the north transept, where the wall had been broken down, a Gothic wheel-window has been inserted, between Romanesque pillars; each of these features—and still more their combination—might have been designed by a country builder. This window would have opened into the upper storey of the domestic buildings, as is plain from any point outside; it is therefore an obvious absurdity. About the exact history of the short north choir aisle, or sacristy, only a very bold man would dogmatise; it is, however, clear on the outside that a complete aisle of some kind has been at least intended. The two arches were walled up, but so as to leave the pillar supporting them visible, and the partition fixed, or "sealed," by the insertion of a late mediæval doorway of considerable beauty, in the local style. Though here especially prudence would have counselled "letting it alone," these arches have been opened up (a very large part of the work in them being renewed), and since the top of the doorway comes above the base of the elevated pillars, a pediment has been made over it. This looks ugly and heavy, and gives additional cause for regret that

the old arrangement was interfered with. But, further, this pediment, which is necessarily connected with the doorway, and comes close down to it, has been ornamented with sculpture of modern character and of aggressive size (being almost on a level with the eye) of a monster and an angel. The effect is, at all events, glaringly incongruous. But these and the wheel-window, with its arch, are (in the *Scotsman* and *Glasgow Herald*) defended by the present architect, who designed them, on grounds not often seen—in print, at least. The latter, it is stated, is "in no sense a restoration; it is a new design, adapted to altered conditions, yet harmonising generally with its surroundings"—which it certainly does not do. The sculpture "may, if done after the manner of the time, carry some truthful message down to future ages." The designer's opinion as to the value of his original work does not seem to be generally held, while his candid statement places the Trustees in an unpleasant position. They have asked for subscriptions for restoration; in the notice on the steamer the object proposed is still less ambitious. It is now clear that they have allowed the money to be largely spent on what is certainly not restoration, and even on what does not profess to be such, with the result that an ancient building of unique character has been to a great extent spoilt. ARTHUR C. CHAMPNEYS.

* * * * *

AN engineer who has had a large and trying experience with architects has put the following notes at my disposal. He says—doubtless with considerable truth—that the engineer's point of view as regards architects is usually of too sacred a nature to find expression in ordinary language, and in setting down these words of advice and suggestion he has endeavoured to keep as far as possible within the limits of ordinary dialectics. He writes:—

"From an engineer's point of view a large number of architects never seem to master the fact that architecture does not only consist of the assembly of various parts to form a building pleasing to the eye (and in most instances a replica of some building designed by their predecessors). Let this idea be cast aside with the art classes and velvet coat. To design a building for public use, start on the work as business men, and consider from the very beginning that the building when finished is for the *public use* and convenience, and that every possible requirement must be foreseen. Meet the engineer, and find out his requirements as regards space for the heating, ventilating, lighting, and lifting machinery, and when all that is arranged, the true architect will start on his work. What would happen in a shipbuilding yard if the naval architects delivered the hull over to the engineers with a large girder fixed right across the engine-room, and no possible chance of getting the machinery into place? I am afraid the engineers would take the matter into their own hands, and remove the obstruction, and at the same time find some other way of getting the necessary strength without the girder. One will say such lack of foresight is hardly possible; but in designing large public buildings we have equal lack of foresight turning up every day. In a large hotel contract in this country a short time ago the architect found it necessary to build in an extra pier under a large hall, as his girder strengths were undercalculated. The pier was built and all seemed well, until the engineers for the electric light came along to put in the generating plant, and the pier was discovered to come right in the centre of one of the engine beds. The result was that, instead of a good belt drive for the dynamos, a special arrangement of chain drive and countershafts had to be adopted. The total effect as worked out in pounds, shillings, and pence was very bad for the unfortunate owner, and the blame as usual was placed on the broad shoulders of the engineer.

"A lift is now almost as necessary as the staircase in a building (and used much more), yet it is about the last thing the architect thinks of. 'Oh, fix the engine somewhere in the sub-basement out of the way,' says the architect, so out of the way the engine is fixed in every sense—quite out of the way of the attendant who should oil and clean it, and out of the way of the inspecting engineer who comes to examine, and there it lies until some day the dirt gets the master hand. Then, let us run for—oil and waste? No. Let us run to the telephone to tell the makers what bad engineers they are.

"Would the designer of the building place his grand piano in the sub-basement? I think not. Yet the electric-lift engine has fifty times as much wire, as many parts, and costs twice as much; still, for all that, down in the damp out of the way is the place for the hard-working machinery. Architects pride themselves on the precedent and traditions of their craft. Well, in the case of the lift engine, let us go back to the early Norman fortress, and we will find a special room reserved for the drawbridge-lifting winch. The room is not in the deepest dungeon under the moat, but on the ground floor, and within easy reach of the armour-plated engineer in charge. It may be claimed that a true architect cannot attend to the two branches—architecture and engineering; but to design a large public building of the present day the architect must be like the marine—architect

and engineer too. We engineers may merit the accusation that beauty in engineering departed with the old beam engine; but engineers of to-day at least know one thing, and that is the practical side of their profession." D. B.

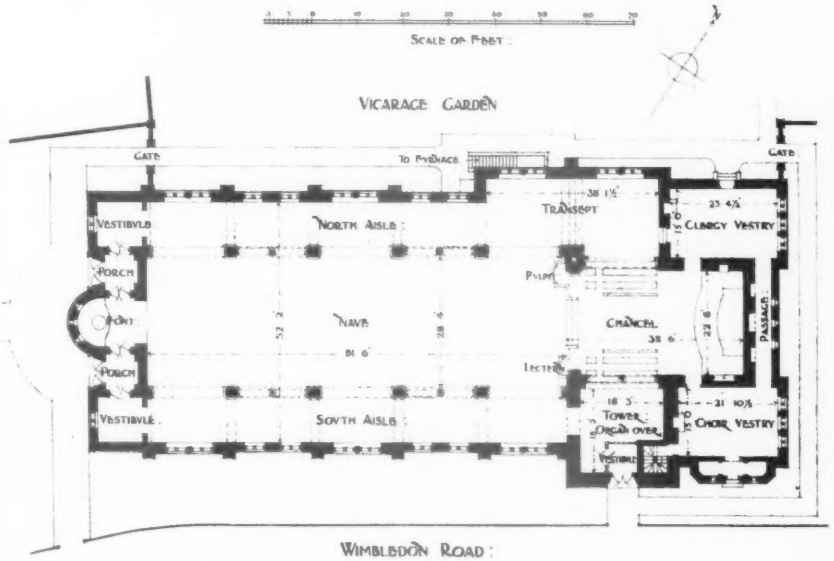
* * * * *

THE Corporation of Dublin is making a very pleasant virtue of a commonplace necessity. It is an answer to the dreary question, "What shall we do with our old street gas standards?" Derelict gas standards, deprived of the normal repainting, bespattered with mud which no one is interested to remove, are a melancholy feature in streets which have gone over to electricity. In Dublin they manage these things better, or rather are making a beginning of better things. The lanterns are being removed, and their place taken by iron baskets containing flowering plants, which give to the street a gaiety and freshness quite extraordinary. The present writer is unhappily ignorant of the authorship of this delightful idea, but was informed by a communicative Dublin jarvey that the Corporation found it more economical to provide the simple iron basket than to uproot the standard and do the necessary repaving caused thereby. The effect is so delightful that one can only wish more power to the municipal elbow—and more derelict lamp-posts. There is, moreover, a practical and economical consideration not to be despised. It seems by no means clear that electricity has come to stay as a street illuminant, if one can judge from mutterings from the City of London and the threatening of a return from electricity to incandescent gas. Perhaps municipalities will be found later to regret their haste in removing gas-posts that they may in the future want to replace. In the meantime their unrevolutionary cry might well be "Flowers au lanterne." While the partisans of gas and electricity are fighting their illuminating battles, the casual wayfarer will be able to rejoice in uplifted spots of colour and freshness in our not too beautiful streets.

LAWRENCE WEAVER, F.S.A.

Current Architecture.

CHURCH OF ST. MARY THE VIRGIN, SUMMERSTOWN, S.W.—The church was dedicated on April 30, 1904. One of the chief conditions laid down by the committee was that the church was to be very well lighted. It is faced inside and out with red Wrotham bricks from Messrs. Pascall's fields, with dressings and linings of chisel-faced Bath stone, and roofed with Westmorland slates. The small columns in sub-arcades and sedilia are of fine-axed grey granite. At present the tower is only built high enough to take the organ (which is in a gallery), and has a temporary roof. The chancel is paved with Portland stone, with borders and steps of blue Pennant stone. The pulpit, reading-desk, and wall are in three sorts of stone: Green Quarella, Hopton Wood, and Beer stone. The font is of Green Quarella on a Portland base. The choir stalls, clergy seats, Communion rail, Commandment tables, and panelling forming reredos are of oak. The stalls have a little inlay in mahogany and English walnut. It is intended at some future time to fill the large lunettes in nave arcade with figure subjects in modelled plaster. The church was designed to be seated with chairs, but when nearly complete the committee decided to have pitch-pine benches. Wiring for electric light has been put in, but owing to the Supply Company being at present unable to bring up their mains a temporary installation of acetylene gas has been made, which works well. The general contractors



CHURCH OF ST. MARY THE VIRGIN, SUMMERSTOWN, S.W. LONDON.
GODFREY PINKERTON, ARCHITECT.

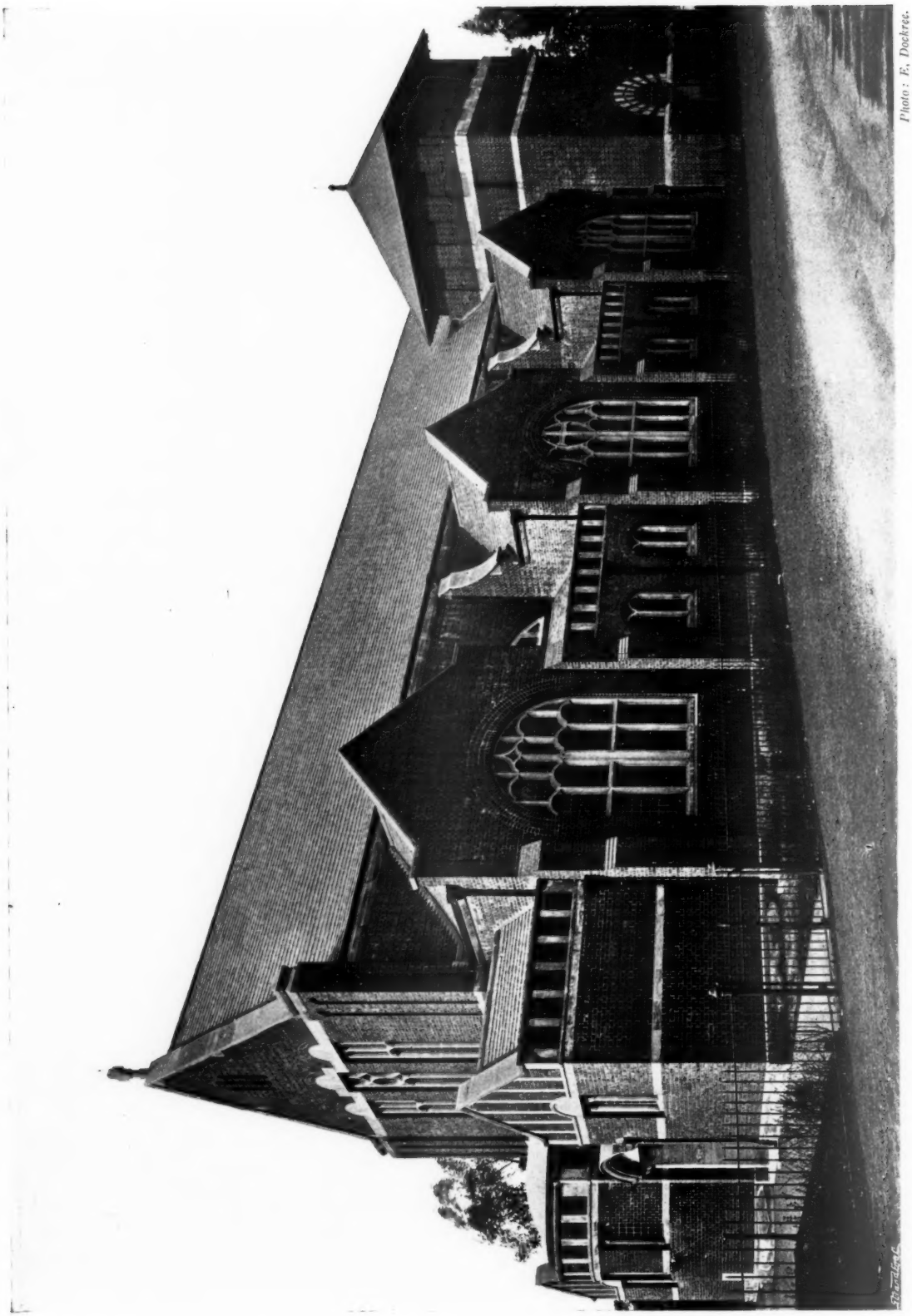


Photo: E. Dockree.

CHURCH OF ST. MARY THE VIRGIN, SUMMERSTOWN, S.W. LONDON. FROM THE SOUTH-WEST.
GODFREY PINKERTON, ARCHITECT.

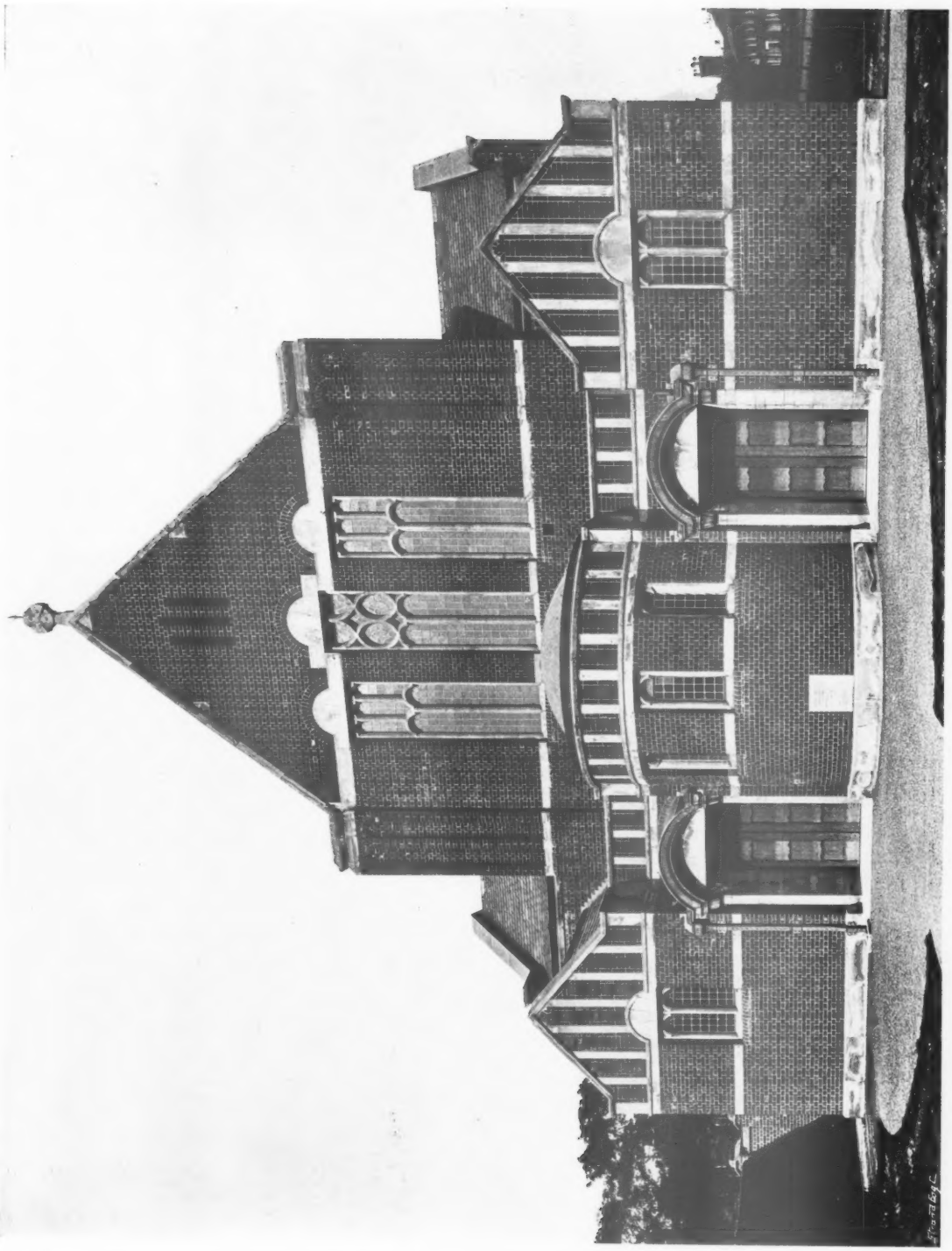


Photo: E. Dochree.

CHURCH OF ST. MARY THE VIRGIN, SUMMERSTOWN, S.W. LONDON. WEST FRONT.
GODFREY PINKERTON, ARCHITECT.

Photo: E. Dockree.

CHURCH OF ST. MARY THE VIRGIN, SUMMERSTOWN, S.W. LONDON. INTERIOR, LOOKING EAST.

GODFREY PINKERTON, ARCHITECT.

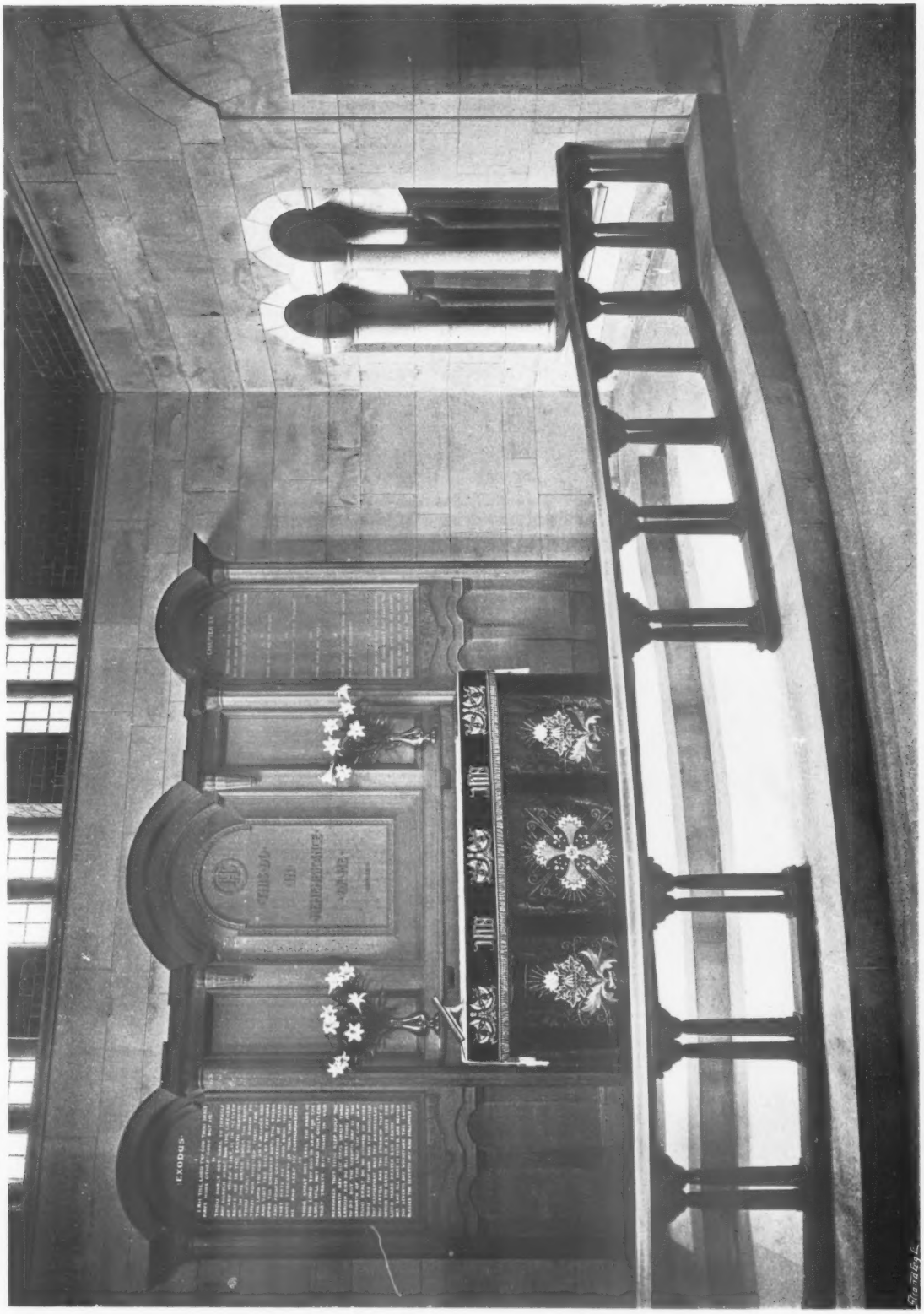


Photo: E. Dockree.

CHURCH OF ST. MARY THE VIRGIN, SUMMERSTOWN, S.W. LONDON. THE SANCTUARY.
GODFREY PINKERTON, ARCHITECT.

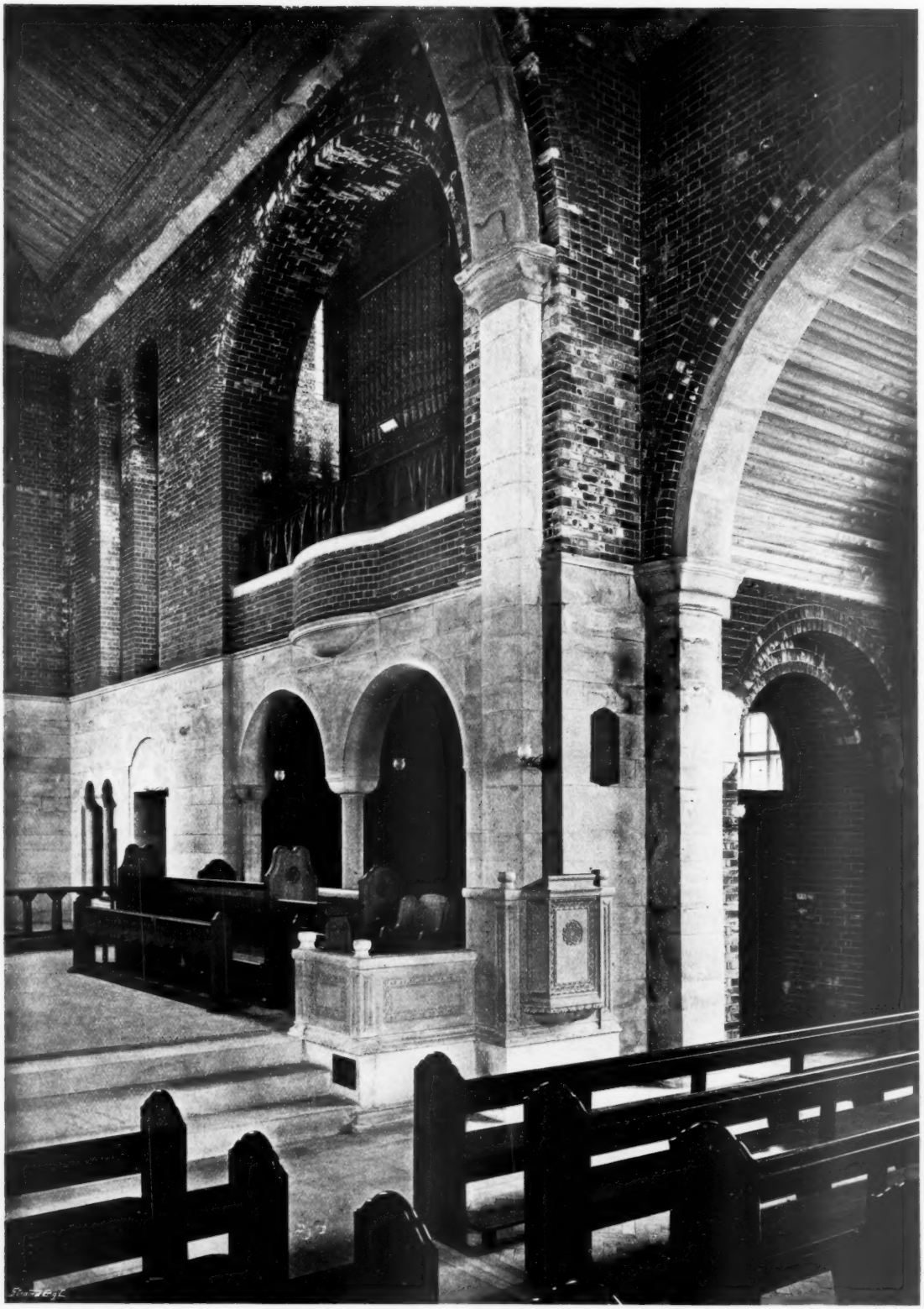


Photo: E. Dockree.

CHURCH OF ST. MARY THE VIRGIN, SUMMERSTOWN, S.W. LONDON. CHANCEL AND ORGAN LOFT.
GODFREY PINKERTON, ARCHITECT.

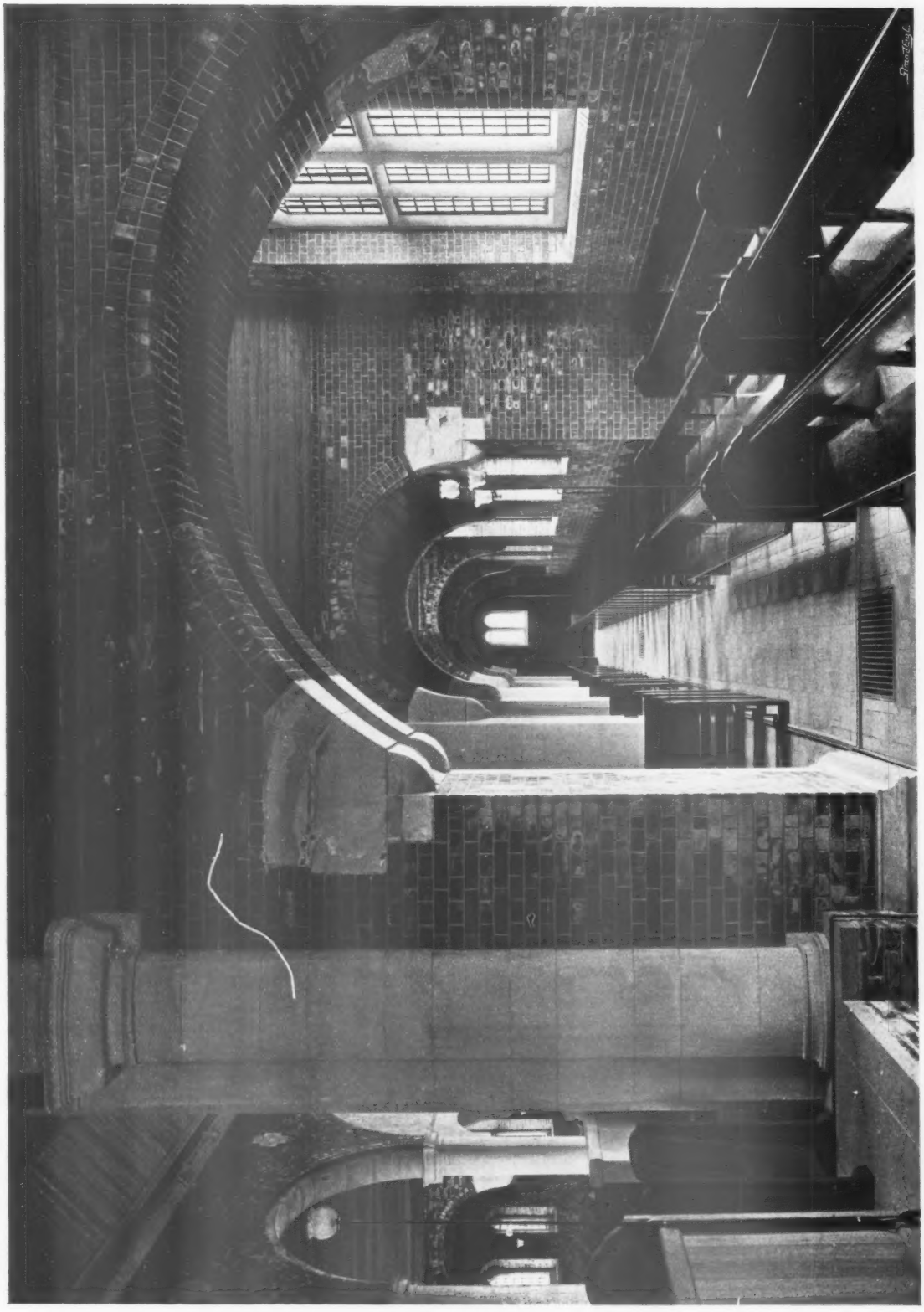
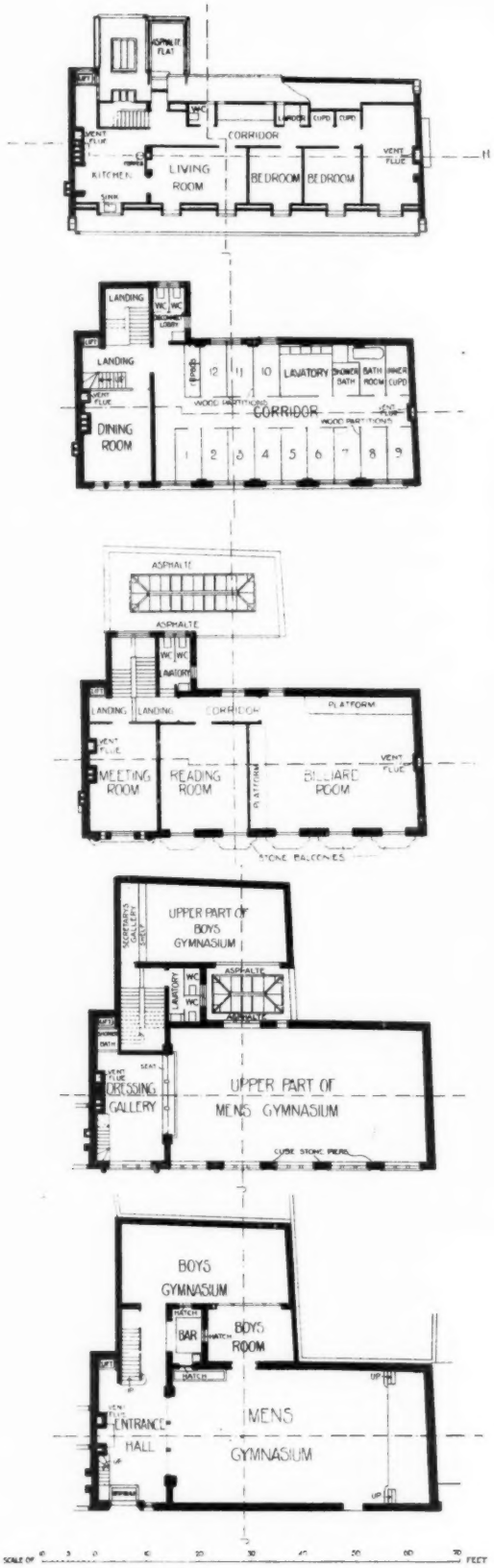


Photo: E. Dockree.

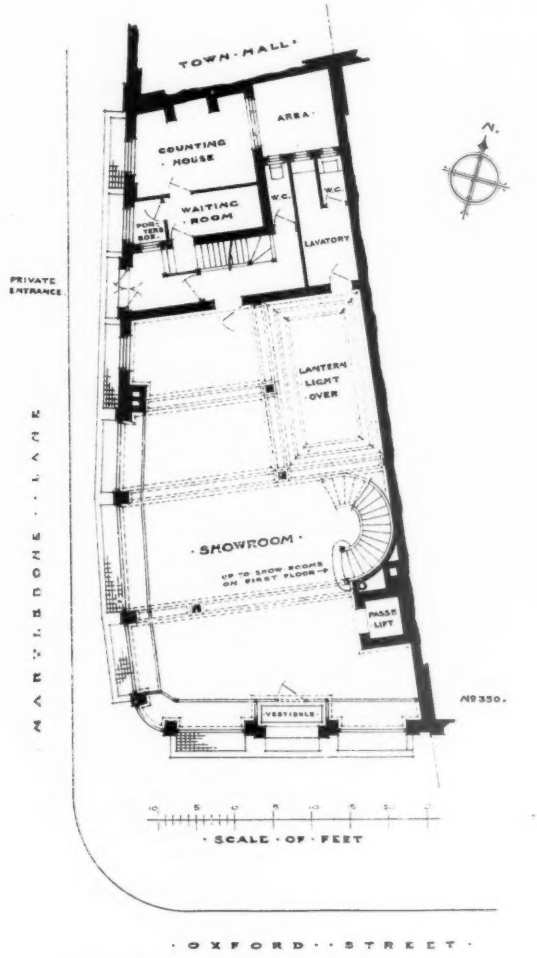
CHURCH OF ST. MARY THE VIRGIN, SUMMERSTOWN, S.W. LONDON. NORTH AISLE, LOOKING WEST.
GODFREY PINKERTON, ARCHITECT.



ST. JOHN'S INSTITUTE, WALWORTH, S.E. LONDON.
PLANS. W. DUNN AND R. WATSON, ARCHITECTS.

both for foundations and superstructure (separate contracts) were Messrs. W. Johnson & Co., of Wandsworth Common. The font and cover were made by Mr. L. A. Turner, who also modelled and executed the other carving, both in stone and wood, from the architect's drawings. The glazing was done by Weldon & Co., of Croydon. Seating in nave and aisles by P. H. Barker & Co., of Hitchin. Heating by Mr. John Grundy, London. The architect was Mr. Godfrey Pinkerton, of 10, Lincoln's-Inn-Fields.

ST. JOHN'S INSTITUTE, LARCOM STREET, WALWORTH, S.E.—This institute was built in 1901 as a club for working men and boys. The floors are all constructed in concrete reinforced with steel straps hooked over the main girders, which are spaced at ten feet centres and are also cased in concrete. The building is heated throughout with hot-water pipes and radiators. The builders were Messrs. J. Marsland & Sons, of 1, York Street, Walworth, S.W. The heating was carried out by Messrs. J. Jeffreys & Co.,



352–4 OXFORD STREET, W. LONDON.
GEORGE HORNBLOWER, ARCHITECT.

Photo: E. Dockree.

ST. JOHN'S INSTITUTE, LARCOM STREET, WALWORTH, S.E. LONDON.

W. DUNN AND R. WATSON, ARCHITECTS.

11, Old Queen Street, Westminster, S.W. The electric lighting was carried out by Mr. J. C. Christie, 3 and 5, Mansell Street, Aldgate, E. The architects were Messrs. W. Dunn and R. Watson.

352–4, Oxford Street, W.—The fronts of the building shown in the illustration are in Portland stone, with a grey granite plinth at footway level; the roof is covered with Tilberthwaite green slates; the joinery work of the shop fronts and range of first floor windows is in darkly finished Moulmein teak. The internal fittings on the ground and first floors are in Austrian wainscot. Messrs. Hall, Beddall & Co. were the general contractors; the wood and stone carving was carried out by Mr. J. W. Sparrow; and the architect was Mr. George Hornblower, F.R.I.B.A.

Photo: S. B. Bolas & Co.

352–4, OXFORD STREET, W. LONDON.
GEORGE HORNBLOWER, ARCHITECT.

A Sketch of Irish Ecclesiastical Architecture.

IV.—ROUND TOWERS.—PART I.

The Irish Round Tower has the general appearance of a lighthouse. Its height varies from 50 to 125 ft., and it is—at the ground level—from 40 to 60 ft. in circumference. It generally rises from a plinth, or even from two or three plinths; though the Tower at Clondalkin stands upon a projecting base of masonry 13 ft. high. The greatest thickness of its walls is usually from 3 ft. 6 in. to 4 ft.; they become thinner towards the top as the Tower diminishes in breadth. Its doorway is nearly always elevated above the ground, the interior measurement of the Tower at this point being from 7 to 9 ft., or sometimes more. It has four or (usually) more stories, which are indicated inside by off-sets, corbels, or holes for joists, the floors having been nearly always, and the connection between them invariably, constructed of wood. Also on the inside wall (above the lowest story) projecting stones are often inserted, and at Tusk one of these is like a large hook, while at Dysert Œngus, near Croom, there are holes apparently for pegs; all these were probably for hanging up books in satchels and other valuables. There is nearly always one window to each story, except the top one; this generally has four, which usually, but not in all cases, face the cardinal points. The doorway is either flat-headed or semicircular; the windows have flat, round, or triangular heads, but what is a semicircular head outside is sometimes square inside, and a head triangular externally may internally be semicircular or square. The openings have jambs more or less inclined, but are usually not splayed. The Tower should end in a conical roof, but for this, in much later times, battlements have in some cases been substituted, and in very many instances the top part is (or has been) ruined; at Donaghmore (near Navan) it has been imperfectly restored. The great majority of the Towers do not form part of any other building.

CLONDALKIN.

These Round Towers were, beyond almost all ancient monuments, a subject around which the antiquarian imagination played with irresponsible exuberance until it was checked by Petric's more rational investigation. They were of enormous antiquity, and therefore Pagan. They were tombs; they were fire-temples, of Persian origin; they were Buddhist temples; they were copied from the Phœnicians; they were astronomical observatories, or minarets from which to proclaim Druidical festivals. Or they were first built by the Danes; they were intended for anchorite pillars, like that of St. Simeon Stylites, or for penitential prisons. These various theories were supported by unfounded assumptions, mis-translation or false etymology, misquotations of existing and quotations of non-existent works. And along with these the true history of them appeared—in fragments.

After the work of Dr. Petric in clearing away the rubbish and establishing a sound theory of the Towers, and of Lord Dunraven and Miss Stokes in strengthening this further, while they supplied the necessary modification to the very early limit of date supposed by Petric, it might well be thought superfluous, so far as the main conclusions are concerned, to do more than to re-state and illustrate these. But there is a considerable number even of well-educated people who still think that some mystery hangs about these Towers—that there may be something in the old speculations after all. I even saw a few years ago a letter, printed in a leading London newspaper, which founded some argument or other against Christianity on one of the wilder theories regarding Irish Round Towers, as if it were accepted fact. It seems therefore better shortly to state some of the reasons which prove the rational view, as well as the conclusions themselves.

(1) These 'high, narrow, and also round' towers were 'ecclesiastical,' as 'Gerald the Welshman,' at the end of the twelfth century, calls them; they have, or have had, invariably a church or churches near them. 'The (apparent) exception proves the rule,' for, where there is now no church near, there are proofs of its former presence—as at Antrim, in the recorded statements of those who cleared away the last remains of the church, and in the human bones found at its base. Nor can they have belonged to Pagan cemeteries, subsequently adopted by Christians. For the Irish seldom (at all events) continued to use the Pagan burial-grounds; a sharp distinction is drawn between

ARDMORE

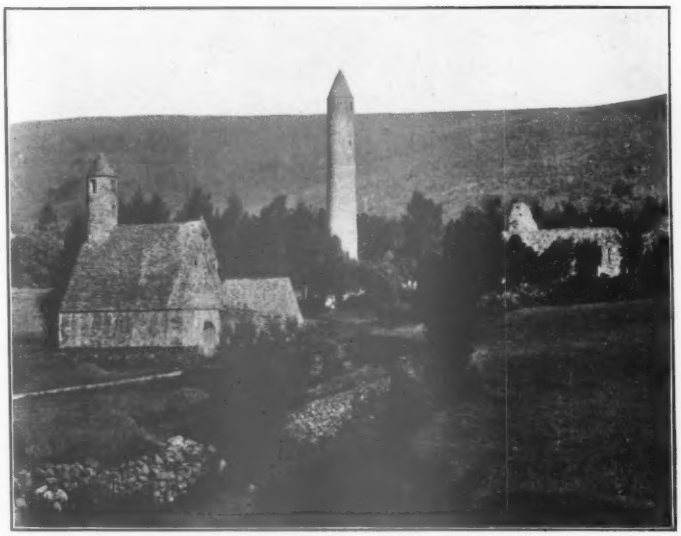
Christian burial and the 'cemeteries of the idolaters' in old Irish writings, and there are no Round Towers connected with the great Pagan cemeteries. At Kilkenny the Tower was found to stand over some graves, the skeletons in which lay with feet to the east, and from the yielding of the foundation the top of the tapering Tower actually overhangs the base at this point. Further, the door of the Round Tower nearly always points to the door of the church, or one of the churches, from near by—at Kilkenny, where the door of the Tower looks away from the Cathedral, that church is of later date, and has no doubt superseded a group of churches on the hill. Usually, therefore, the Tower is west of the church, most frequently to the north-west—perhaps in order to leave more room for burial in the more favoured quarters of the churchyard—but occasionally it stands to the south-west, as at St. Caimin's, Iniscealtra.[14] At Dysert Œngus the church door is, as has been said, in the south wall, towards its west end, and here, too, the Round Tower is 'convenient' to it.

(2) The Round Towers were for defence—refuges into which the monks or clergy might flee, taking with them their books, relics, and church plate. This conclusion is suggested by their position with reference to the church door. It is clinched by the facts that the doorway is almost always raised above the ground, usually to a height of from 6 to 15 ft., and that many (at least) of the Towers show signs of having had double doors and secure fastenings for them. In the year 1838 Dr. O'Donovan was told by an old man living on the shores of Lough Derg, near Iniscealtra, or Holy Island, that he had seen an iron door in the entrance to the Round Tower there. And traces of its fastenings and fittings were then still visible, as they still are, or were until recently, in the Towers at Kilkenny and Fertagh. The windows also (though these are so few, they tend to the safety of a party attacked) are almost always near the level of the former wooden floors, which would be convenient for dropping stones or shooting arrows upon the besiegers. And a good many of the Towers have a large opening just over the doorway, as at Swords, near Dublin, or a little to one side, as at Antrim, doubtless for a similar purpose, like the 'machicolations' and other contrivances defending the entrance to the later castles. Persons trying to force the church door would also (in most cases) be exposed to the arrows shot from this opening, and from the doorway. This use of the Towers as fortresses or refuges is indicated by entries in the Annals, such as that in 950 A.D. 'the *cloictech* [belfry] of Slaine was burned by the foreigners [Danes] with it full of relics and distinguished persons, together with Caeincachair, Lector of Slaine, and the crosier of the patron saint,

DONAGHMORE.

[14] See illustrations in Article II.

and a bell, the best of bells.' Traces of such burning still remain in some cases; a quantity of charcoal mixed with burnt bones was found in the basement of the Tower at Kilkenny; in 1156 'Eochaidh O'Cuinn, the Chief Master, was burnt in the *cloictheach* of Ferta,' in a raid, and 'the Round Tower . . . of Ferta, situate about 12 miles north of Kilkenny, is split, as by fire, from top to bottom, thus affording a singular confirmation of the Annals,' Often, however, the burning of the woodwork would no doubt leave the thick stone walls more or less completely intact, as has apparently been the case at Monasterboice, where, in 1097, 'the *cloictech* . . . with its books and many treasures was burned.' There is plenty of evidence to show that these Towers were used as places of refuge—sometimes unsuccessfully.

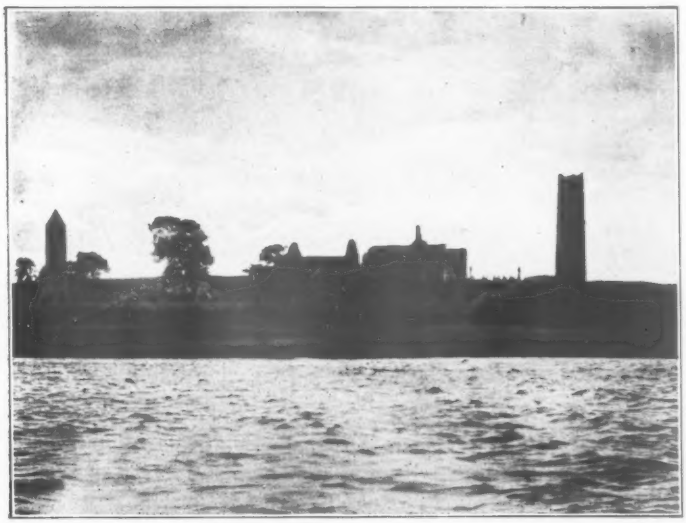


GLENDALOUGH.

(3) A third use of these Towers is indicated in a quotation given above, and in an entry under the year 1020:—'Armagh was burnt . . . and the *cloictheach* with its bells.' These Towers are now always (in Irish) called by this term, which means 'bell-house.' And if it is contended that this name has only been applied to them in later times, 'bell-houses' are frequently mentioned in the Irish Annals, there are no other early buildings to which the name can possibly apply except towers, and of these there are (I believe) none of early date which are not round, 'according to the custom of the country,' except, perhaps, the square tower attached to a church at Iniscleraun, an island in Lough Rec. Further, these towers, with their openings at the top, are adapted to this purpose—'a dinner-bell rung at the top of Clondalkin Round Tower was heard a hundred feet off as if it had been rung close by on a level ground.'

(4) That they were used for watch-towers was the opinion of Viollet-le-Duc, and this is, of course, a natural use for them; on account of their height they command a wide view, overtopping even the smaller rises of ground. This is very markedly the case at Clonmacnoise; here O'Rorke's Tower, though, since its repair after the lightning knocked off its head in 1835 (and without its cap), it is one of the lowest, only 62 ft. high, is visible not only for a long way over the country on the right bank of the Shannon, and up and down the river, but for some distance also across the low hills of glacial deposit on its left bank. Even if they were not primarily intended for watch-towers, they must have been used as such; but Dr. Petric found reason to believe that the direction of the uppermost windows corresponded in many cases with the old lines of thoroughfare leading to the monasteries.

(5) They would at the same time naturally serve as landmarks to guide persons to the church or monastery. I have found them the greatest help in this way myself, but they were much more necessary when many parts of Ireland were far more thickly wooded than the country is at present. It is quite likely that a light would be shown in their top windows at night, as in the much smaller towers, called *Lanternes des Morts*, in certain French cemeteries, and as was the case in a tower at Winchester built in the tenth century. Thus the Round Towers served 'éclairer ou guetter.'



CLONMACNOISE. GENERAL VIEW.

(6) And (whether this was at first intended or not) they certainly give unity and dignity to the ecclesiastical establishment over which they seem to preside, including as this so often did several churches of small size (not necessarily or usually seven) with other buildings collected in a group and surrounded by a 'cashel,' though each often stood in its own subordinate enclosure; many traces of this arrangement are to be seen at

Iniscealtra. It is quite unfair to judge the appearance of a Round Tower taken by itself; it existed as a part of the monastery, and is appropriate only when it is seen in its proper connection.

As regards the date at which these Towers were first built, this is placed by Miss Stokes at about 900 A.D., and the estimate is generally accepted. Of course Towers, round or square (which might conceivably have been imitated in Ireland), are much older than this; besides still earlier examples [15] there is, for instance, in a Greek MS. ascribed to the seventh or eighth century, among the illustrations to the history of Joshua, a picture of Ai having round towers with conical roofs at the corners of the city walls. There are also still existing two towers, square, but in other ways bearing some resemblances to the Irish type, in central Syria, among those many buildings which were in all probability finally deserted at the time of the Mussulman invasion (A.D. 634–638); we have already seen apparent signs of connection between Ireland and the East in early times. Further, a passage in Adamnan's *Life of St. Columba* has been thought to date back the building of an Irish Round Tower to the sixth century, where it is related how, through the prayers of the saint, a man was miraculously preserved who fell from the top of the 'Great House,' called in the title to the chapter (III. 15) 'the Round Monastery,' a part of the establishment being then built under St. Columba's direction at Durrow. But this was doubtless a wooden building. Besides other considerations already mentioned as to the date of stone buildings in Ireland, if in St. Columba's time a stone tower could be built at Durrow, it would be strange if some part of his chief monastery at Iona had not been of stone. But we know that this was of wood, though there was plenty of the other material at hand.

CLONMACNOISE AFTER RESTORATION.

CLONMACNOISE BEFORE RESTORATION.

But it is to the invasions of the Northmen in the ninth century that the general building of towers connected with churches or monasteries is attributed by Viollet-le-Duc, in France at all events. And there are plenty of proofs that towers resembling those in Ireland were built at and about that date on the Continent. Thus a tablet in relief in the library at St. Gall, ascribed to an abbot who died in 912, has on it, besides other buildings, two round towers roofed with cupolas, and having several oblong windows on each floor. And the elaborate plan (with a description) for a re-building of the same monastery in 829 shows two round towers standing on each side of the main church's western apse, a short distance away, but connected with it by two passages; the ascent was to be by a corkscrew stair, 'for overlooking everything.' That St. Gall was an Irish foundation is interesting, and perhaps important. And in England the old cathedral at Winchester had, at least before 971, a tower adjoining its ornamental doorway; this tower, whether of wood or stone, had a cupola-shaped roof ('Turris exat rostrata tholis,' says Wolstan, writing about A.D. 1006). The church built by Æthelwold at Abingdon in the latter part of the tenth century had a round bell-tower. Round towers with conical roofs are represented on a Carlovingian ivory plaque, and round towers flanking a church

[15] There were found at Pompeii paintings of country houses with detached round towers (of no great height) close by them; the coincidence is curious. See Gell and Gandy, *Pompeiana*, 3rd ed., plates 57 and 60.

on a Byzantine ivory, both of the eleventh century and both in the South Kensington Museum. Similar towers with cupola roofs are illustrated in the *Benedictional of Archbishop Roberts*, of the end of the tenth century.

And though the round church towers have, except in Ireland, mostly been superseded by later types, there are enough instances actually remaining to support such records, and to show that in the tenth and eleventh centuries the Round Towers of Ireland would not have seemed by any means so unusual as they do at present. At Épinal, in Lorraine, a round tower very closely resembling the Irish type in its tapering and other features is attached to a transept supposed to be of the tenth century. The campaniles at Ravenna are probably all of some date later than Charlemagne; that of S. Apollinare in Classe, 140 or 150 ft. high, is detached from its church. There are two round towers at the western corners of a church at Gernrode in the Hartz; this church is said to have been founded in 960. The round tower at Nivelles, attached to a church dedicated in 1045, has several bands like those at Ardmore. A good many other instances might be quoted from France, Belgium, Switzerland, Germany, and Italy, still existing or recorded, which, if not themselves the model for the Irish Round Towers, had a common origin with them, and show that the type was formerly not an unusual one. It may be noticed that it was just the supposed unique character of these Irish towers which suggested the assigning to them of some strange origin and 'prehistoric' date. A. C. Champneys.

(To be continued.)

The photograph of Clonmacnoise before restoration is by Langfier, Ltd. The rest are taken by the author and prepared by Messrs. Seaman, of Ilkeston.

Books.

THE CARNEGIE DUNFERMLINE TRUST.

The Carnegie Dunfermline Trust. Scheme for Pittencrieff Park and Glen and City Improvements. Thos. H. Mawson, Hon. A.R.I.B.A.

Mr. Mawson, as one would naturally expect, reports to the trustees more as an æsthetic than as a social reformer. His proposals may in a sense be said to be tentative in detail, but clearly to define certain principles. He very truly says that only by acting on a well-considered plan can anything really worth doing be accomplished. "Given a worthy ideal, a continuous policy, a substantial forward movement which will not turn aside from its purpose, patience to see that all improvement takes time—given these, anything is possible."

It is, of course, difficult, if not impossible, to criticise at all adequately the proposals contained in this report without an intimate acquaintance with Dunfermline and its surroundings; but certain features stand out on which a word or two may be said.

A study of the plans makes it clear that in adopting some such scheme a very great change in the character of the town is effected. The old public park is brought into direct relation with the new park and the city, instead of being isolated, and an attempt is made to weld the whole into one "City Beautiful." The centre of intellectual activity is in the Town Garden, where, arranged in a double crescent, with a broad road and grass between, are the concert hall, picture galleries, and technical schools, designed in a classical manner, with towers at the horns of the crescents. A perspective sketch is given of this. The domed central feature strikes one as being a little small, and the towers are probably only in the sketch stage and are not to be considered too seriously. The idea is a good one. The perspective sketch shows a deeper and more imposing curve of the crescents than the plan suggests.

The scheme for new roads is distinctly ambitious, and cuts rather ruthlessly through buildings and streets with no special regard for the existing alignment. In the centre of the town is a cleared space of very nearly two acres. A boulevard about a mile long and 160 feet wide cuts through the town from north to south, and finally rather trickles away into the country beyond. All this is undoubtedly "fine and large," but is the canvas big enough for the picture?

Mr. Mawson's views on the eternal housing question seem to me to be thoroughly sound. He frankly makes his cottages town cottages, and provides allotment gardens elsewhere. One of the chief attractions of a town is that it *is* a town, and to try to make it into country by providing each cottage with a poky piece of garden where a few wan flowers struggle for existence is ridiculous. Certainly let us have trees in the streets, but collect all the little patches into decent squares maintained by the town instead of multiplying dreary strips, the cultivation of which is left to the caprice of the tenant.

The report is divided under twenty-six heads, is clearly expressed, and shows that the subject has been thoroughly and thoughtfully considered. There are careful maps, plans, and sketches. The proofs might have been more carefully corrected, as there are several misprints. Some of the illustrations have no title, and they seem to have been dropped into the book rather promiscuously: the text refers to an illustration in the following or preceding page, and it is a little confusing to find either no illustration at all or one of some entirely different subject. Ernest Newton.

PROBLEMS OF A SCOTTISH TOWN.

Problems of a Scottish Town. J. H. Whitehouse.

Mr. Whitehouse, who until lately was the Secretary of the Carnegie Dunfermline Trust, describes very frankly the present condition of Dunfermline and its inhabitants for whose benefit Mr. Carnegie has set aside a sum of half a million, together with Pittencrieff Park and Glen, in the hands of trustees—the interest of this sum, amounting to £25,000 a year, to be applied for the betterment of the town and the community generally. The picture drawn by Mr. Whitehouse is not an alluring one: drunkenness, overcrowding,

dirt and squalor, and a river which he describes as "a sluggish mass of ink, stink, and malaria."

One reads between the lines that the constitution of the trust is not an ideal one. The trustees are for the most part the same men as the members of the Town Council, who would appear to show no particular activity outside routine matters; they are appointed for life, and hold their meetings in private.

Mr. Whitehouse's suggested reforms can in no sense be described as revolutionary, and are not more than any self-respecting town might easily undertake without extraneous aid.

The first suggestion is the formation of a "Civic Union" which, amongst other duties, is—quite in a friendly way of course—to keep the trustees up to the mark. Boys' clubs and camps, social settlements, well-appointed libraries, reading-rooms and museums, and a sensible system of education which should stimulate interest in the history of Dunfermline and in its ancient buildings—such briefly are the outlines of a very modest programme. The Trust is also advised to buy land and build cottages as a means of relieving the present congestion.

The laying out of Pittencrieff Park and Glen is only lightly touched upon, as this has already been very elaborately and ably reported on by Professor Geddes; but, as showing the attitude of the official mind, the following paragraphs may be quoted:—

"There is a tendency, which I cannot regard as other than lamentable on the part of those responsible for the care of the Park, to urge that little need be done to it beyond the provision of paths, with railings and notice boards to prevent the public leaving them." And again, "In the summer of 1904 a crowd of happy children were to be seen each day wading and playing about a circular pond in the north-west corner of Pittencrieff Park. The pond was twelve inches deep, fed by fresh running water, and there was no happier sight in the park than this of child joy. The privilege was suddenly withdrawn, the reason given being that the children made a mess, and that their mothers would be grateful that they were prevented from getting wet!" This sort of attitude is not encouraging, and it looks as if there might be ample scope for an active Civic Union if an adequate use is to be made of Mr. Carnegie's gift.

Mr. Whitehouse has evidently studied his subject with great care, and has given much thought to the solution of the many problems; his suggestions are so simple that they should rouse no opposition, and there is no doubt they would make an excellent beginning if carried out loyally and with enthusiasm. One feels though that something a little bigger, a little more imaginative, is called for, if the best is to be made of a unique opportunity.

The book contains a few illustrations of Dunfermline as it is, but in order to follow clearly the suggestions for building developments, a map would have been a valuable addition.

The task set by Mr. Carnegie to his trustees is undoubtedly a difficult one, and the experiment will be watched with interest by many to whom Mr. Whitehouse's book will give a clear idea of the various problems to be solved before even a beginning can be made.

ERNEST NEWTON.

PERSPECTIVE TABLES.

Perspective Tables for Practical Architectural Draughtsmen, with chapters on the principles of linear perspective, the centrolinead, and practical hints. By Robert F. Sherar. 3s. 6d. nett. Edinburgh: A. W. Sinclair, 79, Princes Street. 1905.

So much has been written about architectural perspective that one would have imagined that there was little more to add; yet the 'Tables' compiled by Mr. Sherar are both valuable and new, at any rate in their application. To describe them fully would scarcely be fair to either author or publisher of the little book which is now before us, but it may be said that they have been compiled with the intention of assisting a draughtsman to determine the inclination of radiating lines, and so facilitate the setting up of the centrolinead, when either the point of sight or one or both of the vanishing points are located beyond the limits of his drawing-board. In order to determine the degree of radiation of lines on plan to a point of sight whose distance in front of the picture plane has been pre-determined, a simple principle of graphic proportion has been adopted, and reduced to tabular form. Its application is simplicity itself. By its aid a few radial lines can be determined, and to these the centrolinead can be set, as all perspective draughtsmen know.

To obtain the location of a vanishing point which lies outside the drawing-board, and then to determine a few radial lines to it, is theoretically more difficult; but although two operations have to be performed, Mr. Sherar has removed all difficulty from the problem. In order to locate the v.p., he has cleverly adapted the trigonometrician's Table of Natural Cosines to practical perspective work, reducing its employment to a simple reference and a simple multiplication sum—without saying that he is using trigonometry. If the draughtsman will only accept the Table as being correct, and be content to work to no finer angles than half degrees, he need trouble his head no further. It is not often necessary to set out an angle, in practical perspective work, to minutes of arc; but if it be necessary to do so, then Chambers' Tables must be consulted instead of those given by Mr. Sherar.

Once the vanishing-point has been located in this way, the determination of radial lines towards it proceeds by simple graphic proportion as before.

Young draughtsmen often stumble over setting up the theodolite, and many of those who possess great experience rely entirely upon the unscientific "trial and error" method, so that the description of the correct method as given by Mr. Sherar, rapid and accurate, should be valuable.

The rest of the book is taken up by the enunciation of well-known elementary principles and a few useful practical hints, but this may to a large extent be considered as mere "padding," introduced in order to make the volume large enough in bulk to put upon the market. Its real value lies in the Tables and their application.

G. A. T. MIDDLETON.