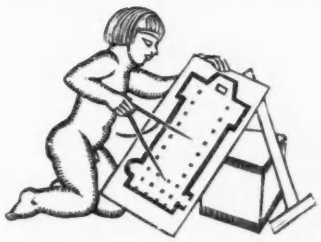
THE ARCHITECTS' JOURNAL



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A number of public school war memorials will be illustrated in the next issue. Among those chosen are the memorials at Eton, Harrow and Marlborough.

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PRINCIPAL CONTENTS

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CHRISTIAN BARMAN, *Editor*

The Editor will be glad to receive MS. articles, and also illustrations of current architecture in this country and abroad, with a view to publication. Though every care will be taken, the Editor cannot hold himself responsible for material sent him.

RENDERINGS OF ARCHITECTURE

Selected and annotated by Dr. Tancred Borenius.

XXXV : Jean Lemaire (1597-1659 ?).
Roman Ruins.

Not very much is known concerning the painter of this noble architectura composition, with its simple and dignified disposition of lines and masses, which attracted much attention at the exhibition of French landscape pictures held at the Petit Palais in Paris last year. The artist shows himself very evidently under the influence of Nicolas Poussin, with whom he was on terms of intimate friendship : he lived at Rome from 1613 to 1633, and accompanied Poussin there in 1642. It is said that Poussin availed himself of Lemaire's collaboration in some of his landscapes ; and the influence of Poussin on Lemaire is reflected in the latter's nickname, "Lemaire-Poussin." The scene is conceived in an austere, melancholy spirit ; we are far removed from the picturesque melodrama of a Salvator Rosa and his following, and there is nothing here that points the way to Pannini's facile Roman rhapsodies. The literary parallel is an obvious one : this composition breathes the spirit of Pierre Corneille's tragedies.—[Paris, Louvre.]

THE ARCHITECTS' JOURNAL

Wednesday, September 15th, 1926

THE DANGER OF FIRE

THE ever-present danger of fire has been once again demonstrated by the appalling catastrophe in the little Irish village of Drumcollogher.

Legislation has been admirably successful in ensuring the safety of the public in their everyday occupations; the party-wall and the safety curtain; the fire-resisting door, and the insistence upon adequate exits make major disasters involving large-scale loss of life practically impossible where legislation is effective; but it is difficult to see how the law can completely counter the greatest source of danger which is to be found in the smaller travelling show, and the occasional charity entertainment performed in "makeshift" surroundings, often of the most inflammable description. It might help if the owner and organizer were legally responsible to the extent of manslaughter, but the only adequate safeguard is a general understanding of the dangers of fire, and an instinctive consideration of means of escape on the part of those selecting halls for public or private gatherings of any kind.

Not nearly enough public attention has been drawn to the use of fireproof materials in new buildings. A boarded floor is liable to cause a conflagration if a lamp is upset or if a film catches fire, and while timber has certain advantages over cement or tiles, yet the counter advantages of safety in the event of fire are so great that not only should such materials be in general use wherever feasible for flooring, but also for staircases. Many lives and much property would be saved every year if it were the recognized custom to build steel or concrete staircases, and the additional cost would be trifling. We most of us live in combustible houses, covered by insurance from the risk of fire; a piquant misnomer since, at the best, we are insured, not against the risk of fire, but for compensation in the event of loss. If we are wise we install extinguishing apparatus, but although there may be little danger to life in the ordinary house, yet our personal property is in constant peril. The inhabitants of concrete and steel houses, such as those at Braintree, must feel a curious sense of freedom from the menace that hangs over the ordinary householder, and with advancing civilization there should come a widening appreciation of fire danger, and with it a far more extensive use of incombustible materials. We have advanced since the days of the timbered and thatched town, let us beware against slackening our fire precautions and see that every move is a move forward. Under the 1919 Housing Act the necessity for projecting the party-walls through the roof was abolished, and this move was justified since, as a precaution, the projection was valueless and it added to the cost and detracted from the appearance; but, under the pressure of economy, there has also been a slackening in other directions which has permitted the growth of mushroom colonies of wooden bungalows, constituting a source of danger to themselves and to each other.

A man living in a house composed of concrete and steel has clearly no need to insure his house against fire loss; further, he need not even insure the contents, since there is no danger of a general conflagration, but only the risk to each individual article, which, by comparison, is trifling and not worth the premium, unless it were made much lower than that applicable to ordinary dwelling-houses. It seems, therefore, that the insurance companies could help to a better understanding of fire prevention if they adopted a different rate for houses in which fireproof materials, such as concrete floors and slab partitions, were used. That this action would be unduly altruistic if it encouraged the growth of fireproof houses may well be urged, but the possible loss to the companies would be more than compensated if such conditions were associated with a wide scheme of propaganda among ordinary policy-holders. Visiting agents might make a periodic round of their clients and, even without insisting on the ideal, give invaluable hints as to reasonable precautions, accessible apparatus, and especially life-saving conveniences. They could draw attention to the dangers from short circuiting where electric installations have been fitted in old houses, or from exposed beams in flues. There are many excellent extinguishers for use against small outbreaks, but the initial outlay, although not unreasonable, prevents these from being found in every house and garage.

But in the end no legislation or appliance can completely forestall the annual toll from fire misadventure while human folly and carelessness persist. Continuous propaganda will remain as necessary as the safety first campaign in traffic control, or of first aid in accidents. To this ideal all responsible parties should unite, public authorities, the Broadcasting Company, insurance offices, architects, and especially the educational departments. Fire drill, reinforced by sensible fire hints, should become more than the quasi-comic game to which it usually degenerates, and the child who has acquired a discipline of reasonable care will not, later on, throw his cigarette end in the wastepaper basket, or, if he has to build a house, stint his architect of the comparatively small extra outlay that will make his home and family safe from the horror and destruction of fire.

NEWS AND TOPICS

THE SMOKE ABATEMENT CONFERENCE—CHISWICK TOWN PLANNING—THE PARSONS GEARED TURBINE—THE THIRD WALL, JERUSALEM—THE NEW UNDERGROUND STATIONS—AN ARCHITECTS' DEFENCE UNION.

THE coal fire of the domestic hearth in modern town-planning schemes formed the subject of debate by the Smoke Abatement League at their conference held at Bingley Hall. The old-fashioned grate is known to be highly efficient as a producer of soot and smoke whatever other merits or demerits it may possess. There are, of course, grates and grates, and an element of luck also enters into the question, for a good grate may be badly installed in a house so planned as to draw wind down the chimney and prevent proper combustion. The ventilating functions of the smoke flue were enlarged upon by Mr. Raymond Unwin, Chief Technical Officer of the Ministry of Health, and still more whole-heartedly blessed by Dr. Leonard Hill, who spoke feelingly of the need for an elastic system of heating and ventilating by means of open fires and open windows. The desirability of a smokeless fuel which could be burned under these conditions was pointed out in a discussion. The advocates of gas and electricity could point to several housing schemes where provision had been made for wholly or partly avoiding the use of raw coal and dispensing with the kitchen range, but rangeless houses are still somewhat in the nature of experiments in England. As coal becomes more scarce and miners become more reluctant to perform mining operations, the experiment will doubtless proceed to a satisfactory conclusion. In the meantime, the confession that some authorities had provided grates and had also wired the premises for heating by electricity will be construed as an acknowledgment of wasted outlay by some critics, and welcomed as evidence of proper exercise of forethought by others.

* * *

The complicated nature of the smoke abatement problem has been further emphasised in connection with the proposal to erect an electricity-generating station on land originally included in the Chiswick Urban District Council's town-planning scheme. That a new works should be constructed to consume no less than 750,000 tons of coal annually, and that the site should be chosen in the neighbourhood of a residential district at a time of increasing coal shortage and when the value of preserving the architectural amenities has already been recognized, is something of a puzzle, whether looked at from the point of view of economics, or art, or psychology. Our efforts towards the peaceful development of our resources—or, concerning coal, of our lack of resources—seem to need a certain amount of straightening out. It may be admitted concerning coal, as Browning's Bishop said of jasper: "There's plenty jasper *somewhere in the world*," but the point is, can we make use of it profitably to the benefit of the whole community? As long as a large proportion of a population contentedly hews wood and draws water without brooding overmuch upon the prospect of reward for these services, the use and waste of the products go cheerily on. When the producer takes to questioning whether the game is worth the candle, the user finds himself forced to put on his considering cap.

The new geared turbine engine which Sir Charles Parsons has invented, and which has been tested in the trial trip of the *King George V*, shows what can be done when a serious attempt is made to apply trained creative ability to a problem. It is claimed that the new geared turbine is from ten to fifteen per cent. more efficient than the old turbine. Naval architecture receives this intensive attention from competent experimenters possibly because the sea is a hard master and is impatient of anything less than sincere effort. As population increases in numbers, and, much more, as it increases its fastidious demands for a high standard of living, kindly Mother Earth grows more exacting, and, assuming something of Neptune's sternness, demands greater efficiency from architects and farmers alike. It is nobody's business to invent an efficient windmill with which to replace coal in the production of power, but it will shortly become expedient to think in terms of such alternative measures. Town-planners and smoke-abatement societies might forward the invention of sightly and smokeless power production in the interests of the profitable development of property, the preservation of building material from corrosion, and the health of the community.

* * *

Excavation in and about Jerusalem has been very greatly facilitated since the English occupation, and many uncertainties which have perplexed both antiquarians and pilgrims may be removed by the gradual unearthing of further evidence of the ancient city walls. The third wall, built by Agrippa to enclose the northern suburb, was at one time incorrectly identified with the present north wall of the city, but excavations undertaken by Dr. Sukenic and Dr. Meyer, of the Jewish Archæological Society, have revealed foundations of a wall running outside the present city wall between St. Stephen's Dominican Convent and the Russian Square. A report in the *Times* states that the whole northern part of the wall is now traceable. One practical reason why Jerusalem, like other Oriental walled cities, should have walls in different places at different periods is that the immemorial practice of dumping offal and rubbish on what is, normally, the leeward side of the town, leads to the migration of all but the poorest inhabitants to more savoury quarters. Immense deposits of debris were encountered by earlier excavators on the south and east sides of the city, where—until the Turks were driven out, at all events—the refuse of the whole population was pitched out towards Siloam. "Cool Siloam's shady rill" is an expression in which poetic licence arrives at its limits.

* * *

The Practice Standing Committee of the R.I.B.A. is about to invite subscriptions to the new Defence Union. By joining this Union, and paying a small annual subscription, any architect may insure himself against expenses incurred in defending his copyright and recovering fees, and may also face slander actions and (most important of all, of course,) actions for negligence with the knowledge that he has powerful support behind him. I doubt whether the majority of architects really have a clear idea of their legal responsibility on the score of "neglect, default or error." To say that this responsibility is excessive and hopelessly out of proportion to their actual professional responsibility would be to put it mildly. It is true that the plaintiff has to make good his accusation of negligence,

and that until this is done no question of liability can arise. But the state of the law is such that anything that goes wrong on a modern job, no matter where or how, may be laid at the architect's door by an irate or an exploiting client.

* * *

Thus it is quite fair to say that the architect is legally responsible for every action of every employee of every sub-contractor, and that a claim in respect of such an action may at any moment be lodged against him. The reason why most of these claims are never heard of by the profession is that the architect is always tempted to settle out of Court. For one thing, the publicity which would result from a hearing in Court is not particularly good for an architect's reputation, no matter how foolish the claim; the costs, moreover, which an architect has to pay even after winning a case have several times been known to exceed the amount of the original claim. Without suggesting that the bulk of these actions are anything but genuine, one or two letters which I have received of late make it fairly clear that claims for negligence may easily become a disguised form of blackmail. The more this matter is considered by the profession at large, and the more of these claims resisted by the new Defence Union, the happier for all of us. I have heard it said that the number of negligence actions is on the increase. If this is true it certainly cannot be because architects are becoming more negligent of their clients' interests. I am inclined to think, though, that they are still somewhat negligent of their own.

* * *

Our red terra-cotta tube stations, like our public monuments, have long been a target for the verbal bricks of the architectural dilettante. The Morden extension of the City and South London Railway, opened this week, is of interest in that the traditional red terra-cotta to which we have hitherto been accustomed has been definitely abandoned. The company has not repeated the stations of its Edgware extension, these being presumably more suited to semi-rural areas than to the long-developed districts of South London, such as Balham and Tooting. The consulting architects, Messrs. Adams, Holden, and Pearson, have evolved a very interesting design, capable of adaptation, with only slight modifications, to all shapes of site, and the result is an admirable expression of the entrance to an underground railway. The material used is Portland stone with blue enamel and bronze metalwork, and the façades will be flood-lit at night. The lettering, signs, advertisement spaces, and the necessary canopy over the entrance have all been carefully considered and incorporated as parts of the design. Too often in the past these have been left to the ruthlessly practical engineer and advertisement contractor. The new station is specially designed for use in built-up areas, where it has to serve as a base for other buildings while maintaining its own entity. It will be quite as unmistakable an "Underground" entrance as were the terra-cotta monstrosities which it supersedes.

* * *

The reading of Messrs. Dawnay's advertisement in last week' JOURNAL filled me with delight. For here it was stated that over 1,000 tons of constitutional steelwork had been used in the G.E.C.'s power station at St. John's Wood. "Ah, ha!" said I, "Here is an old British firm that delights in the building of well-ordered things. They have seen my illustration in this paper a fortnight ago of the memorial to the Third International. They have seen it, and they abhor such work. *Their* delight is in that which is inherent in the natural frame, which is agreeable to the constitution or frame of Government, which is essential, legal, *constitutional*. Herr Hans Poelzig, Herr Erich Mendelssohn, must shift for themselves. If these gentlemen's ideas are contorted they themselves must persuade the steelwork into shape—Messrs. Dawnay will have nothing to do with it." And then the Editor told me that the word *constitutional* was a misprint for *constructional*. This I do not want to believe.

* * *

The All-Russian Central Council of Trades Unions has earned our gratitude by the invention of a new word which will be invaluable to the architectural critics of the future. It occurs in the long telegram which Comrade Tomsky sent to the Trades Union Congress at Bournemouth on their behalf. Next time I am taken down to admire some new effort of one of our more conservative designers I mean to try it on. I shall blow out my cheeks, shake my head vigorously, and murmur in disappointed tones, "but this is of the 'elementariest!'" ASTRAGAL

AUTHORITY AND LIBERTY IN ARCHITECTURE

[BY ARTHUR J. PENTY]

I: THE GOTHIC REVIVAL

[*The following article is the first of a series of five attempting a reasoned history of English Architecture during the latter part of the nineteenth century. Those of our readers who are acquainted with Mr. Penty's works on economic questions of the hour will watch the author's return to the sphere of architecture with peculiar satisfaction. The next article, which will appear in our issue for September 29, has for its subject the so-called "vernacular movement."*—Editor, A.J.]

IT is now twenty-five years or so since the crisis overtook English architecture which tipped the scales in favour of Renaissance and Classic Art. The adoption of Renaissance and Classic architecture subsequently became so general in the profession, and its triumph so continuous, that it looked until yesterday as if the choice of a style for modern use had been settled once and for ever. The Battle of the Styles appeared to have ended in a complete and final victory for the Classic school. The profession, after wandering in the wilderness for a century, had, it was supposed, at last returned to sanity and accepted the fact that modern civilization is a part of the Renaissance and, therefore, that the Renaissance style is the only one fitted to the circumstances of modern life. Yet no sooner was the battle won than doubt began to enter. Better manners prevail, but a suspicion gains ground that our inspiration is failing. The profession and the public alike are becoming weary of the endless procession of columns, architraves, cornices, pediments, that do duty for architecture, and are asking themselves whether the much-advertised progress is real or imaginary; whether, in fact, the successes of the Classical revival are to be regarded as the prelude to better things or whether they do not partake of the nature of those facile half-successes that lead to ultimate impotence?

This question is difficult; for the issues are complex and in consequence do not admit of a simple answer. For while it is certain that the Classical revival has made a definite contribution to the solution of the problem of architectural style, it is equally certain that it has placed obstacles in the path of its final solution by reason of the peculiar attitude towards architecture it has brought into existence. To change this it is necessary to relate the Classical revival to its background of history; for the peculiar attitude of the Classical school towards the problems of architecture rests finally on a particular interpretation of the history of architecture during this last hundred years, which, I am persuaded, cannot be maintained.

Thus, in reviewing the work of the International Congress of Architectural Education, Professor Budden gives expression to the accepted view of the Classical school. He says: "The industrial revolution, the romantic movement, with the stylistic fashions which succeeded it, and the ever-increasing complexity of architectural programmes and structural methods combined to break up the orderly progress of the art. In the welter of styles that ensued British architecture temporarily lost its bearings."[1] This sounds very plausible; but I hope to show that it will not bear

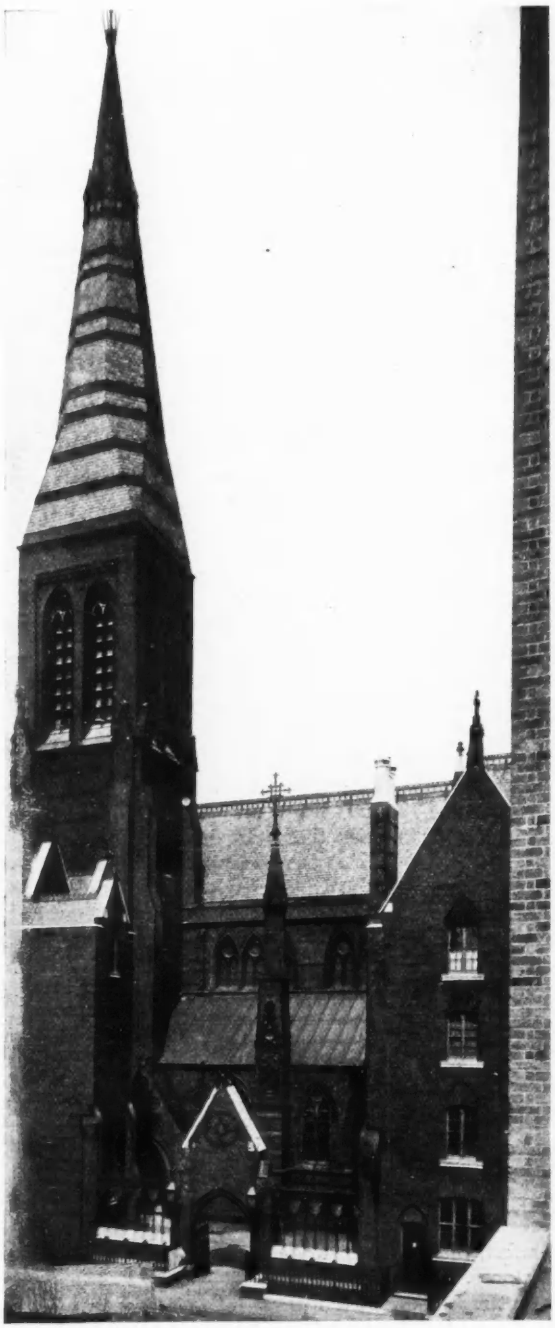
[1] Proceedings of the First International Congress on Architectural Education. Review of the Conference, by Professor Lionel B. Budden, p. xlv.

Saint Augustine's Abbey, Ramsgate (circa *1840*).

examination in so far as it implies that the Gothic revival was the beginning of the trouble by breaking the continuity of the architectural tradition.

It is to be observed that the Gothic revival was not the first architectural movement to break the continuity of tradition, for its continuity was first broken in the sixteenth century, when Renaissance architecture was introduced into this country. If, therefore, the Classical school take their stand on the continuity of tradition, they must accept responsibility for the confusion of architecture to-day as their progenitors in the sixteenth century were the first innovators. Indeed, a very strong case can be made out for regarding them in this way, as anyone familiar with the literature of the Gothic revival is well aware. Nevertheless, we have to face the fact that while some confusion accompanied the introduction of Renaissance architecture in the sixteenth century, it did not give rise to the chaos which followed the Gothic revival. The question, therefore, which arises is: Why was the introduction of Renaissance architecture only followed by temporary confusion, while the Gothic revival was followed by chaos and collapse? To answer that question is to get at the root of the trouble.

The reason is to be found in the fact that whereas in the sixteenth century a capacity for design was the common property of the building trades, by the first quarter of the nineteenth century it had practically ceased to exist. The consequence was that while the building trades in the sixteenth and seventeenth centuries were capable of assimilating to their traditions the new ideas that came with the Renaissance, such was not the case with the architects (who in the meantime had come to monopolize the function of design) when the Gothic revival came along. The instinct for design and workmanship had during the interval almost disappeared, and the cause of this disappearance is to be connected with the pedantic attitude of the architects of the Classical revival in the latter half of the eighteenth century, which resulted in the total strangulation of any feeling for design.



All Saints' Church, Margaret's Street, London, W. (circa *1850*).

In the sixteenth century the Gothic tradition of design was alive. The architects and craftsmen assimilated to their traditions the materials of design which Classic art supplied in the same way as they did those which their immediate forefathers had transmitted to them. They handled Classical forms in such a natural way that the early Renaissance may justly be regarded as a form of Gothic architecture. The early Renaissance was, to quote Symonds, "a Classic flower on a Gothic stock." But a time came when the Gothic element dropped out of Renaissance art. The architects aspired to scholastic rather than æsthetic propriety. Their one ambition was to be correct according to Roman standards of design. And with this idea uppermost in their minds, they enforced their classicalisms stringently over the whole country. The height and projection of every feature in the five Orders was insisted on to a decimal point, with the result that in the space of fifty years they succeeded in destroying entirely that instinctive capacity for design which had existed among craftsmen since the dawn of history. It was thus the communal tradition of design, the common inheritance of architecture in which all shared and each made use of according to his ability, came to an end. It came to an end because the late Renaissance architects were so shortsighted that they set out to destroy it, not understanding that architecture lives by experiment rather than precedent. It was this pedantry which got the upper hand in the latter half of the eighteenth century that was the death of architecture. The Greek revival which followed the publication of Stuart's *Athens* in the early years of the last century was the last flicker of life in a tradition that was dead at its roots. In so far as obedience to the Orders could keep an architect straight, something resembling architecture for a time continued to be produced. But it was an architecture without inspiration and without adaptability, and because it had neither it could not survive.

The impulse which led to the Gothic revival did not

come from the profession, but from the public, who rebelled against the ineptitudes of the Classic architects. Instinctively they recognized that, under the Classical revival, architecture had gone astray. They missed in it the human touch and craved for something more attractive than the architects of the day were capable of supplying. It was natural, therefore, that in such circumstances their thoughts should turn to the idea of reviving that native and traditional art which the Renaissance had displaced. The first architects of the Gothic revival were pushed into it by their clients. They knew little about Gothic. But the demand for houses of Gothic design was so insistent that a systematic study of Gothic was undertaken. The first efforts of the revivalists consisted in grafting Gothic details upon Renaissance plans, just as previously the first efforts of the Renaissance architects consisted of grafting Classic features upon Gothic plans. The plans were invariably symmetrical: a porch on the south side had to be balanced by one on the north side. This practice continued until the advent of Pugin, who revolutionized ideas of Gothic. He had some perception of the principle of growth that is inherent in Gothic design, while he saw its basis in craftsmanship. His teaching was such a great advance upon what had preceded it that it began to look as if the revival would before long come to its own and Gothic be finally established as the national style of architecture. But it was not to be. The spirit of pedantry that had destroyed the Renaissance reincarnated as antiquarianism stood in the way of a reasonable and rational development of the spirit of Gothic. Antiquarianism, from being a help by inculcating methodical study, had become a hindrance. If, therefore, the Gothic revival like the Renaissance was not to be strangled, it would be necessary to break through the trammels of antiquarian precedent; and this necessity is the justification of the challenge of Ruskin.

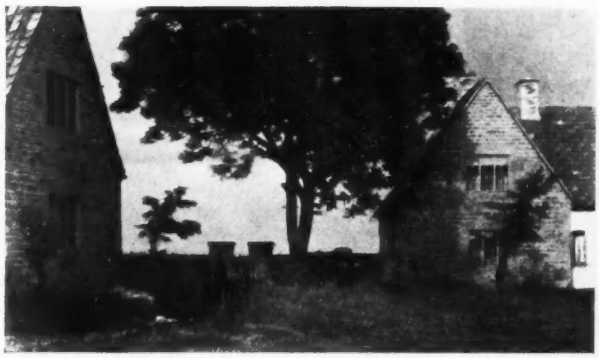
In 1848 Ruskin published *The Seven Lamps of Architecture*, which broke the spell of antiquarian authority by raising up the spirit against the letter. Before his advent Gothic had had a narrow connotation. Attention was given only to the more formal examples which were considered pure in style, while buildings exhibiting the more vigorous and elemental manifestations of the Gothic spirit were ignored because of certain incongruities of detail. Ruskin challenged the validity of all such judgments, exalting Venetian Gothic, which had hitherto been regarded as beyond the pale, to the place of honour, whilst relegating many examples of Gothic which had been regarded as the finest to a position of inferiority. He also in the *Seven Lamps* and in the *Stones of Venice*, published three years later, insisted on the basis of Gothic design in craftsmanship. Pugin had seen this, too, but it needed Ruskin's eloquence to secure acceptance of such an idea.

So far Ruskin's influence was good. The effect of his teaching was to broaden the conception of Gothic. But, unfortunately, his detailed advice was not always admirable, and, as so often happens, what was right in his teaching was generally disregarded, while what was wrong met with immediate response. In both the *Seven Lamps* and the *Stones of Venice* he repeatedly advocates the use of natural colour in construction, which, in effect, meant the mixing of different coloured bricks and stones. Such advice is fatally easy to follow, and after Butterfield adopted this treatment in All Saints', Margaret Street, it was not many years before architects vied with each other in the use of this form of colour. As a consequence, all sense of restraint entirely disappeared so far as the majority of architects were concerned. Any idea that plain surfaces were a necessary part of architectural effect vanished, and buildings became an orgy of features, different coloured bricks and stone, patterns, carving thrown together without rhyme or reason, sense of colour, or proportion. Henceforth every incompetent architect could pose as original by the wholesale use of such ornamentation, which rose rapidly into favour for street buildings and suburban villas. Thus came into existence that peculiar order of Victorian architecture which was afterwards distinguished by the familiar and not altogether inappropriate name of the Streaky Bacon style. In justice to Ruskin it should be pointed out that in advocating natural colour in construction he was advocating the use of brick instead of stucco. It was unfortunate that he did not leave it at that.

Yet when all is said against the immediate bad effect of Ruskin's teaching he was not finally to blame for the chaos that overtook Victorian architecture. It may be argued that the chaos was as inevitable an accompaniment of any rebirth of architecture as the social and economic chaos that accompanies revolutions is the inevitable accompaniment of any rebirth of societies. Innovation was in the air. The year 1851 not only witnessed the publication of the *Stones of Venice*, but also the Great Exhibition, which was not without its influence on architecture. The design for the Crystal Palace, as the exhibition building came to be called after its removal to Sydenham, had been selected in competition. Sir Joseph Paxton, it was said, had achieved an epoch-making success by following the light of his own native sagacity, and architects could do the same if only they would abandon obsolete traditions; and they were solemnly warned that if they had no other idea than to look to ancient examples for precedents to follow they had better abandon their vocation altogether. Henceforth architects were required to be original, and the public came to insist on the use of plate glass. Ninety-nine clients out of a hundred demanded it, and it was vain to oppose them. The use of large sheets of plate glass became the permanent hypothesis in architecture. An architect might indulge his fancy in other directions, but plate glass he had to accept on pain of forfeiting his future prospects. It was thus the bottom fell out of any rational treatment of architecture so far as domestic and city work was concerned, for when the architect is forbidden to use small panes his design will lack scale. Simple building looks naked, and there arises the desire to clothe the nakedness with ornament. This, I believe, to be the underlying reason why in the Victorian age buildings came to be covered with meretricious ornament of all kinds. Architecture became irrational because architects were not allowed by the public to be rational. Thus we see the Classic school are not justified in ascribing the chaos of architecture in the latter half of the nineteenth century to the Gothic revival. On the contrary, it was, as we saw, due in the first instance to the pedantry of the eighteenth century, which destroyed the instinct for design and workmanship, and in the next to the spirit of modernism which came into collision with the Gothic revival and defeated it. It would have been just the same if Classic had been in the ascendant, for as a matter of fact what remained of the Classic school was no more able to withstand the impact of modernism than were the Gothic revivalist.

[*To be continued*]

CURRENT
ARCHITECTURE
SECTION

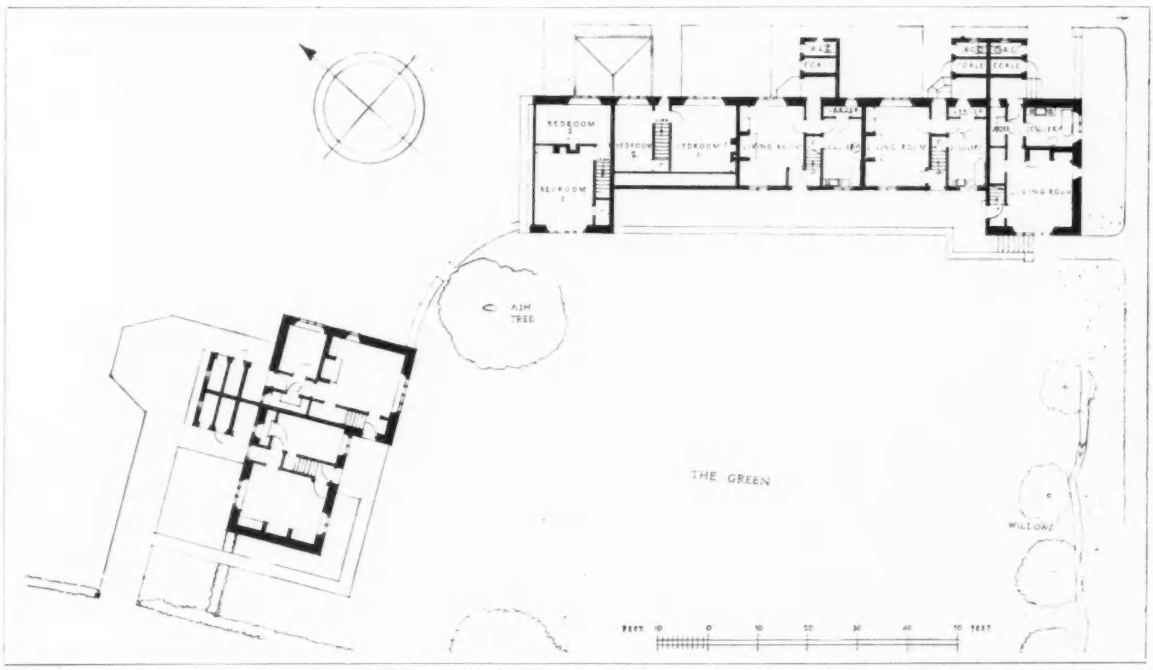


MINERS' DWELLINGS

[BY W. P. FERGUSSON]

THE firm of Mauchlen and Weightman has been for a number of years so closely associated with the subject of colliery housing that it is well known in the north country; in the south, however, it hardly receives the conscious attention due to it. Messrs. Mauchlen and Weightman may be regarded as pioneers of this class of work, and they have evolved many improvements over the recognized formulæ for the planning of miners' dwellings. None of the schemes illustrated here is under Government control, yet in practically every case the area of the rooms is greater than the figure laid down by the Ministry of Health; and, in spite of this, the costs compare very favourably with Ministry schemes which were erected in the neighbourhood at about the same time. Many of the methods used by this firm will be found to be of extreme use and general interest, and, in view of the progress with the erection of mining villages all over the country, it is interesting to see the practical and æsthetic possibilities suggested in the following pages.

Anyone may be excused for supposing that in such work it is the practical side of efficiency which governs the preferences of the client, and that the question of appearance takes a humbler place somewhere in the background. It is



Seven houses for colliers at Coalburns, near Ryton-on-Tyne. By Mauchlen and Weightman. Above, a view from the green looking north. Below, the plans.

E

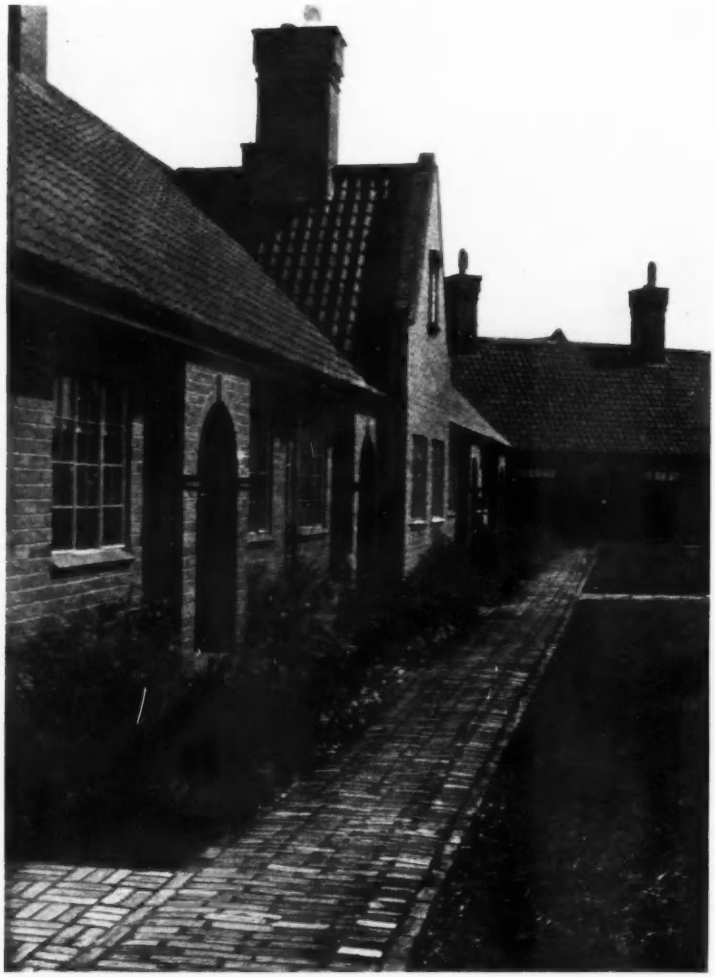
plain that Messrs. Mauchlen and Weightman have given the necessary time and consideration to questions of practicability, and it is the more creditable to find that the æsthetic side is always satisfactory. There is a subtlety of grouping; a combination of convenient spacing with keen architectural regard for the composition so produced.

The planning is, of course, the most important factor, and is influenced by the methods on which the particular colliery is conducted. The pitman's bath is one consideration. In the old days the tub in front of the kitchen fire was the custom, but this has given place to the provision of baths by the colliery owners. Some companies have a system of pit-head baths, but the more general method is to provide a bathroom with each house. In these cases the tenants prefer it on the ground floor so that the pitman need not go upstairs in his working clothes. It is usual to find the bath in the scullery, as at Coalburns, and the back entrance is so planned that this room is not a thoroughfare; but a better arrangement, where it is feasible, is to provide a separate room altogether, and this has been done with great success at Greenside. At Coalburns the hot water is supplied by gravitation from a set pot, while at Greenside an open-topped side boiler in the kitchen range has proved very successful, and is almost foolproof.

The question of wear and tear in these houses is one of considerable importance, and it is essential to build with a

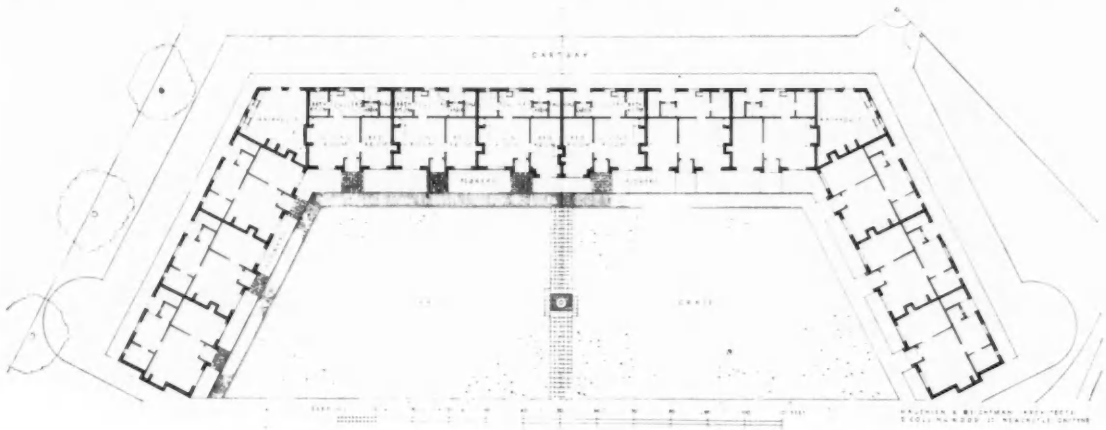
Seven houses for colliers at Coalburns, near Ryton-on-Tyne. By Mauchlen and Weightman. The front elevation of the block of five houses.

Seven houses for colliers at Coalburns, near Ryton-on-Tyne. By Mauchlen and Weightman. Above, a detail of the main front of the block of five houses. Below, the pair of semi-detached houses.



view to reducing maintenance charges as far as possible. Hardware must be very strong and the materials generally must be selected with a view to durability. The work of Messrs. Mauchlen and Weightman is particularly notable from this point of view because, while everything is of such a nature as to withstand hard wear, it still gives satisfactory æsthetic results. Hard brick is used throughout; woodwork is eliminated as far as possible, and steel casements are found in practically every case.

The seven houses at Coalburns were built to accommodate hewers with small families. The lay-out is distinctly pleasing, the houses being in two groups centred



Houses for aged mine workers at Crookhill, near Ryton-on-Tyne. By Mauchlen and Weightman. Above, a view of the main front. Below, the ground-floor plan.

round a green, which gives an indefinable atmosphere of a community, and yet the arrangement is economical. Each cottage has two bedrooms on the first floor, and a living-room, scullery (with bath), and a larder on the ground floor, with a coal-store and w.c. detached. The compactness and economy of the plans are so self-evident as to need no comment. The scheme replaced a number of dilapidated cottages which were demolished, the stone being re-used in building the new group, interspersed with cement plastered walls. The roof is also composed of pantiles taken from the old buildings.

It is fitting that with a scheme such as that at Crookhill the lay-out should be reminiscent of the traditional almshouse plan. The twelve houses are grouped symmetrically about a grass lawn, which is divided on the main axis by a flagged path leading towards the gable, which forms the central feature. The group was built for the Durham Aged Mine Workers Association to house the elderly and infirm. All the rooms are, therefore, on one floor, and internal access has everywhere been provided. The planning and arrangement of the back rooms are very ingenious, since every room is easily accessible without the necessity of exposure of the occupier to the outside air. Two washhouses have been provided, and these very creditably

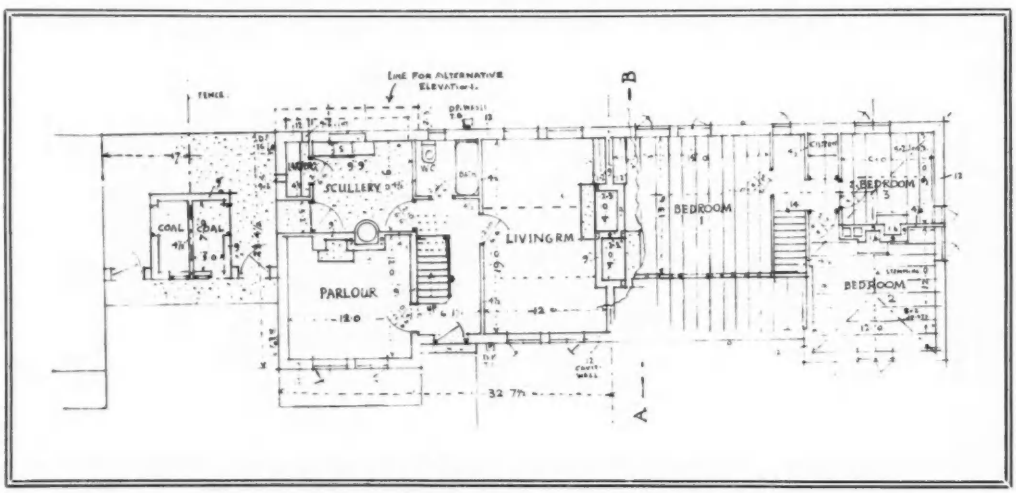
Houses for aged mine workers at Crookhill, near Ryton-on-Tyne. By Mauchlen and Weightman. The centre feature of the main front.

account for the spaces at the angles of the building, which always tend to cause difficulties with a plan of this type. They are, besides, admirably placed from the point of view of convenience. The elevations are very pleasing indeed; they are of red brick roofed with dark pantiles. The general effect is one of modernity, tempered with a due respect for traditional forms and an appreciation of the style prevalent in the neighbourhood; and there is an atmosphere of quiet repose which admirably suggests the purpose of these houses. The placing of the sundial in the forecourt has the curiously unexpected psychological effect of uniting the whole group, and of providing, as it were, a common interest to all the inhabitants.

The Holly Bush scheme was built to house the deputy class—overseers and foremen—and the cottages are rather more spacious than those previously mentioned. It is worthy of notice that in all the houses designed to accommodate pitmen the living-rooms are provided with windows on two walls; this, in itself, is a worthy object and one which should receive greater consideration than is generally shown to it.

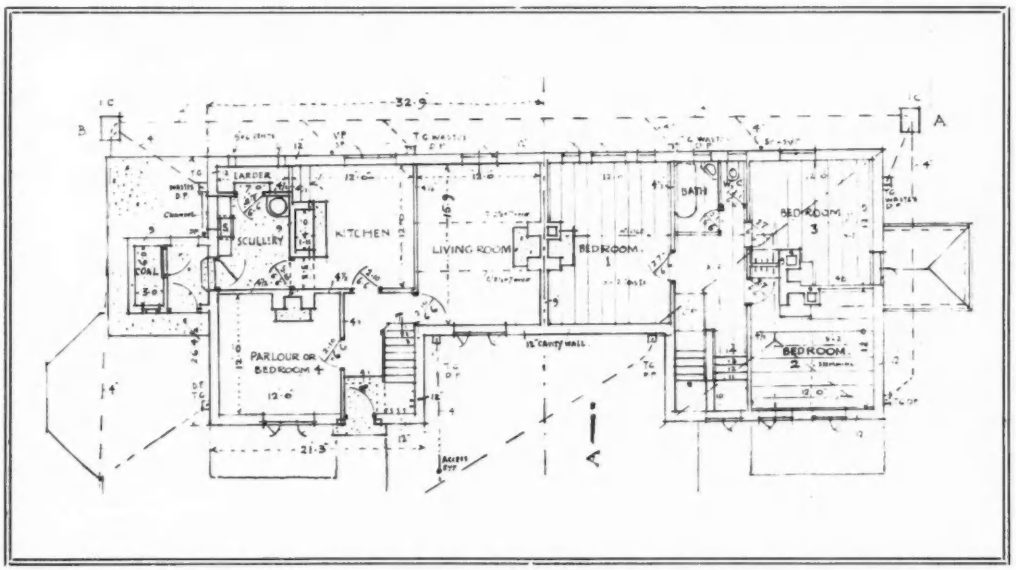
The cottages at Coalburns are actually part of a larger project, of which Greenside forms another section. Both are connected with the same pit, but the latter is composed of a larger type of house. They are built in rows, but are treated architecturally as a single composition. There is a fine studied interest about the elevations, and the lay-out is most effective, lacking the peculiar dullness and apathy which, by long usage, has come to be summed up by the word row. The materials used are local cream-brown bricks, which blend admirably with the dark red pantiles.

Messrs. Mauchlen and Weightman are great students of local style and material, so that their work has a pleasant

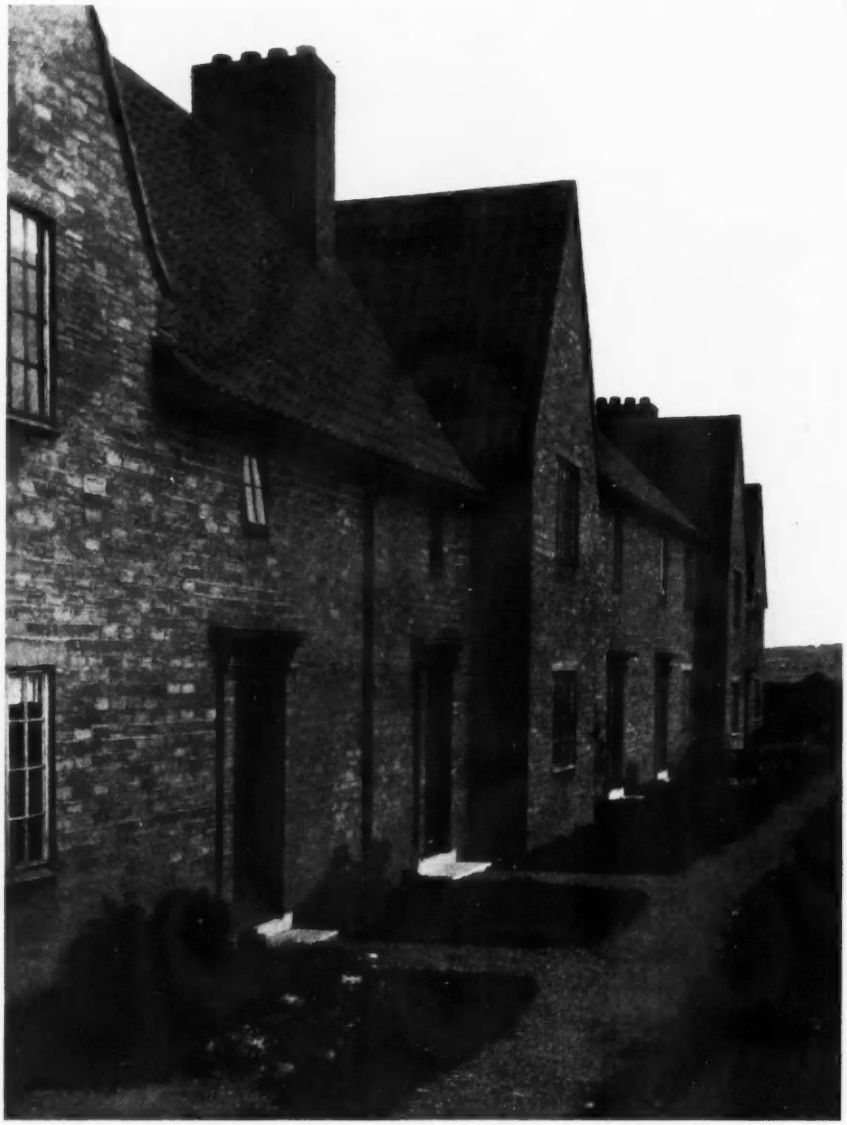


Colliers' houses on the Holly Bush site, Crookhill, near Ryton-on-Tyne. By Mauchlen and Weightman. Above, the front elevation of houses Nos. 3 to 18. Below, the ground and first floor plans.

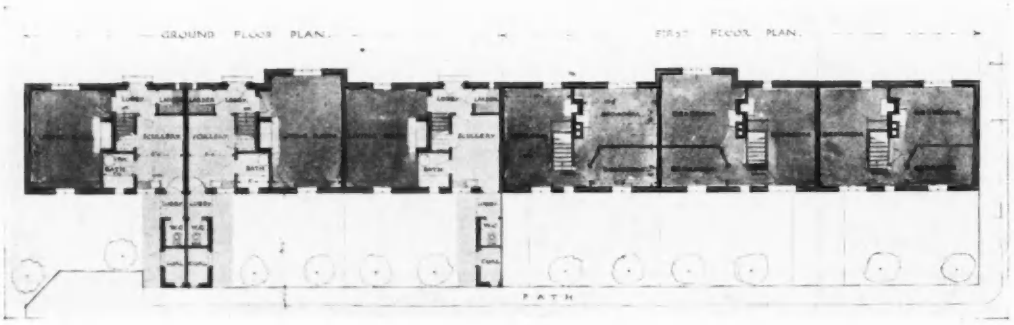
appearance of restraint. It is the fault of much work of this sort that it strikes the beholder as being artificial, and foreign to its neighbourhood; but here the designs seem to settle among their surroundings and become an integral part of them. With the development of East Kent it is to be urged that some such qualifications should be sought in the erection of the dwellings. The work illustrated here proves beyond all question that the ugliness and drabness which we abhor, and yet are compelled to associate with colliery housing schemes, can be eliminated by the proper understanding and use of appropriate forms and materials.



Colliers' houses on the Holly Bush site, Crookhill, near Ryton-on-Tyne. By Mauchlen and Weightman. Above, the front elevation of houses Nos. 1 and 2. Below, the ground and first floor plans.



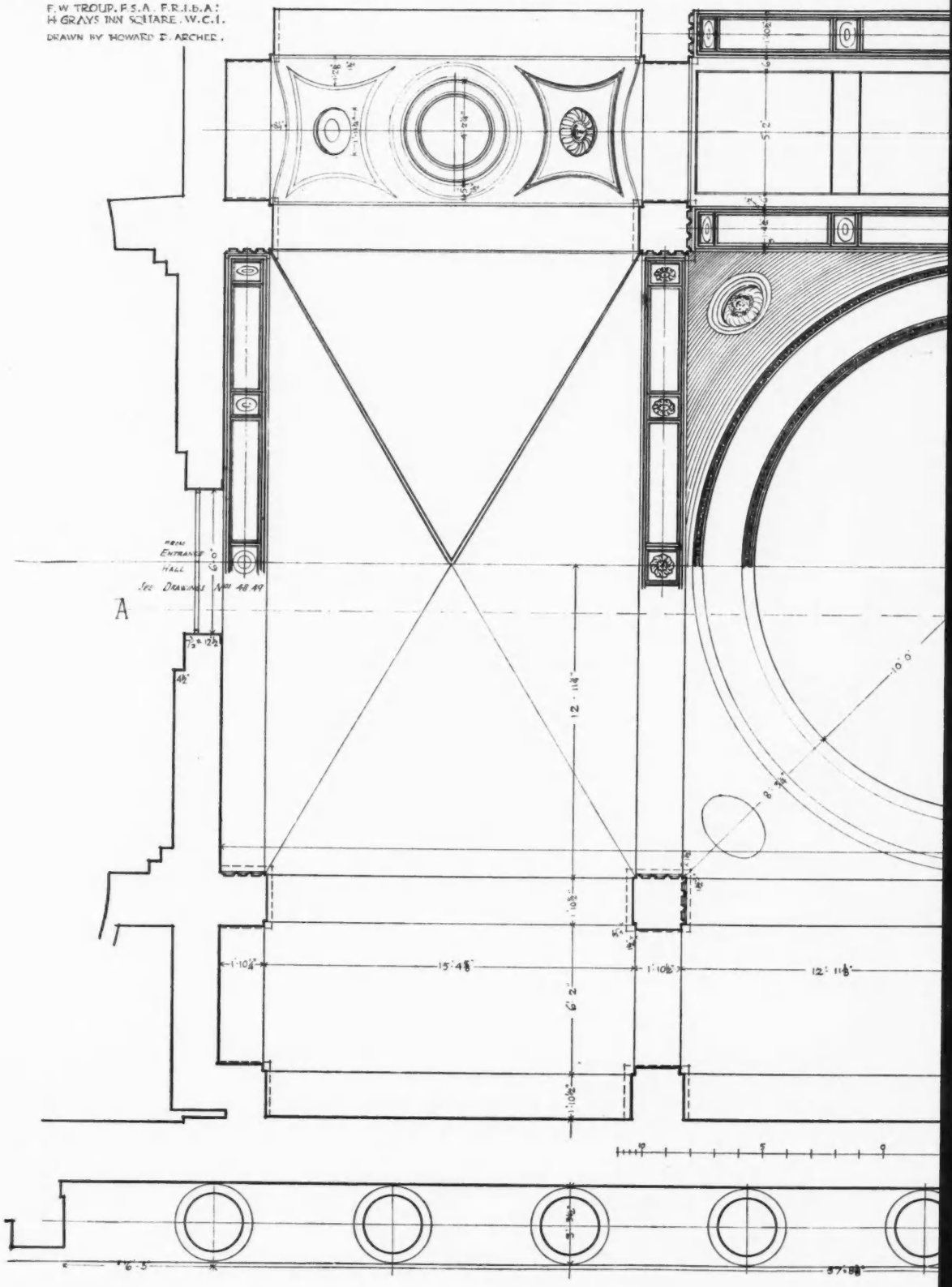
Colliers' houses at Greenside, near Ryton-on-Tyne. By Mauchlen and Weightman. Above, the front elevation. Below, the ground and first floor plans.

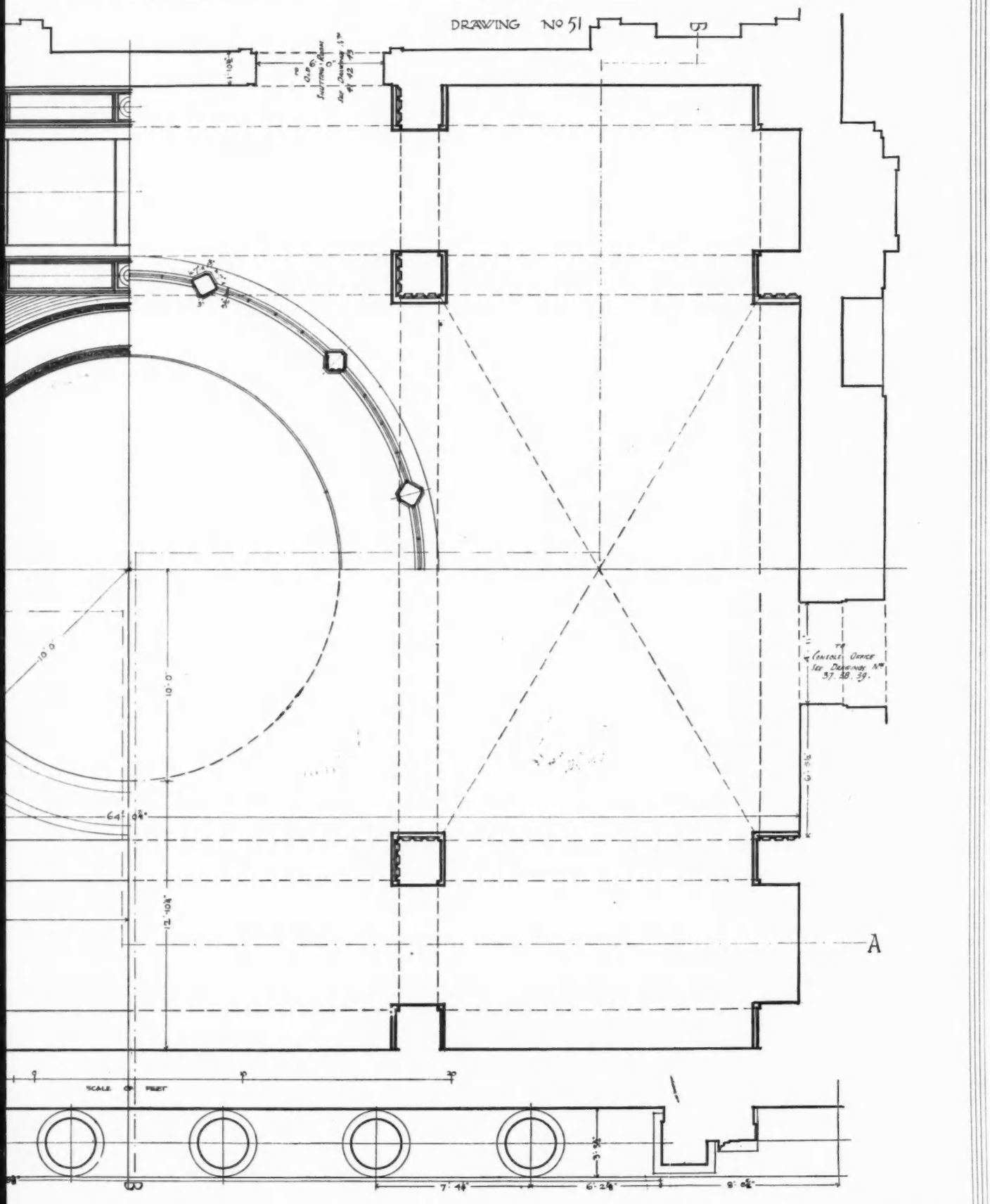


THE BANK OF ENGLAND

HALF INCH SCALE PLAN OF BANK STOCK OFFICE

F.W TROUP, F.S.A. F.R.I.B.A.:
H GRAYS INN SQUARE. W.C.1.
DRAWN BY HOWARD P. ARCHER.





SOANE'S BANK OF ENGLAND. MEASURED DRAWINGS OF THE INTERIORS. i: THE BANK STOCK OFFICE. a: THE PLAN

THE
PLAN

SOANE'S BANK OF ENGLAND

i: THE BANK STOCK OFFICE

a: The Plan

This was the first work of importance undertaken by Soane at the Bank. It was built, 1792-3, to replace one of the Taylor Transfer Offices, the timber roof of which had rotted through the action of wet. No wood was used in the construction of the new room; the piers, pilasters, wall facings, and springings were of stone, while hollow earthenware "pots" in conjunction with brick were employed, with a plaster finish, for the vaulting and shallow dome. Both stone and plaster surfaces were painted. Top-lighting was wholly employed; the absence of windows permitted of planning without relation to the features of the street wall, part of which, the Bartholomew Lane colonnade, shows in the lower half of the plan.—[H. ROOKSBY STEELE.]

TALKS TO STUDENTS OF ARCHITECTURE

[BY W. S. PURCHON]

I: PROBATIONERSHIP OF THE R.I.B.A.

MANY of the younger readers of this JOURNAL are students in the various schools of architecture which have received the recognition of the R.I.B.A. These talks are not addressed to them. They may find something of use to them; but they will be wise if, during their period of school training, they reject advice which runs counter to that given by their teachers. For while it is true that various roads lead to Rome, it is best to keep to one of them at a time. There are, however, large numbers of students who are outside the schools, and it is for them, pupils and junior assistants, that these notes are primarily intended. Those, however, who are thinking of taking up the profession of architecture would be well advised to communicate with the Secretary of the Board of Architectural Education of the R.I.B.A. at 9 Conduit Street, London, W.1. He will gladly give full particulars of *a:* the examinations leading up to membership of the Royal Institute; *b:* the scholarships awarded by the R.I.B.A. and by the leading schools of architecture. He will also send you, if you ask him, a suggested outline course of study and a list of books, and, for the sum of 1s., the pamphlet *Membership of the R.I.B.A.*, which contains much valuable information.

Of particular importance, especially to those who have not yet entered the profession, are the details of the requirements for qualification as Probationer of the Institute. These should be ascertained, if possible, a year or so before leaving school, so that candidates may enter the profession after having qualified as Probationers. Making the right start may easily save years of wasted effort. Such candidates should also make as sure as they can that they are really fitted for the profession. A set of examination papers for the Intermediate and Final examinations wil lmake it clear that much has to be accomplished beside the making of charming drawings; or a visit to a school of architecture, where the candidate should ask to be shown work done in such subjects as mechanics, strength of materials, structural steel, and reinforced concrete, as well as the more captivating designs. From these he will learn that besides some aptitude for drawing he needs some little ability in mathematics and the like; he should also realize that he has at least five years of very hard work before he can reach the standard required for the Associateship of the Institute.

The bulk of those to whom these talks are addressed are, however, already engaged in the study of architecture, either as pupils or junior assistants. Some of the things I have already said, and some I shall say, may lead to the belief that I look upon examinations as an end in themselves. Let it be said at once that such is not the case. I know all about the good men who have never been examined, just as I am familiar with the heavy men who have never been weighed. One or two of the young men who read these notes may become great architects, although they do not qualify for the R.I.B.A. by examination, and the day may come when the Institute will ask them to accept Fellowships, but it is not wise to count on such things. It is not the examinations in themselves which are important, but the work done in preparation for them, particularly if it is not undertaken solely with the object of passing examinations, but rather with the object of reaching a higher standard. It is the effort, the struggle, the striving to overcome difficulties that is beneficial.

Some may reply that they can do all the necessary study quite apart from the question of examinations, and one is bound to agree that such rare cases do exist. But for the majority of us the incentive of the examination test is necessary in the early years of our training, just as the actual race is to the athlete. Some few again may ask why they should worry about the R.I.B.A. at all, and to these I might quote long lists of the material advantages which the Institute offers to its members. I will, however, content myself with the statement that there is nothing aloof or mysterious about the Institute; it is simply a great association of British architects pledged to further the interests of a noble art, and that it is up to us all to do our share in this work.

May it be assumed, then, that those who read further have made up their minds to tackle seriously the work involved in taking the R.I.B.A. examinations, and that this work is presenting difficulties to them? It is my hope to deal with certain of these difficulties, and to indicate ways in which they can be tackled. The first real difficulty often met with by the pupil is that of qualifying for the Probationership. He may possibly have been at work a year or two before he heard of it; well, if he is nearing thirty years of age he can abandon the idea of the Probationership and work for the Special Final examination, which is now open to all architects and architects' assistants of the age mentioned whose applications are approved. Younger men may feel that they have started their professional training; they may even have been engaged in it for some few years and do not care to return to secondary-school work. I most strongly urge all such students to reconsider this point. First of all, obtain from the R.I.B.A. exact particulars of what is required. You may discover that you hold one of the necessary qualifications, or that the head of the school you attended is prepared to state that you had reached the necessary standard in the requisite subjects. In this case that particular difficulty is readily overcome, but failing that, either put on one side entirely any professional studies you may be undertaking in your spare time, or devote much less time to them, and make up your mind to qualify for the Probationership at the earliest possible moment. It may mean attending two or three evening classes in such subjects as French, mathematics, and mechanics, but when you have achieved your object you will be very glad you have taken this advice. Do not put this off to some distant future. You cannot take the Intermediate examination until after you have obtained the Probationership; working for the latter will not get easier as you get older, and it is always possible that the qualifications for it may be stiffened up at a later date. In any case, remember that the signed statement from a headmaster, towhich reference has been made, cannot be accepted after October 1, 1927.

In future articles I intend to deal with the professional subjects of the Institute examinations. In so doing I shall attempt to show how the various subjects should be approached, how they are best studied, how, in fact, your efforts can best be employed in tackling the problem that is before you. Before starting a consideration of these professional subjects I should like to stress two points. The first of these is the importance of continuing your general education. Do not think that because you have passed the Probationership hurdle you can wisely ignore such matters for the future. It may well be that you still need a little more mathematics or mechanics, and physics, and that your powers of expressing yourself in clear, straightforward English might be improved. You are almost sure to read many non-technical books; you will be wise so to do, but see that they are good ones. If in doubt about modern authors—and the reading of modern books is a necessity if you are to keep abreast of the times, read Hardy, Wells, Bennett, Galsworthy, and Shaw. If by any chance you feel that you really have not sufficient time for study, read Arnold Bennett's *How to Live on Twenty-four Hours a Day*.

It may be asked why I, the head of a school of architecture, should write these notes. Obviously I should not hold my present position unless I was an out-and-out believer in the school system. I am convinced that the full-time day school of architecture, with its systematic courses extending over five years, is the best method of entering the architectural profession. At the same time I know that there are at the present time large numbers of pupils and junior assistants who are outside the direct influence of the schools, and while I would not lift a finger to prolong the life of the pupil system or to hinder the progress of the schools, I gladly do what I can to help and encourage those who, having entered the profession by the older path, feel that they are encountering difficulties.

[*To be continued*]

EASEMENTS OF LIGHT

[BY JOHN SWARBRICK]

IV: METHOD OF PREPARING DAYLIGHT PLANS

DIFFERENT parts of the sky differ widely in their power to illuminate any horizontal surface. Consider a flat projection of a quarter-sphere of sky, such as would be visible from an unobstructed window, as figure fifteen. Obviously each of the spaces of 5 deg. horizontally by 5 deg. vertically will vary in size, not more than two being similar in the projection. Equally obvious is it, especially to anyone acquainted with the cosine law of optics, that any given sky area near the zenith will illuminate a horizontal surface far more powerfully than the same area near the horizon from which the light would only fall upon a horizontal surface at a glancing angle. A little consideration also will serve to show that for the illumination of a horizontal surface like a table there can be no difference between the same area of sky visible in a direction at right angles to the window glass, the so-called direct sky, and the same area visible in some lateral direction. Lateral light is just as useful as direct light so long as it is visible from the point under consideration. Obviously, therefore, if the view of a window opening and of obstructing buildings seen through it were produced on to the flat projection of a quarter-sphere of sky, as shown in figure sixteen, in order to ascertain how much sky would be visible over or beside such obstructing buildings, it would be necessary, before one could put any value upon that sky area, to know the relative value of every part as compared with the whole. At one time this mathematical correction, very tedious and at best approximate, had to be performed in all cases. Fortunately, Mr. Waldram devised the calculating diagrams now widely used, of which figure seventeen is an example. Figure eighteen shows a calculating diagram, on which a sky projection at a distance of 10 ft. back from the centre of a window has been plotted. In these diagrams all parts of the sky projection are accurately adjusted so that every unit of area on the flat projection of sky has the same lighting value. If the diagram be drawn, say, 20×10 in. (200 square inches), then every square inch of any part of the diagram =0·5 per cent. of the whole quarter-sphere. If, then, the diagram be assumed to represent a quarter-sphere of sky having an apparent brightness of 500 foot-candles (card measurement) on a roof or 250 foot-candles on an unobstructed sill, any piece of sky projected on to the diagram, the measured area of which is 2 sq. in., represents 1 per cent. of the whole diagram, or 2½ foot-candles of illumination; and any patch of sky measuring less than 0·8 sq. in. when projected on to the diagram will be insufficient to give 1 foot-candle of illumination in moderately dull weather. Figure nineteen shows how the daylight ratio decreases as the observer recedes from the window opening.

The simple geometrical construction of these diagrams and similar diagrams for horizontal illumination on vertical surfaces is explained in a paper read before the Illuminating Engineering Society by P. J. and J. M. Waldram in May, 1923, and published in pamphlet form by Messrs. Batsford. In the same paper, and in the one in the R.I.B.A. Journal already referred to, will be found simple directions for tracing the apparent paths of the sun across flat projections of quarter-spheres of sky at any given aspect. The appendix regarding this matter in the Journal was reproduced by permission from the *Transactions of the Surveyors' Institution*. Figure twenty represents a flat projection of a quarter-sphere of the sky, showing the apparent solar paths, looking west, at latitude 51 deg. 31 min. north.

It is merely necessary, whether plotting on sky diagrams or calculating diagrams to ascertain the angles subtended vertically and horizontally at the point under consideration of any feature of the building which it is desired to project, and of the head and sides of the window, and to mark them on the diagram. Figure twenty-one shows a flat sky projection, prepared by the writer in this way. It is not necessary to use a new diagram for every point considered—the necessary projections can be made on tracing paper placed over a firmly-drawn diagram. The necessary curves of light should be drawn on squared paper. The work is certainly tedious, but a little experience would soon enable most draughtsmen to avoid unnecessary work and shorten their labours materially.

[*To be concluded*]

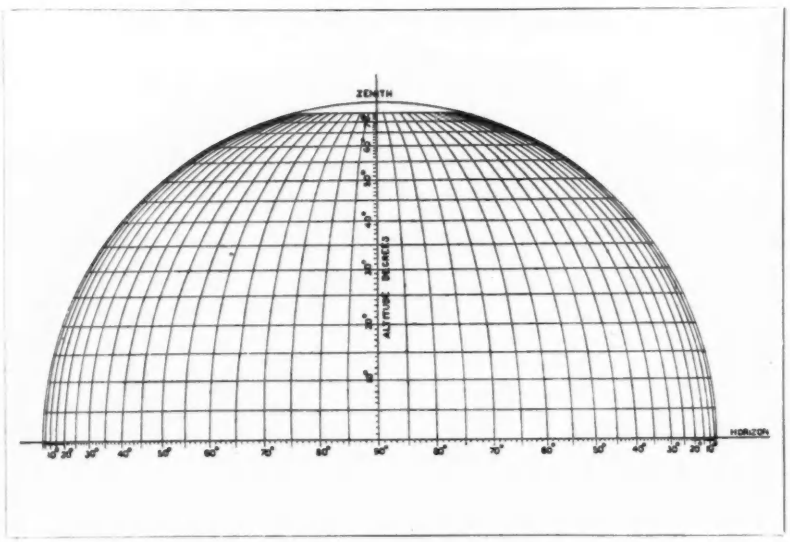


Figure fifteen. Flat projection of quarter-sphere of sky.

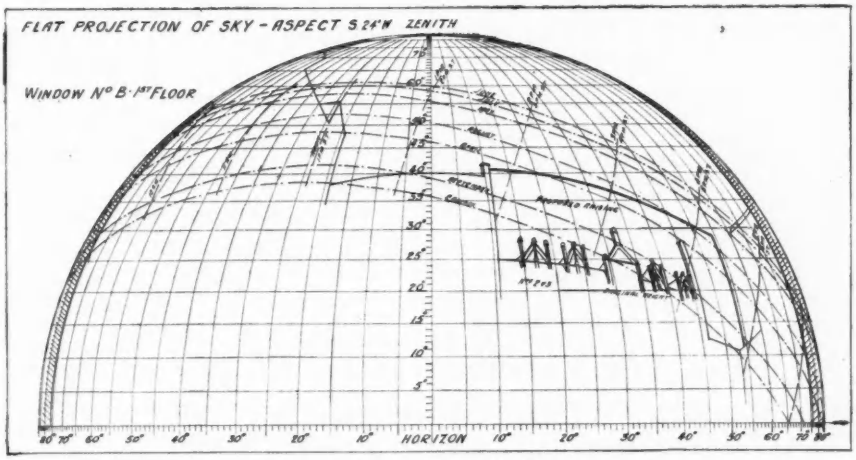


Figure sixteen. Typical diagram showing loss of sun due to obstructions.

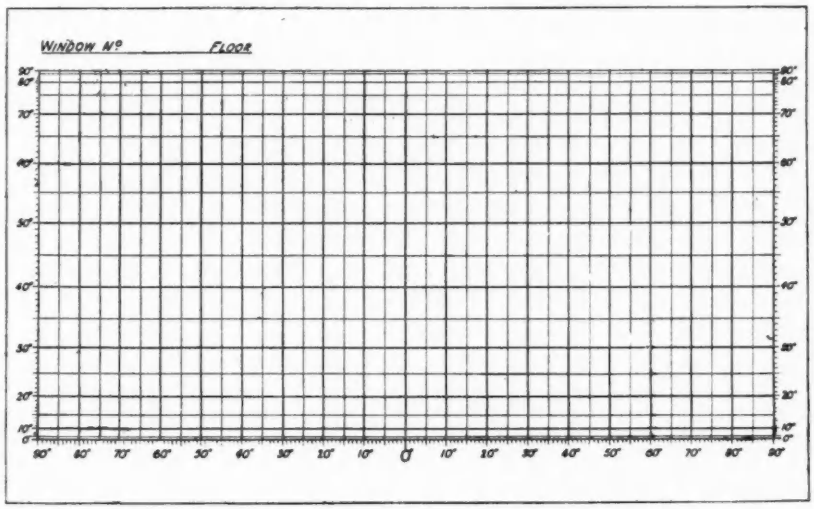


Figure seventeen. Calculating diagram for direct light factor; illumination measured vertically on a horizontal plane.

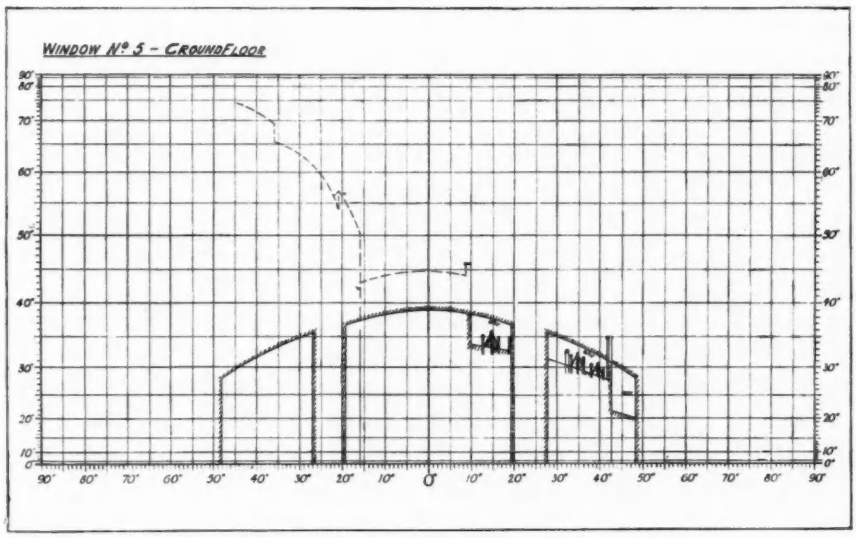


Figure eighteen. Calculating diagram, on which a sky projection at a distance of ten feet back from the centre of a window has been plotted.

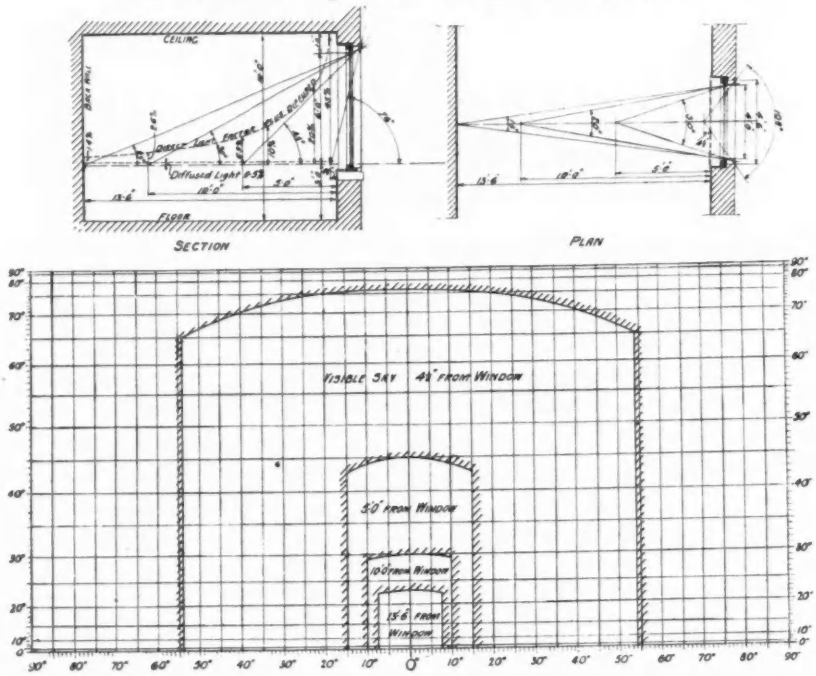
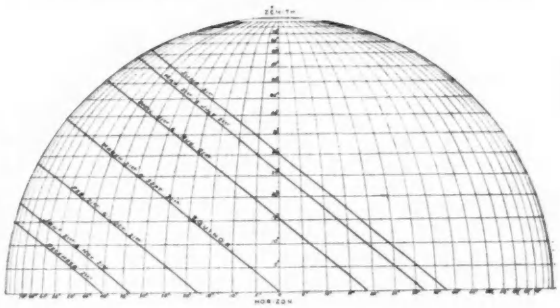


Figure nineteen. Diagrams showing how the daylight ratio decreases as the distance of the observer from the window increases.

Figure twenty. Flat projection of quarter-sphere of sky, showing apparent solar paths, looking west.



(The maximum altitudes on the meridian as seen at latitude 51° 31′ North are indicated.)

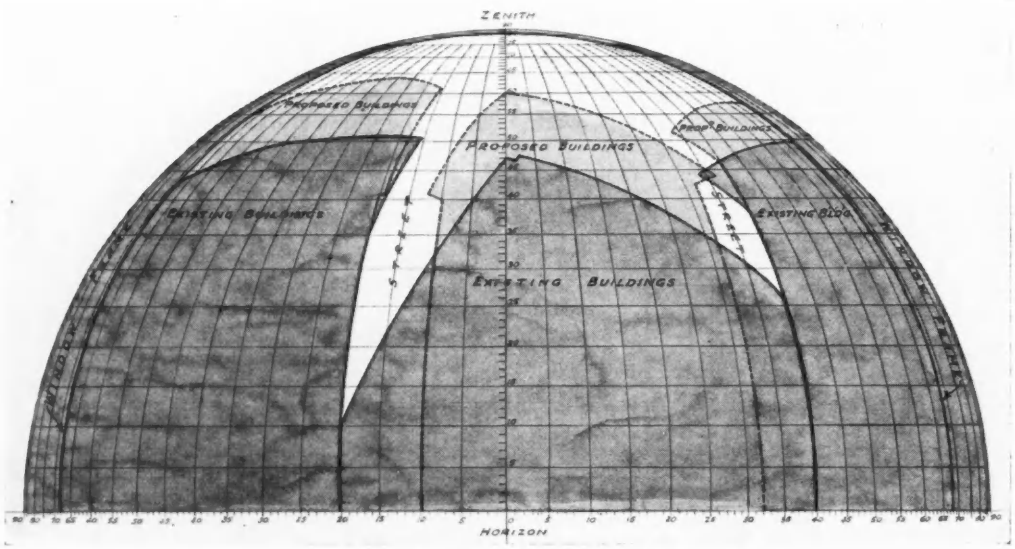


Figure twenty-one. Flat sky projection, prepared by Mr. John Swarbrick.

THE COMPETITORS' CLUB

[*This week* SENESCHAL, *the well-known architect who conducts this page, summarizes the conditions of the competition, promoted by the Manchester City Council, for designs for the Proposed Town Hall Extension, Municipal Offices, and Public Reference Library.*]

THE MANCHESTER PROGRAMME

ASSESSORS: Mr. T. R. Milburn, F.R.I.B.A.; Mr. Robert Atkinson, F.R.I.B.A.; and Mr. Ralph Knott, F.R.I.B.A.

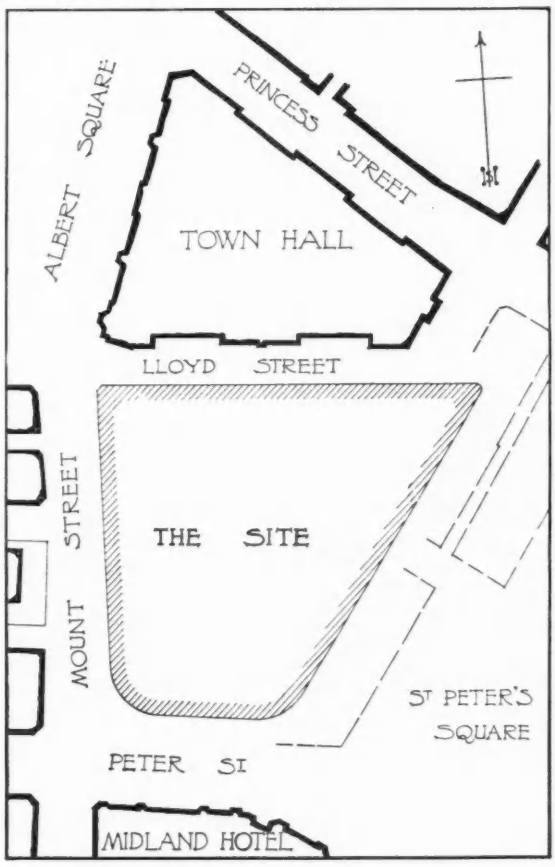
The competition is in two stages. Not more than six designs will be selected from those submitted in the preliminary competition, the authors of which will be invited to submit final designs, and from such final designs the assessors will make an award. Each of such architects in the final competition will receive £500. Date for questions, October 2, 1926; sending in date, January 8, 1927.

The site is detached, in plan an irregular quadrilateral with the north frontage, facing the present town hall, about 400 ft. in length, N.E. angle 60 deg., E. frontage about 400 ft., S. 190 ft., and W. 340 ft., see sketch plan. (The adjacent frontages on the east are not clearly defined, and a question will have to be put *re* these.)

The town hall extension should be situated to the N.W., and communication from the existing town hall provided by means of a bridge, or bridges, over Lloyd Street, at the first floor level. The reference library, which will, it is anticipated, be the first section of the scheme to be built, should be situated at the southern end of the site.

Town Hall Extension

a: Council chamber for Lord Mayor, 35 aldermen, 105 councillors, council officials (and extension for a probable further 50). Press 20, public 150, and a few distinguished visitors.



Separate access from the street for the public, retiring room for press, anteroom or lobby to the council chamber, with cloakroom and lavatory accommodation, and retiring-room for lady councillors.

Municipal Offices

b: Gas committee, about 25,000 sup. ft., including showroom.

c: Electricity committee, about 20,000 sup. ft., including showroom.

d: Water committee, about 25,000 sup. ft.

e: Public-health committee, about 30,00 sup. ft.

Also an apartment for accounts and inquiries centrally situated for the joint use of gas, electricity, and water departments, with an area of 12,000 ft, exclusive of above accommodation. Possible extension of the above departments should be indicated. The lower part of the building may be a lower ground floor or basement.

f: Provision is to be made for:

Parks department	2,250 sup. ft.
Baths department	2,250 ,,
Markets department	2,250 ,,
Rivers department	1,250 ,,
Cleansing department	2,500 ,,

g: Public entrances from Lloyd Street, Mount Street, and St. Peter's Square. Staircases and passenger lifts.

h: Lavatories, cloakrooms, cleaners' rooms, access for carts to internal courts, fuel and heating chamber. It is suggested that provision be made in a suitable position for a staff dining-room.

Reference Library

It is desirable that the library be independent and self-contained whilst forming part of the general scheme. The following accommodation is required in suggested positions:

Basement, or Lower Ground Floor

Packing room	1,000 ft.
Binding room	2,500 ,,
Print room	1,500 ,,
Newspaper file room	2,500 ,,
Porters and cleaners' staff room and store	1,000 ,,
Photographic room, including dark room	400 ,,
Lecture hall, including lecturers' retiring room	2,400 ,,
Staff rooms	2,500 ,,
Library records room	300 ,,
Strong room	400 ,,

Public toilet-rooms, boiler-house, and coal store.

Ground Floor

Lending library	2,400 ft. or more
Foreign library	1,500 ft.

It is suggested that the remainder of this floor should be allocated to a book store, with direct vertical connection by book lifts and staircases with the main reading hall and other rooms.

First Floor

Main reading hall	13,000 ft., or more
Technical and science library	4,250 ft.
Commercial library	2,600 ,,
Music library, including sound-proof trial room	4,800 ,,
Map room	600 ,,
Printing room	600 ,,
Exhibition room	2,000 ,,
Three study rooms	1,200 ,,

Second Floor

Special collections in two long rooms	7,600 ft.
Rare books and manuscripts	800 ,,
Committee-room, with toilet	1,200 ,,
Chief librarian, with waiting-room	700 ,,

Third Floor

Order and cataloguing room	3,800 ft.
Supplies and accounts	1,500 ,,
Clerical room	1,500 ,,
Deputy librarian	400 ,,
Branch superintendent	300 ,,
Library school	2,000 ,,

Space above the library should be left for future extension to the library. The heights of rooms should be in multiples of stack heights. The new building should be of fire-resisting construction, and should be faced with Portland or Stancliffe stone.

The design must conform with the by-laws of the City of Manchester.

Competitors can present their drawings in any medium and any manner in which they think fit. Drawings may be made on any size of sheet, but must be mounted on card. The following drawings are required to a scale of 1 in. to 16 ft.:

a: Plans of all floors.
b: Elevations to all frontages.
c: Comprehensive sections.
d: Block plan of the site to a scale of 1 in. to 44 ft.
e: No perspective views will be considered.

An estimate of cost is required, including the fixed fittings, heating, lighting, ventilation, and drainage. Estimates must be based upon the cubic contents, the library portion being kept separate.

COMPETITION CALENDAR

The conditions of the following competitions have been received by the R.I.B.A.

September 30. Cenotaph for Liverpool. Assessor, Professor C. H. Reilly, O.B.E., M.A., F.R.I.B.A. Premiums, first, £200; second, £150, provided he is an ex-Service man; third, £100; fourth, £50. The author of the selected design will be paid a commission of 500 guineas, which will include the premium of £200 above-mentioned, and, in addition to preparing all the necessary working drawings and superintending the erection of the work, he will be required to superintend the erection of a full-size wood and plaster model of his design on the site. Particulars from the Town Clerk.

October 30. New Offices for Scottish Legal Life Assurance Society, Bothwell Street, Glasgow. Assessor, Mr. John Keppie, A.R.S.A., F.R.I.B.A. Particulars from Mr. William Watson, Secretary, 84 Wilson Street, Glasgow, before August 21. Deposit £1 1s.

January 25, 1927. Conference Hall, for League of Nations, Geneva. 100,000 Swiss francs to be divided among architects submitting best plans. Sir John Burnet, R.A., British representative on jury of assessors.

The conditions of the following competitions have not as yet been brought to the notice of the R.I.B.A.

November 30. *a*: Design for a house costing £1,500; *b*: design for a house costing £850. Assessor, Mr. E. Guy Dawber, P.R.I.B.A., together with two others to be appointed by him whose names will be made known later. Premiums in each section: First, £150; second, £100; third, £50. Particulars from the secretary, *Daily Mail* Ideal Houses Competition, 130 Fleet Street, E.C.4. The prize-winning £1,500 house will be erected and completely furnished and equipped at the 1927 *Daily Mail* Ideal Home Exhibition at Olympia to be held next March.

January 3, 1927. Academy, Perth. Open to Architects practising in Scotland. Assessor, Mr. James D. Cairns. Premiums: £100 and £50. Particulars from Mr. R. Martin Bates, Education Offices, Perth. Deposit £1 1s.

January, 8, 1927. Town Hall Extension and Public Library Building for the City of Manchester. Assessors, Messrs. T. R. Milburn, R. Atkinson, and Ralph Knott. Preliminary competition open to architects of British Nationality. Particulars from Mr. P. M. Heath, Town Clerk. Deposit £1 1s.

No date. Town Hall and Library, Leith. Assessor, Sir George Washington Browne, R.S.A. Particulars from the City Chambers, Edinburgh.

No date. Incorporated Architects in Scotland: 1: Rowand Anderson Medal and £100; City Art Gallery and Museum; 2: Rutland Prize (£50) for Study of Materials and Construction; 3: Prize (£10 to £15) for 3rd year Students in Scotland; 4: Maintenance Scholarship, £50 per annum for 3 years. Particulars from Secretary of the Incorporation, 15 Rutland Square, Edinburgh.

LITERATURE

THE WREN SOCIETY: VOL. III

The reproductions from Wren's drawings in the St. Paul's Cathedral Library have been completed with the third volume of *The Wren Society*, which has just appeared, and a most interesting and instructive collection they make. The editors are certainly right in claiming that the first three volumes "are of extraordinary interest and illustrate the growth of St. Paul's in Wren's mind in the most remarkable way." The present volume contains, besides a list of the second volume of drawings from St. Paul's Library, a reprint of the catalogue of the executors' sale of Wren's drawings and prints which took place in 1749. It seems that a large proportion of the drawings that were sold are in the St. Paul's, the Soane, and the Worcester College collections, but there are two lots (amounting to 200 drawings)—one of the City churches and one of the Kensington Palace—which have not yet been traced, and which may still come to light. If they do, it is safe to say that they will be more appreciated to-day than they were in 1749, when they, and some hundreds of other drawings by England's greatest architect, realized the astounding total of £13 5s.!

Nearly all the thirty-seven plates in this volume deal with St. Paul's, and form a most interesting collection, showing the ebb and flow of ideas in the master's brain. Studies for the dome and its drum form a series of outstanding interest, indicating the amount of hard thinking that contributed to the creation of the perfect outline that to-day delights the world. There are some ten schemes illustrated, including one based very closely on St. Peter's, one with concave buttresses below the drum, and another with four small domed projections in place of the peristyle. All these are very inferior to his completely studied and final scheme. The idea of a single order for the west front evidently fascinated him, as there is here reproduced a scheme for a giant Corinthian portico (a similar scheme for an Ionic portico was given in the second volume), and a single-order scheme is sketched over a rendered drawing of the west front approximately as it was carried out.

Among the many interesting studies are sketches in pen and wash for details and decorative accessories, and there is one for the western towers in which the main lines are lightly drawn in pencil, and masses of the design blocked in with the brush, which sheds an interesting light on Wren's method of working.

After all hope of carrying out his scheme for replanning London on rational lines had been abandoned, Wren did not give up the idea of providing a worthy setting for his masterpiece. He prepared a scheme, which is illustrated, for surrounding it with a *piazza*, the shape of which evidently followed the existing streets and building lines, and he formed an interesting wedge-shaped *place*. The *piazza* was faced with uniform buildings, having an open colonnade at ground level with three stories, contained within the Corinthian order, above, and a fourth in the attic. This would have provided a dignified and orderly setting for St. Paul's, but looks, perhaps, a little cramped. This was probably due to a seventeenth-century "economy campaign," and an attempt to meet the ideas of the hard-headed, but small-minded, "business" men who had succeeded in wrecking his large scheme. The west end of the *piazza* opens into a small semicircular *place* in which is placed a charming circular building, domed and colonnaded, intended for use as a baptistry or chapter-house.

The editors, Messrs. Arthur T. Bolton and H. Duncan Hendry, who cannot be sufficiently complimented on their able and painstaking work, again appeal for an increase of membership to enable the Society to extend its scope. There is an immense amount to be done, apart from the reproduction of the drawings, and they suggest that the publication of the cathedral building accounts would shed a flood of light on the difficulties that Wren had to contend with and upon building methods of the period.

The next volume will be devoted to the drawings of Hampton Court Palace, and St. Paul's will be left for the present, but will

be returned to later. The editors promise that "it will be of surpassing interest and full of beautiful detail," so that the wise will join the Wren Society now, so that they can obtain this volume as well as the three that have already been issued and of which a few copies still remain in print.

GRAHAME B. TUBBS

Third Volume of the Wren Society, 1926. St. Paul's Cathedral. Original Wren Drawings from the collection of the Library of St. Paul's Cathedral. Issued to subscribers only.

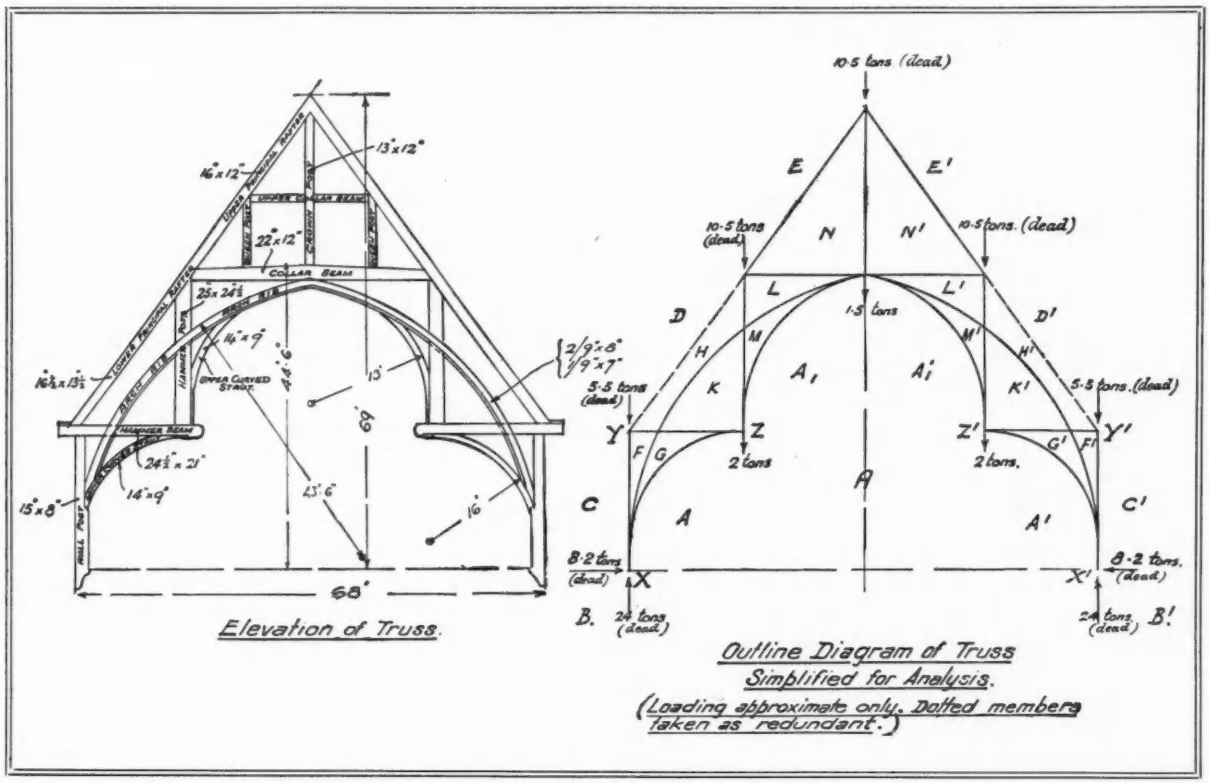
PRIMARY STRESSES IN TIMBER ROOFS

Students of stresses in structures will welcome this little volume as it contains the results of a serious attempt to obtain a nearer approximation to exact analysis of certain cases of roof structures by trigonometrical calculation than has hitherto been possible by this means. The cases examined are such as have admittedly presented considerable difficulties, and Professor A. J. Sutton Pippard and Mr. W. H. Glanville have acted as pioneers in their search for more reliable formulæ and methods of graphical determination of stresses than those formerly in use. Such an excursion on the confines of what may and what may not be solved by a purely mathematical mode of attack cannot be appraised entirely by the practical results achieved, and the process may be followed as a mental exercise even by those who are of opinion that these special cases of ambiguous structure are better examined by other means. The joint authors have introduced formulæ which take into consideration the strain energy in the whole structure due to its external loads, though this involves the modulus of elasticity of the material.

The methods employed to deal with the curved braces are highly ingenious, and have been based upon experiments with curved test pieces of mild steel, and with a straight standard tension test specimen made out of a piece of the same material. The very great reduction of the experimental value of the modulus of elasticity in the case of the curved strut is then utilized in the calculation by substituting an imaginary straight member having a low modulus of elasticity for a curved member made of a material possessing a relatively high one.

While this method of analysis is sufficiently accurate where materials having equal elasticity in all directions are concerned (and the joint authors assume that the material is "isotropic"), it is not practically applicable to curved pieces of timber which are only reliably tested by individual experiment, since their strength is affected by the direction of their grain and by other considerations which affect the construction of roofs, but which cannot easily be reduced to text-book formulæ. As a matter of historical fact, the designers of the mighty old roofs of English oak certainly did not proceed on the lines laid down by the joint authors, who have done as great service to scientific structural mechanics by illustrating the limits of theoretical calculation as they have in attempting, with a considerable measure of success, to enlarge those limits. The ambitious subject of Westminster Hall roof has been chosen as the principal case for the demonstration of the improved method, and the working of the problem has been set down in detail. For the sake of comparison, the results of the former trigonometrical analysis of Westminster Hall roof have been quoted together with its author's summing up of the admittedly inaccurate results obtained, and his statement of the facts observed in the hall just prior to its repair.

The joint authors claim that their methods "will produce more accurate results than the customary treatments," though admitting that "the present work deals with primary stress determination only, and assumes an elastically perfect material." In addition to this assumption several other assumptions have been made, and three separate cases have been considered in which the reactions of the walls have been taken: (1) at the feet of the wall posts; (2) at the tops of the wall posts; (3) the tops and feet of the wall posts, are considered to be rigidly fixed both horizontally and vertically. Under these conditions the



Westminster Hall Roof: arched hammer-beam type. [*From* Primary Stresses in Timber Roofs.] *By permission of H.M. Stationary Office.*

application of trigonometrical calculation becomes subservient to the discretion with which the assumptions are made.

This the joint authors implicitly acknowledge in their comments upon the results obtained in connection with the three cases. "It will be seen from table 5 that case (3) again gives stresses intermediate between the two extremes, and that the way in which the reaction is transmitted is again of first importance, since in most cases stresses of an entirely different order are obtained on the three assumptions. The most marked example is that of the lower principal rafter, in which a tension load of 9·8 tons in case (1) is reversed to a compression load of 22·3 tons in case (2). Case (1) agrees in most details with the . . . evidence in the structure itself, and we must, therefore, conclude that the most nearly correct assumption is that the whole of the reaction is taken at the feet of the wall posts." Table 5, by a clerical error, probably, gives this reversal as from a tension load of 8·2 tons in case (1) to a compression load of 22·3 tons in case (2). But whether the figure be 9·8 tons or 8·2 tons, the lower principal rafter at Westminster Hall is not in tension, and, even in 1914, when the official report was published, the impossibility of it being subjected to tensional stress was pointed out, "as the ends are not properly cleated or framed."

The statical diagram made in connection with this earlier investigation was avowedly made as a matter of "academic" interest to show how "it is largely useless to consider the roof as a framed structure." It is interesting to see to what extent this criticism of the simple stress diagram applies to the more refined and elaborate system of calculation advocated by the joint authors, who claim that their method "at least gives the loads acting in the right sense." Unhappily this claim is founded upon an incomplete knowledge of the action of the roof timbers, and when it is remembered that the list in case (1) has been selected as the most probable of three different assumptions, the accuracy of the method of trigonometrical analysis for timber roofs with redundant and curved members is still open to question. Not only do the results obtained in the three cases differ in magnitude, but in the sense of the stresses, so that no finality is reached. Even when case (1) is selected, and the other two cases arbitrarily discarded, the results do not agree with those observed in the roof during its repair. After the publication in 1914 of the official report, which does not say that the main collar of the roof is in tension, further opportunities for examination of the joints led to the discovery of the remains of stub-tenons on the heads of the hammer posts, and many of these had been bruised and sheared off in a direction which showed, without question, that the main collars were in compression within the limits of the capacities of their bearings to apply this stress. The attribution in table 5 of a tensile function to this member is, therefore, not in accordance with its actual function in the great roof, and no claim of superior accuracy of method can be substantiated on this point.

Table 5 also figures the wall end of the hammer-beam as being subjected to compression, but in the roof this member was bending and fracturing under cross stress and the implied tension in its upper fibres. That the new method should differentiate between the wall end and the free end of the hammer-beam, when in reality both ends were suffering similarly, is not in its favour. To practical constructors the point at issue is not whether the method now propounded is rather more or less incorrect than that employed in illustration of the official report in 1914, but whether it leads to results sufficiently correct to be relied upon in practice.

Those who are intimately acquainted with the action of the actual roof timbers of Westminster Hall will realize that the results obtained are not sufficiently reliable for practical purposes of timber roof design or repair. Of the fourteen members of the roof listed in table 5, case (1), the nature of the stresses ascribed to four members are not in accordance with the facts discovered in the roof itself. In the case of the wall end of the hammer-beam (member HF in table 5) the other two hypothetical cases appear to "confirm" the compressional nature of the stress, so that whichever case had been selected the new method would have failed to reveal the correct nature of the stress in this member.

This deceptive apparent confirmation of the truth of what is really an error is a most dangerous quality in any method of calculation which is relied upon as a guide in practice, and suffices to vitiate the refined theoretical adjustments of which the joint authors have reason to be proud from a purely academic point of view. Without questioning that the working is correct in detail, the application of the system to timber roofs is inadvisable in that its refinement of calculation is liable to inspire confidence which the behaviour of the timber is likely to betray.

In connection with the case of the "Timber Roof with Steel Ties," the joint authors have themselves indicated their over-confidence by suggesting that the outward bursting of the walls might have been avoided "by placing the ties under a sufficient initial tension to ensure that, when the load is applied, they are still able to relieve the walls to the necessary degree." Shrinkage of the timbers after erection soon relieves the tension, and a distortion takes place in spite of it, which becomes more pronounced with age. But apart from this technical detail, there is a reason why trigonometrical calculation fails to produce accurate results with certain complex roofs. Such roofs may violate the cardinal principles of the method of analysis in a flagrant degree. The definition of a primary stress is given in the introduction as an "axial force" of tension or compression, but the joint authors, in common with many other mathematicians, have ignored the fact that axial stresses are only possible in members which are either vertical, and act in the same direction as gravitation, or else are ideal members having no weight.

Certain light and efficient types of truss approach sufficiently near to ideal weightlessness to allow of approximately accurate solution, since they are capable of bearing great external loads in proportion to their own weight, but as the design of the truss departs from efficiency, its weight and the weights of its individual members increase out of all proportion to the external loads, until the weight of the truss represents a large part of the total. The assumption that the frame is subject to loading only at the nodes then becomes inaccurate, even when the frame is pin-jointed, triangulated, and made of "isotropic" material.

Westminster Hall roof obeys none of these conditions of solution by trigonometrical analysis, and the great weight of its individual members suffices to prevent accurate analysis by any system of calculation of which nodal loading is a necessary part. Prolonged study of the state of the timbers of the roof and investigation with collapsible models reveals that the characteristic movements of the timbers—which indicate the nature of their principal stresses—can be produced by the weight of the timbers of the so-called truss without the addition of its load of roof covering. The structure is, of course, not a truss in the modern sense of the word, but is a complex arch and bracket construction, and the *weight of its heavy members* was counted upon by the medieval designers in locking the whole together in a manner utterly unlike the pin-jointing of a modern triangulated frame. Its principal stresses have never been axial in the members, and must always have included cross-stress in greater or less degree in combination with tension or compression.

The joint authors admit that in applying their system "corrections and amplifications will be necessary," and experience shows that more definite ideas as to the actual behaviour of complex arch-like wooden roofs may be obtained from models than from theoretical calculation alone.

Further experiment with models of the whole "truss," but with detachable individual members, will enable the joint authors either to supply their readers with the details of the "corrections and amplifications" they have already recognized as being necessary, or with an alternative method of arriving at reliable results. One such collapsible model is already exhibited in the galleries of the Science Museum, South Kensington.

WILLIAM HARVEY

Building Research Technical Paper, No. 2: Primary Stresses in Timber Roofs with special reference to Curved Bracing Members. By Professor A. J. Sutton Pippard, M.B.E., D.SC., and W. H. Glanville, B.SC., A.M.INST.C.E. London: Published under the authority of His Majesty's Stationery Office, 1926. 1s. 3d.

CORRESPONDENCE

TRIBULATIONS OF EARLY PRACTICE

To the Editor of THE ARCHITECTS' JOURNAL

SIR,—In reply to Ponderivo's criticism of my reservation in regard to exceptional brilliance, may I explain that it was prompted by the remembrance of some few instances of previously neglected architects gaining recognition through their successful handling of works won in competition.

A. W. W.

CANADIAN TIMBERS

To the Editor of THE ARCHITECTS' JOURNAL

SIR,—Mr. Middleton, in his article on *Building and Decorative Timbers* published in your issue for September 8, makes reference to Canadian maple in the following terms: "Unfortunately, it has a bad reputation for shrinking." It is important that no injustice should be done to this most useful Canadian wood. The days when shrinking gave trouble passed many years ago. Scientific methods of kiln-drying by which the exact moisture content of the timber can be disclosed has enabled manufacturers to deliver this flooring in this country in perfect condition. It should, therefore, never be stored in a damp place.

J. WEBSTER

SOCIALISM AND GREAT ARCHITECTURE

To the Editor of THE ARCHITECTS' JOURNAL

SIR,—"If under the Socialist State there is to be an even distribution of wealth, then great architecture must surely die"—thus Mr. Birnstingl, in your issue for September 1. There would not, of course, be any Blenheims or Castle Howards commissioned by private owners. Does he wish taxation to be transferred from the most wealthy to the less wealthy members of the community in order that such private palaces can continue to be built? I think not, or I should not trouble to send words of comfort. There is no evidence that Socialists have less taste than individualists, there were never such opportunities for architectural education as now, and public bodies always enlist the services of architects for their greatest works. In a Socialist State one would expect in all large cities stately civic buildings, such as already exist in Stockholm, Cardiff, and many American towns. Under Socialism there would be no commercial advertisements to vulgarize their environment. And were all land in public ownership, magnificent sites could be allotted with ease. A Socialist of the type of Wm. Morris would claim that the craftsman should be educated in a beautiful school, amidst beautiful surroundings, have leisure to cultivate his taste and be given opportunity for self-expression in his work, thus enriching the buildings upon which he might be employed. Would Liverpool Cathedral have been less an example of great architecture if the money subscribed had been in smaller amounts from a larger number of individuals?

F. HERBERT MANSFORD

A TALE WITH A MORAL

To the Editor of THE ARCHITECTS' JOURNAL

SIR,—Your leading article in your issue for September 1, entitled as above, truly illustrates the timidity which prevents a large number of clients from going to the "fountain-head" at the commencement of building negotiations. Unfortunately, the advice contained therein can only be read by the comparatively small proportion of clientele who are readers of this JOURNAL. It is sad, therefore, that the remaining persons will be unable to benefit therefrom. It would be of considerable value to those persons concerned, and also to the profession, if such advice could be published where it is more likely to be observed, i.e. in the daily papers and in the periodicals perused by the majority. The suggestions could be written by persons who have trod the thorny road of experience, making travel easier for the uninitiated. The dangers of building by direct labour, with the client as owner, builder, foreman, clerk of works, labourer, and other equally strange callings, could be publicly criticized and condemned, for this is the most alluring of all anti-building-profit movements.

This could, undoubtedly, be effected with no breach of professional etiquette, and to the common benefit of all interested in the building industry.

S. BURNETT DAWES

[*If Mr. Dawes is a regular reader of daily papers and of weeklies produced for the general public he will be aware of the way in which statements and suggestions printed in* THE ARCHITECTS' JOURNAL *are taken up by the lay Press. But there is, we think, another excellent reason for publishing such suggestions in papers like* THE ARCHITECTS' JOURNAL, *namely, that it helps architects to formulate their views more accurately, and supplies them with fresh arguments, or fresh and more telling varieties of familiar arguments.*—Editor, A.J.]

THE LIGHTNING GRAPHS

To the Editor of THE ARCHITECTS' JOURNAL

SIR,—The reflections on the accuracy of these graphs, published in your issue for August 18, are based purely on an error on the part of the reviewer. He states: "From the second graph sheet, let $b=7$ and $3=7$, then $a=9$." If he had read the scale correctly, he would have found that $a=9{\cdot}9$, and as mathematically he calculates the answer to be $9{\cdot}8994$, the graphical result is only $\cdot0006$ high. This example is really a testimonial to the accuracy obtainable, which is amply sufficient for practical purposes and well within the average claimed.

J. S. DALGLEISH

Professor Adams writes as follows in reply to the above: "I much regret to find that I misread the scale on the second graph sheet. It is quite plain on looking at it again, and was a pure slip for which sincere apologies are due to the author."

NEW INVENTIONS

[The following particulars of new inventions are specially compiled for THE ARCHITECTS' JOURNAL by permission of the Controller of H.M. Stationery Office, by our own patent expert. All inquiries concerning inventions, patents, and specifications should be addressed to the Editor, 9 Queen Anne's Gate, Westminster, S.W.1. For copies of the full specifications here enumerated, readers should apply to the Patent Office, 25 Southampton Buildings, London, W.C.2. The price is 1s. each.]

LATEST PATENT APPLICATIONS

20944. Allison, R. M. Building construction. August 25.
21197. Anfinset, L. Wooden, etc., buildings. August 27.
20800. Brader, G. B., Centering for laying concrete floors. August 23.
20922. Heymann, M. Tiling roofs, etc. August 25.
21156. Shellard, I. F. Building, etc., composition, etc. August 27.

SPECIFICATIONS PUBLISHED

257022. Estrada, L. Windows.
239879. Dodman, Jun., A. C. Wall coverings and method of manufacture thereof.
243760. Decourt, R. Heat insulating walls.
257199. Meyercord, G. R. Frames of doors, panels, and the like.

ABSTRACT PUBLISHED

254102. British Reinforced Concrete Engineering Co., Ltd., and Hall, E. B., of 1 Dickinson Street, Manchester. Concrete cylinders.

ANNOUNCEMENTS

Mr. Henry A. Mackmin, chartered quantity surveyor, has moved from 39 Maddox Street to 10 Vigo Street, London, W.1. Until the permanent telephone is connected, messages can be received on Regent 2745.

Mr. H. E. Watkinson, F.S.I., M.I.STRUCT.E., has been appointed by the L.C.C. as district surveyor for St. Pancras North, with offices at 272 Kentish Town Road, N.W.5. His district comprises that part of the borough of St. Pancras northward of a line along Albert Road, Delancey Street, High Street, Crowndale Road, and Pancras Road to King's Cross.

Professor A. F. Wickenden, A.R.I.B.A., A.M.INST.C.E., of the Royal School of Engineering, Giza, will be pleased to receive from manufacturing firms trade catalogues and other technical publications likely to prove interesting to students of architecture and building. They should be addressed to him at the Department of Architecture, Royal School of Engineering, Giza, Cairo, Egypt.

TRADE NOTES

For the convenience of residents in the London area a special showroom has been opened by Messrs. Boulton and Paul at 135-7 Queen Victoria Street, London, E.C.4. In this new showroom specimens of the Boulton and Paul joinery work may be seen.

The Cable Makers' Association state that after September 13 members of the Association will be prepared to supply vulcanized india-rubber insulated cables with cab-tyre sheathing, in the sizes suitable for interior wiring purposes, in non-Association (Nonazo) class. Inquiries should be addressed to the members of the Association, whose names will be found in their usual advertisements.

On Monday, September 20, the motor travelling exhibit of the National Radiator Company, Ltd., of Hull, which, as stated in our last issue, has been entirely re-designed, will be at the Goddard Arms Hotel (yard), Swindon. On Wednesday and Thursday, September 22 and 23, the exhibit will be at the Cattle Market, Newport (Mon.), and from Friday to Monday, September 24 to 27 inclusive, in the C.W.S. Ground, opposite the County Club, Westgate Street, Cardiff.

A new type of lamp, the Pearl Osram, with the bulb frosted on the inside, has been produced by the General Electric Company, Ltd. This new lamp has a highly diffusing bulb, which is claimed to be suitable for use under any conditions and for every purpose. It is said to give more light than an outside frosted lamp. The special inside frosted bulb diffuses the light and protects the eye from the bare filament. The diffusing surface is permanent and cannot be destroyed without the destruction of the bulb itself. The bulb is of a delicate pearl colour, which assumes a tint of the colour of its surroundings, and is always in harmony with them even when unlighted.

The first familiar reference to the use of bitumen is in the stories of the erection of the Tower of Babel and of the construction of the Ark, as recorded in Genesis. Bitumen was also used extensively by the Ancient Egyptians for waterproofing their buildings, monuments, tombs, etc., and in the preservation of their dead. Fifty years ago the House of Callender first invented the manufacture of bitumen in thin pliable sheets, and it has since been used in this form for waterproofing structures in all parts of the world. Veribest roofing felt, concerning which an interesting illustrated booklet has been issued, is a modification of the original form of bitumen sheets, and is made with the same care and thoroughness. It is made from a base of selected wool felt, specially prepared. This felt is thoroughly saturated with pure natural bitumen, properly refined and tempered under Callender's original process, and to make this saturation complete the prepared bitumen is by a special method of manufacture forced through the felt so that every fibre is impregnated. The saturated felt is then conducted through heated steel compression rolls to render it homogeneous, and finally receives the outer coating which it is claimed to render it spark and fire-brand proof. One of the most important sections of the booklet is that in which full directions are given for fixing the roofing felt upon different kinds of wood and concrete roofs.

Among the literary features in the August issue of *The Roadmaker* are "Some Important Works in Middleton," by Percy Harrison; "The Post of the World," by A. F. Johnson; and "Imposing Streets: No. III. Sackville Street, Dublin." The illustrations include Collingwood Road, Devonport; Fountain Street, Clough Road, and Hexwood Road, Middleton; and Clarence Street, Kingston-on-Thames. All these roads have been reinforced with B.R.C. Fabric. *The Roadmaker* is issued on behalf of The British Reinforced Concrete Engineering Co., Ltd.

Colour charts, showing the colours in which Cabot's Collopakes can be obtained for colouring and waterproofing stucco, brick, concrete, stone, and wood surfaces, are contained in two leaflets just issued by Messrs. Huntley and Sparks. It is claimed that the pigments are so strongly and finely ground that they sink into the surface of the material and colour it without coating over and spoiling the natural texture. This makes the colouring effects soft and rich, with tones modulated by the variations in the surface itself. For this reason also Collopakes, it is claimed, cannot crack or peel off, but that they grow softer and more artistic on weathering. Of the very greatest importance is the fact that Collopakes are claimed thoroughly to weatherproof the surfaces treated, and provide full protection against driving rains and all forms of atmospheric dampness. In addition, they are claimed actually to act as a preservative and greatly to prolong the life of stucco, roughcast, brick, and stone.

In our issue for September 8 we published the results of tests made by Messrs. Kirkaldy and Son, of London, experimental engineers, on the bricks of the London Brick Company and Forders, Ltd. During the tests the bricks were kept saturated with water, and were frozen and thawed alternatively twenty times during periods of twelve hours each. This week we give the results of a crushing test carried out by Messrs. Kirkaldy and Son on the same bricks previously subjected to the freezing and thawing tests. The tests were made on six Fletton bricks, and the results were as follows:

Description.	Dimensions. Inches.		Base Area. Sq. in.	Cracking Load. lb.	Crushing Load. lb.
Fletton bricks, ordinary plain surfaces recessed one side Phorpres L.B.C. (in recess)	2·62	8·68×4·17	36·2	172,100	196,700
	2·58	8·80×4·21	37·0	178,500	195,500
	2·63	8·83×4·29	37·9	173,200	179,300
	2·63	8·88×4·30	38·2	166,800	175,800
	2·60	8·67×4·18	36·2	143,600	169,700
	2·58	8·92×4·28	38·2	129,400	162,700
		Mean	37·3	160,600	179,900
		lb. per sq. in.		4,310	4,820
		Tons per sq. ft.		277·1	309·9

In the previous test on Phorpres Flettons, June, 1922, the figures were 4,330 and 5,170 lb. per square inch for cracking and crushing respectively, and 284·8 and 332·4 tons per square foot. It is satisfactory to note that there is such a small difference between these two tests, which dispose of the theory that Fletton bricks suffer alarmingly through action of freezing and thawing.

OBITUARY

Mr. George Wittet.

The death has occurred in Bombay of Mr. George Wittet, consulting architect to the Government of Bombay. He designed many notable buildings in Bombay City and Presidency.

ARCHITECTS' WILLS

Mr. Percy Bond Houfton, F.R.I.B.A., fifty-one, of Brookside, Buslow Road, Chesterfield, left £8,656 (net personalty £5,131).

Mr. Alfred Culshaw, of 20 Canning Street, Liverpool, architect, left £12,739 (net personalty £12,520).

THE WEEK'S BUILDING NEWS

A Church for Claygate

A Wesleyan church is to be built at Claygate, Esher.

Flats for Bromley

Sixty more flats are to be built on the housing estate at Bromley, Kent.

Additional Housing at Torquay

Another forty-five houses are to be erected at a cost of £20,210, by the Torquay Corporation on the Windmill Hill estates.

Westbourne Workhouse Converted into Flats

The Westbourne Guardians have arranged to sell an old workhouse for conversion into flats.

Housing at Wellingborough

The Wellingborough Rural District Council proposes to build twenty-four houses at Irchester and ten at Little Irchester.

Extensions to the Fitzwilliam Museum

So large and continuous are the gifts to the Fitzwilliam Museum, Cambridge, that a still further extension to cost £100,000 is contemplated.

A School for Markethill, Ireland

The County Armagh Regional Education Committee has decided to build a new school at Markethill to accommodate 180 pupils.

Housing at Ashburton

The Ashburton Urban District Council has decided to make provision for the erection of twenty-five houses on the new Four Lanes site.

Further Housing at Leyland

The Leyland Urban District Council has received the approval of the Ministry of Health for the erection of an additional fifty houses.

Houses for Port Merrion

Messrs. C. and T. Crampton, Ltd., of Ballsbridge, propose to build 120 houses on the estate of the late Sir John Nutting, St. Helens, Merrion, Co. Dublin.

Housing at Whittlesey

The Whittlesey Rural District Council proposes to build fifty houses, twenty-four of which have already been sanctioned by the Ministry of Health.

More Houses for West Hartlepool

The Ministry of Health has approved of the West Hartlepool Town Council's scheme for the erection of an additional 151 houses on the Rift House estate.

A New Birmingham Stock Exchange

A new building is to be erected for the Birmingham Stock Exchange at the corner of Margaret Street and Great Charles Street, at a cost of £48,000. The architect is Mr. S. N. Cooke.

Reconstruction of Brighton Aquarium

There is much opposition to the Brighton Corporation's scheme for the borrowing of £92,000 for the reconstruction and reconditioning of the Aquarium, which is the subject of a Ministry of Health inquiry.

Westminster Abbey Gift to America

The Chapter of Westminster Abbey has just presented a block of Purbeck marble, first utilized in the Abbey in 1290, to the new church of St. Mary, at Beaver Falls, Pittsburg.

Building Schemes at Glasgow

The Glasgow Corporation has decided to build 330 tenement houses at Possil. The erection of a washhouse at Mair Street, Plantation, at an estimated cost of £19,000, is also recommended.

The Aylesbury County Offices Scheme

The Burnham Parish Council has sent a strong protest to the Bucks County Council with regard to the proposal to spend £74,000 on the erection of new County Council Offices at Aylesbury.

Proposed India House for London

According to the *Sunday Times* there is a strong movement on foot in commercial circles interested in British-Indian trade to establish an India House in London on similar lines to Australia House and Canada House.

Enlargements to Castle Bromwich Exhibition

The Birmingham Chamber of Commerce, which is responsible for the organization of the Birmingham and Midland Section of the British Industries Fair, which is to be held next year, has decided to enlarge the exhibition buildings at Castle Bromwich.

A Cathedral Proposed for Detroit

Approximately £100,000 for the building of the proposed cathedral in Detroit, U.S., has been bequeathed to Bishop Michael J. Gallagher by the will of the late Mgr. James G. Doherty, for many years rector of St. Vincent de Paul's Church, Detroit.

A New Liverpool Building

The firm of Messrs. Lewis, in Liverpool, shortly proposes to extend their premises by the erection of a new building facing Renshaw Street. This building will contain a large hall, and, below ground level, a special railway siding from the Central Station.

Town Planning at Warrington

The Warrington Town Council's decision to invite other adjoining local authorities to co-operate in forming a town-planning scheme for their various areas has not met with the approval of the Warrington Rural District Council, and the matter is being left over for further discussion in the future.

More Houses for Hove

The Hove Works Committee has approved plans for seventeen new houses to be erected by private enterprise, in addition to a number of alterations to existing property and the erection of garages, etc. The Council have now completed 216 of the 365 houses they have contracted to build.

Developments at Ripon

The Ministry of Health has sanctioned the borrowing by the Ripon Corporation of £19,500 for the purchase of 987 acres of land at Ripon Parks and Ure Bank Road, and £3,000 in respect of buildings thereon, for establishing a training ground for Territorials.

Homes for Aged People at Darlington

A bequest of £60,000 has been made by Sir Edward Walker to Darlington for the provision of a colony for aged people. It is announced that £30,000 is to be spent in the erection of fifty houses on a site of ten acres, and the remainder will be invested to provide pensions for the selected tenants and to maintain the colony.

A Church for Colindale

A new church, to cost about £15,000, is to be erected on the London County Council Watling estate at Colindale, Edgware Road, Hendon. Nearly £14,000 is in hand, mainly through the proceeds of the sale of the site upon which the church of St. Alphage in the City stood. The architects are Messrs. Nicholas and Dixon-Spain, FF.R.I.B.A.

A Shoreham Town-planning Scheme

On the recommendation of the Town-planning Committee the Shoreham Urban District Council has agreed to instruct its surveyor to prepare a town-planning scheme to include the whole of the urban district, a portion of the parish of Lancing, and also that portion of Steyning West rural district extending from Applesham Dam to the Worthing Road.

Roman Discoveries at York

The Roman corner tower found last year in the medieval rampart south-east of Monk Bar, York, has now been thoroughly explored. Its constructional sequence has disclosed the fact that it was built following the destruction which took place probably at the time that the Ninth Legion was lost. Another discovery is that of an interval tower, which has made it possible to locate the position of a series of the interval towers in the circuit of the Roman fortress of York. There are high hopes that those towers which are capable of excavation will be found to be in such a state of preservation that it will be possible to preserve them as important links in the chain of Roman associations.

RATES OF WAGES

			I	II
			s. d.	s. d.
A	ABERDARE	S. Wales & M.	1 8	1 3½
A₁	Abergavenny	Do.	1 7½	1 2½
B	Abingdon ..	S. Counties	1 6	1 1½
A	Accrington	N.W.Counties	1 8	1 3½
A₃	Addlestone	S. Counties	1 6½	1 2
A	Adlington ..	N.W.Counties	1 8	1 3½
A	Airdrie ..	Scotland	*1 8	1 3½
C₁	Aldeburgh	E. Counties	1 4	1 0½
A	Altrincham	N.W.Counties	1 8	1 3½
B₃	Appleby ..	N.W. Counties	1 4½	1 0½
A	Ashton-under-Lyne	N.W.Counties	1 8	1 3½
A₃	Atherstone	Mid. Counties	1 6½	1 2
B₃	Aylesbury ..	S. Counties	1 4½	1 0½
B	BATH ..	S.W.Counties	1 6	1 1½
B₃	Banbury ..	S. Counties	1 4½	1 0½
B₃	Bangor ..	N.W. Counties	1 5	1 1
A	BarnardCastle	N.E. Coast	1 8	1 3½
A	Barnsley ..	Yorkshire	1 8	1 3½
B₁	Barnstaple	S.W. Counties	1 5½	1 1½
A	Barrow ..	N.W.Counties	1 8	1 3½
A	Barry ..	S. Wales & M.	1 8	1 3½
B₃	Basingstoke	S.W. Counties	1 4½	1 0½
A	Batley ..	Yorkshire	1 8	1 3½
B	Bedford ..	E. Counties	1 6	1 1½
A₂	Berwick-on-Tweed	N.E. Coast	1 7	1 2½
A₃	Bewdley ..	Mid. Counties	1 6½	1 2
B₃	Bicester ..	Mid. Counties	1 4½	1 0½
A	Birkenhead	N.W.Counties	†1 9	1 3½
A	Birmingham	Mid. Counties	1 8	1 3½
A	Bishop Auckland	N.E. Coast	1 8	1 3½
A	Blackburn	N.W.Counties	1 8	1 3½
A	Blackpool	N.W.Counties	1 8	1 3½
A	Blyth ..	N.E. Coast	1 8	1 3½
B₃	Bognor ..	S. Counties	1 4½	1 0½
A	Bolton ..	N.W.Counties	1 8	1 3½
A₃	Boston ..	Mid. Counties	1 6½	1 2
B₁	Bournemouth	S. Counties	1 6	1 1½
A	Bradford ..	Yorkshire	1 8	1 3½
A₃	Brentwood	E. Counties	1 6½	1 2
A	Bridgend ..	S. Wales & M.	1 8	1 3½
B₂	Bridgwater	S.W. Counties	1 5	1 1
A₁	Bridlington	Yorkshire	1 7½	1 2½
A	Brighouse ..	Yorkshire	1 8	1 3½
B₁	Brighton ..	S. Counties	1 6	1 1½
A	Bristol ..	S.W. Counties	1 8	1 3½
B₃	Brixham ..	S.W. Counties	1 4½	1 0½
A₃	Bromsgrove	Mid. Counties	1 6½	1 2
C	Bromyard ..	Mid. Counties	1 4	1 0½
A	Burnley ..	N.W.Counties	1 8	1 3½
A	Burslem ..	Mid. Counties	1 8	1 3½
A₂	Burton-on-Trent	Mid. Counties	1 7	1 2½
A	Bury ..	N.W.Counties	1 8	1 3½
A₃	Buxton ..	N.W.Counties	1 6½	1 2
B	CAMBRIDGE	E. Counties	1 6	1 1½
B₃	Canterbury	S. Counties	1 4½	1 0½
A	Cardiff ..	S. Wales & M.	1 8	1 3½
A	Carlisle ..	N.W.Counties	1 8	1 3½
B	Carmarthen	S. Wales & M.	1 6	1 1½
B₂	Carnarvon ..	N.W.Counties	1 5	1 1
A₁	Carnforth ..	N.W. Counties	1 7½	1 2½
A	Castleford ..	Yorkshire	1 8	1 3½
B₁	Chatham ..	S. Counties	1 5½	1 1½
B₁	Chelmsford	E. Counties	1 5½	1 1½
B	Cheltenham	S.W. Counties	1 6	1 1½
A	Chester ..	N.W.Counties	1 8	1 3½
A	Chesterfield	Mid. Counties	‡1 8	1 3½
B₃	Chichester ..	S. Counties	1 4½	1 0½
A	Chorley ..	N.W.Counties	1 8	1 3½
B₃	Cirencester	S. Counties	1 5	1 1
A	Clitheroe ..	N.W.Counties	1 8	1 3½
A	Clydebank	Scotland	1 8	1 3½
A	Coalville ..	Mid. Counties	1 8	1 3½
B₁	Colchester ..	E. Counties	1 5½	1 1½
A	Colne ..	N.W.Counties	1 8	1 3½
B₁	Colwyn Bay	N.W.Counties	1 5½	1 1½
A	Consett ..	N.E. Coast	1 8	1 3½
B₁	Conway ..	N.W. Counties	1 5½	1 1½
A	Coventry ..	Mid. Counties	1 8	1 3½
A₃	Crewe ..	N.W.Counties	1 6½	1 2
A₃	Cumberland	.....	1 6½	1 2
A	DARLINGTON	N.E. Coast	1 8	1 3½
A	Darwen ..	N.W.Counties	1 8	1 3½
B₃	Deal ..	S. Counties	1 4½	1 0½
B₁	Denbigh ..	N.W.Counties	1 5½	1 1½
A	Derby ..	Mid. Counties	1 8	1 3½
A	Dewsbury ..	Yorkshire	1 8	1 3½
B	Didcot ..	S. Counties	1 6	1 1½
A	Doncaster ..	Yorkshire	1 8	1 3½
C₁	Dorchester	S.W.Counties	1 4	1 0½
A₃	Driffield ..	Yorks	1 6½	1 2
A₃	Droitwich ..	Mid. Counties	1 6½	1 2
A₂	Dudley ..	Mid. Counties	1 7	1 2½
A	Dundee ..	Scotland	1 8	1 3½
A	Durham ..	N.E. Coast	1 8	1 3½
B₁	EAST-BOURNE	S. Counties	1 6	1 1½
A	Ebbw Vale	S. Wales & M.	1 8	1 3½
A	Edinburgh	Scotland	1 8	1 3½
A	E. Glamorganshire & Monmouthshire	S. Wales & M.	1 8	1 3½
B	Exeter ..	S.W. Counties	§1 7	1 2½
B₂	Exmouth ..	S.W. Counties	1 5	1 1
B	FELIXSTOWE	E. Counties	1 6	1 1½
A₃	Filey ..	Yorks	1 6½	1 2
A	Fleetwood ..	N.W.Counties	1 8	1 3½
B₃	Folkestone	S. Counties	1 4½	1 0½
A	Frodsham ..	N.W.Counties	1 8	1 3½
B₃	Frome ..	S.W.Counties	1 4½	1 0½
A	GATESHEAD	N.E. Coast	1 8	1 3½
B₁	Gillingham	S. Counties	1 5½	1 1½
B	Gloucester ..	S.W.Counties	1 6	1 1½
A₂	Goole ..	Yorkshire	1 7	1 2½
B₁	Gosport ..	S. Counties	1 5½	1 1½
A₃	Grantham ..	Mid. Counties	1 6½	1 2
A₂	Gravesend ..	S. Counties	1 7	1 2½
A	Greenock ..	Scotland	*1 8	1 3½
A	Grimsby ..	Yorkshire	1 8	1 3½
B₁	Guildford ..	S. Counties	1 5½	1 1½
A	HALIFAX ..	Yorkshire	1 8	1 3½
A₁	Hanley ..	Mid. Counties	1 7½	1 2½
A	Harrogate ..	Yorkshire	1 8	1 3½
A	Hartlepools	N.E. Coast	1 8	1 3½
B₂	Harwich ..	E. Counties	1 5	1 1
B₃	Hastings ..	S. Counties	1 4½	1 0½
B₁	Hatfield ..	S. Counties	1 5½	1 1½
B	Hereford ..	S.W.Counties	1 6	1 1½
B	Hertford ..	E. Counties	1 5½	1 1½
A₁	Heysham ..	N.W.Counties	1 7½	1 2½
A	Howden ..	N.E. Coast	1 8	1 3½
A	Huddersfield	Yorkshire	1 8	1 3½
A	Hull ..	Yorkshire	1 8	1 3½
A	ILKLEY ..	Yorkshire	1 8	1 3½
A	Immingham	Mid. Counties	1 8	1 3½
B	Ipswich ..	E. Counties	1 6	1 1½
C₁	Isle of Wight	S. Counties	1 4	1 0½
A	JARROW ..	N.E. Coast	1 8	1 3½
A	KEIGHLEY	Yorkshire	1 8	1 3½
B₂	Kendal ..	N.W. Counties	1 5	1 1
B₂	Keswick ..	N.W.Counties	1 5	1 1
B	Kettering ..	Mid. Counties	1 6	1 1½
A₃	Kidderminster	Mid. Counties	1 6½	1 2
B₂	King's Lynn	E. Counties	1 5	1 1
A₁	LANCASTER	N.W.Counties	1 7½	1 2
A₃	Leamington	Mid. Counties	1 6½	1 2½
A	Leeds ..	Yorkshire	1 8	1 3½
A	Leek ..	Mid. Counties	1 8	1 3½
A	Leicester ..	Mid. Counties	1 8	1 3½
A	Leigh ..	N.W. Counties	1 8	1 3½
B₃	Lewes ..	S. Counties	1 4½	1 0½
A₃	Lichfield ..	Mid. Counties	1 6½	1 2
A	Lincoln ..	Mid. Counties	1 8	1 3½
A	Liverpool ..	N.W.Counties	‖1 9	1 3½
B	Llandudno	N.W.Counties	1 6	1 1½
A	Llanelly ..	S. Wales & M.	1 8	1 3½
	London (12 miles radius)		1 9½	1 4½
	Do. (12–15 miles radius)		1 9	1 4
A	Long Eaton	Mid. Counties	1 8	1 3½
A	Loughborough	Mid. Counties	1 8	1 3½
B	Luton ..	E. Counties	1 6	1 1½
A	Lytham ..	N.W. Counties	1 8	1 3½
A₁	MACCLESFIELD	N.W.Counties	1 7½	1 2½
B	Maidstone ..	S. Counties	1 5½	1 1½
A₃	Malvern ..	Mid. Counties	1 6½	1 2
A	Manchester	N.W.Counties	1 8	1 3½
A	Mansfield ..	Mid. Counties	1 8	1 3½
B₃	Margate ..	S. Counties	1 4½	1 0½
A₃	Matlock ..	Mid. Counties	1 6½	1 2
A	Merthyr ..	S. Wales & M.	1 8	1 3½
A	Middlesbrough	N.E. Coast	1 8	1 3½
A₃	Middlewich	N.W. Counties	1 6½	1 2
A	Monmouth & S. and E. Glamorganshire	S. Wales & M.	1 8	1 3½
A₁	Morecambe	N.W. Counties	1 7½	1 2½
A₃	NANTWICH	N.W.Counties	1 6½	1 2
A	Neath ..	S. Wales & M.	1 8	1 3½
A	Nelson ..	N.W. Counties	1 8	1 3½
A	Newcastle ..	N.E.Coast	1 8	1 3½
A	Newport ..	S. Wales & M.	1 8	1 3½
A	Normanton	Yorkshire	1 8	1 3½
A₂	Northampton	Mid. Counties	1 7	1 2½
A	North Staffs.	Mid. Counties	1 8	1 3½
A	North Shields	N.E. Coast	1 8	1 3½
B	Norwich ..	E. Counties	1 6	1 1½
A	Nottingham	Mid. Counties	1 8	1 3½
A	Nuneaton ..	Mid. Counties	1 8	1 3½
B	OAKHAM ..	Mid. Counties	1 5½	1 1½
A	Oldham ..	N.W.Counties	1 8	1 3½
A₃	Oswestry ..	Mid. Counties	1 6½	1 2
B	Oxford ..	S. Counties	1 6	1 1½
A	PAISLEY ..	Scotland	*1 8	1 3½
C	Pembroke	S. Wales & M.	1 4½	1 0½
A	Perth ..	Scotland	*1 8	1 3
A₃	Peterborough	Mid. Counties	1 6½	1 2
A	Plymouth	S.W. Counties	¶1 8	1 3½
A	Pontefract ..	Yorkshire	1 8	1 3½
A	Pontypridd	S. Wales & M.	1 8	1 3½
B	Portsmouth	S. Counties	1 6	1 1½
A	Preston ..	N.W.Counties	1 8	1 3½
A	QUEENSFERRY	N.W.Counties	1 8	1 3½
B	READING ..	S. Counties	1 6	1 1½
B	Reigate ..	S. Counties	1 5½	1 1½
A₃	Retford ..	Mid. Counties	1 6½	1 2
A	Rhondda Valley	S. Wales & M.	1 8	1 3½
A₃	Ripon ..	Yorkshire	1 6½	1 2
A	Rochdale ..	N.W.Counties	1 8	1 3½
B	Rochester ..	S. Counties	1 5½	1 1½
A₁	Ruabon ..	N.W.Counties	1 7½	1 2½
A₂	Rugby ..	Mid. Counties	1 8	1 3½
A₃	Rugeley ..	Mid. Counties	1 6½	1 2
A	Runcorn ..	N.W. Counties	1 8	1 3½
A₃	ST. ALBANS	E. Counties	1 6½	1 2
A	St. Helens ..	N.W.Counties	1 8	1 3½
A₁	Scarborough	Yorkshire	1 7½	1 2½
A	Scunthorpe	Mid. Counties	1 8	1 3½
A	Sheffield ..	Yorkshire	1 8	1 3½
A	Shipley ..	Yorkshire	1 8	1 3½
A₃	Shrewsbury	Mid. Counties	1 6½	1 2
A₂	Skipton ..	Yorkshire	1 7	1 2½
B	Slough ..	S. Counties	1 5½	1 1½
A₂	Solihull ..	Mid. Counties	1 7	1 2½
B	South'pton	S. Counties	1 6	1 1½
B₁	Southend-on-Sea	E. Counties	1 5½	1 1½
A	Southport ..	N.W.Counties	1 8	1 3½
A	S. Shields ..	N.E. Coast	1 8	1 3½
A₂	Stafford ..	Mid. Counties	1 7	1 2½
A	Stockport	N.W.Counties	1 8	1 3½
A	Stockton-on-Tees	N.E. Coast	1 8	1 3½
A	Stoke-on-Trent	Mid. Counties	1 8	1 3½
B	Stroud ..	S.W.Counties	1 5½	1 1½
A	Sunderland	N.E. Coast	1 8	1 3½
A	Swansea ..	S. Wales & M.	1 8	1 3½
B	Swindon ..	S.W. Counties	1 6	1 1½
A₁	TAMWORTH	N.W.Counties	1 7½	1 2½
B₁	Taunton ..	S.W. Counties	1 5½	1 1½
A	Teeside Dist.	N.E. Counties	1 8	1 3½
A	Todmorden	Yorkshire	1 8	1 3½
A₂	Torquay ..	S.W.Counties	1 7	1 2½
B₁	Tunbridge Wells	S. Counties	1 5½	1 1½
A	Tunstall ..	Mid. Counties	1 8	1 3½
A	Tyne District	N.E. Coast	1 8	1 3½
A	WAKEFIELD	Yorkshire	1 8	1 3½
A₂	Walsall ..	Mid. Counties	1 7	1 2½
A	Warrington	N.W.Counties	1 8	1 3½
A₃	Warwick ..	Mid. Counties	1 6½	1 2
B	Wellingborough	Mid. Counties	1 6	1 1½
A	West Bromwich	Mid. Counties	1 8	1 3½
B	Weston-s-Mare	S.W. Counties	1 6	1 1½
A₃	Whitby ..	Yorkshire	1 6½	1 2
A	Widnes ..	N.W.Counties	1 8	1 3½
A	Wigan ..	N.W.Counties	1 8	1 3½
B₂	Winchester	S. Counties	1 5	1 1
B	Windsor ..	S. Counties	1 6	1 1½
A	Worcester ..	Mid. Counties	1 8	1 3½
A	Worksop ..	Yorkshire	1 6½	1 2
A	Wrexham ..	N.W. Counties	1 8	1 3½
A₁	Wycombe ..	S. Counties	1 7½	1 2½
B	YARMOUTH	E. Counties	1 6	1 1½
B₁	Yeovil ..	S.W. Counties	1 5½	1 1½
B₂	York ..	Yorkshire	1 5	1 1
A			1 8	1 3½

The initial letter opposite each entry indicates the grade under the Ministry of Labour schedule. The district is that to which the borough is assigned in the same schedule. Column I gives the rates for craftsmen; column II for labourers; the rate for craftsmen working at trades in which a separate rate maintains, is given in a footnote. The table is a selection only. Particulars for lesser localities not included may be obtained upon application in writing.

* Plasterers, 1s. 9d.

† Carpenters and Painters, 1s. 8½d.

‡ Plumbers, 1s. 9d.

§ Painters, 1s. 6d.

‖ Carpenters and Plasterers, 1s. 8½d.

¶ Painters, 1s. 7d.

PRICES CURRENT

EXCAVATOR AND CONCRETOR

EXCAVATOR, 1s. 4½d. *per hour*; LABOURER, 1s. 4½d. *per hour*; NAVVY, 1s. 4½d. *per hour*; TIMBERMAN, 1s. 6d. *per hour*; SCAFFOLDER, 1s. 5½d. *per hour*; WATCHMAN, 7s. 6d. *per shift.*

Broken brick or stone, 2 in., per yd.	£0	11	6
Thames ballast, per yd.	0	13	0
Pit gravel, per yd.	0	18	0
Pit sand, per yd.	0	14	6
Washed sand	0	15	6

Screened ballast or gravel, add 10 per cent. per yd.
Clinker, breeze, etc., prices according to locality.

Portland cement, per ton	£2	19	0
Lias lime, per ton	2	10	0

Sacks charged extra at 1s. 9d. each and credited when returned at 1s. 6d.
Transport hire per day:

Cart and horse	£1	3	0	*Trailer*	£0	15	0
3-ton motor lorry	3	15	0	*Steam roller*	4	5	0
Steam lorry, 5-ton	4	0	0	*Water cart*	1	5	0

EXCAVATING and throwing out in ordinary earth not exceeding 6 ft. deep, basis price, per yd. cube . 0 3 0
Exceeding 6 ft., but under 12 ft., add 30 per cent.
In stiff clay, add 30 per cent.
In underpinning, add 100 per cent.
In rock, including blasting, add 225 per cent.
If basketed out, add 80 per cent. to 150 per cent.
Headings, including timbering, add 400 per cent.

RETURN, fill, and ram, ordinary earth, per yd.	£0	2	4
SPREAD and level, including wheeling, per yd.	0	2	4
PLANKING, per ft. sup.	0	0	5
DO. over 10 ft. deep, add for each 5 ft. depth 30 per cent.			
HARDCORE, 2 in. ring, filled and rammed, 4 in. thick, per yd. sup.	£0	2	1
DO. 6 in. thick, per yd. sup.	0	2	10
PUDDLING, per yd. cube	1	10	0
CEMENT CONCRETE, 4-2-1, per yd. cube	2	3	0
DO. 6-2-1, per yd. cube.	1	18	0

DO. in upper floors, add 15 per cent.
DO. in reinforced-concrete work, add 20 per cent.
DO. in underpinning, add 60 per cent.

LIAS LIME CONCRETE, per yd. cube	£1	16	0
BREEZE CONCRETE, per yd. cube	1	7	0
DO. in lintols, etc., per ft. cube	0	1	6

DRAINER

LABOURER, 1s. 4½d. *per hour*; TIMBERMAN, 1s. 6d. *per hour*; BRICKLAYER, 1s. 9½d. *per hour*; PLUMBER, 1s. 9½d. *per hour*; WATCHMAN, 7s. 6d. *per shift.*

Stoneware pipes, tested quality, 4 in., per yd.	£0	1	3
DO. *6 in., per yd.*	0	2	8
DO. *9 in., per yd.*	0	3	6
Cast-iron pipes, coated, 9 ft. lengths, 4 in., per yd.	0	6	9
DO. *6 in., per yd.*	0	9	2
Portland cement and sand, see "Excavator" above.			
Lead for caulking, per cwt.	£2	5	6
Gaskin, per lb.	0	0	5½

STONEWARE DRAINS, jointed in cement, tested pipes, 4 in., per ft.	0	4	3
DO. 6 in., per ft.	0	5	0
DO. 9 in., per ft.	0	7	9
CAST-IRON DRAINS, jointed in lead, 4 in., per ft.	0	9	0
DO. 6 in., per ft.	0	11	0

Note.—These prices include digging and filling for normal depths, and are average prices. Fittings in Stoneware and Iron according to type. *See* Trade Lists.

BRICKLAYER

BRICKLAYER, 1s. 9½d. *per hour*; LABOURER, 1s. 4½d. *per hour*; SCAFFOLDER, 1s. 5½d. *per hour.*

London stocks, per M.	£4	15	0
Flettons, per M.	2	18	0
Staffordshire blue, per M.	9	10	0
Firebricks, 2½ in., per M.	11	3	0
Glazed salt, white, and ivory stretchers, per M.	21	10	0
DO. *headers, per M.*	21	0	0
Colours, extra, per M.	£5	10	0
Seconds, less, per M.	1	0	0
Cement and sand, see "Excavator" above.			
Lime, grey stone, per ton	£2	12	0
Mixed lime mortar, per yd.	1	6	0
Damp course, in rolls of 4½ in., per roll	0	2	6
DO. *9 in. per roll*	0	4	9
DO. *14 in. per roll*	0	7	6
DO. *18 in. per roll*	0	9	6

BRICKWORK in stone lime mortar, Flettons or equal, per rod	33	0	0
DO. in cement do., per rod	36	0	0

DO. in stocks, add 25 per cent. per rod.
DO. in blues, add 100 per cent. per rod.
DO. circular on plan, add 12½ per cent. per rod.

FACINGS, FAIR, per ft. sup. extra	£0	0	2
DO. Red Rubbers, gauged and set in putty, per ft. extra	0	4	6
DO. salt, white or ivory glazed, per ft. sup. extra	0	5	6
TUCK POINTING, per ft. sup. extra	0	0	10
WEATHER POINTING, per ft. sup. extra	0	0	3
GRANOLITHIC PAVING, 1 in., per yd. sup.	0	5	0
DO. 1½ in., per yd. sup.	0	6	0
DO. 2 in., per yd. sup.	0	7	0
BITUMINOUS DAMP COURSE, ex rolls, per ft. sup.	0	0	7
ASPHALT (MASTIC) DAMP COURSE, ½ in., per yd. sup.	0	8	0
DO. vertical, per yd. sup.	0	11	0
SLATE DAMP COURSE, per ft. sup.	0	0	10
ASPHALT ROOFING (MASTIC) in two thicknesses, ¾ in., per yd	0	8	6
DO. SKIRTING, 6 in.	0	0	11
BREEZE PARTITION BLOCKS, set in Cement, 1½ in. per yd. sup.	0	5	3
DO. DO. 3 in.	0	6	6

THE wages are the Union rates current in London at the time of publication. The prices are for good quality material, and are intended to cover delivery at works, wharf, station, or yard as customary, but will vary according to quality and quantity. The measured prices are based upon the foregoing, and include usual builders' profits. Though every care has been taken in its compilation it is impossible to guarantee the accuracy of the list, and readers are advised to have the figures confirmed by trade inquiry.

MASON

MASON, 1s. 9½d. *per hour*; DO. *fixer*, 1s. 10½d. *per hour*; LABOURER, 1s. 4½d. *per hour*; SCAFFOLDER, 1s. 5½d. *per hour.*

Portland Stone:			
Whitbed, per ft. cube	£0	4	7
Basebed, per ft. cube	0	4	8
Bath stone, per ft. cube	0	3	9
Usual trade extras for large blocks.			
York paving, av. 2½ in., per yd. super.	0	6	6
York templates sawn, per ft. cube	0	6	9
Slate shelves, rubbed, 1 in., per ft. sup.	0	2	6
Cement and sand, see "Excavator," etc., above.			

HOISTING and setting stone, per ft. cube	£0	2	2
DO. for every 10 ft. above 30 ft., add 15 per cent.			
PLAIN face Portland basis, per ft. sup.	£0	2	8
DO. circular, per ft. sup.	0	4	0
SUNK FACE, per ft. sup.	0	3	9
DO. circular, per ft. sup.	0	4	10
JOINTS, arch, per ft. sup.	0	2	6
DO. sunk, per ft. sup.	0	2	7
DO. DO. circular, per ft. sup.	0	4	6
CIRCULAR-CIRCULAR work, per ft. sup.	1	2	0
PLAIN MOULDING, straight, per inch of girth, per ft. run	0	1	1
DO. circular, do. per ft. run	0	1	4
HALF SAWING, per ft. sup.	£0	1	0

Add to the foregoing prices if in York stone 35 per cent.
DO. Mansfield, 12½ per cent.
Deduct for Bath, 33⅓ per cent.
DO. for Chilmark, 5 per cent.

SETTING 1 in. slate shelving in cement, per ft. sup.	£0	0	6
RUBBED round nosing to do., per ft. lin.	0	0	6
YORK STEPS, rubbed T. & R., ft. cub. fixed	1	9	0
YORK SILLS, W. & T., ft. cub. fixed.	1	13	0

SLATER AND TILER

SLATER, 1s. 9½d. *per hour*; TILER, 1s. 9½d. *per hour*; SCAFFOLDER, 1s. 5½d. *per hour*; LABOURER, 1s. 4½d. *per hour.*

N.B.—Tiling is often executed as piecework.

Slates, 1st quality, per M:			
Portmadoc Ladies	£14	0	0
Countess	27	0	0
Duchess	32	0	0
Clips, lead, per lb.	0	0	4
Clips, copper, per lb.	0	2	0
Nails, compo, per cwt.	1	6	0
Nails, copper, per lb.	0	1	10
Cement and sand, see "Excavator," etc., above.			
Hand-made tiles, per M.	£5	18	0
Machine-made tiles, per M.	5	8	0
Westmorland slates, large, per ton	9	0	0
DO. *Peggies, per ton*	7	5	0

SLATING, 3 in. gauge, compo nails, Portmadoc or equal:			
Ladies, per square	£4	0	0
Countess, per square	4	5	0
Duchess, per square	4	10	0
WESTMORLAND, in diminishing courses, per square	6	5	0
CORNISH DO., per square	6	3	0
Add, if vertical, per square approx.	0	13	0
Add, if with copper nails, per square approx.	0	2	6
Double course at eaves, per ft. approx.	0	1	0
TILING, 4 in. gauge, every 4th course nailed, in hand-made tiles, average per square	5	6	0
DO., machine-made DO., per square	4	17	0

Vertical Tiling, including pointing, add 18*s.* 0*d.* per square.

FIXING lead soakers, per dozen	£0	0	10
STRIPPING old slates and stacking for re-use, and clearing away surplus and rubbish, per square	0	10	0
LABOUR only in laying slates, but including nails, per square	1	0	0

See "Sundries for Asbestos Tiling."

CARPENTER AND JOINER

CARPENTER, 1s 9½d. *per hour*; JOINER, 1s. 9½d. *per hour*; LABOURER, 1s. 4½d. *per hour.*

Timber, average prices at Docks, London Standard, Scandinavian, etc. (equal to 2nds):

7×3, per std.	£21	0	0
11×4, per std.	31	0	0
Memel or Equal. Slightly less than foregoing.			
Flooring, P.E., 1 in., per sq.	£1	5	0
DO. *T. and G., 1 in., per sq.*	1	5	0
Planed Boards, 1 in.×11 in., per std.	30	0	0
Wainscot oak, per ft. sup. of 1 in.	0	2	0
Mahogany, per ft. sup. of 1 in.	0	2	0
DO. *Cuba, per ft. sup. of 1 in.*	0	3	0
Teak, per ft. sup. of 1 in.	0	3	0
DO., *ft. cube*	0	15	0

FIR fixed in wall plates, lintels, sleepers, etc., per ft. cube	0	5	9
DO. framed in floors, roofs, etc., per ft. cube	0	6	3
DO., framed in trusses, etc., including ironwork, per ft. cube	0	7	3

PITCH PINE, add 33⅓ per cent.

FIXING only boarding in floors, roofs, etc., per sq.	0	13	6
SARKING FELT laid, 1-ply, per yd.	0	1	6
DO., 3-ply, per yd.	0	1	9
CENTERING for concrete, etc., including horsing and striking, per sq.	3	10	0
SLATE BATTENING, per sq.	0	18	6

PRICES CURRENT; *continued.*

CARPENTER AND JOINER; *continued.*

DEAL GUTTER BOARD, 1 in., on firring, per sq.	£3	5	0
MOULDED CASEMENTS, 1¼ in., in 4 sqs., glazing beads and hung, per ft. sup.	0	3	0
DO., DO., 2 in., per ft. sup.	0	3	3
DEAL cased frames, oak sills, 2 in. d.h. sashes, brass-faced pulleys, etc., per ft. sup.	0	4	0
DOORS, 4 pan. sq. b.s., 2 in., per ft. sup.	0	3	6
DO., DO., DO., 1¼ in., per ft. sup.	0	3	0
DO., DO., moulded b.s., 2 in., per ft. sup.	0	3	9
DO., DO., DO., 1¼ in., per ft. sup.	0	3	3
If in oak multiply 3 times.			
If in mahogany multiply 3 times.			
If in teak multiply 3 times.			
WOOD BLOCK FLOORING, standard blocks, laid in mastic herringbone:			
Deal, 1 in., per yd. sup., average	0	10	0
DO., 1¼ in., per yd., sup., average	0	12	0
DO., DO., 1¼ in. maple blocks	0	15	0
STAIRCASE WORK, DEAL:			
1 in. riser, 1¼ in. tread, fixed, per ft. sup.	0	3	6
2 in. deal strings, fixed, per ft. sup.	0	3	9

PLUMBER

PLUMBER, 1*s.* 9½*d. per hour;* MATE OR LABOURER, 1*s.* 4½*d. per hour.*

Lead, milled sheet, per cwt.	£2	3	0
DO. *drawn pipes, per cwt.*	2	4	6
DO. *soil pipe, per cwt.*	2	6	6
DO. *scrap, per cwt.*	1	9	6
Copper, sheet per lb.	0	1	0
Solder, plumber's, per lb.	0	1	2
DO. *fine, per lb.*	0	1	5
Cast-iron pipes, etc.:			
L.C.C. soil, 3 in., per yd.	0	4	1
DO. *4 in. per yd.*	0	5	0
R.W.P., 2½ in., per yd.	0	2	0
DO. *3 in., per yd.*	0	2	5
DO. *4 in., per yd.*	0	3	3
Gutter, 4 in. H.R., per yd.	0	1	5
DO. *4 in. O.G., per yd.*	0	1	9
MILLED LEAD and labour in gutters, flashings, etc.	3	10	6
LEAD PIPE, fixed, including running joints, bends, and tacks, ½ in., per ft.	0	2	1
DO. ¾ in., per ft.	0	2	5
DO. 1 in., per ft.	0	3	3
DO. 1¼ in., per ft.	0	4	6
LEAD WASTE or soil, fixed as above, complete, 2½ in., per ft.	0	6	0
DO. 3 in., per ft.	0	7	0
DO. 4 in., per ft.	0	9	9
CAST-IRON R.W. PIPE, at 24 lb. per length, jointed in red lead, 2½ in., per ft.	0	2	5
DO. 3 in.. per ft.	0	2	10
DO. 4 in., per ft.	0	3	3
CAST-IRON H.R. GUTTER, fixed, with all clips, etc., 4 in., per ft.	0	2	7
DO. O.G. 4 in., per ft.	0	2	10
CAST-IRON SOIL PIPE, fixed with caulked joints and all ears, etc., 4 in., per ft.	0	7	0
DO. 3 in., per ft.	0	6	0
Fixing only:			
W.C. PANS and all joints, P. or S., and including joints to water waste preventers, each	2	5	0
BATHS only, with all joints	1	18	0
LAVATORY BASINS only, with all joints, on brackets, each	1	10	0

PLASTERER

PLASTERER, 1*s.* 9½*d. per hour (plus allowances in London only);* LABOURER, 1*s.* 4½*d. per hour.*

Chalk lime, per ton	£2	11	0
Hair, per cwt.	0	18	0
Sand and cement see "Excavator," etc., above.			
Lime putty, per cwt.	£0	2	8
Hair mortar, per yd.	1	7	0
Fine stuff, per yd.	1	14	0
Sawn laths, per bdl.	0	2	9
Keene's cement, per ton	5	15	0
Sirapite, per ton	3	10	0
DO. *fine, per ton*	3	18	0
Plaster, per ton	3	0	0
DO. *per ton*	3	12	6
DO. *fine, per ton*	5	12	0
Thistle plaster, per ton	£3	9	0
Lath nails per lb.	0	0	4
LATHING with sawn laths, per yd.	0	1	7
METAL LATHING, per yd.	0	2	3
FLOATING in Cement and Sand, 1 to 3, for tiling or woodblock, ¾ in., per yd.	0	2	4
DO. vertical, per yd.	0	2	7
RENDER, on brickwork, 1 to 3, per yd.	0	2	7
RENDER in Portland and set in fine stuff, per yd.	0	3	3
RENDER, float, and set, trowelled, per yd.	0	2	9
RENDER and set in Sirapite, per yd.	0	2	5
DO. in Thistle plaster, per yd.	0	2	5
EXTRA, if on but not including lathing, any of foregoing, per yd.	0	0	5
EXTRA, if on ceilings, per yd.	0	0	5
ANGLES, rounded Keene's on Portland, per ft. lin.	0	0	6
PLAIN CORNICES, in plaster, per inch girth, including dubbing out, etc., per ft. lin.	0	0	5
WHITE glazed tilir g set in Portland and jointed in Parian, per yd., from	1	11	6
FIBROUS PLASTER SLABS, per yd.	0	1	10

GLAZIER

GLAZIER, 1*s.* 8½*d. per hour.*

Glass: 4ths in crates:			
Clear, 21 oz.	£0	0	6
DO. 26 oz.	0	0	7½
Cathedral white, per ft.	0	0	6½
Polished plate, British ⅛ in., up to 2 ft. sup.	0	2	0
DO. *3 ft. sup.*	0	2	6
DO. *7 ft. sup.*	0	3	6
DO. *25 ft. sup.*	0	4	0
DO. *100 ft. sup.*	0	4	6
Rough plate, ⅜ in.	0	0	6
DO. *¼ in., per ft.*	0	0	6½
Linseed oil putty, per cwt.	0	16	0
GLAZING in putty, clear sheet, 21 oz.	0	0	11
DO. 26 oz.	0	1	0
GLAZING in beads, 21 oz., per ft.	0	1	1
DO. 26 oz., per ft.	0	1	4
Small sizes slightly less (under 3 ft. sup.).			
Patent glazing in rough plate, normal span 1*s.* 6*d.* to 2*s.* per ft.			
LEAD LIGHTS, plain, med. sqs. 21 oz., usual domestic sizes, fixed, per ft. sup. and up	£0	3	6
Glazing only, polished plate, 6½*d.* to 8*d.* per ft. according to size.			

DECORATOR

PAINTER, 1*s.* 8½*d. per hour;* LABOURER, 1*s.* 4½*d. per hour;* FRENCH POLISHER, 1*s.* 9*d. per hour;* PAPERHANGER, 1*s.* 8½*d. per hour.*

Genuine white lead, per cwt.	£3	11	0
Linseed oil, raw, per gall.	0	3	7
DO., *boiled, per gall.*	0	3	10
Turpentine, per gall.	0	6	2
Liquid driers, per gall.	0	9	6
Knotting, per gall.	1	4	0
Distemper, washable, in ordinary colours, per cwt., and up	2	0	0
Double size, per firkin	0	3	6
Pumice stone, per lb.	0	0	4
Single gold leaf (transferable), per book	0	1	11
Varnish copal, per gall. and up	0	18	0
DO., *flat, per gall.*	1	2	0
DO., *paper, per gall.*	1	0	0
French polish, per gall.	0	19	0
Ready mixed paints, per gall. and up	0	10	6
LIME WHITING, per yd. sup.	0	0	3
WASH, stop, and whiten, per yd. sup.	0	0	6
DO., and 2 coats distemper with proprietary distemper, per yd. sup.	0	0	9
KNOT, stop, and prime, per yd. sup.	0	0	7
PLAIN PAINTING, including mouldings, and on plaster or joinery, 1st coat, per yd. sup.	0	0	10
DO., subsequent coats, per yd. sup.	0	0	9
DO., enamel coat, per yd. sup.	0	1	2½
BRUSH-GRAIN, and 2 coats varnish, per yd. sup.	0	3	8
FIGURED DO., DO., per yd. sup.	£0	5	6
FRENCH POLISHING, per ft. sup.	0	1	2
STRIPPING old paper and preparing, per piece	0	1	7
HANGING PAPER, ordinary, per piece	0	1	10
DO., fine, per piece, and upwards	0	2	4
VARNISHING PAPER, 1 coat, per piece	0	9	0
CANVAS, strained and fixed, per yd. sup.	0	3	0
VARNISHING, hard oak, 1st coat, yd. sup.	0	1	2
DO., each subsequent coat, per yd. sup.	0	0	11

SMITH

SMITH, *weekly rate equals* 1*s.* 9½*d. per hour;* MATE, *do.* 1*s.* 4*d. per hour;* ERECTOR, 1*s.* 9½*d. per hour;* FITTER, 1*s.* 9½*d. per hour;* LABOURER, 1*s.* 4*d. per hour.*

Mild steel in British standard sections, per ton	£12	10	0
Sheet steel:			
Flat sheets, black, per ton	19	0	0
Do., Galvd., per ton	23	0	0
Corrugated sheets, galvd., per ton	23	0	0
Driving screws, galvd., per grs.	0	1	10
Washers, galvd., per grs.	0	1	1
Bolts and nuts, per cwt. and up	1	18	0
MILD STEEL in trusses, etc., erected, per ton	25	10	0
DO., in small sections as reinforcement, per ton	16	10	0
DO., in compounds, per ton	17	0	0
DO., in bar or rod reinforcement, per ton	20	0	0
WROT. IRON in chimney bars etc., including building in, per cwt.	2	0	0
DO., in light railings and balusters, per cwt.	2	5	0
FIXING only corrugated sheeting, including washers and driving screws, per yd.	0	2	0

SUNDRIES

Fibre or wood pulp boardings, according to quality and quantity. The measured work price is on the same basis per ft. sup.	£0	0	2½
FIBRE BOARDINGS, including cutting and waste, fixed on, but not including studs or grounds, per ft. sup. from 3d. to	0	0	6
Plaster board, per yd. sup. from	0	1	7
PLASTER BOARD, fixed as last, per yd. sup. from	0	2	8
Asbestos sheeting, 5/32 in., grey flat, per yd. sup.	0	2	3
DO., *corrugated, per yd. sup.*	0	3	3
ASBESTOS SHEETING, fixed as last, flat, per yd. sup.	0	4	0
DO., corrugated, per yd. sup.	0	5	0
ASBESTOS slating or tiling on, but not including battens, or boards, plain "diamond" per square, grey	2	15	0
DO., red	3	0	0
Asbestos cement slates or tiles, 5/32 in. punched per M. grey	17	0	0
DO., *red*	19	0	0
ASBESTOS COMPOSITION FLOORING: Laid in two coats, average ¾ in. thick, in plain colour, per yd. sup.	0	7	0
DO., ½ in. thick, suitable for domestic work, unpolished, per yd.	0	6	6
Metal casements for wood frames, domestic sizes, per ft. sup.	0	1	6
DO., *in metal frames, per ft. sup.*	0	1	9
HANGING only metal casement in, but not including wood frames, each	0	2	10
BUILDING in metal casement frames, per ft. sup.	0	0	7
Waterproofing compounds for cement. Add about 75 per cent. to 100 per cent. to the cost of cement used.			
Plywood:			
3 m/m alder, per ft. sup.	0	0	2
4½ m/m amer. white, per ft. sup.	0	0	3¾
⅜ m/m figured ash, per ft. sup.	0	0	5
4½ m/m 3rd quality, composite birch, per ft. sup..	0	0	1½