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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

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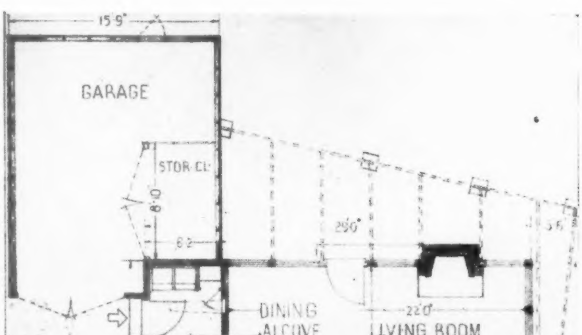
PRINCIPAL CONTENTS

THE AMERICAN IDEAL HOME

1

2



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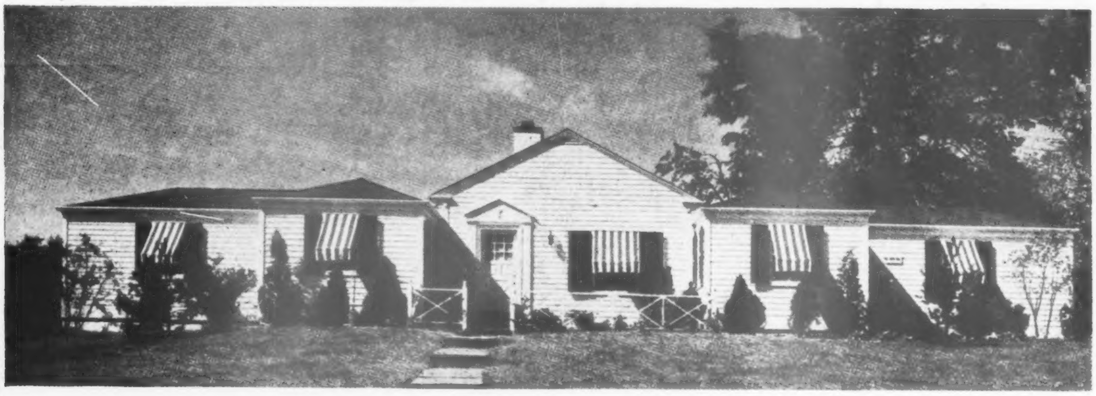
On this and the following page are illustrated four of the eight houses designed for the American magazine,* Life, *by various American architects. The architects were asked to design the ideal house for typical American families of differing size and income. The scheme has been very successful, and over 100 houses are now built or in course of construction throughout the United States. These houses are the subject of this week's leading article.*

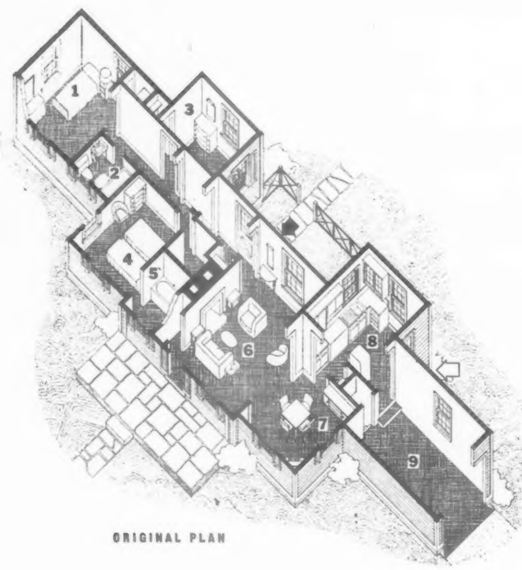
1 and 2, the smallest of the eight Life *houses, designed by Cameron Clark. A few changes, chiefly the addition of the garage, have been made in the original plan. Timber frame with resin-bonded plywood facing in 2-ft. strips and shingle roof. Inclusive price about £1,200. Mortgage costs, £65 per annum.*

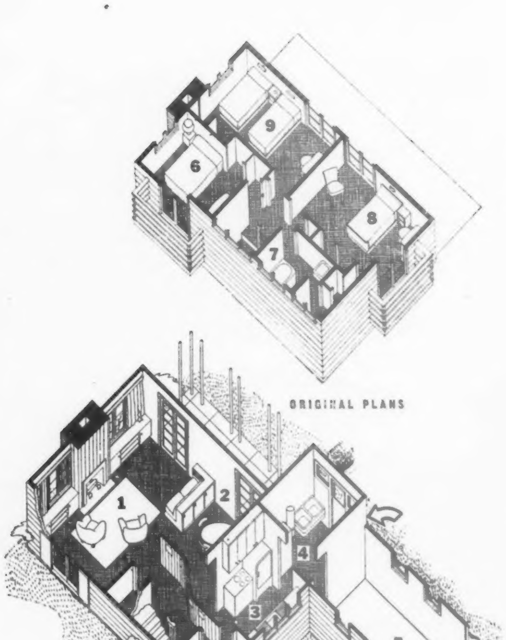
3 and 4, House No. 2, by Gardner A. Daily. Redwood boarding and cedar shingles. For British conditions, the plan of this house is the best of the one-floor types. Inclusive price is about £1,170 and mortgage costs £70 per annum, but it should be noted that the standard of kitchen and cupboard equipment is high in all houses.

* Reproduced from the *Architectural Forum* for July.



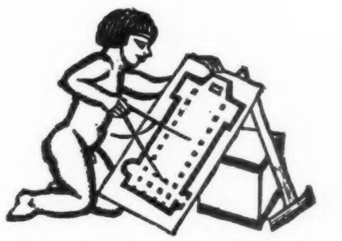
Two of the Ideal Houses in the programme organized by the magazine Life *(see previous page).*
House No. 6, by Treanor and Fatio. Painted weather-board and timber frame. The en suite *living rooms and central passage are notable differences from British practice. Cost £2,100; mortgage costs £180 per annum. Key: 1, bedroom; 2, bathroom; 3–4, bedrooms; 5, bathroom; 6, living room; 7, dining room; 8, kitchen; 9, garage.*





House No. 8, by Shaw, Naess and Murphy. Timber frame sheathed with weatherboard. Cost about £2,250 with mortgage costs of £180. Key: 1, Living room; 2, dining room; 3, kitchen; 4, heating and laundry; 5, garage; 6, bedroom; 7, bathroom; 8–9, bedrooms.

THE AMERICAN IDEAL HOME



LIFE'S HOUSES

AT the time of the Munich Crisis the magazine LIFE, which is to the U.S.A. much what *Picture Post* is to Britain, held a small houses exhibition of its own. It illustrated in great detail a series of houses which it had commissioned architects to design for American families of various size and income. The American public proved as interested in Ideal Homes as any of the hundreds of thousands in this country who would never dream of missing Olympia, and LIFE scored one more big success: so big a success that the idea was carried further.

Eight firms of architects were commissioned to design a second series of eight houses, of which examples were to be built in various parts of the U.S.A. LIFE's second housing enterprise has been as popular as its first: more than a hundred of the houses have already been built and examples of each type are illustrated in the *Architectural Forum* for last month.*

To British architects these houses will be of the greatest interest. The appearance and layout of a country's small houses are a sure measure of the rest of its architecture. The design of a small house is one of the most difficult and delicate problems in architectural practice. And it is nearly always in small house design that new forms of construction, new architectural movements and influences first appear, are tried out, and thereafter generally accepted or rejected. Small houses are a training ground and experimental laboratory for architects in every country.

The general conditions which LIFE's houses had to satisfy resemble those in Britain in that most Americans live in houses and many of those who do not would like to. The differences spring chiefly from greater space, or a tradition of greater space, and greater mobility: the detached house on a single floor is the rule, and the cheapness of motor transport and single-floored timber construction place such a house on a 100 × 100 plot within reach of far greater relative numbers than in this country.

LIFE's houses were designed for families whose incomes range from about £400 to £1,600, and costs (excluding site costs) run from about £1,000 to £2,500. These costs are higher than those of equivalent houses in this country: but British architects must remember (at the risk of a smile from abroad) that they cover a heating chamber and efficient central heating.

An authority on small house planning once emphasized to a youthful audience that, next to a sphere, a cube was the form which contained the greatest volume for the least area of external surface. LIFE's architects—very rightly where land is available—have preferred to spread out their rooms on one floor rather than go to two. But their plans show clearly that the grim law of the cube cannot be escaped by crossing the Atlantic. Both the expense and the advantages (in British eyes) of the greater spread have been cut down by using central passages, with borrowed light and ventilation, or inter-connecting rooms. In one house, hall, living-room, dining-room and kitchen are *en suite*, and can only be traversed in sequence. The British architect can only sigh at the thought of what he could do with a house costing £2,000 if he could do that: and then turn to the other chief architectural standard—appearance.

The external design† of LIFE's houses can be judged on two standards—as being the best the architects can do; or as representing as much architectural progress as the American public can be expected to stand for just at the moment. The second standard is almost certainly the right one.

Of the eight houses, five follow Colonial precedent, one bows towards Frank Lloyd Wright, one is vaguely Californian Mission and one is of stark mid-West frame type. All were primarily designed for execution in timber.

These results are not startling: no new architectural trail has been opened, no cultural Renaissance has burst into flame from LIFE's progressive torch. But it would be wrong to consider the houses a failure because they show little sign of the influence of the best American work of the last few years.

LIFE's aim, one may suppose, was not only to show the extra value, in all senses, of houses designed by architects, but also to coax the American public into appreciating the fundamentals of good design in building. And for this larger aim to have any general success, it was necessary that—as a first step—the difference between good and bad design should be illustrated in terms of *familiar* building forms. In LIFE's house the basic architectural virtues of good shape and scale, texture and colour have been introduced to the ordinary American in the form best calculated to reassure the timid.

Once that ordinary American has got those basic virtues so much into his system that he begins to expect them and ask for them, period trimmings, and any other stylistic barriers to architectural development, can be quietly dropped. But for its first experiment in architectural education, LIFE has been wise to keep them: and by its caution will have done much more for architectural progress than it could have by any attempt to convert the multitude to full understanding of modern architecture in one huge, unlikely jump.

*** Plans and photographs of four of the winning types are reproduced on pages 143 and 144 of this issue.**

† The lush Department Store furnishings of the Show Houses cannot be held against the architects.

The Architects' Journal
45 The Avenue, Cheam, Surrey
Telephone: Vigilant 0087-9.

NOTES & TOPICS

AFTER THE WAR

A NEW society for taking thought about post-war problems during the war made its bow to the public at the Building Centre last Thursday. It is called the Association for Planning and Regional Reconstruction, will have its headquarters at the Building Centre and has as its directors Lord Forrester and Messrs. E. A. A. Rowse, Cyril Sjöström and F. R. Yerbury.

*

Those who try to make an association of this kind a going concern at present must be admitted to have faith and courage. In the intervals of wartime work many people may wonder whether, after the war, the largest internal problems—industrial location, territorial planning, housing, education and other social services—cannot be tackled realistically; and some of them may believe, anxiously or hopefully, that after the strain of the war these things will *have* to be tackled realistically if chaos is to be avoided.

*

But apart from such passing thoughts among a section of the public, a society which now sets out to prepare for post-war reconstruction has every circumstance against it. Most of those who would be its keenest supporters or ablest helpers are not available; the collection of official facts is hampered by the number of subjects which are now official secrets, and private research organizations have changed their staff or evacuated their records.

*

It is therefore difficult to believe that in two of its aims—planning and research—the new Association will be able to do much more than keep track of what had been done before war began—and by whom.

*

Its third aim—publicity—is a very different matter. People of every type and income have been shaken up by the war. Those who never before took any interest in "large questions" are trying to understand them now: and a very large number would like to think about something constructive in the intervals of war work.

*

There is in this an opportunity for the new Association which Lord Forrester realizes. A short film on the theme, "What are we fighting for?" is now going the rounds of the cinemas in which great play is made with the white cliffs of Albion and sweet country villages. Of those who see that film, many have never seen either the white cliffs or a sweet country village. As far as those cliffs and villages mean defending one's native land, dockers, miners and iron-workers will appreciate the symbolism: but in so far as they are meant to mean the defence of a way of life, and of the hope of a better and fuller life, they will have little appeal to those who never see them or will never live in them.

*

Beyond beating Hitler, the mass of the population are fighting for better surroundings and opportunities, and are in the mood to try to understand how they can be obtained and what are the impediments. The new Association with the aid of a Penguin or a film can help them to understand.

*

For instance, it could arrange for the publication of a simply-written book (called *When Peace Comes**), dealing with the dozen major problems of reconstruction—territorial planning, industry, agriculture, education, housing and so on. This book could show how each of these questions is linked with the rest; describe the progress made in each before the war and, very precisely, where failure occurred and why; and outline the organization and methods which will be necessary to prevent continued failure after the war.

*

Properly planned large-scale reconstruction after the war will be obtained as easily as a battleship in wartime if ordinary people make it clear that they will not stand anything else. But if they are not in this mood, no expenditure on research, no training of a thousand brilliant planners, will bring regional planning or any other kind of planning an inch nearer. Therefore, it would seem wise for the whole energies of the new Association and all similar bodies to be expended for the duration on simple propaganda. Only a firm alliance with the ordinary man and woman can make the planner's dreams come true.

HOUSING MAINTENANCE

In a letter to *The Times* last week the Chairmen of the Housing Centre and the Westminster and St. Pancras Housing Societies pointed out that considerable deterioration had taken place in State-aided housing since the war began, chiefly because the maintenance staffs of local authorities had been put on to A.R.P. and other emergency work.

*

This deterioration, as the writers pointed out, may have serious consequences. Housing of this kind is subjected to hard wear and the tenants cannot be expected to carry out repairs themselves. Small defects, if neglected for some months, are very much more costly to remedy than if tackled promptly, and may even produce conditions dangerous to health. Moreover, if such maintenance works are neglected till the end of the war they will form an

* Or *You and the Peace* as a corollary to *Science and the War.*

immense addition to the demands which will then be made on the building industry.

★

Once local authorities' housing committees realize that their house property cannot be left untended for the duration, this situation seems extremely easy to remedy. If the officials normally engaged on maintenance work are now absorbed in A.R.P., there are plenty of architects and surveyors who would carry out inspections in their place. And most local authorities have arranged with local builders to have materials and labour ready to repair air raid damage. There seems nothing to prevent a small portion of this skilled labour carrying out house repairs while waiting for the sirens.

LAST WEEK'S NEWS

I had just completed the following note on last Thursday evening when London's air raid sirens sounded for the first time (bar one) since September. And they have sounded often enough in the past week to make me unable to discard unprinted the only one of my prophecies which has proved startlingly true :

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The sporadic air raids of the last few weeks have produced a crop of stories, all of which described the misfortunes of a person, or family, who tried to escape from disturbed nights and was remorselessly pursued throughout the country by bumps or bangs or sirens.

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By now, sardonic appreciation of these tales has become tinged with scepticism : they are found to bear a suspicious resemblance to those of Haw-Haw's intimate knowledge of doings in every market-town in England. But—at present —those who live in London and have stayed put since September would not be human if they did not indulge in one smile at the expense of the rest of their countrymen. Remembering September, one cannot help relishing a visitor's congratulations on the unruffled peace of the metropolis.

★

The wise Londoner will bow his acknowledgments, take full credit for the foresight which is being attributed to him, and will then remember that London's liability to be bombed is greater than it was when war broke out.

MR. BAGENAL'S POEMS

The Oxford University Press has this week published a volume of poems* by Mr. Hope Bagenal, until lately the librarian at the A.A. It is not his first venture in verse (many of the poems have been published before), though he is perhaps better known as a scholar than as a poet. It is a quiet-toned little book. Mr. Bagenal has no burning message to convey. He is no crusader, nor (thank heaven) politician. I do not mean by this that his poems are fanciful or what is called " escapist." He is an accurate observer of the contemporary scene—John Betjeman would approve of his topographical approach—and his ivory tower is in Hertfordshire—much nearer events than Hollywood whence our more celebrated poets declaim.

★

His poems are, however, unassuming. They tell of simple delights and experiences, and jog along gently without effort and with no surprises. These virtues when described sound negative. Perhaps they are, but there are times when " great thoughts " and " clarion calls " become a bit of a bore. Such a moment is now, and Mr. Bagenal's poems will be welcomed the more because of the time in which they appeared.

* *Sonnets in War and Peace.* By Hope Bagenal. Oxford University Press. Price 5s.

THE MARCH OF TIME

All architects are familiar with the scale of architectural values which has been distilled by the more resplendent estate agents out of the ambitions and prejudices of a long procession of wealthy clients.

★

Thus the order of merit in country houses is well known to run : Ancient, Elizabethan, Tudor, Georgian, Modern, Architect-Designed. And the order of greatest merit (*specially recommended*) runs : Completely Modernized Ancient, Elizabethan ditto, ditto, ditto. The only permissible exception to these classifications is an occasional use of the legend, *A Lutyens House*—for no well-informed estate agent can get over the fact that Sir Edwin has built for some of the very best people.

★

I suppose that it was inevitable, sooner or later, that Sir Edwin Lutyens, too, should enter the *specially recommended* class and pay the inevitable price : yet one could not avoid a little surprise at seeing, advertised in *The Times* by one of the best agents, *A BEAUTIFUL LUTYENS HOUSE*—JUST RECENTLY BEEN MODERNIZED AT GREAT COST.

CAMOUFLAGE . . .

Perhaps there are good reasons for leaving the issue of information about camouflage to a number of independent trade bodies, while the authorities prescribe a procedure dependent on the co-ordination of that information. But when one of the bodies gives the coverage of a certain paint in hundredweights and its price in gallons and this is pointed out to them, is there a good reason for those authorities to reply : " Yes, we know ; isn't it silly ? We are afraid we cannot give you the conversion figures " ?

. . . IN TOWN AND COUNTRY

The Minister of Transport, I see, has forbidden any owner of a private car to camouflage it to resemble a camouflaged vehicle in the service of the Armed Forces. This cuts both ways. It would be too bad if a dive bomber mistook your invisible sedan for an invisible light tank.

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In order to help those who are anxious, nevertheless, to make their car as invisible as possible, the Ministry advise " any neutral colours other than greys and khaki."

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The British Industrial Design Group, however, are more helpful. They suggest that one-half of the car, divided longitudinally, should be painted to harmonize with the country, and the other half with the town. If there is a raid in the country, you drive the town half up against a hedge ; if in the town, you drive the country half up against a wall.

★

This method, of course, does not apply to residents of Welwyn Garden City.

ASTRAGAL

NEWS

NEW ASSOCIATION*

The members of the Executive Council of the newly-formed Association for Planning and Regional Reconstruction (see Astragal's note on page 146) are as follows :

Dr. David Anderson (representing the Institution of Civil Engineers); Mr. E. J. Elford (representing the Institution of Municipal and County Engineers); Mr. A. P. M. Fleming; Lord Forrester; Lord Horder; Sir Alfred Hurst; Sir Edwin Lutyens, P.R.A.; Mr. E. A. A. Rowse; and Mr. F. R. Yerbury.

The Board of the Association is as follows :

Lord Forrester (Chairman); and Messrs. Ambrose Rowse (Director of Planning); Cyril Sjöström (Assistant Director of Planning); and F. R. Yerbury (Hon. Organizing Secretary).

Reasons for the formation of the Association are given in a four-page leaflet, just issued, extracts from which are printed below :

If we are to keep faith with future generations, we dare not lose from sight the difficulties that will face us after the war. They will be too great to be tackled only from the contemporary political and economic points of view of an exhausted people; they will affect every aspect of the life of the country, they will be technical as well as social, and they will call for creative effort and constructive planning along new lines. It is now that we should begin. There is a vital need today for detailed research and precise analysis of present and future problems, in many fields, so that at least in embryo there may be co-ordinated resources of knowledge and experience to draw upon. This thinking and planning ahead need in no way detract from the nation's war effort; on the contrary, if it is well done, even on a small scale, and the news of it can be wisely spread abroad, its moral value in sustaining the nation in the bitter trials which lie ahead might be immense.

The Association has been formed to investigate some of the problems of the post-war period, in a modest but realistic manner. It endeavours in its work to keep itself free from the bias of party or creed, and as an association to make no criticism that is not constructive. The emphasis of its activities lies essentially on practical and technical research into current and coming problems, and the results of its work are available to all.

It is the belief of the Association that even a small group of people, thinking and planning constructively at the present time, may render practical service of real value to the nation.

The Association believes that the responsibility for sane reconstruction after the war must be accepted by local and regional bodies, all over the country, and not only by central departments in London. It hopes to be able to co-operate to the full with individuals, organizations, local and national authorities, both during and after the war, but not itself to undertake direct works of reconstruction; its object is to serve as a centre for research and co-ordination of ideas, to advise and suggest but not to control, to correlate experience but not to compete with institutions or organizations operating in any specific fields of activity.

As an integral part of its organization the Association endeavours to train men and women in the technique of planning in its broadest sense, and in this respect (as in many others) has the full advantage of the experience gained by the School of Planning and Research for National Development during the past six years. The school itself has ceased to operate independently as such; its work will be carried on through the medium of the Association.

It is proposed that the organization should be financed in four ways: (1) By annual subscription from individuals, for the time being in reserved occupations, who wish to assist (anonymously) in planning for the future; (2) by payments from firms or organizations, producing or controlling materials or services, whose contribution shall be used for research into the better and fuller use of such materials and services, but in no way to advertise one product against another; (3) by private donations, anonymous so far as possible; (4) at a future date, by payment for services rendered, so long as the services do not compete with services at present available through other channels.

Full details are obtainable from the Hon. Secretary, Association for Planning and Regional Reconstruction, 158 New Bond Street, London, W.1.

* As we go to press we learn that the Association has already started work, with paid workers, on a scheme for the regeneration of a region in South Wales.

WARTIME BUILDING

Wartime Building Bulletin No. 8, just issued by the Building Research Station of the Department of Scientific and Industrial Research (H.M. Stationery Office, price 1s.) is in three parts.

Part I deals with walls and piers for the factory types described in Wartime Building Bulletins Nos. 1, 4 and 5. The walls are designed to give the code standard of protection against bomb splinters, and to utilize the thickness necessary for this purpose in carrying the load of the adjacent roof and in resisting the entire wind forces imposed on the walls. It is thus possible to dispense with steel in the outer walls while enabling them to resist forces which, if passed on to the roof members in the ordinary way, would have made necessary an overall increase in the weight of steel in the roof structure.

Three column designs are given ; the first consists of a shell constructed in brickwork on the flat which can be filled with a brick or concrete core ; the second is a similar design with the shell constructed in brick on edge ; and the last, a precast concrete shell as a permanent shuttering for a concrete core. In almost all the types, some reinforcing steel has been necessary, but the amount is considerably below that required for steel stanchions. The piers are, of course, slightly more bulky than the steel stanchions. Working drawings of the wall and column designs are available on application to the Building Research Station, price 2s. 6d. per type, post free.

Part II of the Bulletin describes, as an alternative to the structural steel designs previously issued, a design using welded tubular steel trusses and purlins. This has been prepared by Messrs. Tubewrights, Ltd., and shows a distinctly useful economy in weight of steel. In Part III of the Bulletin is discussed a design which has been submitted by Mr. J. W. Cooling, M.SC., M.I.H.V.E., and examined for the Station by a panel of experts, for a heating and ventilation system for wartime factories built to the designs outlined in previous bulletins. The necessity to avoid loads suspended from the roofs, the advantages in respect of resistance to air attack of decentralized heating units, the desirability of adequate ventilation in the blackout, and the ever-present need to conserve metal have all been factors qualifying the design. Warm air is forced through underground ducts by means of fans, to be distributed throughout the body of the factory through rising ducts at each stanchion. The air is heated by direct-fired airheaters located at suitable points around the factory. Details are given in the Bulletin for the construction of the ducts, and for the design of the essentials of the system, although variations can, of course, be devised to suit particular cases. On a typical factory design, it appears that the economy in steel should approximate to 40 or 50 per cent.

TIMBER ORDER

The attention of all stock holders of imported timber, whether consumers or merchants, is called to the provisions of the Timber Charges (No. 1) Order, made by the Treasury under the Emergency Powers Defence Act, 1939, under which, with certain exceptions mentioned in Article 2 of the Order, all private opening stocks of imported timber falling within the definition of timber in the Control of Timber (No. 13) Order are liable to a charge at the rates set out in the Schedule to the Charges Order.

As far as consumers are concerned, the most important exemption is that which provides that the charge shall not be payable on the consumption of timber up to one standard of softwood or 100 cu. ft. of hardwood in the case of timber acquired on or before October 4, 1939.

The charge is payable on or before the last day of the month following the date of delivery or consumption to the Timber Control Officer in the area from which the timber is delivered or in which it is consumed. The first payments will thus become due on August 31 in respect of deliveries or consumption during the month of July. Under Article 2 (4) of the Order, the charge is recoverable as a debt due to the Crown or by the Minister of Supply in the same manner as a civil debt under section 35 of the Summary Jurisdiction Act, 1879.

Under the Control of Timber (No. 14) Order, which came into force on August 8, every person liable to pay the charge must make a return of the amount payable, accompanied by a remittance, to the Timber Control Officer in the area concerned. Copies of the prescribed forms of return, which are scheduled to the Order, will be obtainable shortly at Timber Control Area Offices or, in the case of mining timber, at Timber Control Pitwood District Offices.

AUCTION SALES OF TIMBER

A number of enquiries have been received by the Ministry of Supply and the Timber Control regarding the effect of the Timber Control Orders on auction sales of timber, and a procedure has now been evolved for the holding of these sales within the framework of the Orders.

As fixed prices have been laid down for imported timber, and it is just as much an offence to sell at rates below these prices as above them, it is clearly not possible for auction sales of imported timber to take place. Similarly, auction sales of plywood cannot take place now that fixed prices have been provided for plywood under the Control of Timber (No. 16) Order. Auction sales can, however, be held for home-grown timber, in respect of which maximum prices are provided, and for second-hand timber or plywood as defined in the Control of Timber (No. 15) Order. This Order lays down that timber or plywood obtained from the destruction, demolition or breaking up of any structure or article; timber or plywood which having been used for any purpose has thereby deteriorated; and slabs or off-cuts produced in any sawmills in the United Kingdom may be certified by the Timber Control as "recovered—unclassified." The maximum price payable for such timber or plywood may either be determined by agreement between the buyer and seller subject to the approval of the Timber Control, or alternatively a maximum price may be provided on application to the Control.

Under Direction No. 4, which was made on August 15 under the Control of Timber (No. 13) Order and comes into force on August 21, timber and plywood sold at public auctions licensed by the Timber Control may be acquired without an acquisition licence. Persons purchasing timber at such auctions, however, must normally obtain a licence before they consume this timber and must not resell it without the authority of a licence or at a price exceeding the maximum price provided under the Order.

Persons wishing to hold auctions of timber must apply, either themselves or through their auctioneers, to the Timber Control Area Officer, and must submit, at least seven days before the date of the sale, a list of the material to be offered, divided into the lots in which it will be offered, with the vendors' valuation of each lot at the appropriate maximum price marked against it. The Area Officer will then satisfy himself that each lot has been properly priced in accordance with the relevant provision of the Order. No bid for any lot may be accepted by the auctioneer in excess of the maximum price so laid down, and no lot may be divided. Every purchaser must sign a receipt in duplicate for any timber purchased, and one copy of this receipt must be given to the auctioneer. Both the auctioneer and the purchaser may be called upon by an Officer of the Timber Control to produce this receipt.

A special procedure has been devised for small sales of under £150 in value. At these sales a single maximum price is fixed by the Timber Control Area Officer to cover all the material to be offered. No catalogue with the vendors' valuation of the material need be submitted in advance and division into lots is not required, although the auctioneer may, of course, divide the material into lots as he wishes. No part of the material may be sold at a price disproportionate to the maximum price fixed for the whole, and within three days after the sale a return of the aggregate of the bids accepted and a description of the materials unsold must be submitted to the Area Officer. This procedure is intended primarily for small agricultural sales, and the Timber Control are, of course, under no obligation to allow the normal procedure to be modified in the case of all sales under £150 in value and will not normally do so unless they are satisfied that the procedure may properly be applied.

Persons wishing to hold auctions of timber are particularly requested to give as ample notice as possible to the Timber Control Area Officers of their intentions.

IRON AND STEEL CONTROL APPOINTMENTS

The Iron and Steel Control announce that Mr. J. M. Duncanson has succeeded Mr. Ralph Alsop as Deputy Controller of Steel Supplies under the Ministry of Supply. Prior to the outbreak of war, Mr. Duncanson joined the Iron and Steel Control as Director of Heavy Steel, including semi-finished steel and shell steel. He was later appointed to the position of Assistant Controller of Steel Supplies.

Mr. Duncanson is a director of the Steel Company of Scotland, and deputy-chairman of R. Y. Pickering & Co., Ltd. He is also on the board of the Glasgow Railway and Engineering Co., Ltd. These companies have seconded Mr. Duncanson, who has been given leave of absence so as to devote his services whole-time to the Control.

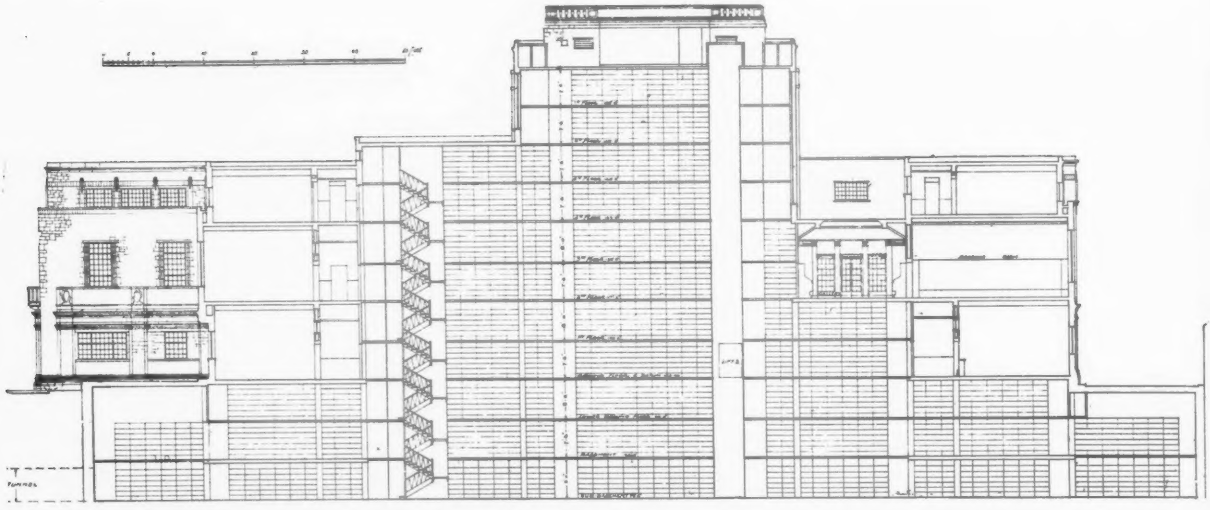
Mr. Duncanson has been succeeded in the position of Assistant Controller of Steel Supplies by Mr. A. G. E. Briggs, who was formerly the Director of Alloys, Special Steel and Ferro-Alloys for the Control.

BODLEIAN LIBRARY EXTENSION

OXFORD BY SIR GILES GILBERT SCOTT, R.A.

PROBLEM AND SITE—The new Bodleian Library Extension is situated at the junction of Broad Street and Parks Road, opposite the Clarendon Buildings, in the centre of Oxford. Although the new building covers almost exactly one acre, the restrictions regarding height made the problem of providing accommodation for the number of books required—5,000,000—very difficult. The solution adopted is a large central bookstack, artificially lighted, with staff rooms, research and reading rooms arranged around it.

Main entrance in Broad Street.



SECTION LOOKING WEST

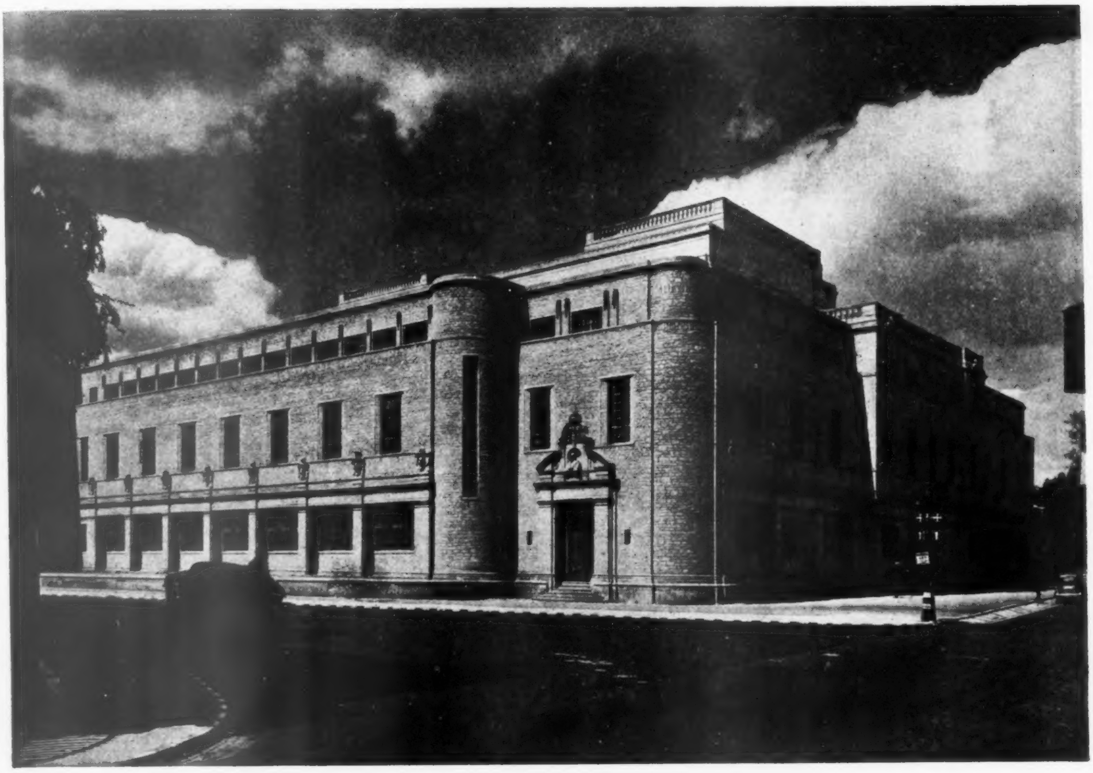
SECTION

PLAN—As there was some doubt as to whether the staff, research and reading rooms would always be required, they have been constructed and designed in such a way as to render possible their conversion into stacking space for books. This applies even to the large reading room which has been provided on the north side, overlooking the gardens of Trinity College. The building is primarily a book store, the main reading rooms being situated in the old Bodleian. The books are conveyed between the new and old Bodleian buildings by means of a mechanical conveyor, which runs vertically to the full height of the new building and horizontally through a tunnel under Broad Street to the old Bodleian. A pneumatic tube for the conveyance of documents and messages is also provided.

CONSTRUCTION AND EXTERNAL FINISHES — Steel-framed, with *in situ* R.C. floors to the stacks and pre-cast concrete floors elsewhere. The sub-basement floor is well below water level, therefore sheet steel piling was used, with reinforced concrete raft and retaining walls up to pavement level. External walls are of Bladon stone from quarries a few miles outside Oxford, with dressings of Clipsham stone. Windows are of anodized aluminium alloy.

Entrance gates at the north-west end of the Parks Road front.

BODLEIAN LIBRARY

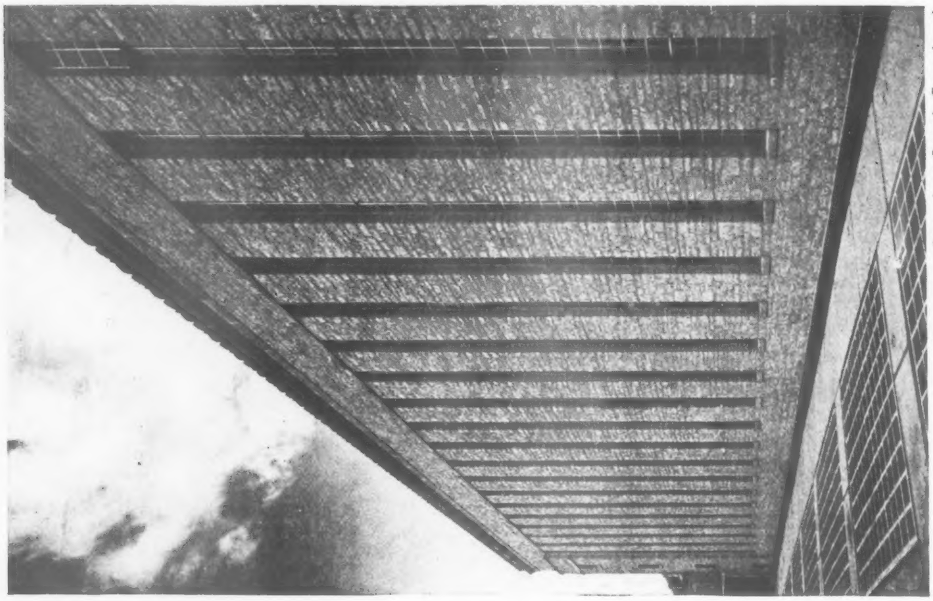


Top, fronts to Broad Street (left) and Parks Road; Broad Street front showing entrance to loading dock.

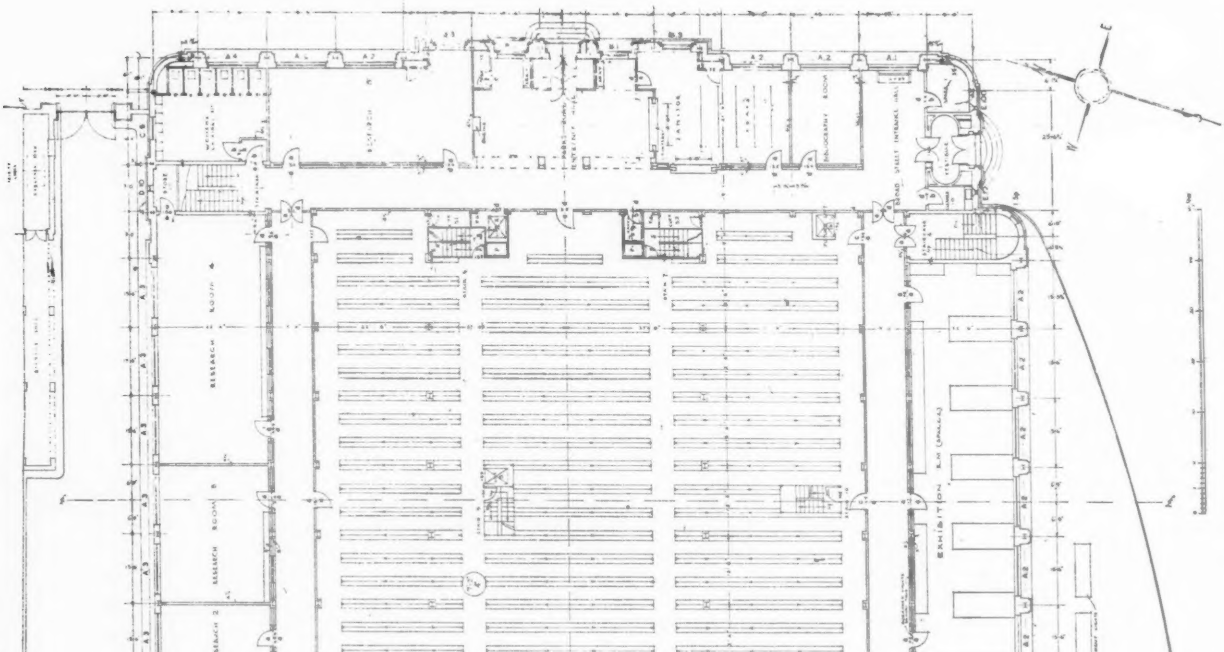
EXTENSION • DESIGNED BY SIR GILES GILBERT SCOTT, R.A.

BODLEIAN LIBRARY EXTENSION, OXFORD

DESIGNED BY SIR GILES GILBERT SCOTT, R.A.



Detail at fourth floor level.



GROUND FLOOR PLAN

Detail at fourth floor level.

GROUND FLOOR PLAN

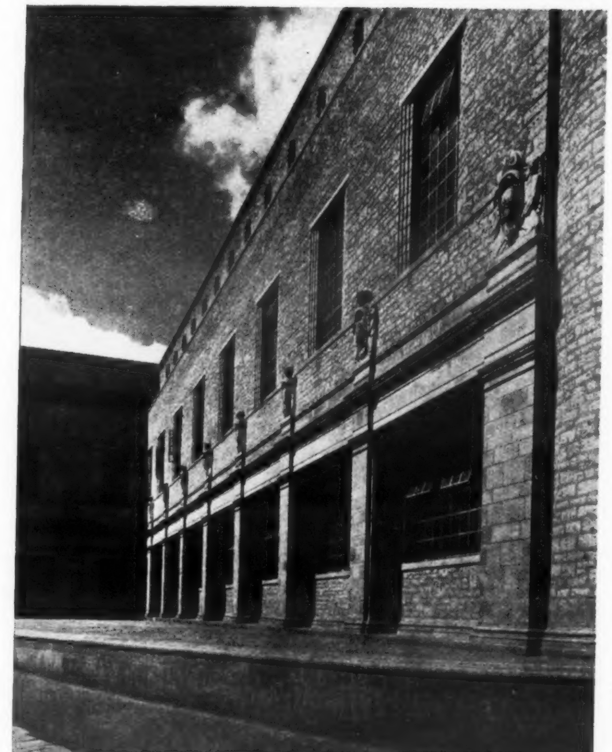
INTERNAL FINISHES—Internal walls are finished with lime plaster, the floors covered with rubber, and the corridors lined with a dado of Taynton stone. The reading room has a decorated ceiling carried out entirely in inlaid woods ; the walls are lined with bookcases in sapele mahogany, on the top of which are concealed the indirect lighting fittings.

COST—£352,598 11s. 8d.

General contractors were Benfield and Loxley, Ltd. ; for list of sub-contractors, see page xviii.

BASEMENT PLAN

SB



Broad Street front

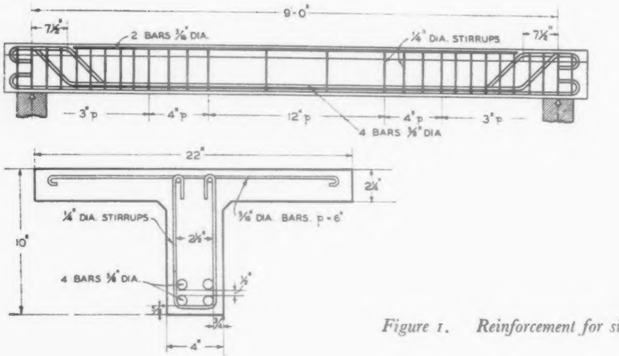


Figure 1. Reinforcement for simple beams

PROPPING OF R. C. BEAMS

THE following bulletin (No. C.3) dealing with the Propping of Reinforced Concrete Beams, has just been issued by the Research and Experiments Department of the Ministry of Home Security. Bulletin C.6, devoted to damage to Cast Iron Pipes in Works, is printed on page 155.

Where an existing reinforced concrete floor above a basement shelter is not strong enough to support the debris which may fall on it, the floor must be strengthened by reducing the effective spans of the various floor members by inserting new beams and props. Alternatively, a new roof could be erected below and independent of the floor, but as timber and steel are scarce this alternative is in abeyance. As far as possible, strengthening should be done by the insertion of props, which may take the form of brick-piers.

Rules have been given for determining the strength of propped steel and timber beams in Ministry of Home Security, Research and Experiments Department Bulletin No. C.1, " New Design Methods for Strutting of Basements." Objection may be raised to propping a reinforced concrete beam or slab on the ground that if there is insufficient top steel at the centre of the span vertical cracking will occur over the prop when additional debris load is applied. This effect will not, however, cause collapse of the system, and can be allowed for in estimating the maximum bending moment in the member by assuming that the two halves are simply supported at the prop.

Weakness in shear is most likely to be the cause of failure. Doubts of the shear strength of reinforced concrete beams may well have deterred engineers from strengthening them by propping.

With slabs, shear is unlikely to be serious. For a slab of normal proportions and design, the insertion of a support along the centre line will increase its load-carrying capacity fourfold without the permissible shear stress being exceeded at the support.

If, in estimating the safe load of beams, the conventional working stress for shear is used, it may be found that little apparent advantage accrues from the insertion of a central prop. Recent tests, however, while confirming that shear, or more properly diagonal compression, at the prop, is the usual cause of failure, show that this occurs at loads far in excess of what would be expected on the basis of the usually assumed shear strength of concrete.

The beams for these tests were designed to represent, to one half full scale, typical main beams in a reinforced concrete building. Most of them were designed as simply supported at their ends, to carry a load uniformly distributed throughout the span. In addition tests were made on two beams designed as two-span continuous beams, one being tested with props at the centre of each span and the other being tested unpropped.

The concrete proportions were such that at the age of test the strength of the concrete (4 in. cube) was about equal to the lowest value allowed by the Code of Practice (2,250 lb./sq. in.). The strength actually varied from 2,000 to 2,400 lb./sq. in. (See Table 1.)

The reinforcement for the simply supported beams is shown in Fig. 1 and for the continuous beams in Fig. 2. Compression bars are theoretically unnecessary in view of the large compression area afforded by the flange of the beam, but the small bars provided would normally be used in practice for fixing the vertical stirrups. Towards the centre of the span, where the shearing forces are small under uniform loading, the stirrups are widely spaced and their shearing resistance is theoretically less than that of the concrete itself.

The beams were tested on a 9 ft. span. Eight equal loads were applied, uniformly spaced, along the beam so that the conditions were not very different from those that would be obtained with a continuous loading. For the strutted beams the strut was a steel block, on which the beam was bedded, with plaster or thin plywood inserted between the beam and the strut.

The deflections of the beams were measured at mid-span, and at the centre of the reduced spans when strutted, and the appearance and development of cracks were noted. The rate of loading was controlled in all tests, the total time for each test being about four hours in the case of the strutted beams and three hours for the beams tested without strutting.

In all the strutted beams failure was determined by the ultimate strength of the concrete in diagonal compression. The results of the tests are summarized in Table 1, and the main results of the deflection measurements are shown in Figs. 3, 4, 5 and 6.

The nominal shearing stresses at failure may be of interest.

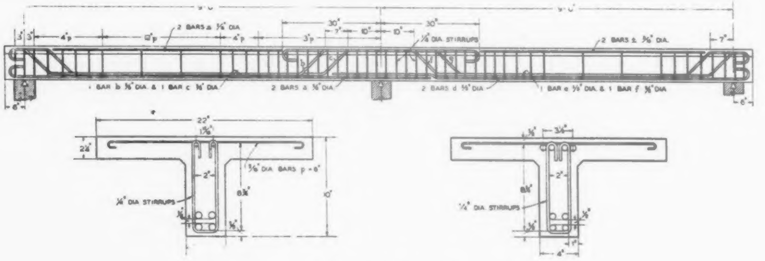


Figure 2. Reinforcement for continuous beams

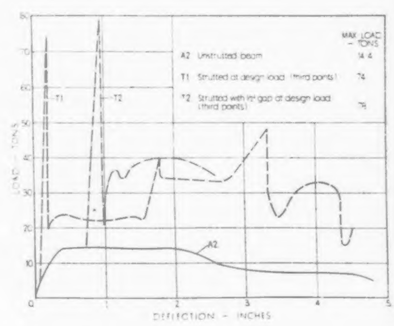


Figure 5

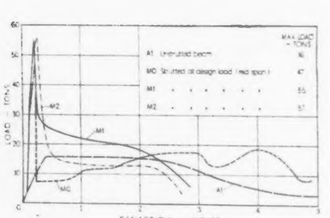


Figure 3

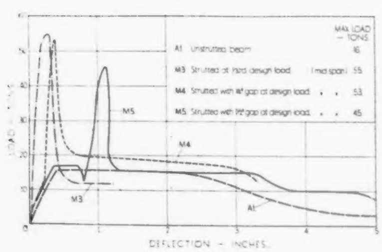


Figure 4

TABLE I

STRENGTH OF STRUTTED REINFORCED CONCRETE BEAMS SUBJECTED TO STATIC LOADS

	Beam No.	Concrete strength lb./sq. in.	Propping	Gap left between prop and beam	Prop became operative at load (tons)	Failing load (tons)	Calculated shear stress at failure lb./sq. in.	Ratio. Failing load of propped beam / Estimated failing load of unpropped beam
BEAMS DESIGNED AS SIMPLY SUPPORTED	A 1	2,300	None	—	—	15·7	—	—
	A 2	2,000	None	—	—	14·4	—	—
	M 0	2,000	At mid span	None	5·4	47	910	3·2
	M 1	2,400	,,	,,	5·4	55	1,070	3·4
	M 2	2,400	,,	,,	5·4	57	1,140	3·5
	M 3	2,100	,,	,,	1·8	55·3	1,160	3·7
	M 4	2,000	,,	¼ in.	12·0	53	890	3·7
	M 5	2,100	,,	1½ in.	10·0	45·3	760	3·1
	T 1	2,000	At third points	None	5·4	74	660*	5·1
	T 2	2,200	,,	½ in.	14	78	720*	5·1
BEAMS DESIGNED AS CONTINUOUS	C 1	2,200	None	—	—	40	—	—
	C 2	2,000	At mid span	None	11	83	850	2·1

* These were the stresses in the centre reduced span where shear failure occurred. Greater nominal shear stresses were present in the outside spans.

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COLUMNS FORMED FROM PLATED SINGLE JOISTS TO WITHSTAND BENDING MOMENTS AS WELL AS DIRECT LOAD.

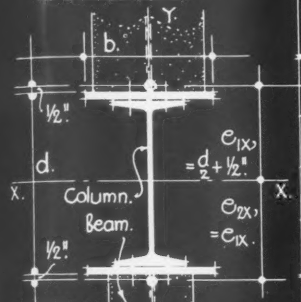

FIGURE 1: typical eccentricity about x-axis.

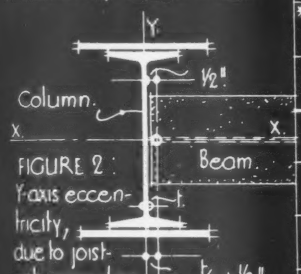

FIGURE 2: Y-axis eccentricity, due to joist-web connection.

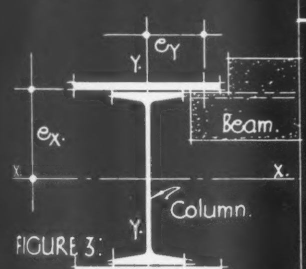

FIGURE 3: Y-axis eccentricity due to joist-flange connection.

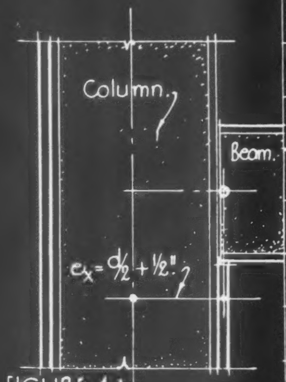

FIGURE 4: Flange plate used as stool.

TABLE GIVING REDUCTION COEFFICIENTS (β) FOR PLATED, SINGLE B.S.S. JOIST SECTIONS AS ECCENTRICALLY LOADED COLUMNS (STRUTS).

Overall size of col., d x b INS.	Section of joist, INS.	Total Nº of plates	Section of Plates, INS.	ECCENTRICITY e_x INS.	ECCENTRICITY e_Y INS.	LENGTH OF COLUMN OR STRUT IN FEET. 6.	7.	8	9.	10.	11.	12.	13.	14.	16.	18.	20.
9 x 12	8x6	2	12x½	5·00	1·86	1·49	1·48	1·45	1·43	1·43	1·41	1·39	1·37	1·34	1·27	1·20	1·11
9½x 16	8x6	2	16x¾	5·25	2·89	1·50	1·50	1·49	1·48	1·48	1·47	1·45	1·43	1·43	1·41	1·38	1·34
** 10 x 18	8x6	2	18x1	5·50	3·62	1·50	1·50	1·49	1·49	1·48	1·48	1·45	1·44	1·43	1·43	1·40	1·37
10 x 10	8x6	2	10x1	5·50	1·96	1·48	1·45	1·44	1·43	1·41	1·39	1·37	1·32	1·28	1·20	1·11	0·99
10 x 12	9x7	2	12x½	5·50	1·76	1·49	1·47	1·45	1·43	1·42	1·40	1·38	1·34	1·33	1·24	1·15	1·06
10½x16	9x7	2	16x¾	5·75	2·67	1·50	1·49	1·49	1·48	1·47	1·45	1·44	1·44	1·43	1·40	1·37	1·32
** 11 x 20	9x7	2	20x1	6·00	3·75	1·50	1·50	1·50	1·49	1·49	1·48	1·48	1·47	1·45	1·43	1·42	1·40
11 x 12	9x7	2	12x1	6·00	2·36	1·49	1·48	1·47	1·44	1·44	1·43	1·41	1·38	1·37	1·29	1·22	1·15
11 x 12	10x8	2	12x½	6·00	1·78	1·49	1·47	1·45	1·43	1·42	1·40	1·38	1·34	1·33	1·24	1·15	1·06
11½x16	10x8	2	16x¾	6·25	2·58	1·50	1·49	1·49	1·48	1·47	1·45	1·44	1·43	1·43	1·40	1·37	1·32
** 12 x 22	10x8	2	22x1	6·50	4·01	1·50	1·50	1·50	1·50	1·49	1·49	1·48	1·48	1·47	1·44	1·43	1·42
12 x 12	10x8	2	12x1	6·50	2·06	1·49	1·48	1·47	1·44	1·43	1·43	1·41	1·38	1·37	1·29	1·22	1·15
* Depends on joist used.	• 12x8	2	12x½	7·00 †	1·66	1·49	1·47	1·45	1·43	1·42	1·40	1·38	1·34	1·33	1·24	1·15	1·06
	14x8	2	16x¾	7·25 †	2·37	1·50	1·49	1·49	1·48	1·47	1·45	1·43	1·43	1·42	1·39	1·37	1·29
	16x8	2	24x1	7·50 †	4·11	1·50	1·50	1·50	1·50	1·50	1·49	1·49	1·49	1·48	1·47	1·45	1·43
	18x8	2	12x1	7·50 †	2·04	1·49	1·48	1·45	1·44	1·43	1·42	1·40	1·38	1·34	1·28	1·20	1·11
	One of 4 above	4	24x1	8·50 †	5·09	1·50	1·50	1·50	1·50	1·50	1·50	1·49	1·49	1·48	1·48	1·45	1·44
14 x 9	13x5	2	9x½	7·50	1·20	1·44	1·43	1·40	1·37	1·32	1·28	1·22	1·15	1·08	0·95	0·82	0·72
14½x16	13x5	2	16x¾	7·75	2·59	1·50	1·49	1·49	1·48	1·48	1·45	1·44	1·43	1·43	1·41	1·37	1·33
** 15 x 20	13x5	2	20x1	8·00	3·61	1·50	1·50	1·50	1·50	1·49	1·49	1·48	1·48	1·47	1·44	1·43	1·42
15 x 9	13x5	2	9x1	8·00	1·51	1·47	1·43	1·43	1·40	1·37	1·34	1·31	1·24	1·20	1·06	0·95	0·79
16 x 10	15x6	2	10x½	8·50	1·29	1·45	1·43	1·42	1·39	1·37	1·32	1·28	1·22	1·16	1·04	0·91	0·82
16½x16	15x6	2	16x¾	8·75	2·40	1·50	1·49	1·49	1·48	1·47	1·45	1·44	1·43	1·43	1·40	1·37	1·32
17 x 20	15x6	2	20x1	9·00	3·38	1·50	1·50	1·50	1·50	1·49	1·49	1·48	1·48	1·47	1·44	1·43	1·42
17 x 10	15x6	2	10x1	9·00	1·61	1·48	1·45	1·43	1·42	1·40	1·37	1·32	1·29	1·24	1·15	1·13	0·94
** 19 x 24.	15x6	4	24x1	10·00	4·94	1·50	1·50	1·50	1·50	1·50	1·50	1·49	1·49	1·49	1·48	1·47	1·44

* These columns are to be carried out in accordance with fig. 3 on Sheet Nº 14 of this series.

Columns marked with one or two asterisks may be also of double joist section and have practically the same reduction coefficients.

† Eccentricities refer to joist 12"x8". For a 14"x8", 16"x8" or 18"x8" joist, the eccentricity is to be taken 1", 2" or 3" larger respectively.

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INFORMATION SHEET

• 802 •

STRUCTURAL STEELWORK

Subject : Economical Column Sections to Withstand Bending Moments as well as Direct-load : 5, Plated Single Joists.

General :

This series of Sheets on steel construction is not intended to cover the whole field of engineering design in steel, but to deal with those general principles governing economical design which affect or are affected by the general planning of the building. It also deals with a number of details of steel construction which have an important effect upon the design of the steelwork.

Both principles and details are considered in relation to the surrounding masonry or concrete construction, and are intended to serve in the preliminary design of a building so that a maximum economy may be obtained in the design of the steel framing.

This Sheet is the thirty-first of the series, and sets out in tabular form the reduction coefficients by which may be calculated the comparative economic efficiencies of eccentrically loaded columns, composed of plated, single joist sections.

Column Type :

Columns formed from plated joists are useful where the bending moments occur particularly about the *x*-axis, and it can be seen from the table on the front of this Sheet that the reduction coefficients are all rather high. From column e_y it can be seen that the corresponding eccentricity in the *y* direction varies greatly, and where bending moments about the *y*-axis are concerned it is always an advantage to choose a section for which the characteristic e_y is high. This condition generally coincides with wide flange plates.

Examples :

On the other hand if, as shown in Figure 3, the eccentricity itself is a consequence of the width of the flange plate, it is more advantageous to reduce this width, although at the same time, e_y gets smaller.

Although e_x, the typical eccentricity about the *x*-axis, is taken ½ in. greater than half the total depth of the section (Figure 1), the actual eccentricity can sometimes be reduced by using the flange plate as a stool, see Figure 4.

Eccentricity about the *y*-axis may occur due to a joist connected to a web (Figure 2), (in which case the eccentricity is usually fairly small) or due to a joist connected to the corner of the flange (Figure 3). Such position of a joist, relative to a column, should be avoided where possible, as the large bending moment always increases the required section, and these structural arrangements are of advantage where column and beam are in one vertical plane.

Efficiency :

In every case the carrying capacity of a section is :—

$$7{\cdot}2 \times A \times C_3$$

where A = the area of the section, and

$$C_3 = \frac{C}{1 + \alpha\beta}$$

where C is taken from Sheet No. 14 of this series (given on that sheet as e), β from the table on the front of this Sheet,

and α = the percentage of load which acts eccentrically at a distance equal to that given in column under heading e_x from the *x*-axis, or that given in column under heading e_y from the *y*-axis. Where the actual eccentricity is different, α is to be reduced in accordance with the formula given on Sheet 28 of this series. For the use of this formula for eccentricity in both directions, see Sheet No. 28 of this series.

Previous Sheets :

Previous Sheets of this series dealing with structural steelwork are Nos. 729, 733, 736, 737, 741, 745, 751, 755, 759, 763, 765, 769, 770, 772, 773, 774, 775, 776, 777, 780, 783, 785, 789, 790, 793, 796, 798, 799, 800 and 801.

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·ARMOURPLATE· GLASS: DESCRIPTION:

·Armourplate· is manufactured from clear Polished Plate glass by a process of heating and sudden cooling, finally resulting in strong compression in the two outer surfaces, with tension in the centre.

As there is no introduction of an organic interlayer there is no change in transparency & no discolouration even with years of use or after the glass has been subjected to severe changes of temperature.

PROPERTIES:

1. PROTECTION.	2. RESISTANCE TO IMPACT.	3. RESISTANCE TO PRESSURE.
The protective quality of ·Armourplate· glass lies in the fact that on breakage it does not fly into large splinters with razor-like edges, as is the case with ordinary plate glass, but it disintegrates into innumerable small pieces which are neither large enough nor sharp enough to cause serious injury (These fragments can be crumpled between the fingers)	When simply supported at the ends or bedded along the edges upon the putty, the resistance to impact loading of ·Armourplate· glass is about seven times that of ordinary plate glass, but when bedded evenly on a layer of sand the resistance is reduced to about twice that of ordinary plate glass.	The transverse tests on sheets simply supported show ·Armourplate· glass to be about four times as strong as ordinary plate glass: e.g. the breaking load for ·Armourplate· = 230 to 280 lbs: for ordinary plate glass = 50 lbs. for a load applied without shock to the centre of the glass suface.

RESISTANCE TO BLAST PRESSURE: Official tests have proved that ·Armourplate· is highly resistant to blast pressure. (Ref. A.R.P. Handbook Nº 5, ·Structural Defence.)

RESISTANCE TO WAVE SHOCK:

In the case of ships' port-lights the pressure to which the glass is subjected is different from the examples already quoted. The shock of a wave exerts a momentary pressure all over the glass.

The Board of Trade permits ·Armourplate· glass in the following thicknesses to replace ordinary plate glass of the greater thicknesses given:

BOARD OF TRADE REGULATIONS–RESPECTIVE THICKNESSES.

·ARMOURPLATE·		ORDINARY PLATE GLASS.
¾ inch thick	instead of	1½ inches thick.
⅝ " "	" "	1¼ & 1⅛ " "
½ " "	" "	1 & ⅞ " "
⅜ " "	" "	¾ & ⅝ " "
¼ " "	" "	½ & ⅜ " "

RESISTANCE TO SUDDEN CHANGES OF TEMPERATURE:

Ordinary plate glass breaks if unevenly heated. It cannot be used with certainty for an inspection window to an electric oven or be exposed to steam from the spout of a boiling kettle. Armourplate· is quite safe under either of these conditions, and will, if desired, withstand much more severe tests.

Thermal tests show that ·Armourplate· glass offers considerable resistance to severe temperature changes, if free to expand & provided that the heat is uniformly distributed, it will withstand a temperature of 300°C on one surface with the other at ordinary atmospheric temperature. It has also been tested for resistance to impact at 15° below zero.

SIZES AVAILABLE:

SUBSTANCE ·	UP TO LENGTH ·	UP TO WIDTH	
3/16" i.e. 4·8/5·5 m.m.	51"	25"	Sizes over 3'0" should be as near 5·5 m.m. as possible.
¼"	70"	52"	Sizes over 9' super to be in 17–20/64"
5/16" – ⅜"	82"	70"	Also strips 9" to 18" wide by 110" long.
½"	82"	70"	
⅝"	70"	52"	
¾" ⅞" 1" 1¼"			Can be supplied in sizes up to 8 square feet. Larger sizes in these thicknesses should be submitted for consideration.

SPECIAL REQUIREMENTS:

SILVERED ·ARMOURPLATE·	SHAPED ·ARMOURPLATE·	BENT ·ARMOURPLATE·
·Armourplate· can be silvered if necessary, but it cannot be guaranteed to be perfectly free from distortion.	Most shapes, if they are not too irregular, can be Armourplated. Any irregular shape should be submitted to the works for consideration.	Can be supplied within certain limitations. Details should be submitted to the works for consideration.

For information on the toughening of other types & tints of glass, especially worked sheets, etc., see the reverse side of this Sheet.

Information from Pilkington Brothers Limited.

INFORMATION SHEET: THE ARMOURPLATING OF PLATE GLASS.

SIR JOHN BURNET TAIT AND LORNE ARCHITECTS ONE MONTAGUE PLACE BEDFORD SQUARE LONDON WC1

THE ARCHITECTS' JOURNAL
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INFORMATION SHEET

• 803 •

GLASS

Type of Product: Toughened Glasses

The toughening process can be applied to certain other forms of glass, but the extent to which the strength of the glass and its resistance to temperature changes can be increased depends upon the type of glass used.

Types:

Toughened Black Glass:

	Length up to	Width up to	
5/16″, 7/16″	82″	70″	Also in sizes up to 110″ long by 9″ to 18″ wide.

It is recommended that all Black Glass used for exterior work be toughened to lessen the possibility of breakage due to sudden changes in climatic temperature.

Toughened Rough Cast Double Rolled:

	Length up to	Width up to
¼″	70″	30″
⅜″	70″	52″

★*Toughened Figured and Tinted Cathedral Glasses:*

Certain standard patterns can be toughened in sizes up to 24″ × 18″ in 3/16″ and ¼″ substance.

Toughened Sheet Glass:

	Length		Width
18 oz.	14″	×	10″
24 oz., 26 oz.	24″	×	18″
32 oz.	36″	×	24″

★*Toughened Stippolyte and Selenium Glass:*

About ⅛″ thick in sizes up to 24″ × 18″.

Peacock	Emerald	Olive
Blue	Flame	Orange

★*Toughened Coloured Clear Glass and Flashed Opal:*

About 3 mm. thick, sizes up to 24″ × 18.″

Amber (Flashed)	Green (Pot)
Signal Green (Pot)	Ruby (Flashed)
Amber (Pot)	Opal (Flashed)
Dark Blue (Pot)	

Toughened Tinted Polished Plate:

3/16″	51″ × 25″
¼″	70″ × 30″

The following tints only can be toughened:—

¼″ standard blue	3/16″ and ¼″ amber
¼″ pale blue	¼″ pink
¼″ steel blue	¼″ deep green

Neutral tinted cannot be toughened.

Embossed, sandblasted, painted and fired toughened glass can be supplied. Details should be submitted for consideration.

★ These glasses are twice as strong as untoughened glass of the same kind and thickness and provided that the heat is evenly distributed, will withstand temperatures up to 150°C., even when sprayed with cold water.

Important:

Any work on "Armourplate" or Toughened Glass, i.e. embossing, brilliant cutting, sand-blasting or drilling of holes, must be carried out before the glass is subjected to the special treatment, as it definitely cannot be cut or worked afterwards.

Holes should not be near the edge of "Armourplate" and when bevelled glass is required, not more than ⅛″ of glass must be removed so that ¼″ glass must be left ⅛″ thick on the edges, thus ⅜″ glass must be left ¼″ thick on the edges and so on.

Care is necessary in handling and fixing "Armourplate" Glass so as not to damage the edge of the sheets by chipping. The edge of "Armourplate" Glass and Toughened Glass is not stronger than the edge of ordinary glass, and wherever possible the edge should be protected.

To avoid confusion, three distinctive types of labels are used to denote the different forms of glass.

Manufacturers: Pilkington Brothers, Ltd.
Head Office: St. Helens, England
Telephone: St. Helens 4001
London Office: 164 Shepherdess Walk, N.1
Telephone: Clerkenwell 1051
West End Office and Showroom: 63 Piccadilly, W.1
Telephone: Regent 4281

These have been calculated in the usual way and are given in Table 1.

Since the crushing strength of the concrete was the minimum permissible in the Code of Practice, it may reasonably be assumed that these results can, in practice, safely be applied to any concrete in good condition.

The tests show that:

For the beams designed as simply supported:

(1) The failing loads of the unpropped beams were 2·9 and 2·7 times the design load;

(2) The insertion of a central prop further increased the load-carrying capacity more than three times;

(3) The insertion of props at the third points increased the load carrying capacity more than five times;

(4) The gap left between the prop and the beam had no serious effect on the static load-carrying capacity, i.e. reasonable sinking or mild wedging of the prop is no danger;

(5) The nominal calculated shear stress at failure, though variable, is large.

For the beams designed as two-span continuous beams:—

(1) The failing load of the unpropped beam was 3·6 times the design load;

(2) The insertion of a central prop further increased the load-carrying capacity more than twice;

(3) The nominal calculated shear stress of the propped beam at failure was much the same as for the beams designed as simply supported.

These conclusions are, of course, based solely on the

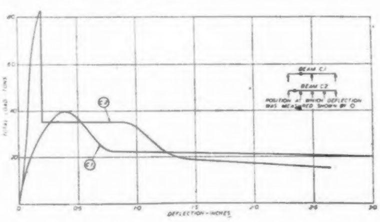


Fig. 6. Deflections of continuous beams of two spans, with and without strutting

results of tests on beams subjected to static loads. It is clear that the design of a beam, whether propped or not, forming part of the roof of a basement shelter, should be based on the ability of the beam not only to carry static debris load but also to absorb the energy due to this load falling on the roof of the shelter. Little evidence is at present available on this question, but what there is suggests that the capacity of an R.C. beam to absorb impact energy can be foretold with some accuracy from the shape of the load-deflection diagram under static loading. On this assumption the tests described in this note show that the energy which can safely be absorbed by a strutted beam is considerably increased if a gap is left between the beam and the strut. Thus, assuming a static debris load of twice the design load, the energy which could safely be absorbed by beam M.5 (strutted with 1½ in. gap) is 2·4 times that which could safely be absorbed by the beams strutted without any gap.

It is clearly impossible to give any generally applicable figure for the safe shear stress in a propped reinforced concrete beam on the basis of these few tests. All such propping should, of course, be carried out under the supervision of a competent engineer. These test results, which show that the generally accepted values of the safe shear stress may be largely exceeded without endangering the safety of the structure, will help him to decide the adequacy of a propped system.

BULLETIN C 6.

CAST IRON PIPES

Recent reports of damage due to enemy air attack have shown the serious vulnerability of cast-iron water mains and other pipes buried in the ground. For example, an important works was put out of production for 4½ days after a raid as a result of damage to cast iron water pipes.

Pipes above ground may be perforated by bomb splinters, though they can be protected against these without serious difficulty by a covering of at least 30 in. of earth, or 15 in. of concrete.

Pipes and ducts buried in the ground, though protected against splinters, are liable from their nature to be fractured owing to the large earth movement produced when a bomb explodes in the ground. An effective method of protecting them against destructive earth movements is to provide guard trenches, or to isolate the pipes or ducts by the provision of an air space 12 in.–18 in. wide between them and the ground. Where the pipe is not buried at a great depth guard trenches on either side could in some cases be dug to a depth below the pipe. These trenches can be filled with brushwood to prevent erosion without destroying their effectiveness. The greatest care must, of course, be taken to ensure that the trenching does not introduce any possibility of the pipe line sinking. Where the pipe runs under a crossing it can be isolated from the surrounding earth by running it through a conduit.

Where the pipe is buried at a considerable depth the method suggested above is impracticable and in any case all parts of a system cannot be protected by guard trenches. It is important, however, that the danger from earth movements should be realized.

It should be made a matter of routine in any works to inspect all water circuits immediately after bombs have been dropped in the neighbourhood, to ensure that action can be taken without delay when damage has been caused.

Other Bulletins just issued deal with steps that should be taken to increase resistance of "Umbrella" type roof sheds to collapse due to air attack (No. C 5); and protection of glass in hospitals (No. C 4).

BRIDGE HOTEL

SHOREHAM, SUSSEX

BY C. BERESFORD MARSHALL AND PARTNERS

ASSOCIATE ARCHITECT: E. J. THRING

GENERAL—The rebuilding of the existing Bridge Hotel was necessitated by road widening by the County Council. The clients required public, private and saloon bars, children's lobby and a tenant's flat which was to be entirely unconnected with the licensed premises. A separate off-licence was also required, as well as garage accommodation for a car and delivery van.

SITE—Prominent position in Shoreham High Street on the main Worthing-Brighton road. The new building was erected behind the original hotel before the road widening took place. The site is bounded at the rear by the River Adur, and an existing boat slipway has been renovated and landing steps provided.

The sign, shown above, is carried on a brick pier and consists of a concrete slab in a copper frame with a coloured mosaic on each side. These panels were designed and executed by E. J. Thring.

The terrace

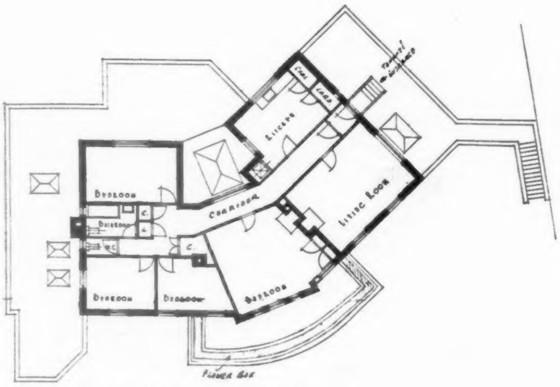
CONSTRUCTION—Brick, with 11-in. cavity external walls ; a certain amount of steel was used to carry the first floor brickwork in order to allow open space in the bars and service area. Ground floor is constructed of timber joists on sleeper walls, the floor over the boiler house being a solid concrete slab insulated with 2 in. of cork on the underside. First floor consists of a Truscon floor cast *in situ*. Flat roofs over ground floor are solid concrete slabs, and the main pitched roof is of ordinary timber construction. Basement is tanked with asphalt, the walls being 13½ in. thick. Partitions are of moler blocks.

EXTERNAL FINISHES—Roof is covered with mixed brown glazed pantiles. The central gable and upper portion of the elevation are yellow Dutch bricks with flush pointing of similar colour, the lower portion being of dark brown sand-faced bricks with light flush pointing and black tiled dado. Cills, copings and dressings are of artificial stone. The two piers between the windows on the central gable are tiled with light green glazed tiles and the neon signs are painted a similar colour. Window frames are painted cream and the main entrance doors grey with mouldings picked out in cream.

INTERNAL FINISHES—Walls and ceilings to all bars are finished in rough textured plastic paint with a brown quarry tile dado in the public bar and oak-panelled dado to counter height with burnished copper strips and black ebonized skirting in saloon bar. Floors to all bars are of rubber laid in squares ; lavatory floors are of heather brown quarries and the floor behind counter is of red asphalt. Back fittings are of natural oak with peach mirror backs. Counters are of oak throughout, and those in private and saloon bars have recessed horizontal strips of burnished copper and black inlaid counter tops. All electric light fittings are in copper. Over the fireplaces in the saloon and public bars are mosaic panels carried out by E. J. Thring, A.R.C.A., depicting views of Shoreham and lit by concealed lights shining through glass bricks on either side. All internal doors are flush doors in oak, those to bars having circular portholes glazed with Georgian wired glass.

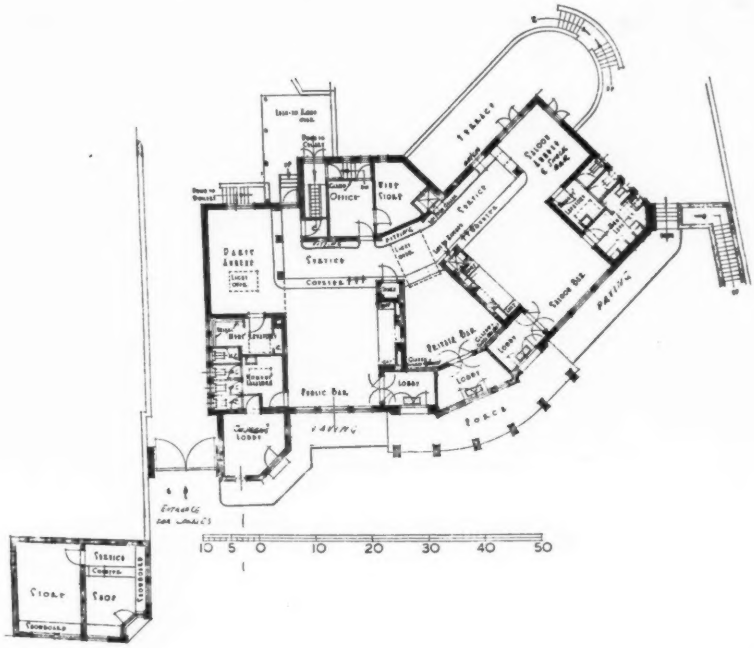
COST—£9,932.

General contractors were Patching and Company ; for list of sub-contractors and suppliers, see page xviii.

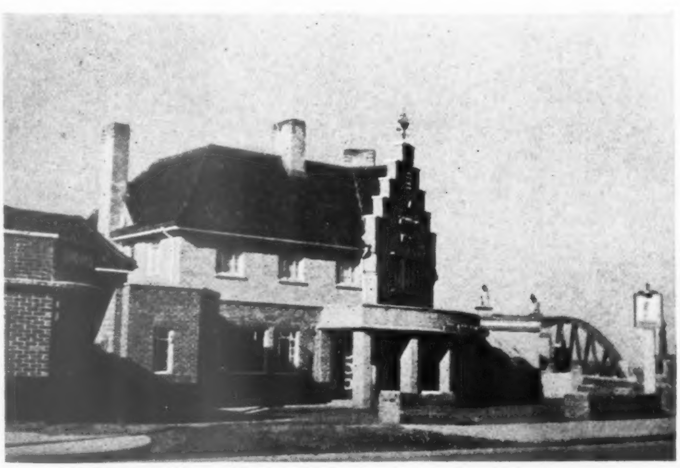


FIRST FLOOR PLAN

PLAN—The three bars are planned to be served by one central service space, thus simplifying supervision and attendance, and each bar is entered through a separate lobby opening off the front portico. A darts annexe with three dart boards is provided to the public bar and a similar annexe adjoins the saloon bar which is used as a snack bar. French windows open out of this on to a paved terrace which is served by a hatch from the bar service. This terrace faces south and looks out over the river to the beach. The tenant's flat is reached by an outside staircase leading from the front courtyard. The off-licence is a separate building which is linked to the main building by a screen wall.



GROUND FLOOR PLAN



Above, view from the main road ; right, the central gable.

ASSOCIATE ARCHITECT: E. J. THRING

MARSHALL AND PARTNERS

R. I. B. A.

ELECTION OF MEMBERS

As Fellows (6)

Chackett, L. A. (London); Forbes, I. (London); Hughes, J. (Manchester); Tomlinson, L. D. (Romford); Davies, G. H. (Abergavenny); and Youngman, L. S. (Bournemouth).

As Associates (14)

Bailey, W. (Bingley); Basto (Miss) M. A. De C. (Liverpool); Benington, P. H. (Salford); Benington (Miss) P. E. M. (Salford); Christie, M. F. (Barnton, Midlothian); Lawrence, F. (Newport, I.O.W.); Lobban (Miss) E. M. K. (Lundin Links, Fife); Miles, W. N. M. (Clevedon); Patrick, T. E. (Edinburgh); Purser, E. O. (Midhurst); Wall, J. N. (London); Wilson, H. C. (Shoeburyness); Wilson, (Miss) M. J. (Stretford); and Woodley, H. (Liverpool).

As Licentiates (10)

Aris, B. B. G. (Salisbury); Barclay, T. (Glasgow); Dodd, A. (Leicester); Kershaw, S. (Halifax); Morgan, A. (Gloucester); Nolan, H. G. (Coventry); Oxenbury, T. B. (Ipswich); Schofield, H. W. (London); Stewart, R. (Ulverston); and Webber, C. (Paignton).

EXAMINATIONS

The Final Examination was held in London and Edinburgh from July 3 to July 11, 1940. Of the 139 candidates examined, 75 passed (23 of whom sat for and passed in Part I only; 4 passed the whole examination subject to approval of the Thesis, and 1 subject to approval of Testimonies of Study), and 64 were relegated. The successful candidates are as follows:

Addison, A. J. (Part 1 only); Adler, C. (Subject to approval of Thesis); Almrott, A. F.; Annand, G.; Baff, L. C. McKew (Part 1 only); Bidmead, G. R.; Binney, W. (Part 1 only); Bullimore, G.; Burton, H. E. (Part 1 only); Cathery, E. L. (Distinction in Thesis); Causon, A. H.; Channing, L. T.; Clark, J. N.; Cooper, R. E.; Davis, D. I. S. (Distinction in Thesis); Dobson, R. (Part 1 only); Doe, D. B. (Part 1 only); Dryburgh, J. (Part 1 only); Dunford, F. W.; Eaton, T. C. R.; Edwards, E. J.; Elder, A. J.; Elwood, S. L. (Part 1 only); Eyre, R. (Subject to approval of Thesis); Fox, R. H.; Freeman, A. M. (Subject to approval of Thesis); Godfrey, W. E.; Griffin, J. O.; Griffiths, J. (Part 1 only); Henderson, J. M.; Hitschmann, H. (Part 1 only); Hodgson, C. W.; Holbrook, L. C. (Distinction in Thesis); Horsfield, A. J.; Huggins, F. R.; Hyde, L. A.; Johnson, R. D; Johnston, J. S. (Part 1 only); Lambert, R.; Lane, E. A. J.; Lawton, K. W. (Part 1 only); Leah, E. A.; Levy, A. P.; Lightowlers, C. V. (Part 1 only); Mabley, P. J.; McKenzie, J. G.; Malcolm, F. K.; Mallinson, L. (Part 1 only); Milne, W. F. (Part 1 only); Norfolk, D.E.W. (Part 1 only); Oexle, J. S.; Parker, C. K.; Parsons, R.W. B.; Rampton, T. L. (Part 1 only); Rexilius, P. H. G.; Richardson, A. E.; Robertson, D. O. (Part 1 only); Royce, N. A.; Sands, D. O.; Sargison, V. J.; Silcock, R. (Distinction in Thesis) (Subject to approval of Testimonies of Study); Soulsby, J. P. F. (Part 1 only); Steer, O. E. (Subject to approval of Thesis); Stroud, H. W. (Part 1 only); Talbot, E. W. (Part 1 only); Thomas, R. B.; Thorp, C. H.; Tong, S. E.; Treleaven, R. H.; Turner, N. G. E.; Viney, T. L.; Walter, J. F. (Part 1 only); Watson, J. F.; Weinreich, H. (Part 1 only); Wilkinson, J.

The Special Final Examination was held in London and Edinburgh from July 3 to July 10, 1940. Of the 29 candidates examined, 11 passed (1 of whom sat for and passed in Part 1 only) and 18 were relegated. The successful candidates are as follows:

Henderson, H.; Hobson, L. J.; Macfarlane, R. A.; Mitchell, A. D.; Mochrie, H. A.; Pratley, G. J. (Part 1 only); Richardson, D. W.; Selby, L. J.; Smith, L. T. J.; Thomson, G.; Wilson, W. G.

The Examination in Professional Practice for Students of Schools of Architecture recognized for exemption from the R.I.B.A. Final Examination.—The examination was held in London and Edinburgh on July 9 and 11, 1940. Of the 14 candidates examined, 5 passed and 9 were relegated. The successful candidates are as follows:

Barragan, J. E.; Drill (Miss) H. S.; Stammers, J. R.; Strang, A.; Twigg, L. H.

SCHOOLS

LIVERPOOL SCHOOL OF ARCHITECTURE

The University of Liverpool has just issued the prospectus of the School of Architecture, which contains full details of the facilities offered by the School and a description of the Department of Civic Design. The new session starts on September 24. It is pointed out that as the number of students in the School has had to be limited to 200—approximately 40 in each year—it is advisable for candidates for admission to make their applications as soon as possible.

GRAY'S SCHOOL OF ART

We have received from the Gray's School of Art, Robert Gordon's Technical College, Aberdeen, a copy of its prospectus for 1940–1941.

The School is recognized by the R.I.B.A. Students who obtain the Diploma of the School are eligible for exemption from the final examinations of the R.I.B.A. in all subjects except professional practice, the examination in which is conducted in the School by external examiners.

The day classes in the new session will commence on September 9, and the evening classes on September 24.

NORTHERN POLYTECHNIC SCHOOL OF ARCHITECTURE

R.I.B.A. recognition was first granted to the above school in 1925, when the Diploma of the Three Years' Day Course was accepted as a qualification for exemption from the Intermediate Examination.

Similar recognition was also granted to the Five Years' Evening Course in Architecture in 1933, an important event in architectural education, which encouraged evening students to submit to a comprehensive training instead of "cramming" for examination subjects in the shortest possible time.

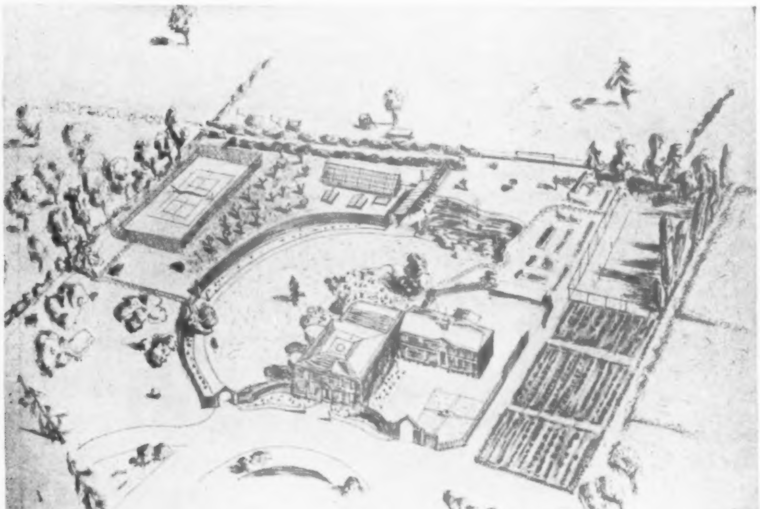
The day school has now been granted full recognition, and students who complete satisfactorily the five years' course will be exempted from the Final Examination for Associateship, R.I.B.A.

The School of Architecture is an important section of the Department of Architecture, Surveying and Building, which also provides day and evening training for those engaged in all branches of the building industry and the allied professions.

Since the outbreak of the war and with the approval of the R.I.B.A., certain temporary modifications have been made in the curriculum so that, without any lowering of standard, students who enter the school before reaching the age of 17 are enabled, subject to satisfactory progress, to obtain the necessary qualifications for Associateship before becoming liable for military service.

No important changes have been made in the staffing arrangements. Air raid shelters have been erected on the Polytechnic premises, and it is proposed to continue the school activities for as long as circumstances permit.

Application for admission next month should be addressed to Mr. T. E. Scott, F.R.I.B.A., Head of the Department of Architecture, Surveying and Building, Northern Polytechnic, Holloway, N.7.



From the Architectural Association's exhibition of students' work. Perspective of a scheme, by J. S. Minton, for the garden layout of the Mount House, Hadley—the present headquarters of the School of Architecture.

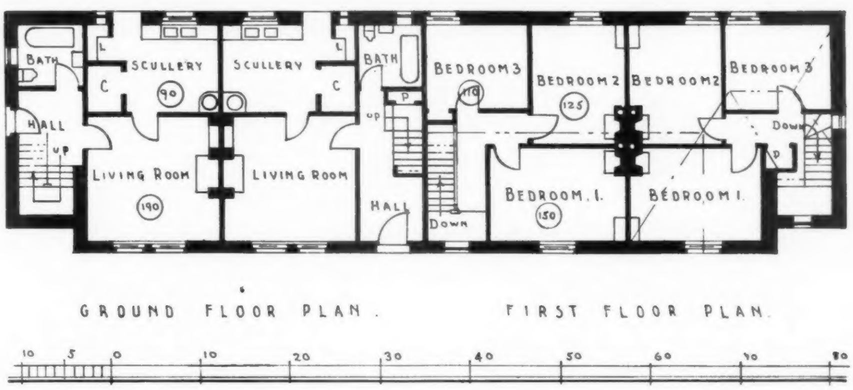
NEW SPECIFICATION

A British Standard Specification for Light-locks at Entrances to Buildings was issued some time ago as B.S./A.R.P. 15.

Since that time many factories and office buildings have had to be in use during black-out hours in warm weather, and the ventilation of the buildings has given rise to many problems. It has been necessary to obstruct the windows and other openings in such a way as to provide a light-trap without interfering with ventilation, and with a view to giving guidance in this matter a new specification has just been issued by the British Standards Institution. This specification, which bears the reference B.S./A.R.P. 31 and the title, "Ventilation for Buildings in Conditions of Black-out," has been prepared under the ægis of the Ministry of Home Security and the Illuminating Engineering Society. It describes the principles of design, the effect of light-traps on ventilation, and suitable materials for the construction of ventilator light-traps. Numerous illustrations of typical light-traps

HOUSING SCHEME, ABERDEENSHIRE

DESIGNED BY W. L. DUNCAN



GROUND AND FIRST FLOOR PLANS

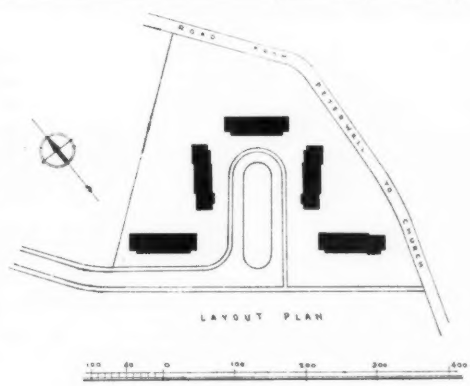
GENERAL—This scheme at Fyvie, Aberdeenshire, for the Aberdeenshire County Council, contains eight four-room houses and twelve three-room houses. A further development of 30 houses is proposed to the west of the present site.

SITE—The site slopes from north to south and, in planning, it was found necessary to step the floor levels of the side blocks to eliminate underbuilding as far as possible. The bathrooms had to be planned on the ground floors, because of low water pressure.

CONSTRUCTION AND FINISHES—The ground owner stipulated the houses should be built of local stone, rubble built, with artificial stone dressings and dormer windows.

COST—£9,815. Price per ft. cube, 8¾d. Price of four-room house, £510 ; price of three-room house, £464.

For names of sub-contractors and suppliers, see page xviii.



suitable for various circumstances are then given.

Although primarily designed for premises such as factories, ventilator light-traps are also applicable to domestic premises, and the construction of suitable light-traps should not be beyond the scope of householders themselves, using materials readily to hand and working to one of the examples clearly illustrated in the specification.

Copies of this specification may be obtained from the British Standards Institution, Publications Department, 28 Victoria Street, London, S.W.1 ; price 8d., post free.

CIVIL DEFENCE

The provision of expert advice at a nominal fee on the strengthening of dwelling houses, so that they may be made efficient air raid shelters, has been rendered possible by a number of professional institutions. The Government's pamphlet, *Your Home as an Air Raid Shelter*, which can be obtained at any Post Office, gives full details of the half-guinea consultant scheme.

The Central Board has been set up at the request of the Ministry of Home Security.

The constitution of the Board is given below :

C. Roland Woods, M.B.E., LL.D., Chairman. Dr. David Anderson, LL.B., B.SC., M.INST.C.E. (Institution of Civil Engineers), Christopher Chart, F.S.I., L.R.I.B.A. (Chartered Surveyors' Institution), E. Graham Clark (Institution of Civil Engineers), Douglas H. Green, O.B.E., M.C., B.SC., A.M.INST.C.E., M.I.STRUCT.E. (Institution of Structural Engineers), G. Lansdown, F.R.I.B.A., F.S.I. (Chartered Surveyors' Institution), R. F. Maitland, O.B.E., M.I.STRUCT.E. (Institution of Structural Engineers), G. E. Marshall, F.I.A.A. (Incorporated Association of Architects and Surveyors), H. H. Murray, F.F.A.S., M.S.R.A. (Faculty of Architects and Surveyors), T. E. Scott, F.R.I.B.A. (Royal Institute of British Architects), C. D. Spragg (Royal Institute of British Architects), J. E. Swindlehurst, M.A., M.INST.C.E., M.I.STRUCT.E. (Incorporated Association of Architects and Surveyors), Dr. A. D. Merriman, M.A., M.ED., HON. F.F.A.S. (Faculty of Architects and Surveyors) Secretary.

SOME QUESTIONS ANSWERED THIS WEEK:

★ *COULD you give me any information regarding the "Stewart Pump" designed specially for use in air-raid shelters, also the names of manufacturers of any other power pumps?* Q468

★ *WHO are the manufacturers of Pthalocyanide anti-gas paint?* - - - - - - Q473

★ *WHAT type of paint is most suitable for a garage roof of corrugated iron, nearly flat, repairs to which were carried out recently in a plastic bitumen compound?* - - - Q474

★ *WORK we are pricing specifies that the roadways are to be formed by spreading the coarse aggregate and the whole work finished with a Colcrete cement-sand grout. Who supplies this Colcrete material?* - - - - Q476

THE ARCHITECTS' JOURNAL INFORMATION CENTRE

THE Information Centre answers any question about architecture, building, or the professions and trades within the building industry. It does so free of charge, and its services are available to any member of the industry.

Questions may be sent in writing to THE ARCHITECTS' JOURNAL, 45 The Avenue, Cheam, Surrey, or telephoned direct to the Information Centre: Regent 6888.

Enquirers do not have to wait for an answer until their question is published in the JOURNAL. Answers are sent direct to enquirers by post or telephone as soon as they have been prepared.

The service is confidential; and in no case is the identity of an enquirer disclosed to a third party. Samples and descriptive literature sent to the Information Centre by manufacturers for the use of a particular enquirer are forwarded whenever the Director of the Centre considers them likely to be of use.

Finally, if an answer does not provide all the information needed, the Centre is always glad to amplify any point on which the enquirer wants fuller explanation.

Any questions about building or architecture may be sent to:

THE ARCHITECTS' JOURNAL
45 THE AVENUE, CHEAM, SURREY
Telephone: VIGILANT 0087

or ring the Architects' Journal Information Centre at

REGENT 6888

Q467 ARCHITECT, N.E. COAST.—*In the matter of ROOF PROTECTION AGAINST INCENDIARY BOMBS officialdom glibly instructs us to "lay 1-in. rough boards over the ceiling joists which can be strengthened if necessary." I want to know when it is not necessary. Building construction rules and by-laws were not devised for fun. How can joists be strengthened except by propping from the floor(s) below and thus causing inconvenience to residents? How far is one justified in adopting the idea of additional loading without the propping? Calculations show that joists of the strength of ½ in. depth per foot of span have a good margin of strength, but pursuing the matter down to practical details, would not the hammering and traffic of fixing tend to break the plaster key of the ceiling below and subsequent vibration cause a fall? Any architect who had agreed to such a method against his better judgment, appreciating the attendant risks, would cut a poor figure if called upon to answer for a failure, although having been prompted by the best motive, that of saving a client's pocket.*

Where it is necessary to strengthen the ceiling joists for the provision of a boarding and sand incendiary bomb platform, the usual procedure is to reduce the effective span of the joists by providing hangers from the rafters or purlins. These hangers can either be of wrought iron or timber. Since the floor boarding will distribute its load, hangers to every third or fifth pair of joists will be sufficient. Since the boarding will not be used for constant traffic it can be fixed by just enough screws to keep it in position and vibration damage to ceiling can thus be avoided.

Q468 ARCHITECT, SCOTLAND.—*I shall be glad if you could give me any information regarding the "Stewart Pump" which I understand has been designed specially for use in air-raid shelters. You might let me know also the names of manufacturers of any other power pumps which may be used for this purpose.*

The pump you have in mind is called the "Stuart" and is made by Messrs. Stuart Turner & Co., Ltd., Henley-on-Thames, Oxon. Other firms which sell pumps for use in shelters are given below:*

Q469 ARCHITECT, DERBY.—*I have been asked by some clients who own a considerable number of granaries and MALTING HOUSES to try to cure some DAMP which occurs IN one of their GROUND FLOOR BINS. The facts are these: Most of their bins are treated in the way they should be in order to keep the malt dry, namely by having the walls and floor asphalted in one complete operation. In the present case, however, it is not desired to spend money on doing this. The kiln in question is adjoining the river on one side with water constantly running along one wall of it at a level of about 18 in. to 2 ft. below the ground floor level, and on the other side at right angles to the river is the main road 3 ft. or 4 ft. above the inside floor level. The front wall and the other side wall opposite the river are respectively open to a yard and adjoining other bins. The walls are chalk and flint rubble about 18 in. thick. The present floor is of boards on joists, ventilated by air bricks immediately over the water in the river, and the flint walls have been faced about 3 ft. high with a wall board forming a sort of dado. As the clients do not want to go to the expense of a solid floor with asphalt or to the cost of asphalting the walls, I suggested that the boarded floor should be taken up and 3 in. of brick rubble and 3 in. of waterproof concrete and 1 in. of cement and sand waterproof screeding should be laid. I have an idea, as they have too, that the damp rises up through the air bricks and comes up through the floor boards. Do you see any objection to this and do you think that the concrete or cement finish will be worse than the present boarded floor? I am wondering whether the cement will sweat and therefore whether the cure will be worse than the present evil. I have suggested this method because I pointed out to them that, if they wished to do so later, asphalt could be laid on this concrete and the expense of the concrete floor would not be utterly thrown away.*

The construction suggested should considerably improve existing conditions and is a preliminary to the best construction, asphalt tanking. But in its initial life considerable sweating of the concrete must be expected. This disadvantage could be overcome by relaying the wood floor and bearers as a temporary measure, the bearers resting on dry built brick piers about two courses in height and the underside of the flooring ventilated through walls away from the river elevation, the ventilators being connected by vertical ducts where necessary. The existing ventilator openings on the river elevation could be sealed.

Q470 ARCHITECTS, LONDON.—*We are drawing up plans for a decontamination post and we would be interested to know the amount of WATER used PER PERSON PER SHOWER bath.*

The figure given for this on page 34 of "Waterworks for Urban and Rural Districts," by H. C. Adams, is from 3–6 gallons per person.

Q471 ARCHITECT, SURREY. — *I am an associate of the R.I.B.A. and have already registered for MILITARY SERVICE but have not yet been medically examined. Can I make application to join the Officers' Cadet Training Corps at the time of the medical examination?*

Qualified professional men contemplating volunteering for the Services, including Technical branches of the Services, would be wise to apply for registration in the Army Officers' Emergency Reserve. Forms of application for this may be had by writing to: The Under Secretary of State, War Office, Dept. A.G. 12, Thames House, Millbank, London, S.W.1. The enquirer should attempt to secure entrance to an Office Cadet Training Unit before he receives notification to attend a medical examination, since normally no recommendation that a man should be sent direct to such a Unit is made at the time of medical examination.

Q472 ARCHITECTS, WARWICKSHIRE. — *A client of ours owns a single-storey office heated by means of a gas fire. The FLUE from this fire is IN the BOUNDARY WALL AND extends about 2 ft. above the flat roof of the office. At the time of erection the land ADJOINING was an open site but is now occupied by a two-storey BUILDING which has rendered the gas flue in question ineffective. The owner of the adjoining property has been approached regarding the raising of the gas flue to make it effective again. He has replied to the effect that as his building is only of normal height our client must correct his own flue himself. We shall be glad if you can clear up this point for us.*

Unless the boundary wall in question is a party structure erected on both sides of the boundary line or otherwise admitted by the two parties to be a party structure, then it belongs solely to your client, in which case it is of no interest or use to the adjoining owner and consequently he has no liability for its decay, behaviour or the functioning of flues therein.

Q473 BUILDING CONTRACTORS, LONDON. — *Who makes Pthalocyanide ANTI-GAS PAINT?*

Pthalocyanide is one of the active and essential ingredients of anti-gas paint made up to the official specification. Anti-gas paints to this specification can be obtained from most paint manufacturers, including the firms given below.*

Q474 ENQUIRER, LEEDS.—*What type of PAINT is most suitable in the following circumstances? A garage roof of CORRUGATED IRON, nearly flat, repairs to which were carried out recently in a plastic bitumen compound. Colour does not matter greatly.*

Since bitumen has been used for the repairs the simplest procedure would be to use a bitumen paint. With the

* *Messrs. A. J. Binns, Ltd., 53 Great Marlborough Street, London, W.1 Messrs. Rhodes, Brydon and Youatt, Ltd., 28 Victoria Street, Westminster, S.W.1: Messrs. W. H. Wilcox & Co., Ltd., 32 Southwark Street, London, S.E.1.*

* *Messrs. I.C.I. (Paints), Ltd., Slough, Bucks; Messrs. Jos. Freeman, Sons & Co., Ltd., Cementone Works, Wandsworth, S.W.18; Messrs. Lewis Berger and Son, Ltd., Morning Lane, London, E.9.*

use of any normal oil-bound paint there will be a tendency for the bitumen repair patches to bleed through the paint film and, to counteract this, precautions would be necessary in coating over these patches. It is not held, of course, that a bitumen paint coating has any other than mere mechanical protection of the underlying metal, but it will provide a tough waterproof film. Certain other specifications could be suggested: such as red oxide paint and chromic oxide primers which have an alloying and rust-preventing film, but the conditions set out and the repairs already carried out suggest that minimum cost is desirable. Bitumen paints are available in black and a limited range of dark tones.

Q475 ARCHITECTS, LONDON.—*Some time ago we constructed for factory employees lines of precast concrete unit underground shelters. Experience has now been gained in the occupancy of these shelters during times of raid warnings, and the owners have complained of the BABBLE OF NOISE IN the SHELTERS caused by numerous conversations. They have asked for suggestions as to how this noise nuisance could be reduced. Could you advise us of any acoustic paint which would help?*

It is difficult to see how anything of the nature of a paint coating would be of great assistance in the present circumstances. It might be that the "Corktex" cork-filled paint by Messrs. Thomas Parsons and Son, Ltd., Mitcham, Surrey, would be of use. The material is designed for the absorption of condensation, but with a sufficiently thick coating an improvement on the conditions resulting from bare concrete should be obtained. The use of sprayed asbestos fibre, built up to a thickness of, say, ¼ in. and applied to the upper walls and ceiling should largely eliminate the nuisance. Sprayed asbestos work of this kind is carried out by Newalls Insulation Co., Ltd., Broxbournebury, Broxbourne, Herts, or by J. W. Roberts, Ltd., Armley, Leeds.

Q476 BUILDING CONTRACTORS, LONDON.—*In work which we are pricing it is specified that the roadways are to be formed by spreading the coarse aggregate and the whole work finished with a COLCRETE CEMENT-SAND GROUT. Who supplies this Colcrete material?*

Colcrete is a system of concreting rather than a material. The manufacturing firm is Messrs. Colcrete, Ltd., Winchester House, Old Broad Street, London, E.C.2. The process consists in making a concrete by pouring a cement-sand grout into aggregate previously placed in position. Special mixers are used in the preparation of the grout, which has great penetrative powers. Details of these mixers and of the system generally will be available from the firm.

REFERENCE BACK

[This section deals with previous questions and answers.]

Q442. *August* 1, 1940.

In this inquiry the address given for Watco, Ltd., was Blackfriars Road, London, S.E.1, whereas the present address of the firm is 56 Buckingham Gate, London, S.W.1, and telephone number Victoria 0623.

Q446. *August* 1, 1940.

This was a request for names of suppliers of oiled silk for the replacement of damaged window glass. In our reply it was mentioned that imports of this material might be restricted, but addresses were given of firms normally handling oiled silk. A Glasgow architect has written to correct our statement.

Oiled silk is not imported. Only the silk is imported and the processing is carried out in this country. Our informant also points out that oiled cotton is a much more suitable material for use as temporary glazing and gives the names of manufacturers as follows: M. Barr & Co., Ltd., 51a Miller Street, Glasgow, C.1, and with a London address at 168 Regent Street, W.1; and Edward MacBean & Co., Ltd., Wellington Mills, Mary Street, Port Dundas, Glasgow, C.4, and London office at Walton House, 1 Newman Street, London, W.1. We are indebted to our informant for this correction.

TRADE NOTES

Following notes on the rational design of load-bearing brickwork have been received from the Clay Products' Technical Bureau of Great Britain.

It is well known that structures in which the load-bearing members are of reinforced concrete or steel are always rationally designed. That is to say, the form and dimensions of columns, girders, beams and associated members are all determined by calculations based upon the mechanical properties of the structural material itself. What is not so well known is that all modern building regulations also contain clauses governing a similar application of rational design to load-bearing brickwork.

To summarize briefly the sense of those clauses, seven classes of brick, ranging in compressive strength from 1,500 lb./sq. in. upwards, may be used for load-bearing brickwork in conjunction with a series of mortars, ranging from lime mortar up to 1 : 2 cement mortar. For each of the seven classes of brick, when laid up in any one of the specified mortars, a maximum load-bearing capacity is laid down. Hence structural members such as brickwork walls, piers and columns can be rationally designed by calculations based upon the mechanical properties of the brickwork. The maximum permissible stresses which are common to both the current L.C.C. Building By-Laws and the Ministry of Health Model Bye-Laws, are summarized in the following table:

MAXIMUM PRESSURES PERMISSIBLE ON WALLS AND COLUMNS CONSTRUCTED IN VARIOUS TYPES OF BRICKWORK AND HAVING A SLENDERNESS RATIO OF SIX OR LESS

Wet Brick Strength (lb./sq. in.) not less than	Mortar composition by volume			Maximum* permissible load in tons per sq. foot
	Cement	Lime	Sand	
1,500 ...	1	1	6	7
1,500 ...	1	—	4	8
3,000 ...	1	1	6	10
3,000 ...	1	—	4	11
4,000 ...	1	—	3	13·5
5,000 ...	1	—	3	16
7,500 ...	1	—	$2\frac{1}{2}$	23
10,000 ...	1	—	$2\frac{1}{2}$	30
Over 10,000 say *M*	1	—	2	$\frac{M}{500}$ + 10 but not greater than 40

* The Ministry of Health Bye-Laws allow a 50 per cent. excess where loading is a combination of uniformly distributed, eccentric and concentrated loads, provided *average* pressure does not exceed that tabulated above.

It must be noted that the stresses tabulated here are permissible only when the "slenderness ratio" is six or less, and must be reduced *pro rata* as the "slenderness ratio" of the wall or column increases from six to twelve. This reduction amounts to 60 per cent. when the maximum permissible "slenderness ratio" (12) is reached. The "slenderness ratio" of any storey height of a wall or column is defined, in the L.C.C. By-Laws, as the ratio of "effective height" to the horizontal cross-sectional dimension of the member which lies in the direction of the lateral support (if any) at the head of the wall or column. When laterally supported, the "effective height" of a wall is three-fourths of the actual storey height; of a column the actual storey height. When not so supported, to get the "effective height" the actual storey height must be multiplied by 1½ or 2 respectively.

From this outline of rational brickwork design procedure, as officially recognized, it is clear that to arrive at a suitable design, the architect or engineer has first to carry out a series of arithmetical conversions (for any proposed storey height) for each of the types of brickwork possible when the seven classes of brick are associated with the various specified types of mortar. The arithmetical work gets more tedious still when the proposed cross-section, storey height and type of brickwork are varied simultaneously, so as to arrive at, say, a minimum cross-section, minimum cost, maximum storey height with a given brick or some other data of immediate practical value.

Such tedious work could be partially shortened by preparing a set of tables, one for each possible type of brickwork, setting forth the load-bearing capacity of walls (or of columns) of various storey heights and thicknesses (or cross sections in the case of columns). In view of the immense number of possible permutations, however, such tables would be very bulky and, to arrive at the most satisfactory solution of a given problem, reference would probably have to be made to each of the tables. A like or even greater amount of information can, however, be shown clearly on a single well-planned chart.

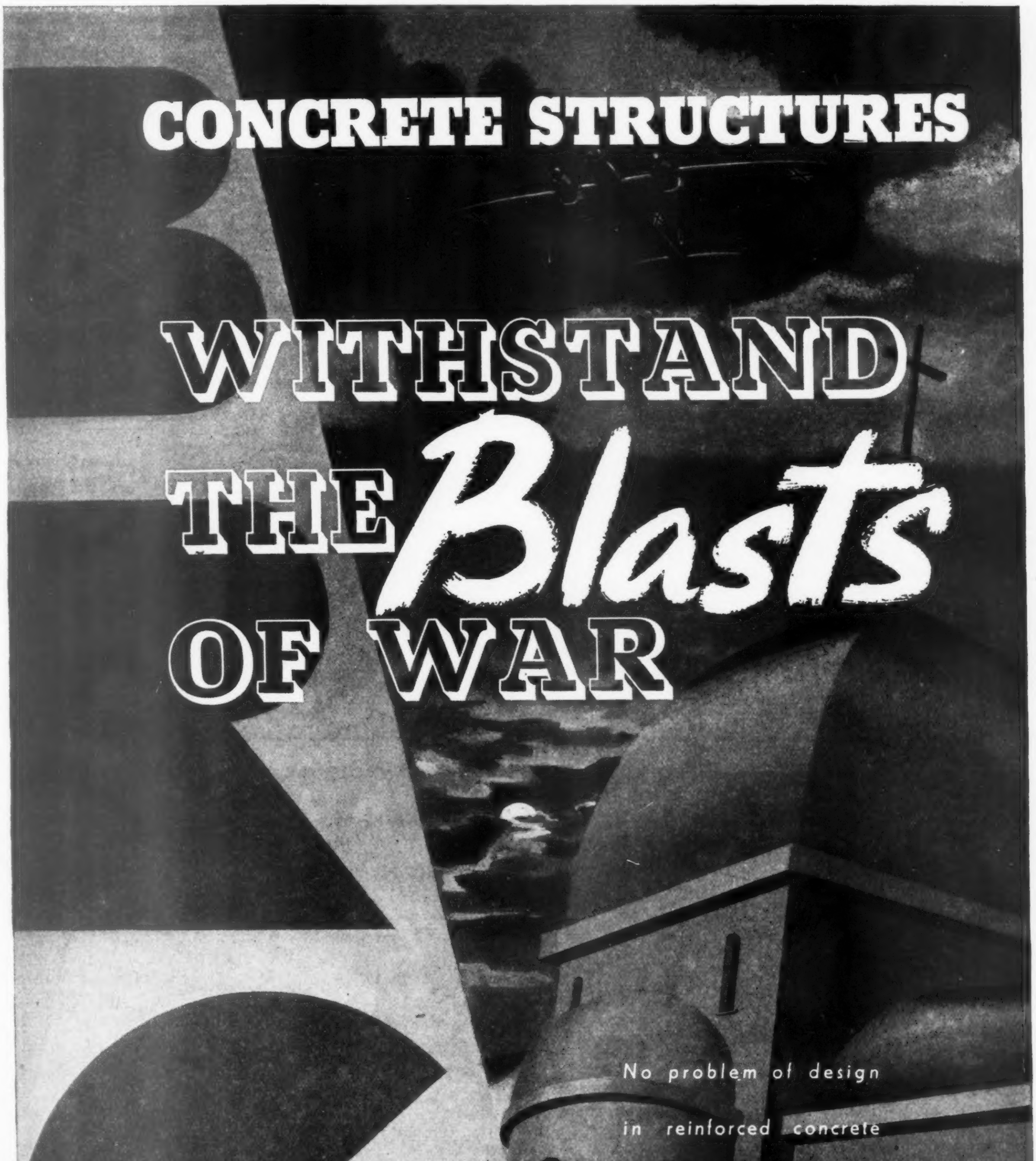
The Bureau has, therefore, prepared a series of charts,* from which can be read straight off the actual practical answer to any specific problem which may arise in the design of load-bearing brickwork in accordance with building regulations. The first two of these charts, dealing with walls and columns respectively, are now published. They deal with the more usual types of load-bearing brickwork only, i.e. those types which can be constructed with ordinary bricks of average strengths (1,500–5,000 lb./sq. in.), in association with mortars giving reasonable load-bearing capacities. Storey heights up to 24 ft. for walls and 18 ft. for columns are given inch by inch; wall thicknesses and column dimensions up to 18 in. and loads up to 36 tons; five typical examples illustrating their use are also given.

Copies of these very open scale, easily read charts, which are printed side by side on one 34 in. by 22 in. sheet, suitable for fixing to a drawing office wall, are obtainable from the Clay Products Technical Bureau of Great Britain, Ltd., 90 Ebury Street, London, S.W.1, at 1s., post free.

* Reproductions of parts of these charts were reproduced in the Brick issue of the JOURNAL published on July 18.

THE BUILDINGS ILLUSTRATED

BODLEIAN LIBRARY EXTENSIONS, OXFORD (pages 149–154). Architect, Sir Giles Gilbert Scott, R.A. General contractors were Benfield and Loxley, Ltd., who were also responsible for the foundations, etc. Sub-contractors and suppliers included: G. N. Haden and Sons, Ltd., electric wiring, telephones and bells;


CONCRETE STRUCTURES
WITHSTAND
THE Blasts
OF WAR
No problem of design
in reinforced concrete
is too large or too
small for BRC

Owing to the paper shortage, the JOURNAL, *in common with all other papers, is now only supplied to newsagents on a "firm order" basis. This means that newsagents are now unable to supply the* JOURNAL *except to a client's definite order.*
To obtain your copy of the JOURNAL *you must therefore either place a definite order with your newsagent or send a subscription order to the Publishers.*

Fredk. Alden, boilers, central heating and ventilation; James Gibbons, Ltd., casements and window furniture; H. H. Martyn & Co., Ltd., ornamental bronzework and stone carving; Ralph E. Smart, Ltd., Fullway sewage-sump pumps; Concrete, Ltd., reinforced concrete, pre-cast concrete floors; Cambridge Artificial Stone Co., precast partitions; Hoyle, Robson, Barnett & Co., Ltd., Glazement internal wall treatment; Ragusa Asphalte Paving Co., Ltd., dampcourses and asphalt work; Redpath, Brown & Co., Ltd., structural steelwork; Sika-François, Ltd., waterproofing materials; Haywards, Ltd., toplights; Leeds Fireclay Co., Ltd., sanitary fittings; Bratt Colbran, Ltd., electric fires; Falk, Stadelmann & Co., Ltd., electric light fittings; Acme Flooring and Paving Co. (1904), Ltd., wood-block flooring; N. F. Ramsay & Co., Ltd., door furniture; Potter Rax Gate Co., Ltd., folding gates, iron staircases and metalwork; Trollope and Sons, (Decorators), Ltd., plastering; John Tann, Ltd., fireproof doors; Accordo Blinds, Ltd., sunblinds; J. Avery & Co., Ltd., all other blinds; Watts & Co., Ltd., curtains; Whitehead and Sons, Ltd., marblework; J. L. Green and Vardy, Ltd., joinery, furniture and office fittings; Sovex, Ltd., book conveyor; Lamson Engineering Co., Ltd., pneumatic tubes for conveying documents and manuscripts and vacuum cleaning plant; Roneo, Ltd., book stacking throughout and clockroom fittings; Express Lift Co., Ltd., lifts; Reliance Telephone Co., Ltd., loud speaker installation; J. W. Gray and Son, Ltd., lightning conductors; W. Edwards & Co., fumigating plant; Korkoid Decorative Floors, cork treads and landings to staircases; Inlaid Ruboleum Tile Co., Ltd., linoleum; St. Helens Cable and Rubber Co., Ltd., rubber flooring.

THE BRIDGE HOTEL, HIGH STREET, SHOREHAM-BY-SEA (pages 155-157). Architects, C. Beresford Marshall and Partners, in collaboration with E. J. Thring, A.R.C.A. General contractors were Patching & Company. Sub-contractors and suppliers included: Drewitts Asphalt (Southern), Ltd., asphalt and patent flooring; A. H. Herbert & Co., Ltd., and the Keymer Brick and Tile Co., bricks; D. G. Somerville & Co., Ltd., artificial stone; Trussed Concrete Steel Co., Ltd., Truscon floors; Walker (Hove), Ltd., tiles; Turners Asbestos Cement Co., roof insulation; Building and Insulating Material Co., Ltd., partitions; Williams and Williams, Ltd., patent glazing and casements; Redferns Rubber Works, Ltd., patent flooring; G. N. Haden and Sons, Ltd., heating and ventilation; George Wright (London), Ltd., grates; Pages and Miles, Ltd., electric wiring and telephones; Best and Lloyd, Ltd., electric light fixtures; Broad & Co., Ltd., sanitary fittings; W. N. Froy and Sons, Ltd., door furniture; Middleton & Co., Ltd., decorative plaster; William Saunders and Son, metalwork; Merchant Trading Co., Ltd., flush doors; Osgood & Co., Ltd., A. H. Herbert & Co., Ltd., and W. T. Lamb and Sons, tiling; Patching & Company and Heal and Son, Ltd., textiles; North British Chemical Co., Ltd., paint; Harris and Sheldon, Ltd., furniture; Hammond and Champness, Ltd., lifts; Smith's English Clocks, Ltd., clocks; Pearce Signs, Ltd., signs; Gaskell and Chambers, Ltd., bar fittings; Noel Wood Mosaic Co., Noelite paving; Cox and Barnard, glass bricks; W. A. Gooding and Sons, Ltd., weathervane and copper work; R. L. Pickard & Co., rainwater goods; Wm. Mallinson and Sons, Ltd., Maltas wall veneer; Dale's, lettering; Atkinson-Mare, Ltd., refrigeration; Langley London, Ltd., roof tiling.

HOUSING SCHEME, FYVIE (page 159). Architect, W. L. Duncan. Separate contract for each trade. Sub-contractors were: Alex. B. Ogston and Son, mason work; Geo. W. Bruce, artificial stone; Geo. A. Hay, joiner work; W. J. C. Eddie and Sons, slater work; Duncan and Mackie, plaster work; Anderson and Lowe, plumber work; Alex. Cumming, painter work; Anderson and Lowe, electric lighting.

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APPOINTMENTS

Mr. Edward Baynes, C.B.E. (Colonial Administrative Service, Retired), has been appointed Secretary of the Association of Consulting Engineers (Incorporated).

Mr. Maurice W. Jones has been appointed Surveyor to Worcester Cathedral.