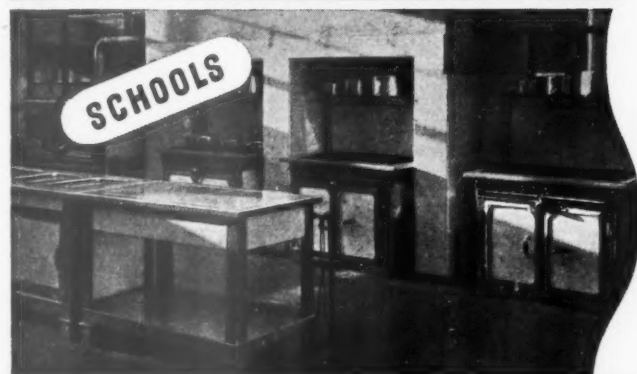
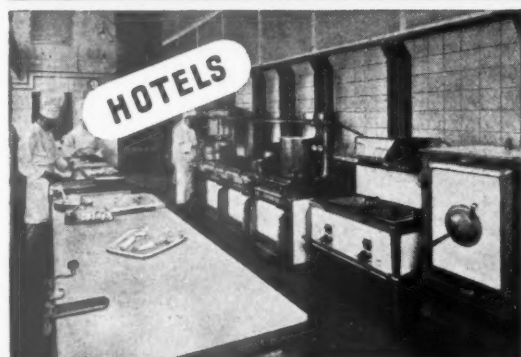


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IS PUBLISHED EVERY THURSDAY BY THE ARCHI-  
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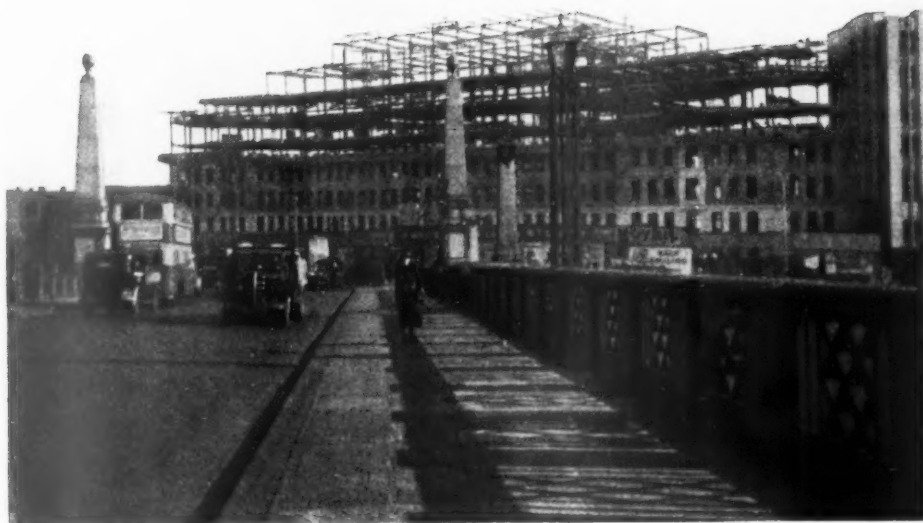
THURSDAY, MARCH 7, 1940.

NUMBER 2355 : VOLUME 91

### PRINCIPAL CONTENTS

	PAGE
A.R.P. Shelters .. .. .	247
This Week's Leading Article .. .. .	249
Notes and Topics .. .. .	250
<i>Astragal's notes on current events</i>	
News .. .. .	252
Cinema at Towcester. Designed by Sir John Brown and A. E. Henson .. .. .	255
Letters .. .. .	261
Church at Newbridge, Monmouthshire. Designed by P. D. Hepworth .. .. .	262
Information Sheets .. .. .	264
<i>Structural Steelwork (777)</i>	
<i>The Equipment of Buildings (778)</i>	
Information Centre .. .. .	265
<i>Questions and Answers ; Temporary and Semi-permanent Buildings</i>	
Prices .. .. .	270

## UNDER CONSTRUCTION



*Office building in course of construction at the junction of Albert Embankment and Lambeth Road; view was taken from Lambeth Bridge. On the extreme right is seen part of the new Doulton's building.*

## AIR RAID SHELTERS

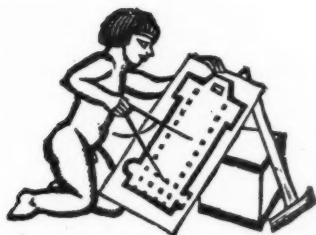


*Left, general view of the forecourt of a block of working-class flats in Southwark showing the entrances to the recently-completed air-raid shelters; these underground shelters are of brick and concrete construction. Right, entrance to a shelter in Fumival Street, E.C.*



## COPENHAGEN

*Church in Copenhagen of brick construction with a stone spire. The tops of the railings are gilded.*



## MR. HOWARD ROBERTSON

ON April 4 the JOURNAL will begin to publish a study by Mr. Howard Robertson of the building industry and its post-war circumstances, which will be called *THE NEXT YEARS*.

The JOURNAL believes this study to be of great importance. The war and the changes which may follow it concern all members of the building industry in two ways. They are concerned, as citizens, with winning the war, and with its social and political consequences. And they are concerned, as builders, with the faults in the industry's organization which have been shown up by the war.

The main point of Mr. Robertson's coming articles lies in that they put forward remedies for this failure *within* the industry. For few members of the industry now believe that the war was the sole cause of the industry's distress during the past six months.

In building organization and technique, efficiency in wartime activities is not incompatible with the aims and work of the industry in times of peace. There is need for more speed, but less diversity. We know that if the responsibilities of the various sections of the industry and its professions had been established and clearly understood and acknowledged *within* the industry in peacetime, they would have been accepted *outside* the industry in war, and the lopsided, wasteful use of the industry during the last six months would not have occurred.

Knowing these things, the industry cannot use the present time better than in surveying its organization, so that it may be ready for the next great call on its powers when that comes—and especially that it should be ready for the end of the war. For the first boom after the war will be a building boom; and remedies not applied before that boom will be remedies which never will be applied.

This examination of the industry to find in what ways its methods have been strained or outmoded by developments since 1919 affects everyone whose livelihood is connected with building. The whole industry has an interest in finding remedies which can be agreed by all, be big enough to matter and small enough to lie within the industry's own powers to put right.

This is not easy. For instance, the failure of town planning and trunk road schemes to produce any

measurable improvement in the use of land has turned the thoughts of many thinking people to a reconsideration of national remedies—socialism, national ownership of land, territorial planning. And the distinction is often lost between these national measures, whose consequences would greatly affect the building industry, and measures of building reorganization which lie within the industry's own power. It is in this, in the search for strains and faults in the building industry which can be remedied by *builders*★, that we believe Mr. Robertson's articles will provide a starting-point.

The JOURNAL attaches special importance to these coming articles—and it believes all architects will do the same—because the views in them are put forward, not by a theorist, but by one of the foremost of those who must decide what reforms are needed in architecture and building and who, if they desire, can carry them out.

Mr. Howard Robertson's views are, of course, personal and in no way official. But when he considers reform in the industry's organization at a time when all are thinking of reform, we cannot forget that the writer was one of the founder members of B.I.N.C. and is now a member of its War Committee and a Vice-President of the R.I.B.A. And we remember also, when he writes of architectural education, that he has followed up his work as Head of the A.A. School by membership of the Board of Architectural Education.

Mr. Robertson surveys the enterprise of building under four main heads: present political disorder and its possible effects; building organization and the relationship of architects and builders; architectural responsibility and the relationship of architecture with other arts; and education and other means of adjustment to new conditions.

In the present months the whole industry is concerned with one or another of these questions. Every member of it feels that the present time of inactivity should be used for a review and a reorganization. Mr. Howard Robertson, the JOURNAL believes, is one from whom the whole industry would expect, and accept, guidance on what needs doing and how it can be done.

★ By which is meant all who build, including the architectural profession.



*The Architects' Journal*

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## N O T E S

&

## T O P I C S

### WAR-TIME BUILDING

AT the meeting between M.P.s and the B.I.N.C. at the House of Commons last Thursday two questions were talked over: How the Building Industry can best help to win the war; and how it can do this cheaply, quickly and with least injury to its power of recovery after the war.

It was decided to ask all sections of the industry to send suggestions to B.I.N.C. as to how these objects can be achieved; and to hold another meeting with M.P.s after the suggestions have been examined.

Thursday's meeting is encouraging in that it shows that the importance of building is realized by Members of Parliament.

On the other hand, it seemed clear in December that, (1), the efficient use of the industry in war depended on establishing a single distributing office for all Government orders, which could decide materials and choose the contractor according to the urgency and size of the work. And, (2), that the proportion of the industry which should be kept going in war must be based upon potential A.R.P. requirements, upon those of housing and evacuation, and on the importance of the industry as a means of post-war recovery.

It is disappointing to find that in two months B.I.N.C. has been unable to convince the Government of the necessity of (1) or to secure Government co-operation in making the calculations involved in (2).

### POST-WAR PARADISES

Mr. R. Gardner-Medwin has been sickened by a note with this title which was published on February 22.

In it, I stated that the events of the last few years had made many people think over the various large remedies which have been advocated for them—political, social or technical. The new interest I thought encouraging; but regretted the loss of a sense of proportion which it often caused—especially the tendency of reformers only to consider the largest reforms, and the announcements by groups and committees of programmes plainly beyond their powers.

In a letter published last week,\* Mr. Gardner-Medwin attacked these views under four heads:—

1: "Heaven save us from discussion groups unless they do actively organize themselves as groups with a programme."

—Certainly: but a group with a programme which it obviously cannot carry out may be worse than no group at all.

2: "The obsession . . . with schemes of largest size is . . . encouraging."

—I was careful to say that, within limits, this was so.

3: "Let us urge . . . that half-a-dozen exceptionally able men should be employed straightway to give their full-time, life-long labour to the job."

—Certainly: provided we can all agree what section of what job they are to tackle, and to pay them for tackling it.

4: "The U.S.A. has achieved more than a small bit . . . of Territorial Planning, National Roads and Federal Union . . . Our job is to point out (from this) that a planned world . . . is an immediate, practical proposition."

—Under stress of a great internal emergency the U.S.A. did embark on some large experiments such as the Tennessee Valley Scheme; and the results have at any rate been partly encouraging.

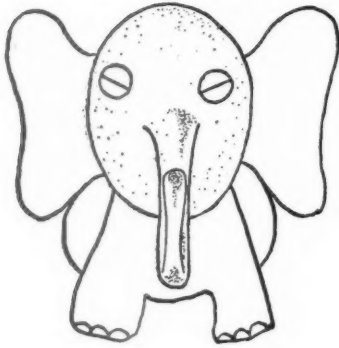
But these results were obtained by careful planning for particular areas under particular conditions. And if a well-planned world is to be an immediate, practical proposition, wishful thinking of the vague and grandiose kind whose prevalence I was regretting is one of the things that will have to be put over the side.

### MORE OXFORD

To the casual eye Oxford is only superficially affected by the war. There seem to be fewer bells chiming than usual, but more bicycles; there is a large air-raid shelter behind the Radcliffe Camera and the neighbouring stained glass windows are boarded up, but the pubs, hotels and restaurants are crammed to overflowing. On Sunday the bar of *The Trout* at Godstow echoed to the jargon of the mess instead of the common-room, and in *The George* a man dined alone in an astrakhan-lined overcoat, and a Siamese read a newspaper whose letterpress looked like knitting.

In contrast to these busy and picturesque scenes many of the colleges wore a damp, deserted air. Some of them

\* Reprinted on page 261 of this issue.



are closed to visitors, and the notices outside the porters' lodges fluttered hopelessly in the icy wind.

As I wrote last week, "The Clarendon" has now closed its doors for ever, and it was with difficulty that I at length obtained a room at a hotel. The charges were high and the discomfort considerable. The water (which served a basin called "Cambridge Ware") was not hot, the anti-syphonage pipes were audibly inefficient, and the only heating provided in the bedroom was a slot-meter electric fire, a glow-worm which swallowed 2s. during the periods of undressing and dressing.

However, to complain of English hotels is to lie, as it were, on a horse-hair sofa; and in favour of this place I must record a drawing discovered behind the lavatory door (reproduced above), which made ingenious use of a brass hook and its double screw fixing.

#### A.R.P. LECTURE

Partly to learn whether one's A.R.P. knowledge was up to date and partly to see how things were done in smaller communities, I accompanied a friend last week to an A.R.P. workers' lecture in a small town 30 miles from London.

The subject was H.E. and incendiary bombs; and to call the lecture eye-opening is to do it gross injustice.

Either by official instructions or as a hangover from the Finsbury dispute, a good quarter of an hour was taken up in condemning deep shelters. There is the probability, we were told, that a 500-lb. delayed-action bomb will penetrate 40 ft. into the earth, explode, and cause shock-waves which will lead to the collapse of the shelter and burial alive. The audience took this without blinking.

Then came incendiary bombs. When a bomb falls in the attic—from which all combustibles have been removed, and the joists sprayed with fire-resisting solution—the alert citizen was told to carry out the following actions:

Pop his head through the trap door and observe position of bomb; calculate shrewdly where it will fall in the room below; pop down and place the largest available baby's

bath (full of water) under the ceiling in the chosen place; wait till the bomb falls into the water; throw sand over it; pick up bath, bomb, water, sand and all and throw out of window.

I must admit that this drew some laughs from the audience, which were sternly deprecated by the lecturer. But after what we have heard of A.R.P. preparations and efficiency it is remarkable to think of this rigmarole of nonsense being handed out weekly to people on whose actions the lives of others may one day depend.

#### SOUTH AFRICA

A correspondent in South Africa mentions that a slight dispute has arisen over the planning of the new foreshore at Capetown. This huge scheme, which has involved the reclamation of a large part of the harbour bay, is due to be completed next July, and the problem of its final layout (which may include a new civic centre) has become urgent.

Two years ago, when the work was started, a preliminary planning scheme was drawn out by harbour and railway engineers; and since then the City Engineer's Architectural Department has been engaged in planning a more detailed and extended version of this.

Both the South African Government and Capetown City Council, however, now feel that the development of so important a site should be placed under the control of town-planning experts, and the dispute referred to has arisen over the question of whom these experts are to be.

The Government wish to select for the job the two South African architects best fitted for it by their experience and qualifications. To this end all architects practising in the Union have been asked to submit for consideration a testimony of their town-planning qualifications. The City Council, on the other hand, say in tones which have a familiar ring that their City Engineer's Department can do as well as any South African architect, and that the City's prestige demands the employment of experts from overseas whose reputations must be world-wide.

It seems likely that the Government will prevail in the end, and their view is certainly supported by my correspondent. He has been greatly impressed with the vigour and enterprise of contemporary South African architecture, and believes there are several architects in the Union who are quite capable of tackling the job and doing it as well as any imported expert from Europe.

After all, did we not lose our own Professor Thornton White to South Africa not so long ago?

#### COUNSEL OF PERFECTION

The sixth and last aim of the Noise Abatement League—as printed in its magazine, *Quiet*—is "advising and, where possible, assisting members in connection with their own personal noise troubles."

ASTRAGAL

## NEWS

## General

## BUILDING COSTS

L.C.C. has appointed a special sub-committee with the following terms of reference:

To consider and report whether and to what extent it is practicable and desirable to reduce the cost of constructing and equipping the buildings provided by the Council by reviewing the requirements as to accommodation and treatment in certain cases, by simplification of specifications, by the use of new methods and substitute or alternative materials, by the greater use in all services of standardized methods, materials and equipment, or otherwise.

The names of the members are as follows: Mr. F. C. R. Douglas, Mr. Arthur N. Dove, Mrs. Monica Felton, Mr. C. W. Gibson, Sir Samuel Gluckstein, Mr. Thomas H. Jones, Mr. Edward P. Martin, and Mr. Lewis Silkin.

## R.I.B.A.

The President of the R.I.B.A. received the following cable on February 24 from Mr. J. M. Dawson, President of the New Zealand Institute of Architects:

*Members of New Zealand Institute assembled at Annual General Meeting during Dominion Centennial year send message of loyalty to and affection for Mother Institute.—Dawson, President. Wellington.*

Mr. Stanley Hall has replied to Mr. Dawson's greeting by cable.

## SIR JOHN SOANE'S MUSEUM

The above museum re-opened on March 5. There is a very valuable exhibition of designs of domestic work by Sir Christopher Wren, Wm. Talman, Sir John Vanbrugh, Thomas Archer and others. There are two Vanbrugh drawings for houses hitherto unknown, and measured drawings and photographs of two authentic Wren houses, made specially for the Wren Society.

## PETERBOROUGH CATHEDRAL GATEWAY

The friends of Peterborough Cathedral hope to undertake the restoration of the gateway as their next effort, but are still £900 short of the amount required, which will be about £2,000.

## BEDFORD TOWN HALL

Following report of a meeting of the Town Hall Committee of the Bedford T.C. appeared in a recent issue of the *Bedfordshire Times*:

The Town Hall Committee recalled in its report that six selected architects had been invited to take part in a competition in connection with the proposed new Town Hall. Immediately after the outbreak of war, the committee approached the shire hall committee of the County Council with a view to the suspension or modification of the terms of the competition as it was obvious that during the war it would not be possible to proceed with the schemes for the erection of a new Town Hall and the extension of the Shire Hall.

After conferring with the Assessors, the two committees communicated with each of the selected architects asking whether they would be prepared to take part in the competition subject to amendments relating to fees. One of the amendments is that the competition shall proceed, the dates for questions and for delivering of designs being postponed for a reasonable period. As there would appear to be no prospects of proceeding with the works within twelve months of the award, the selected architect shall be

*As a result of the necessity of economizing paper in war-time, newsagents are unable to keep a stock of journals and periodicals for casual sale. If you wish to make sure of receiving your copy of this JOURNAL in future, you should either place a definite order with your newsagent or subscribe direct to*

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paid, in addition to the £100 fee for the design of each of the proposed buildings submitted by him, the additional sum of £250. If the designs of the same architect are selected for both buildings, he would thus draw £700—if for one building only, the two selected architects would each draw £450.

## GLOUCESTER ARCHITECTURAL ASSOCIATION

It was reported at the annual meeting of the Gloucestershire Architectural Association, held at Gloucester, that building to the value of over £500,000 under the control of its members was stopped owing to the war.

The annual report stated that the Council had given earnest consideration to the serious position caused by the stoppage of work. At the request of the R.I.B.A. and the Building Industries National Council, members were asked to return details of work held up.

Representations had been made to the R.I.B.A. and other authorities in connection with the employment of architects on emergency works.

The report also stated that the Council had under consideration, in conjunction with the C.P.R.E., a scheme for providing standard plans for small houses, for use by builders and others, when conditions permitted, on payment of an appropriate fee. It was intended to issue full particulars shortly.

The officers were elected as follows: President, Mr. V. S. Barnes; vice-president, Mr. F. C. Ravenhill; hon. secretary, Mr. K. Nealon; hon. treasurer, Mr. H. F. Trew; assistant hon. secretary and librarian, Mr. J. J. Smith; hon. auditor, Mr. H. Ellis Moore. Council: Messrs. L. W. Barnard, C. M. Cameron Johnson, R. W. Paterson, S. E. Urwin, J. V. Worsnip, E. W. Mitchell, and J. L. Jones. Representatives on the Council of the Wessex Society: The President and Hon. Secretary (ex officio), Messrs. L. W. Barnard, E. Cole, H. Stratton Davis, R. W. Paterson, Miss J. E. Townsend, Messrs. H. F. Trew, and S. E. Urwin.

## BILSTON'S HEALTH CLINIC

Bilston's new central health clinic, which has been erected in Wellington Road, was formally opened last week by the Countess of Harrowby. The building, which was the subject of an open competition, was designed by Messrs. Lyons, Israel and Elsom.

## IN PARLIAMENT

In the House of Commons on March 4 Sir Frank Sanderson asked the Minister of Supply whether he was aware of dissatisfaction and distress among architects and surveyors because, at the commencement of the war, they were scheduled as a reserved occupation and barred from finding other work, and since that time they have been removed from the reserved list, and have lost the only work open to them; and would he consider using the services of members of these professions on some of the official work now in progress so as in some degree to alleviate the distress.

Colonel Llewellyn, who replied, said that unemployment was not, of course, the province of the Ministry of Supply, but he had heard of the existence of distress amongst architects and surveyors. He did not

think, however, that it was due to the cause mentioned, but to the decline in civil building since the war broke out. It was not the case that surveyors had been removed from the Schedule of Reserved Occupations.

With regard to the second part of the question, there had been some increase in the numbers of architects and surveyors temporarily employed in connection with building work for the Ministry of Supply, and consideration was at present being given to the question of making more extended use of the services of these professional men.

## OBITUARY

H. W. CHATTAWAY

The death has occurred at his home, "Chouette," Balsall Common, of Mr. Herbert William Chattaway. He was 85 years of age. Mr. Chattaway specialized in ecclesiastical architecture, and was responsible for many notable buildings and restorations in the Midlands.

H. M. HAMMICK

The death has occurred of Mr. H. Montague Hammick, eldest son of Mr. H. J. Hammick, of Plymouth, with whom he had been in practice as an architect and surveyor for the past 13 years. He was previously engaged in the architectural department of Devon County Council at Exeter for three years.

## MEETINGS

*Monday, March 11.*—6 p.m. Joint informal meeting with the Institution of Mechanical Engineers, the Institution of Electrical Engineers and the Institution of Civil Engineers. At the Institution of Electrical Engineers, Savoy Place, Victoria Embankment, W.C.2. Discussion on "Emergency Repairs, with Special Reference to Welding."

*Tuesday, March 12.*—8 p.m. Air Raid Protection Institute. At Royal Society of Arts, John Street, W.C.2. "The Factory and A.R.P." By S. A. Mitchell.

*Tuesday, March 12.*—1 p.m. Housing Centre. "The Barlow Report." By F. J. Osborn, Garden Cities Association.

*Wednesday, March 13.*—2.30 p.m. Royal Society of Arts, John Street, Adelphi, W.C.2. "Design and the Retailer." By Harry Trethowan.

*Wednesday, March 13.*—7 p.m. I.A.A.S., 75 Eaton Place, S.W.1. "Decontamination of Building Materials." By Mr. D. Williams. Lecture will be followed by a short talk on control of fires caused by incendiary bombs. No tickets are required. Open meeting, non-members invited.

*Friday, March 15.*—London Society, Lancaster House, St. James's, S.W.1. Annual meeting. 3 p.m.

*Tuesday, March 19.*—1 p.m. Housing Centre. "Evacuation—What is your Solution?" (An open discussion.) Chairman: Miss E. E. Halton.

*Tuesday, April 2.*—1 p.m. Housing Centre. "The Effect of War on the Community Centres Movement." By Major

E. Sandford Carter (Community Centres Committee, N.C.S.S.).

## ANNOUNCEMENTS

All correspondence to the A.A.S.T.A. and "Keystone" should be addressed to: 113 High Holborn, W.C.1 (Telephone: Holborn 7710).

Messrs. Holland & Hannen and Cubitts, Ltd., have left their temporary offices in Wimbledon, and have returned to 1 Queen Anne's Gate, S.W.1.

# Building

## INCOMBUSTIBLE MATERIAL

With a view to minimizing the dangers resulting from possible incendiary bomb attacks of the enemy, active consideration has been given by the A.R.P. Department of the Ministry of Home Security to the development of materials which could be used in the attics and roof spaces of buildings so as to confine and afford protection against the incendiary effect of the bomb. In order to assist in the development of such materials a test has been devised by means of which the performance of materials under incendiary bomb effect may be ascertained.

This method of test, together with the results which should be expected from a suitable material, has been made the subject of a standard in the BS/ARP series, which has just been issued by the British Standards Institution as BS/ARP 27.

It is stated in a note to the Standard that the method of test is one which has been in use for some time at the testing station of the Fire Offices' Committee, and it is indicated that the tests on materials will be made at the Elstree Testing Station on behalf of manufacturers who would like to have their materials examined.

Copies of the standard may be obtained from the British Standards Institution, 28 Victoria Street, London, S.W.1 (price 3d. post free).

## WINDOWS

"The Protection of Windows in Commercial and Industrial Buildings" is the title of a pamphlet (A.R.P. Memorandum No. 12), issued by the Air Raid Precautions Department and published by the Stationery Office, price 4d. This memorandum gives advice on the protection of window openings and roof lights in commercial and industrial buildings. Most of its recommendations are also applicable in public and institutional buildings.

The devices described aim at the protection of the contents of rooms (e.g. machinery) rather than the preservation of glass; the latter will rarely be possible without doing away with the use of windows for admitting light and air. In protecting the contents of rooms there are two aims, namely: protection of the contents against the effects of bomb explosion; the minimizing of the results of glass breakage, such as the penetration of wind and rain.

This Memorandum is not concerned with the protection of personnel. If any window in a commercial or industrial building is part of an air raid shelter within the meaning of the Civil Defence Act, 1939, it must be protected as laid down in the Revised Code (August, 1939), entitled "Air Raid Shelters for Persons working in Factories, Mines and Commercial Buildings." The methods of protection described in this pamphlet which are not specified in the Code may not be taken as alternatives to those in the Code for the purpose of protection in shelters, unless a Ministerial Order sanctioning their use has been issued.

## PROTECTION

Now that many sandbag revetments and other forms of protection have been in position for six months and have endured the rigours of a hard winter, the question of their renewal or replacement has become of interest to those who are responsible for the provision and maintenance of such protection, whether under the Civil Defence Act, or as local authorities.

The matter is dealt with in detail in a pamphlet prepared by the technical services of the Ministry of Home Security, entitled "Notes on the Construction, Maintenance and

Replacement of Sandbag Revetments" (Stationery Office, price 3d.). Of particular interest is the section devoted to the subject of alternative types of protection to sandbag. Figures are given of the relative unit costs of various forms of protection, including brickwork, hollow concrete blocks, etc., as well as sandbagging itself, and it is pointed out that "even without taking account of its lack of durability, the sandbag revetment will be found to compare unfavourably in the first cost with other forms of protection, except as emergency protection."

Technical details are given of alternative types of protection, and such practical details are dealt with as the relative cost of removal of sandbag and other forms of protection, such as brickwork, when no longer required.

## EXHIBITION

An exhibition entitled "Artistry in Brickwork" was opened at the Doncaster offices of the Brick Marketing Co. on Friday last. More than forty types of high-grade bricks were displayed in the form of construction to which they were best suited.

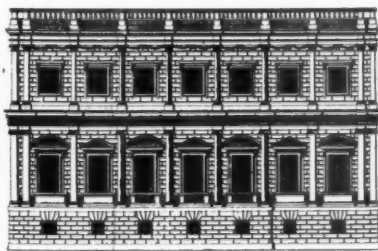
An address was given by Mr. A. Lester Boddington, Chairman of the company. He said:

The groups of companies (The Yorkshire Brick Co., The Yorkshire Amalgamated Products, Ltd., The Askern Brick and Tile Co., etc.) for which we act as distributors, are the largest producers of high-grade bricks in this country, and we are all very proud of the variety and quality of our products—products which have been used all over the United Kingdom with every satisfaction and in buildings which are models of their kind, including the famous "King's House" at Burhill.

Our exhibition is intended to show architects and surveyors in particular and the building trade in general, as well as the public, the beauty of really good brickwork, and the artistic possibilities which exist when the designer and the craftsman co-operate. Our motto is "Artistry in Brickwork."

In view of the slump in the building industry which has been brought about by the war, and the general pessimism prevailing among all sections of the industry, it would perhaps appear a foolish step to hold such an exhibition at this time, but my colleagues and I feel that now is the time to make the public conscious of the many advantages which bricks possess over other forms of building material. We also have two other objects in view, viz.: to keep all our works and quarries in production and our workers in employment, and also to be in the position to assist local authorities in their areas through enemy action as well as render service in the reconstruction of industry and the country when peace once more rules in the world.

The use of bricks in the erection of hutments and temporary buildings of all kinds, such as are projected and are necessary owing to war conditions, in place of timber, would do much to relieve the present shortage of this material, and as much of this has to be imported, would also release large quantities of shipping for the transportation of other essential commodities. It would also go far to assuage the ever increasing hardship in the building industry as a whole. Brick has an advantage over concrete in that shuttering is unnecessary, thus also conserving our timber supplies. I am glad to say that the Government is at last recognizing the position, but up till now the industry of which we form a considerable part has suffered badly from the restrictions placed by the Treasury on local authorities in the matter of expenditure on building and development schemes, and by the failure of the Government to provide a scheme for the insurance of buildings against war risks—a failure which has made it advisable for the building societies to curtail their loan activities.



## ARCHITECTURE AND THE PLAY

[By OSBERT LANCASTER]

IT is a curious paradox and one worthy, perhaps, of some slight attention that, while we live in an age notorious, as we are constantly reminded from a dozen pulpits, for a general and shameless concentration on pleasure, we should so signally have failed in that department of architecture

which is called upon to build its haunts. Whether we subscribe to the doctrines of Corbusier or hang upon the words of Sir Reginald Blomfield, none of us can escape the fact that, with a few, very few, exceptions, the theatres and cinemas built since the war are poor things and, moreover, not even our own, for every age and style from the Ancient Egyptian to L'Art Nouveau has been pillaged to make a Metro-Goldwyn holiday.

However, it is not with the question of the cinema and its decoration that I propose to concern myself, for, like a sensible man, I always endeavour to arrive a minute or two after the programme has started, and leave halfway through the last long fadeout, so that, save in those houses where the audience is condemned to twenty minutes of the elephantine archness of a Wurlitzer recital, I have little or no idea of the nature of my surroundings, but it is as a member of the play-going public that I intend to register my little protest.

At the play the auditorium is never, as at the cinema, in complete darkness, and thus there always exists a subtle and important relationship between the two sides of the footlights. Both the importance and the subtlety of this decorative co-operation was forcibly brought home to me recently on witnessing a revue at a theatre which, although of quite recent date, I had never previously visited. Of the name of the architect and the possible architectural merits of the exterior I am alike ignorant, but the decoration and construction of the interior bore witness to a not altogether happy flirtation with modernism. The circles were so only in name, as they showed no appreciable tendency to curve and extended in practically straight lines from wall to wall parallel with, and at a considerable distance from, the stage. Admittedly this system has many advantages, more people can be accommodated and none condemned to an oblique and neck-twisting point of view, but on the other hand, between the actors and a considerable section of the audience there was now a great gulf fixed, and while in the cinema this would have been wholly immaterial, in the theatre the audience itself, and particularly that part of it that is situated in the cheaper seats, has a part to play, and anything that renders the co-operation between it and the actors more difficult must always be regarded with the gravest suspicion.

The proscenium arch was a bare and undecorated structure, extending its gaunt and concrete blankness in unbroken curves across that part of the auditorium where we were once accustomed to find boxes. The ceiling, austere and colourless, was a grim pall above our heads, where all architectural virtues had been abandoned in a completely unsuccessful effort to solve the problems of acoustics. Perhaps a Duse or a Bernhardt could have triumphed over these factory-like surroundings or maybe, had it been an Aeschylean tragedy and

not an exceptionally amusing revue, they would have proved a positive aid to the dramatic action; but as it was the extremely competent cast seemed to be going through a dress rehearsal in a peculiarly unattractive barn, rather than to be giving a performance in a London theatre. The beauty of the settings, the wit of the songs, found no echo in the megalithic grimness in which they were enshrined, and one found oneself bitterly regretting the gilt cupids, the swags of impossibly luscious fruit, the lyres and the trumpet-blowing muses of an earlier epoch.

The relationship between picture and frame provides an interesting and almost exact parallel; the paintings of Derain and Christopher Wood lose nothing of their contemporary quality through being in frames that have little in common with the products of the fitness for purpose school, rather, they gain from the contrast, and thus these moulded and curving frames of tradition are in fact far fitter for this particular purpose than are those tasteful rectangles of plate-glass and chromium steel so dear to the heart of the modernistic decorator.

In the theatre, however, it is obvious that it is economically impossible to change the frame to suit each successive picture and so the solution must lie in the achievement of some sort of compromise; a scheme of decoration that will automatically adjust itself to a wide variety of stage settings. (It would obviously be a great improvement if theatre magnates would return to the old system of confining the various species of theatrical productions to certain theatres: musical comedies to the successor of the Gaiety, spectacles to the Lyceum, drawing room comedies to the Haymarket, etc.). In the eighteenth century, when the theatre was bound by far more rigorous conventions than it is today, and there existed whole schools of architects and stage designers such as the Bibbiena family, and when, incidentally, the lights were never lowered in the auditorium, the most perfect harmony existed between the two parts of the theatre, and the canvas glories of the stage were echoed in the marble magnificence of the boxes.

The extraordinary completeness of this sense of unity can today be realized only by those fortunate enough to have attended a performance of some eighteenth century play or opera in one of the few remaining untouched theatres of that epoch, such as the Residenz Theater in Munich or the Teatro Comunale at Bologna. Unfortunately, however, Parnassus is now grown overcrowded, and Wagner must be catered for no less than Mozart, Shaw no less than Sheridan, and what is wanted today is some style of decoration that is not so frivolous as to prove inadequate as a frame for the collapse of Valhalla nor so austere that it will inevitably kill the humour of Figaro and the fantasy of the Swan Lake; something that can accommodate the didactic soliloquies of both

Mr. Shaw and Mr. Robey. Meanwhile, let us guard jealously what we have already got and see to it that such theatres as Covent Garden, about whose approaching dissolution rumours are so constantly rife, which have both dignity and a certain degree of adaptability, are carefully preserved—at least until such time as we can face the prospect of their substitutes with tolerable equanimity.

## ARCHITECTURAL ASSOCIATION

An ordinary general meeting of the Architectural Association was held last week at 36 Bedford Square, W.C.1, with Mr. J. Murray Easton, F.R.I.B.A. (President), in the chair. Major-General G. B. O. Taylor, C.B.E., Director of Fortifications and Works, the War Office, delivered an address on the "Problem of Providing Accommodation for the Army on the Outbreak of War."

The lecturer said that about April, 1939, the militia system had been inaugurated when the Secretary of State for War laid down that the standard of accommodation was not to be less than that of the regular soldier, and further that every man should be properly housed before winter. This gave about five months in which to provide complete accommodation for about 100,000 men. There were no completed designs for the type of hatted camps required, no layouts, no bills of quantities, and scales and schedules of accommodation were still in active preparation. It was obvious that any form of competitive tendering on a lump sum or schedule of quantity basis was hopeless because it would have taken two or three months to prepare the sets of contract documents on which tendering could have been invited. The work was therefore allocated to selected contractors on a prime cost plus fixed profit basis, the only element of competition being in the amount of fixed profit. Six weeks of almost continuously wet weather had a disastrous effect on the work: there was a serious loss of time and costs went up by leaps and bounds. A further difficulty was that of obtaining workmen, especially carpenters; and to reduce the number required on a site a sectional form of hut was adopted, fabricated in various shops and assembled on the site.

On the outbreak of war, air defences were manned at full strength, the Territorial Army was called up and the Regular Army mobilized. This involved the calling up of all reservists from civil life. The first step was to apply war scales throughout. In brief, this meant housing men at 45 ft. super. instead of 60 ft. super.; and this was made applicable to all military barracks in permanent occupation as well as to militia camps. Territorial units, apart from those employed on air defence, could remain in billets or hired or requisitioned premises for some time, but in other directions no such interval was permissible.

The air defence of the country involved the provision of accommodation for well over 100,000 men scattered all over the country in battery positions, searchlight posts, and so on. Apart from accommodation for the men, gun emplacements and their accompanying buildings had to be constructed, vehicle, ammunition and supply depots of various kinds built, and so forth. The main difficulty was the excessive dispersion of the job and the innumerable small packets into which it was divided. Again, most of the organization was mobile, and this demanded a form of portable hut which could be easily erected, taken down, transported and re-erected.

Apart from air defence, the building programme comprised: (1) the provision of a large number of training centres; (2) the provision of a number of training areas in which larger formations could assemble for collective training prior to going overseas; (3) the provision of practice camps for training in particular

weapons, and (4) the provision of additional hospital accommodation.

Under war conditions the mathematical regularity of the military camp had to be modified, the reduction of the air target presented being the chief consideration. The layout was so arranged that no bomb aimed at any collection of huts automatically hit another collection because this was in the line of descent of the bomb. As to design, there was an enormous amount of repetition work. Units were the same strength everywhere, and design was limited to the production of standard designs for every building used in the Army. For hutting, the primary considerations were simplicity, economy of material, particularly where mass production was concerned, rapidity of erection and general cheapness. Traditional materials were timber and corrugated iron.

The war had started with timber stocks far lower than they had ever been at that time of the year. The principal source of supply, the Baltic, was likely to prove difficult to maintain; Archangel became icebound early in the winter, as also the eastern ports of Canada, while British Columbia required three months or more for the round trip. Hutting was required for England and for the expeditionary force in France.

It was decided that huts for France should be of steel and corrugated iron with such timber as was necessary, and those for England in various substitutes for timber. For France an improved pattern of Nissen hut had been decided on. It was cheap (costing about £9 per man accommodated), portable, could be erected by unskilled labour, and was fairly durable.

So far as concerned this country the original intention had been to build in timber, and when this idea had to be abandoned various alternative methods were considered and tried. One was an 8-in. hollow wall with 3-in. on edge brick work. Concrete, terracotta, gypsum blocks, paving slabs, slate, cemented on wall board and so forth, had been tried, and for floors concrete covered with cheap linoleum. Roofs had been very difficult. It had not been found possible to produce a design requiring neither timber, steel nor centering for its production. When timber was used it was as wooden purlins with asbestos sheeting. Steel roof types comprised: (1) steel trusses, timber or steel purlins and sheeting; (2) a special form of stamped steel truss and purlin; and (3) reinforced concrete roofs in the form of reinforced concrete trusses and slabs.

Substitute materials lending themselves to a timber technique had been tried, but none had been entirely suitable.

The lecturer gave particulars of the various methods of contracting that had been adopted. Where prime cost was the basis the Government had endeavoured to set up controls by (1) the selection of only large and well-established firms of contractors; (2) a watch and control exercised by leading firms of surveyors, and (3) a final audit by Government auditors. But the method met with only qualified success.

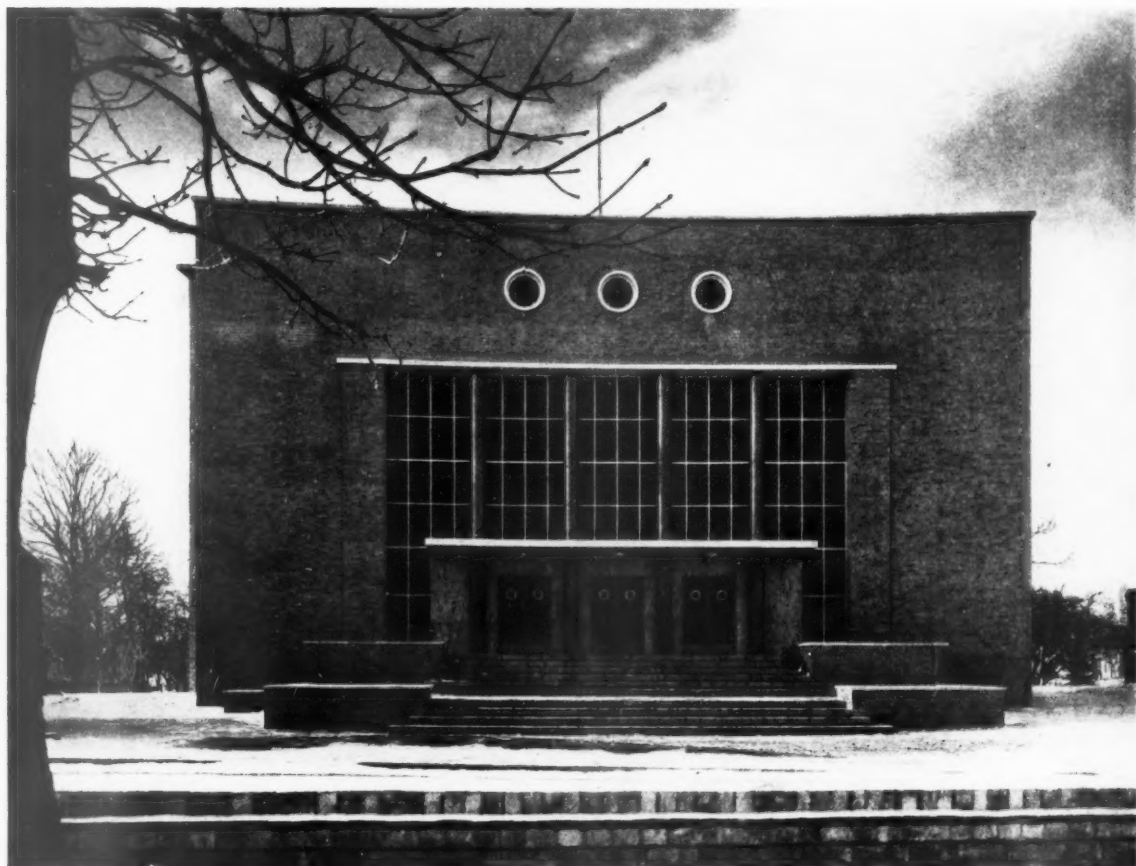
Another series of contracts was placed on a target cost form. In this sort of contract the estimate or target cost is fixed for the job, and the contractor gets a fixed fee, say, 4 per cent., on the target cost and a bonus of perhaps 25 per cent. on any saving. In practice the snag to this form of contract was that the work had to be got on with at once while the target cost was being established by agreement between the War Department surveyors and those of the contractor. There was so much delay in fixing these mutually agreed costs that the contractor's prime cost tended to become the target cost, and thus the contractor lost any opportunity of earning a bonus.

A modified form of target contract was tried with more success, but the final form of contract was virtually a lump sum one. The tendering was on a schedule of quantities for the whole of a camp instead of on a detailed bill for each individual building in the camp, the reason being that preparing these detailed bills would delay the starting of the work. It would be a simple matter to prepare the necessary detailed quantities for each building during the progress of the work, and to transfer the rates quoted by the contractor to those bills.

A discussion then followed.

## CINEMA AT TOWCESTER, NORTHANTS

DESIGNED BY SIR JOHN BROWN AND A. E. HENSON



The main front.

**GENERAL**—Clients required a first-class modern cinema, with ample room for patrons and also good sight lines to screen everywhere. The scheme had to include a private box entered by a separate stairway.

**SITE**—In Watling Street, Towcester. The car park for patrons is on the opposite side of the street.

**CONSTRUCTION**—Walls: auditorium, solid brick; remainder, reinforced concrete frame with brick filling. Roof: auditorium, steel decking; projection roof, reinforced concrete. Internal walls, brick. Floors: auditorium and entrance foyer, concrete, reinforced with metal fabric; balcony, balcony foyer, projection room, etc., reinforced concrete.

**EXTERNAL FINISHES**—Front elevation and returns to auditorium, lbstock facing bricks; auditorium, rustic flettons. Windows: steel casements, with reconstructed stone (Weldon finish) treads, and brick on edge cills; windows on side elevation are glazed with amber double-rolled cathedral glass; window to private staircase, and circular windows to front elevation, are glazed with green double-rolled cathedral glass. The large main window, entrance doors and window to main staircase are glazed with double sheets of glass. The main window has inside glazing of amber double-rolled cathedral glass, silvered and having lead backing, with similar plain glass facing the exterior. The edges are sealed with gummed brown paper; this means of glazing was adopted to comply with the "Black-out" Regulations. Concrete columns are cased with sheet bronze. Walls, under outside canopy, adjoining the entrance doors, are faced with thin slabs of Sienna marble.



The main entrance.



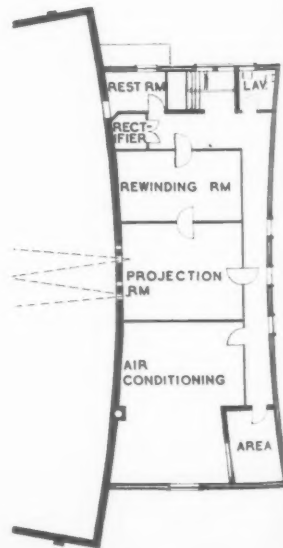
GROUND FLOOR, BALCONY AND  
(BELOW) PROJECTION-ROOM PLANS



Left, one of the two display boards on either side of the main front.

PLAN—The provision of a private staircase necessitated a slight departure from the usual planning of a cinema.

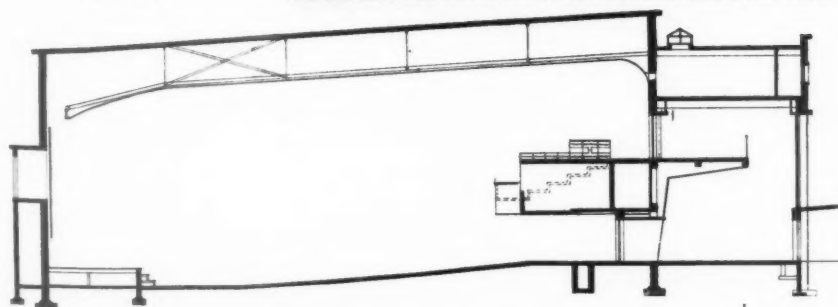
INTERNAL FINISHES—Walls and ceilings : auditorium, main foyer, pay-box, cloak room, manager's room and balcony foyer are plaster finished with plastic paint, stippled in red and gold ; private staircase is similarly treated but stippled in green. Lavatories : terrazzo tiles up to top of doors, paint over. Projection and rewinding room : green paint. Staff room and staff lavatories, etc. : stone-coloured paint.





Entrance foyer

SECTION



## INTERNAL FINISHES—(continued)

Floors: Main and private staircases and balcony foyer: carpet on granolithic screed. Auditorium, balcony, pay-box, cloak room and manager's room: deal boarding, carpeted; entrance foyer, terrazzo tiles laid diagonally; lavatories, terrazzo; private staircase lobby and lavatory, reconstructed Hopton wood and black tiles laid diagonally; projection room and rewinding room, concrete tiles, light stone finish.

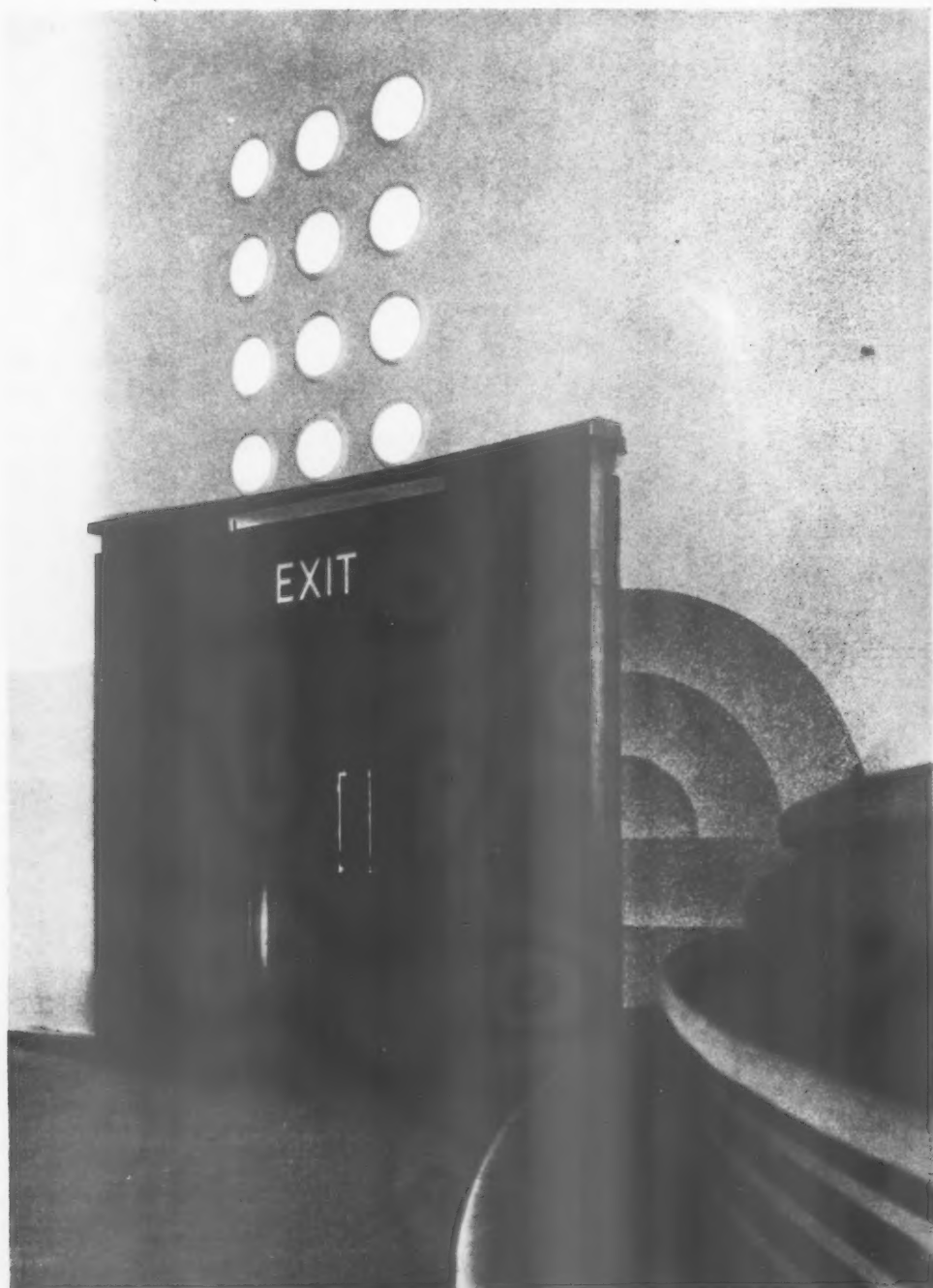
CINEMA AT TOWCESTER, NORTHANTS

• BY SIR JOHN BROWN AND A. E. HENSON

**INTERNAL FINISHES (cont.)**—The following are executed in fibrous plaster : Auditorium : combined ceiling lighting trough and conditioned air inlets ; extract grilles at sides of the screen ; lighting troughs over exit doors (near screen end) ; extract grilles along front of balcony ; lighting troughs on underside of balcony ; screen walls to private box ; columns by exit doors (near screen end) ; coat of arms on face of private box ; ducting in private box and balcony foyer. Foyers : low relief decorations on walls of entrance foyer and balcony foyer, and lighting troughs under inside canopy of entrance foyer. Balcony foyer railing and railing on top of the private box is iron, painted in gold and black cellulose paint, with an oak handrail on top. Pay-box and cloakroom glazing is framed in stainless steel. Doors : Flush, painted, with the following exceptions : doors to auditorium, lavatories, manager's room, and balcony are flush-finished both faces with polished stainless steel ; exit doors and surrounds, by stage, walnut veneer ; entrance doors, steel, with bronze cellulose finish. Pay-box and cloakroom counters have oak tops, deal framing, and are faced with plywood covered with polished stainless steel.

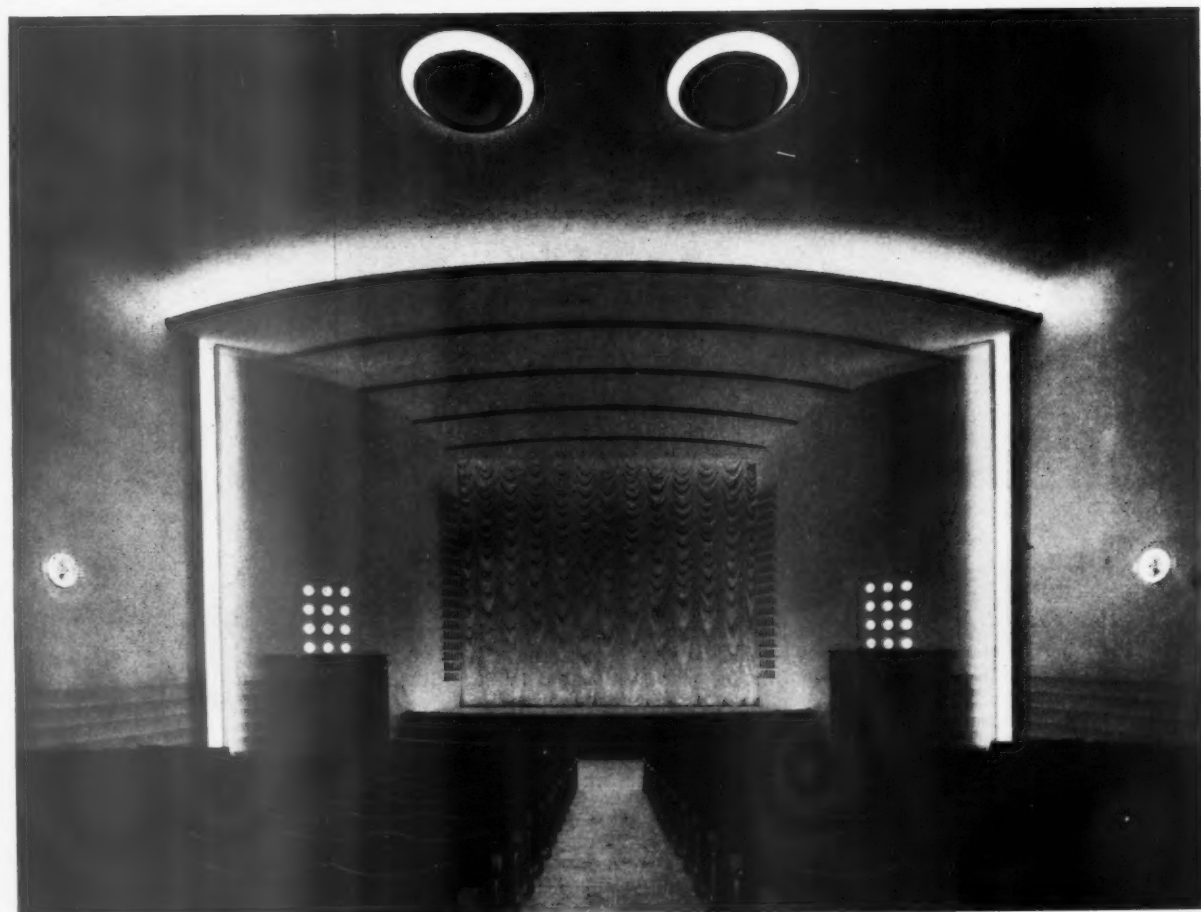
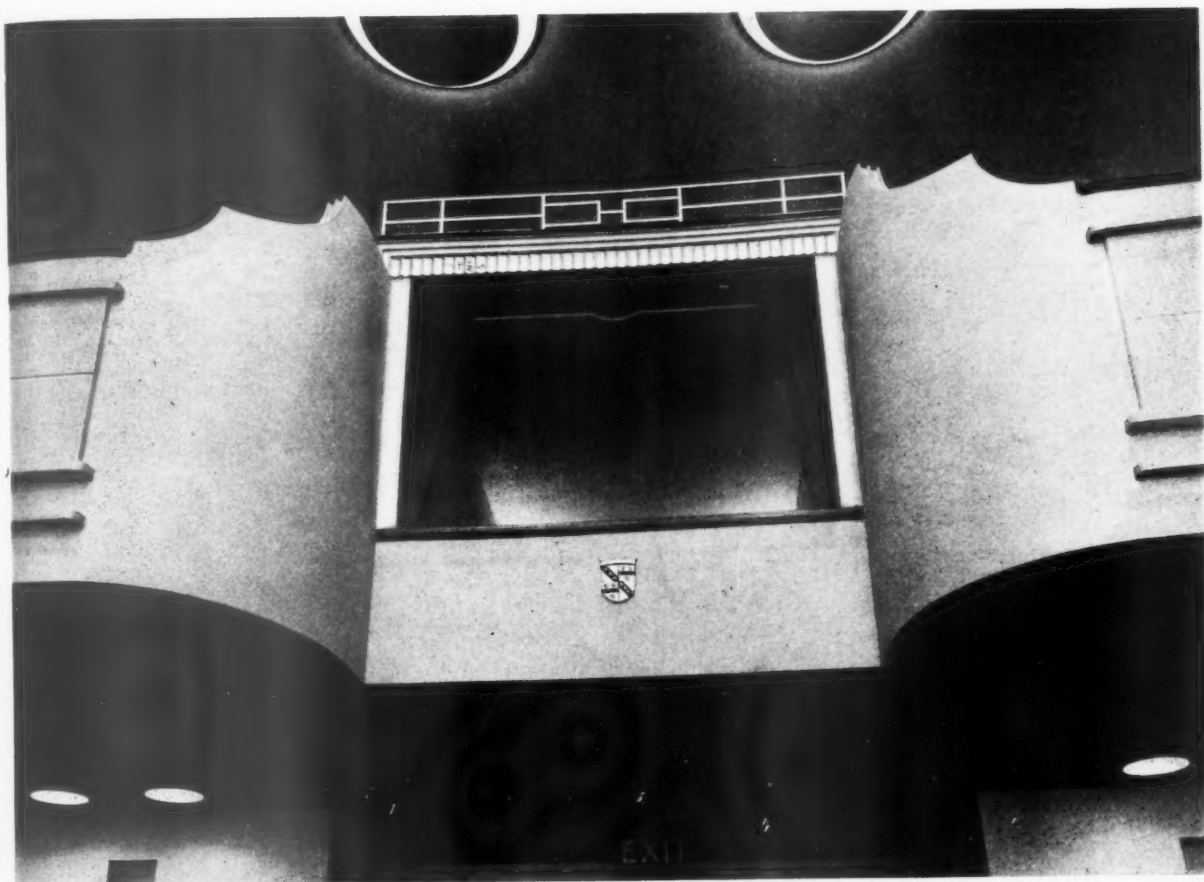
*Below, exit door in auditorium. Facing page : top, the private box ; bottom, auditorium.*

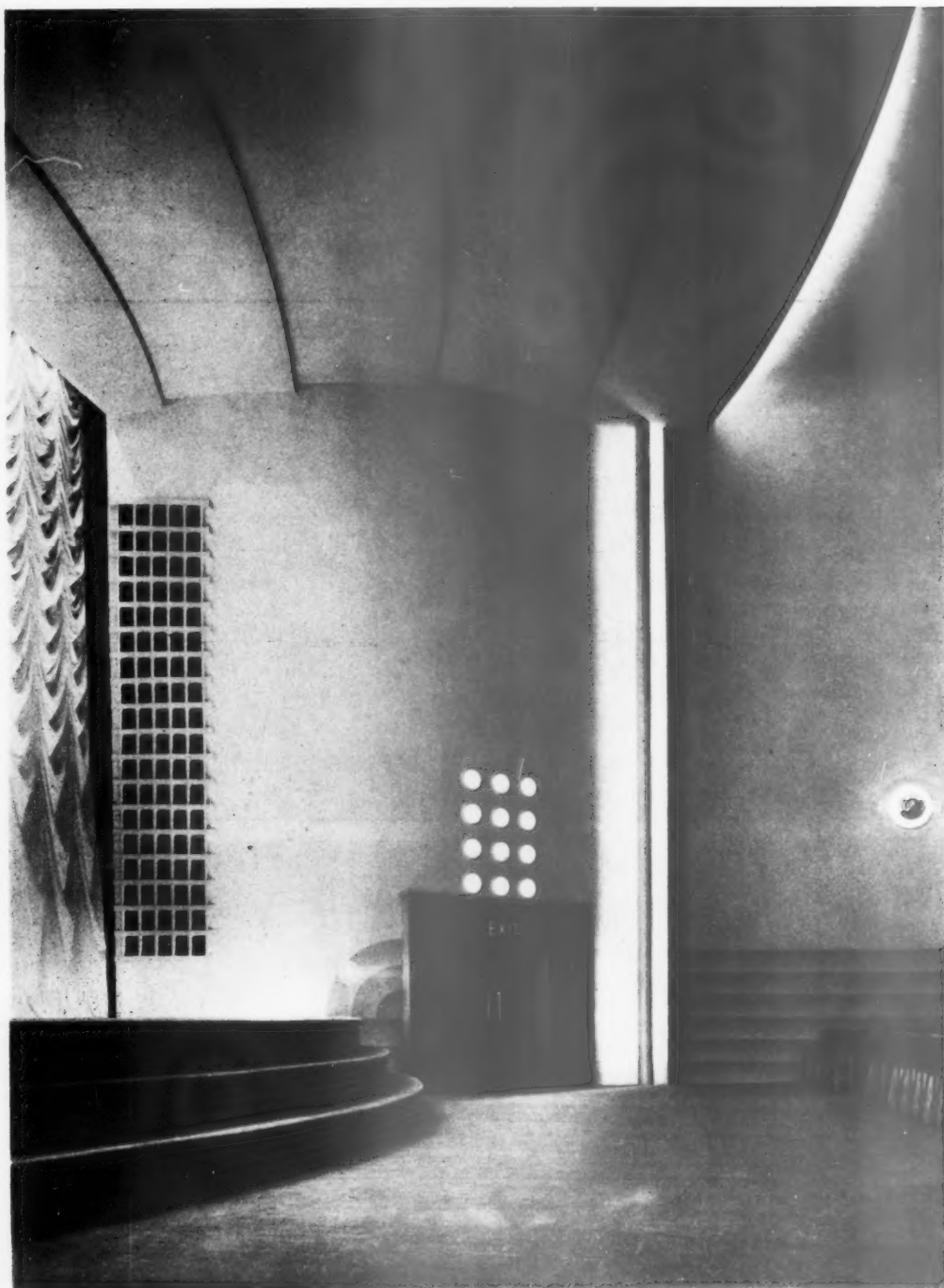
**CINEMA AT TOWCESTER, NORTANTS**  
*DESIGNED BY SIR JOHN BROWN AND A. E. HENSON*



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*Side wall of the auditorium.*

**SERVICES**—Air-conditioning plant, supplying conditioned air to auditorium ceiling at the screen end, the private box and the foyer. These separate supplies are independently controlled by thermostats. Radiators in main rooms, not controlled by the air-conditioning plant; radiators in the private box and radiators and heating pipes at the screen end of the auditorium. Heating is provided by a sectional boiler, oil fired. The ducting is either of brick or of galvanized sheet steel, insulated where it is in the roof space.

General contractors were Underwood and Weston; for list of sub-contractors, see page xxii.

CINEMA AT TOWCESTER, NORTHANTS  
DESIGNED BY SIR JOHN BROWN AND A. E. HENSON

# LETTERS

## Architectural Criticism

SIR,—Your footnote to my letter in your issue of February 22 seems to me to be in complete agreement with my point. Apparently, in your view, it is "aesthetics" and not all the other things that the architect is really interested in. Do you want the public to think so, or ought you not to be keeping it dark?

ONLOOKER

## Building in War-time

SIR,—You will be interested to know that on Thursday, February 29, a meeting of representatives of all branches of the building industry was held at the House of Commons. The meeting was well attended by Members of all parties, and the objects considered were:—

(a) How to enable the building industry, both in whole and in part, to do its utmost to help win the war;

(b) How to achieve this as expeditiously and economically as possible, and with the least injury to the industry; so that, when the war is over, the most important industry will be available for reopening the arteries of trade as it alone, among all our industries, is capable of doing by housing schemes, schools, hospitals and so forth.

The technical speakers included: Mr. Howard Robertson, Vice-President of the Royal Institute of British Architects; Mr. Oswald Healing, President of the Chartered Surveyors' Institution; Mr. George Hicks, M.P., President of the National Federation of Building Trades' Operatives; Mr. H. J. C. Johnstone, President of the Building Industries National Council; Mr. J. L. Gibson, B.A., of the Lead Industries National Council; Major Lefebure, a Director of Imperial Chemical Industries; Mr. F. Leslie Wallis, a Member of the National Federation of Building Trades' Employers; and Mr. Sydney Tatchell, a Fellow of the Royal Institute of British Architects.

A considerable number of questions were put and answered by the speakers, and it was decided that anyone having any practical suggestions should send them at once to Mr. H. B. Bryant, The Building Industries National Council, 85 Gloucester Place, London, W.1, who will tabulate these suggestions. A résumé will then be made which will be circulated to the interested Members of Parliament.

Later, another meeting will be called at which Members of the House will consider the next step to be taken so that the industry may be helped to the utmost in its present serious situation.

If any of your readers have any practical suggestions to put forward,

I would like you to draw their attention to the fact that Mr. Bryant is collecting this data so that we may obtain the maximum amount of beneficial information at the earliest possible moment.

The subject covers such a wide field, and the possibilities of constructive advice are so unlimited, that any attention you may be able to draw to the effort that is being made will, I am sure, be most valuable.

ALFRED C. BOSSOM,

F.R.I.B.A., M.P.

Carlton Gardens, S.W.1

## National Planning Council

SIR,—The conference initiated by the Housing Centre and held at the R.I.B.A. last month was an undoubted success in so far as the formation of a National Planning Council was approved by the delegates.

During the past two and a half weeks, however, one has continually heard from all sides a sense of disappointment that the constitution of the Council was "cut and dried" and presented to the Conference as a *fait accompli*. The delegates had no opportunity of saying other than "Yea" or "Nay." Truly, a half-hour's discussion was allowed—but was that adequate for the purpose? One was unpleasantly reminded of von Ribbentrop hurriedly reading an important document in German to the British Ambassador. A list of names was read to the Conference, a show of hands called—and it was all over. Was that the only purpose for which such a gathering was convened?

One does not doubt the integrity and ability of the nucleus Council members, but one cannot avoid a sense of misgiving about the method employed to elect them. Were the delegates not trusted to nominate prospective members for ballot? It is notable that a number of most worthy organizations such as the National Adult School Union (the importance of whose work was referred to by Mr. Henry Morris), already doing a practical job of work where it is needed, have not been afforded representation. Who can assure that such useful institutions will ever have a representative on the Council? When and where will it meet? Shall we ordinary human beings ever know what, if anything, it is doing? Will the high hopes of four months ago ever be justified? No one apparently knows. No one knows whether or not individuals such as myself with eminently useful experience in slum-clearance work will be allowed to make the altruistic contribution we so much desire. There are many useful folk willing and ready to give of their best in any forward, constructive effort today, but there seems little hope that their contribution will be accepted.

Lord Horder's suggestion that in six months' time the delegates should be called together to consider a report of

the Council's activities was the only reasonable and democratic contribution to the whole affair, but we have no guarantee that even this suggestion will be taken. The whole business seems shrouded in a cloak of autocracy and uncertainty. A National Planning Council with apparently no planned organization for its own effort. Is it just one more committee of experts already overworked and insulated by a well-shielded professionalism from the life and suffering of the people it is our duty to serve?

One would like to see set up a group of working parties or committees each consisting of men and women pre-eminently suitable for tackling their particular problem. Each committee to be responsible to the National Council in much the same way as the many social service bodies doing the job "out in the field" are represented on the National Council of Social Service.

Without some such organization, one fears the new Council will prove unwieldy, and abortive. For the sake of the community and those sections of it which have a special claim on us architects, our future national expression and, last but not least, the architectural profession itself, we hope that this initial step of a conference may develop into an effective, democratic organization amply justifying the altruistic hopes of the delegates.

GUY METCALF

Talbot House, E.C.

## Post-War Paradises

We reprint below a letter which was published last week. Astragal replies to Mr. R. Gardner-Medwin on page 250 of this issue.

SIR,—I was disgusted with Astragal's weary complaints last week about "post-war paradises." Commenting on the historic meeting of 150 representative technicians at the R.I.B.A. to discuss the problem of social replanning after the war, he complains that when a *discussion group*, tackling a great subject of this kind, turns itself into a *group with a programme*, he for one "feels great discomfort."

This strikes me as a most un-A.J.-like attitude. Heaven save us from discussion groups in these days unless they do actively organize themselves as groups with a programme.

But Astragal has other extraordinary complaints which he cannot be allowed to get away with. He complains that—

"An obsession with ideas and schemes of the largest possible size has spread through societies, committees, schools and individuals. Students will hardly accept a scheme unless it involves the replanning of a continent."

The second sentence, of course, is peevish exaggeration. But as for the "obsession," let us welcome it as one of the few encouraging signs of the times.

"All the time, everywhere (wails Astragal), societies, groups and committees are setting cheerfully about some research which, for its tolerable performance, would require the full-time, life-long labour of half-a-dozen exceptionally able men."

True. But *somebody* has got to do the groundwork, and let us urge for our worth that the half-dozen exceptionally able men should be employed straightway to give their full-time, life-long labour to the job. What are they doing now?

I shall have to quote (and demolish) one more paragraph: "Most people agree vaguely with the principles of Territorial Planning, National Roads, Federal Union and all that. What they need to reinforce their loyalty is just one small bit of practical achievement towards realizing any one of them."

Fair enough. But if we look at the United (and democratic) States of America, we shall see more than a "small bit" of practical achievement in *all* of these three principles: Territorial Planning, National Roads and Federal Union. Our job is to point unceasingly to these embryonic achievements and persuade the people of this country, and their representatives, that the planned world we visualize is not a distant ideal but an immediate practical proposition.

In this season of anguish people are ripe for propaganda. Let us see that they get the enlightened kind.

R. GARDNER-MEDWIN

Old Coulston,

# CHURCH AT NEWBRIDGE

DESIGNED BY P. D. HEPWORTH



**GENERAL**—Roman Catholic church and priest's house at Newbridge, Monmouthshire. The site lies below the level of the adjoining road. Seating is provided for 175 persons.

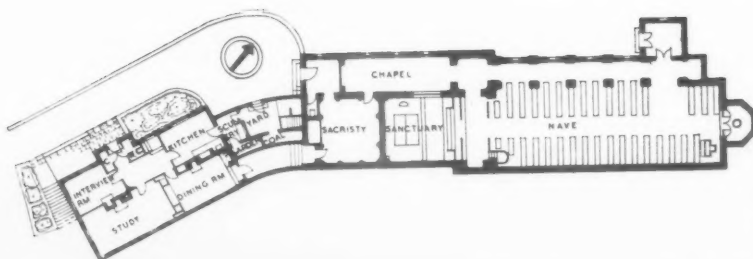
**CONSTRUCTION AND EXTERNAL FINISHES**—Walls of both buildings are cavity construction. Church has two skins of 9 in. brickwork with a 3-in. cavity. External walls of the church and priest's house are rendered and finished in a light cream colour above a tarred plinth. Retaining walls, gate piers and paving are of local stone. Roofs are covered with grey pantiles.

**INTERNAL FINISHES**—Walls are plastered and finished with a rough surface ; walls of the sacristy are in oak ply panelling. Floor is of wood composition blocks. Dela-bole slate has been used for the paving in the sanctuary and baptistry, the slabs being wax polished. The pulpit, font and altars are executed in travertine. Screen and electric light fittings in the nave are of wrought iron.



Top, looking along north-west front ; above, view from south-east.

GROUND FLOOR PLAN



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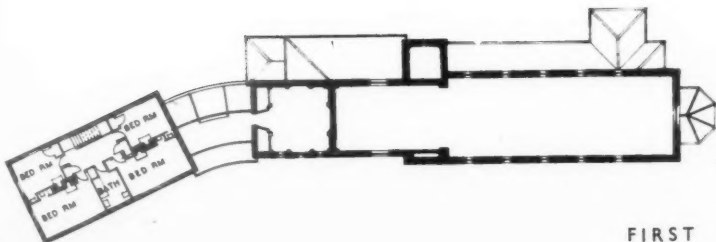
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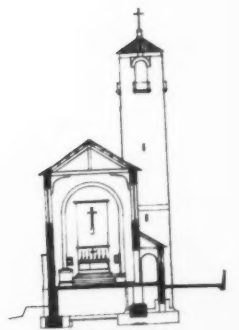
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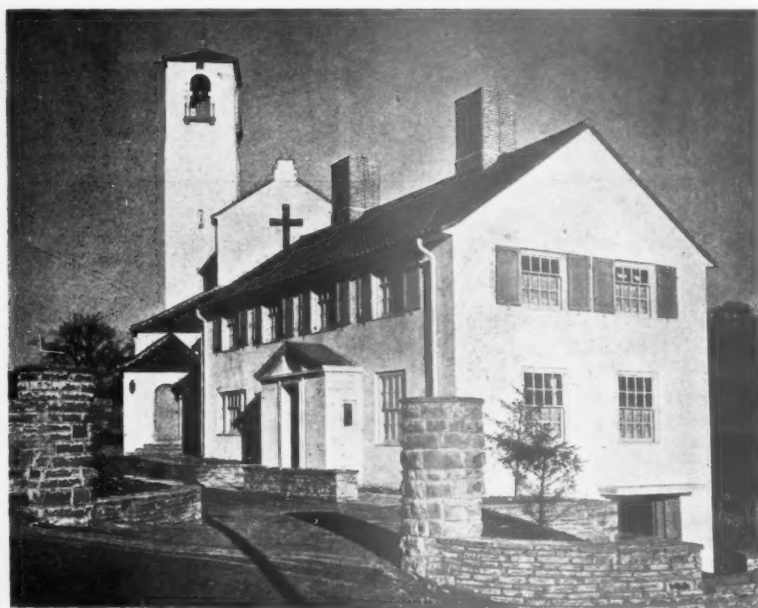


FIRST FLOOR PLAN



SECTION

## CHURCH AT NEWBRIDGE, MONMOUTHSHIRE

DESIGNED BY  
P. D. HEPWORTH

COST—Church, 1s. 4½d. per ft. cube. Priest's house, 1s. 9d. per ft. cube.

The general contractors were J. G. Thomas and Sons; for list of sub-contractors, see page xxii.

Left, the priest's house.

## INFORMATION SHEETS: INDEX

Following sheets have been published since Index I—700.

- |   |   |   |
|---|---|---|
| 701 : Tile Hanging                                      | 726 : Metalwork                             | 750 : Wall Facing Materials and Wall-boards |
| 702 (420 revised) : Fixing Insulating Board             | 727 : Waterproof Jointing and Bedding       | 751 : Structural Steelwork                  |
| 703 : Sheet Metals                                      | 728 : Timber Construction                   | 752 : A.R.P.                                |
| 704 : Plan Elements                                     | 729 : Steelwork                             | 753 : Hardware and Ironmongery              |
| 705 : Metal Work  | 730 : Wall Facing Materials and Wall-boards | 754 : Carpentry and Joinery                 |
| 706 : Plan Elements                                     | 731 : Metalwork                             | 755 : Structural Steelwork                  |
| 707 : Furniture Layout                                  | 732 : Concrete Construction                 | 756 : Metalwork                             |
| 708 : Plan Elements                                     | 733 : Structural Steelwork                  | 757 : Carpentry and Joinery                 |
| 709 : Flue Construction                                 | 734 : Metalwork                             | 758 : Roofing                               |
| 710 : Natural Lighting                                  | 735 : Plumbing                              | 759 : Structural Steelwork                  |
| 711 : Glass and Glazing                                 | 736 : Structural Steelwork                  | 760 : Carpentry and Joinery                 |
| 712 (109 revised) : Quarry Tiles                        | 737 : Structural Steelwork                  | 761 : Automatic Stokers                     |
| 713 : Glass and Glazing                                 | 738 : Metalwork                             | 762 (483 revised) : Flue Linings            |
| 714 : Metalwork   | 739 : Plan Elements                         | 763 : Structural Steelwork                  |
| 715 (106 revised) : Hot Water Radiators (Pressed Steel) | 740 : Timber Construction                   | 764 : Plumbing                              |
| 716 : Furniture Layout                                  | 741 : Structural Steelwork                  | 765 : Structural Steelwork                  |
| 717 : Metalwork   | 742 : Metalwork                             | 766 : Sanitary Equipment                    |
| 718 : Flooring Materials                                | 743 : Wall Finishes                         | 767 : Carpentry and Joinery                 |
| 719 : Plumbing  | 744 : Waterproofing and Damp-proofing       | 768 : X-Rays                                |
| 720 : Water Heating                                     | 745 : Structural Steelwork                  | 769 : Structural Steelwork                  |
| 721 : Wall Facing Materials and Wall-boards             | 746 : Metalwork                             | 770 : Structural Steelwork                  |
| 722 : Roofing   | 747 : A.R.P.                                | 771 : Carpentry and Joinery                 |
| 723 : Metalwork   | 748 : Waterproofing and Damp-proofing       | 772 : Structural Steelwork                  |
| 724 : Timber Construction                               | 749 : Metalwork                             | 773 : Structural Steelwork                  |
| 725 : Sanitary Fittings                                 |   | 774 : Structural Steelwork                  |
|   |   | 775 : Structural Steelwork                  |
|   |   | 776 : Structural Steelwork                  |

X

/all-



## THE ARCHITECTS' JOURNAL LIBRARY OF PLANNED INFORMATION

## TYPES OF MECHANICAL CONNECTIONS IN RELATION TO LOAD TRANSMISSION :

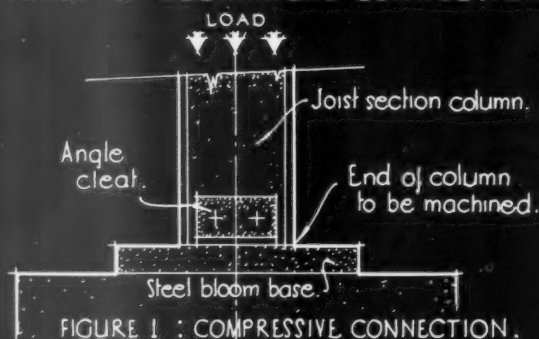


FIGURE 1 : COMPRESSIVE CONNECTION.

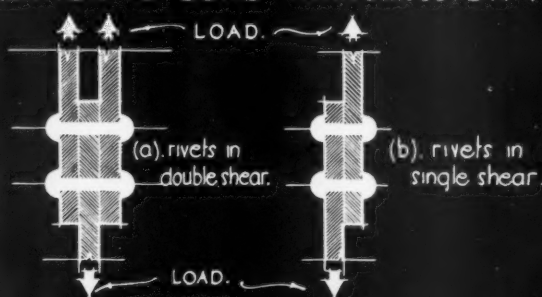


FIGURE 2 : SHEAR CONNECTIONS.

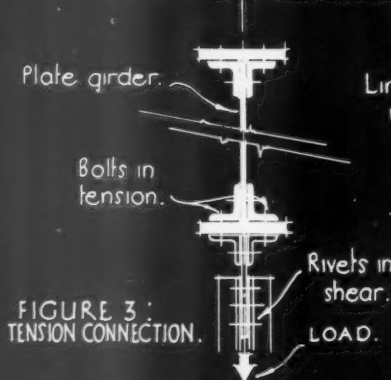
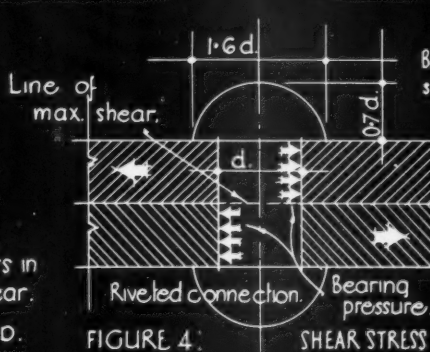
FIGURE 3 :  
TENSION CONNECTION.

FIGURE 4.

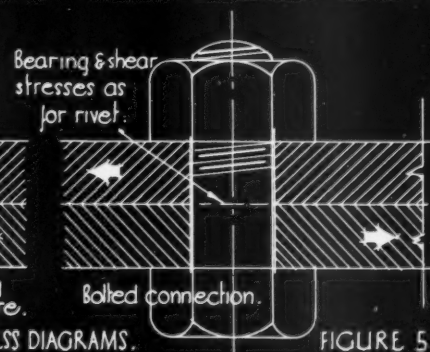


FIGURE 5.

TABLE GIVING MAXIMUM LOAD CARRYING CAPACITY OF RIVETS OR BOLTS IN SINGLE SHEAR.

Diameter of bolt or rivet. COL. 1.	Type. * COL. 2.	L O A D I N T O N S							
		Single Shear. COL. 3.	Tension. COL. 4.	Bearing on plates, etc. of thickness of					
				3/8 IN. COL. 5.	1/2 IN. COL. 6.	5/8 IN. COL. 7.	3/4 IN. COL. 8.	7/8 IN. COL. 9.	1 IN. COL. 10.
1/2 IN.	a.	1.178	0.983	2.23	3.00	3.75	4.50	5.25	6.00
	b.	0.981	0.707	1.87	2.50	3.12	3.75	4.37	5.00
	c.	0.785	0.607	1.50	2.00	2.50	3.00	3.50	4.00
5/8 IN.	a.	1.940	1.380	2.92	3.75	4.68	5.62	6.56	7.50
	b.	1.533	1.104	2.34	3.12	3.90	4.68	5.46	6.25
	c.	1.227	1.016	1.87	2.50	3.12	3.75	4.37	5.00
3/4 IN.	a.	2.650	1.987	3.37	4.50	5.62	6.75	7.87	9.00
	b.	2.208	1.590	2.92	3.75	4.68	5.62	6.56	7.50
	c.	1.767	1.519	2.25	3.00	3.75	4.50	5.25	6.00
7/8 IN.	a.	3.607	2.706	3.94	5.25	6.56	7.87	9.18	10.50
	b.	3.005	2.165	3.28	4.37	5.46	6.55	7.65	8.75
	c.	2.404	2.108	2.63	3.50	4.37	5.25	6.12	7.00
1 IN.	a.	4.712	3.534	4.50	6.00	7.50	9.00	10.50	12.00
	b.	3.927	2.827	3.75	5.00	6.25	7.50	8.75	10.00
	c.	3.141	2.770	3.00	4.00	5.00	6.00	7.00	8.00

NOTE { \* a — shop rivets ; b — field or site rivets ; c — black bolts.  
 (i) For shear, turned bolts are equal to shop rivets ; for tension, turned bolts — black bolts.  
 (ii) For proportions of rivets and bolts, see B.S.S. N° 92 (1919), 190 (1924), 275 (1927), 28 (1932).

*Issued by Braithwaite & Co., Engineers, Ltd. Compiled by C.W. Hamann, Consulting Engineer.*

INFORMATION SHEET : STEEL FRAME CONSTRUCTION : 19  
 SIR JOHN BURNET TAIT AND LORNE ARCHITECTS ONE MONTAGUE PLACE BEDFORD SQUARE LONDON WCI

## INFORMATION SHEET

• 777 •

### STRUCTURAL STEELWORK

**Subject :** Standard Connections, Splices and  
Bases : I—Analysis of Connections

**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 adjoining 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 nineteenth of the series, and deals with types of mechanical connections for steel sections in relation to load transmission. Welded connections will be discussed in a separate group of Sheets.

**Load Transmission :**

Connections between different members of a steel construction depend upon the loads which have to be transmitted from one member to the other. Such transmission can take place in three ways, and accordingly in this and the following Sheets connections will be shown divided into the following groups :—

(1) Compressive connection (Fig. 1). The load is carried directly from one member to another and the connection serves mainly for the purpose of fixing the different parts of the steel structure together.

(2) Shear connection (Fig. 2, (a) and (b)), in which the force is transmitted by means of rivets or bolts, stressed in shear.

(3) Tension connection by means of rivets or bolts which are stressed in tension (Fig. 3).

**Grouping :**

Of the three groups of connections listed above, the first (compressive connections) is the most economical, wherever it is applicable. Where group (1) (compressive) connections cannot be employed, however, those in group (2) (shear) are preferable to those in group (3) (tension), which should be used only in special cases.

**Shear Connections :**

For the transmission of shear (group 2), the following three connections may be used :—

(a) Rivets (Fig. 4).

(b) Turned bolts of driving fit (Fig. 5).

(c) Black bolts (Fig. 5).

Black bolts form the cheapest and simplest connections, but are less reliable statically. Rivets are used mostly in the workshop, while at the site they are employed on large buildings only (otherwise the cost of equipment would be too heavy). For smaller structures the use of turned bolts is cheaper than that of rivets. Turned bolts are more reliable than black bolts, as they fill the bolt hole properly.

**Loading :**

The load which any rivet or bolt is allowed to carry depends on :—

(a) The diameter of the rivet or bolt.

(b) The width of the material against which the rivet or bolt presses.

(c) The number of sections in which the shear acts.

If a rivet is to transmit a certain number of tons, care should be taken that it is of sufficient section to withstand the shear as well as the bearing pressure—or in other words every rivet should be checked with reference to bearing pressure as well as shear—and the smaller transmitting capacity is to be considered as the actual capacity.

The bearing pressures for different thicknesses of mild steel plates are given in columns 5, 6, 7, 8, 9 and 10 of the table on the front of this Sheet. If a rivet is stressed in single shear, its transmitting capacity can be taken from column 3 of the table. If the shear is distributed to two, three or four sections—that is, if the rivet is stressed in double, treble or quadruple shear—this capacity should be multiplied by two, three or four respectively.

A rivet or bolt which is to transmit tension has a transmitting capacity as given in column 4 of the table, but the following remarks should be kept in mind for rivets and bolts in tension.

1. Rivets have initial and incalculable tension stresses owing to their cooling after being driven. Any tensile stresses due to loading would be additional and such rivets are, therefore, apt to be overstressed. Although the regulations permit the use of rivets in tension, they should be used in this way as little as possible.

2. There is no difference between black bolts and turned bolts as far as tension is concerned, but every bolt in tension should be secured by a double nut.

**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, and 776.

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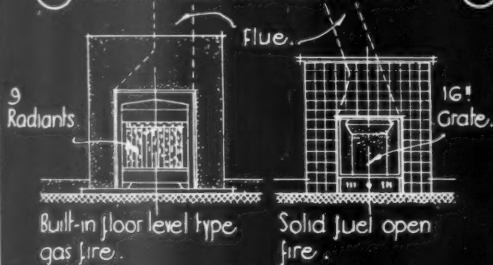


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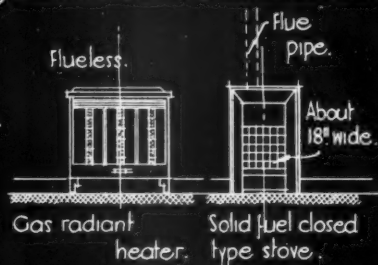
## THE ARCHITECTS' JOURNAL LIBRARY OF PLANNED INFORMATION

DIAGRAMS COMPARING SIZE &amp; HEAT OUTPUT OF TYPICAL GAS HEATERS WITH OTHER HEATING EQUIPMENT :

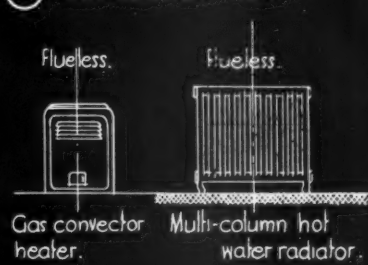
(A) RADIANT HEAT WITH VENTILATION.



(B) COMBINED RADIANT &amp; CONVECTION HEAT.



(C) CONVECTION HEAT.



APPROX. HEAT OUTPUT (B.Th.U./HR.) :

10,000 (9 radiants).

10,000 (Average).

9,000 (Three units).

9,750 (Average).

3,000 (Average).

3,000 (6-section rad.).

## DETAILS OF THE THREE MAIN TYPES OF GAS FIRES :

(1) INSET TYPE GAS FIRE : for new or existing grate openings.



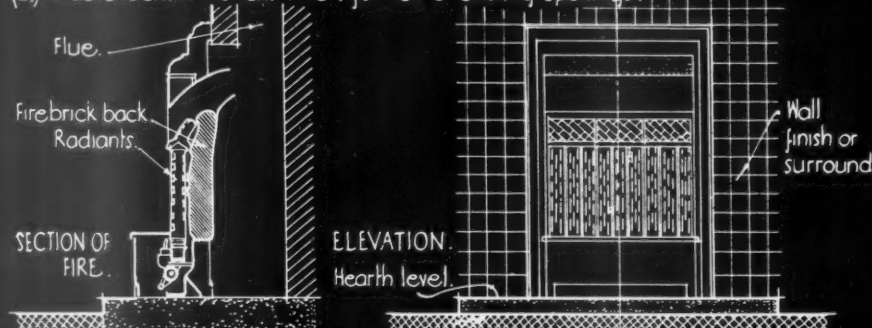
CHARACTERISTICS : easy fitting in place or instead of solid fuel grate. Retains wide heat distribution and high ventilation of a solid fuel fire.

## TYPICAL SITUATION :

Domestic living rooms, public houses, offices, etc.

GAS CONSUMPTION : approximately  $2\frac{1}{2}$  cu. ft. per inch of width of opening.

(2) INDEPENDENT TYPE GAS FIRE : for new or existing openings.

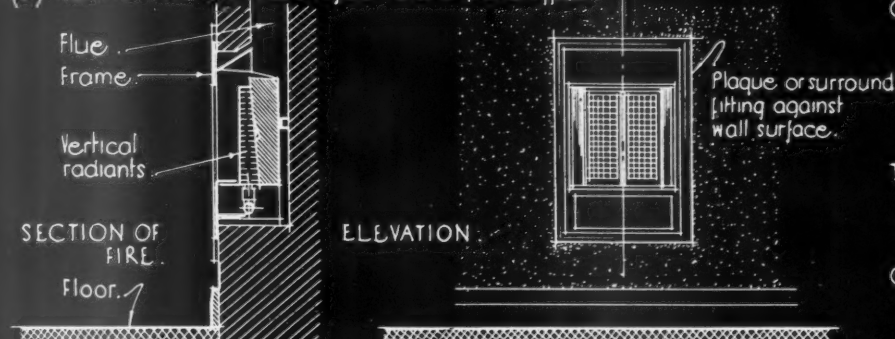


CHARACTERISTICS : neat and easy fitting in front of fireplace opening. A surround may be needed. Distribution of heat not so wide as type (1).

TYPICAL SITUATION : general domestic room heating, especially valuable for intermittent use, offices, etc.

GAS CONSUMPTION : approximately  $3\frac{1}{2}$  cu. ft. per inch of width of opening.

(3) BUILT-IN TYPE GAS FIRE : in floor level or panel types.



CHARACTERISTICS : space saving. Easily used with small section precast flue. Distribution of heat same as (2) above.

TYPICAL SITUATION : bedrooms, dining rooms, flats, etc.

GAS CONSUMPTION : approximately  $3\frac{1}{2}$  cu. ft. per inch of radiant.

*Information from The British Commercial Gas Association.*

INFORMATION SHEET : THE EQUIPMENT OF BUILDINGS : GAS APPLIANCES, 1 : No 8.  
SIR JOHN BURNET TAIT AND LORNE ARCHITECTS ONE MONTAGUE PLACE BEDFORD SQUARE LONDON WC

THE ARCHITECTS' JOURNAL  
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## INFORMATION SHEET

• 778 •

### THE EQUIPMENT OF BUILDINGS

**Subject :** Gas Installations ; Gas Heating Appliances  
for Space Heating, and Gas Fires

**General :**

This is the eighth Sheet of the series covering the installation of gas services in buildings and deals with the general considerations affecting comfort and specifically with gas fires. Subsequent Sheets will deal with other gas appliances in this field.

**Requirements :**

The problem is primarily one of providing comfort to the individual and not one of providing heat to a room. The individual is maintained at comfortable warmth if the temperature of the air and the average temperature of the surroundings are in appropriate balance.

**Occupants :**

The contrast between different types of heating tends to disappear when the appliances have been in operation for some time and the air, walls, etc., have been given opportunity to become heated. Contrast in comfort effect of different types of heating is therefore chiefly in the earlier stages of heating, so that the length of time and the way in which the room will be occupied are of vital importance in determining the type of heating appliance to be provided.

There is, however, a psychological and physiological benefit if radiant heat, especially radiant heat from a bright source, is used, and the air of the room is kept comparatively cool. In addition to adequate heating, comfort and hygiene demand also adequate ventilation.

**Combined Heating and Ventilation (A) :**

**Gas Fires.** These provide pure radiant heat to the room and also ensure ventilation—generally two to four air changes per hour. General characteristics similar to solid fuel fire. A few minutes after lighting, ample radiant heat is available for warming persons in front of the fire. This heat, which does not directly warm the air, gradually warms up the furniture, walls and ceiling, which in turn re-radiate heat and also warm up the air, leading to general comfort throughout the room.

**Appliances providing Heat only (B) :**

(1) **Flueless gas radiant heaters.** These appliances provide a substantial proportion of radiant heat, the balances of heat from the gas warming the air of the room. In performance they are therefore

similar in effect to the closed solid fuel stove and electric fire. The heavier varieties are usually permanently fixed, the lighter varieties, provided with flexible tubing, being portable and capable of being plugged in at any suitable point. For particulars see Sheet No. 9 of this series.

(2) **Flueless gas convection heaters (C).** These appliances provide little, if any, direct radiant heat, the gas being devoted to warming up the air of the room, which in turn warms up the walls, furniture, etc. Their performance is thus similar in effect to the hot water radiator. They may be of the fixed or portable type, see Sheet No. 10 of this series. When used as background heaters in conjunction with an ordinary radiant gas fire, they provide a heating method approaching ideal comfort conditions.

**Size of Flueless Heaters :**

To avoid stuffy conditions, flueless heaters (types B) should not be fixed having a gas rate exceeding 1 cu. ft. per 100 cu. ft. of room space in rooms, or 2 cu. ft. of gas per hour per 100 cu. ft. of room space in halls, passages, etc.

**Size of Gas Fires :**

Maximum radiant heat output is generally equivalent to the maximum on a solid fuel fire of the same width. Since quick heating up of the room is of great advantage, a larger size is preferable to the minimum possible. The user can always turn the fire down when comfortable conditions have been obtained. Undue waiting for comfortable conditions is an inconvenience.

The heat output from modern gas fires is generally about 50 per cent. more than fires of the older type of the same width. Thus no general rule for sizing is applicable, but allow if possible 25 cu. ft. of gas per 1,000 cu. ft. of room space.

Gas fires are of three main types :

(1) Inset type capable of being fitted inside existing grate opening.

(2) Independent type with front casting projecting forward from the plane of the surround, and providing a self-contained fire capable of being placed in front of existing grate opening ; preferably provided with surround to cover existing opening. Surround in incombustible material, finished in colour to suit surroundings.

(3) Built-in type ; may be of floor level or panel type, the latter being raised from the floor. In the former case structural alterations may be required if the casting of the fire projects backwards from the plane of the surround and cannot be accommodated in the existing opening. In new work it will be necessary to provide a suitable opening at the required level for fires of the panel type, and for existing work to adapt the opening and make good the lower portion, or cover with a suitable surround.

**Issued by :** The British Commercial Gas Association

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**Telephone :** Sloane 4554

## SOME QUESTIONS ANSWERED THIS WEEK:

- ★ *WHAT is the best material for a floor finish in a factory canteen?* - - - - - Q<sub>197</sub>
- ★ *WHAT P.C. sums are allowable for equipment and fittings in A.R.P. shelters and cleansing stations?* Q<sub>198</sub>
- ★ *HOW can condensation be reduced on the underside of a concrete roof?* - - - - - Q<sub>200</sub>
- ★ *IS there any method of obscuring factory roof-lights which complies with regulations and costs less than 1s. a square foot?* - - - - - Q<sub>202</sub>

## THE ARCHITECTS' JOURNAL

## INFORMATION CENTRE

SINCE it was first announced that the JOURNAL'S Information Centre would answer general questions about building and architectural practice, as well as those concerning A.R.P. and other Emergency problems for which the Centre was begun, the number of general questions has grown steadily. So much so, that these general enquiries now outnumber those connected with purely wartime matters.

It is clear that there is a real demand for a Centre of this kind, and the JOURNAL has therefore made preparations to help in any architectural or building difficulty which is encountered by any member of the industry.

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*or ring the Architects' Journal Information Centre at*

R E G E N T 6 8 8 8

Q<sub>195</sub> SURVEYOR TO PROPERTY OWNERS, LONDON.—*What action can be taken in the following circumstances? A property consists of shops with offices over. On the declaration of war the firm leasing the whole property and using the shop premises as showrooms decided to evacuate and set about finding alternative emergency premises. This was done, but the reconditioning of these emergency premises and the subsequent removal of staff occasioned a delay and was completed only after some nine weeks of war. Under the Civil Defence Act, and for purposes of DEMANDING A SHELTER BE ERECTED and claim made for a grant in respect thereof, notice was sent to the owners of the property by the local Council requesting a return of the number of persons ordinarily employed there, but—because of the intended removal of the tenants—no completed form was returned to the Council but notice was sent of the intention of the tenant to remove completely from the building for the duration of war. While at ordinary times over one hundred people are employed between showroom and office, the property is now empty. Even so, the local Council have re-approached the building owners and are demanding the erection of shelter accommodation, holding that on the normal day for making return of*

*the form sent originally, staff to a number exceeding fifty persons were employed upon the premises—a fact which is admitted by the inquirer.*

The problem is not one to which the obvious answer of "no staff—no shelter" can be given without consideration of the possible legal aspects of the case. On the one hand there is this simple reply to the Council that there now being no staff there need be no shelter. But on the other hand, on the normal day for making a return there were conditions obtaining which made it compulsory that a shelter be provided for people then employed upon the premises. It is suggested that the Council should be asked whether, if the shelter were built with no one to use it, they would be prepared to take it over as a Public Shelter and pay compensation. If it appears that the Council intend to keep to the letter of the law despite the special circumstances, a case can be stated direct to Department O2, Grants, Ministry of Home Security, Cleland House, London, S.W.1.

**Q196** ARCHITECT, HAMPSTEAD.—*A client has asked me to tell him definitely whether he is responsible in part for a REAR GARDEN WALL WHICH HAS COLLAPSED and which his next-door neighbour is asking him to rebuild at joint expense. According to past experience in these matters, I have told my client that a rear garden wall in brickwork is the sole responsibility of the owner of the property if it is on the left of the garden looking out from the back of the house, and that this being the case here, he should refuse part-payment as he would in any case be responsible in full for the other wall on his side of the garden. My client has been asked for proof of this statement, and as I have nothing definite to work on, I ask for your advice.*

The contention that, when looking from the back of a house, the garden wall on the left always belongs to that house and is the responsibility of the house-owner has no foundation in fact or law, though perhaps it may sometimes work out that way in practice. It is a most unsafe way of arriving at a decision in such matters. The only safe way to assess responsibility for re-building is by reference to the land or property transfer formed at the time of building of the house or by reference to the lease. In both these documents there will be set out the boundaries of the properties and any boundary fences or walls. If these fences or walls have been erected since the date

of creation of the land transfer or lease, they will be built inside the boundaries marked on such transfer or lease. With a wall, the outer edge of the footings or foundation usually extends to the extreme boundary of the land to which it belongs, and with a fence the nails are usually driven towards home—i.e. the owner's property. But a wall or fence may be a party responsibility, and, if so, some mention of this joint responsibility will appear in writing on some document such as the ground transfer or lease.

**Q197** ARCHITECTS, DEVON.—*What is best material for use as FLOOR FINISH IN A FACTORY CANTEEN? The floor should have following qualities: Not too hard and cold; able to withstand considerable spilling of liquids and heavy treading by wet and dirty feet; be of solid construction to avoid danger of vermin; easy to clean; durable.*

There is no ideal floor covering. A material which is comfortable underfoot is more difficult to clean than a hard material with an impervious surface like a quarry tile. So, as always, the choice must either be a compromise, or be narrowed by the elimination of some of the conditions which at the moment are considered essential. The following materials all possess points of merit. Asphalt is fairly comfortable, durable and easy to clean, the essential danger being the spilling of greases which, if allowed to remain on the surface for any length of time, might act as solvents and disfigure the surface. Jointless flooring when well laid—e.g. on the earth-dry and tamping technique as approved in the Code of Laying Practice—is durable and not so cold as quarry tiles. In maintenance, it should be oiled periodically and for general cleaning mopped over, with only occasional washing—such washing to be done with as little soap or soda as possible. Linoleum of say 4.5 or 6 mm. thickness, stuck down, would provide fair conditions of comfort, be easily cleaned and withstand hard traffic conditions. But a sheet covering of this type should not be fixed to concrete which in itself is in contact with the ground—i.e. a solid concrete floor. If so, then difficulties might arise from water being sucked up through the concrete by capillarity and eventually breaking down the adhesion and causing blistering of the linoleum. If linoleum is to be laid on a solid concrete flooring, provision should be made at some point for an asphalt layer either in the concrete or under

the screeding. Wood block flooring of an inexpensive hardwood and laid in a bitumen mastic will withstand all the conditions of use specified and give fair comfort underfoot. With the difficulties today of timber supplies it might not be possible to obtain wood blocks; but the nature of the work being carried out suggests that some sort of priority order or licence will be available for procuring the necessary timber.

**Q198** ARCHITECTS, LONDON.—*Where can I obtain a list of the P.C. SUMS ALLOWABLE FOR equipment and fittings in A.R.P. SHELTERS and cleansing stations?*

Such a list is available in Home Office Circular No. 340, entitled "Prime Cost Contracts for Emergency Works," and obtainable from H.M. Stationery Office, York House, Kingsway, London, W.C.2, price 1d.

**Q199** QUANTITY SURVEYOR, LONDON.—*What were the RATES OF WAGES for building trade craftsmen in High Wycombe, Bucks, on January 1, 1939? What are they now, and when were increases made?*

The present rate of wages in High Wycombe is 1s. 7½d. per hour for all craftsmen. That existing on January 1, 1939, was 1s. 6½d. per hour, increases of ½d. per hour having taken place at the beginning of December, 1939, and at the beginning of February, 1940.

**Q200** ARCHITECT, KENT.—*How can CONDENSATION be reduced on the underside of a concrete roof? The building is one of three storeys, the upper storey being divided into flats. The roof is uninsulated, being constructed of concrete with asphalt on top. The flats are at present untenanted and attempts to let them have not been successful because of the condensation.*

Only the provision of efficient insulation and the heating of the flats would effect a cure. Condensation occurs largely by warm air impinging on cold surfaces and with the drop in temperature so caused, moisture from the atmosphere is deposited on these surfaces. The provision of insulation would prevent loss of heat through

the ceiling, and at the same time would make it more possible for the surfaces to be heated to the same temperature as the room, so that there would be no question of warm air impinging on cold surfaces. But to introduce the insulation material on top of the present roof—i.e. on the asphalt—would mean that further layers of asphalt would have to be provided since the insulation material can only be successful if maintained in a dry state. A layer of cellular concrete, of compressed cork slab, or wood fibre insulation board would provide the insulation. A new asphalt finish could be laid on any of these. While the provision of an insulating layer might reduce the amount of condensation, a cure could only be effected by keeping the flats heated and so making the inside air independent of the vagaries of fluctuating outside temperatures.

and using only the system of adjustable obscuration where daylight is absolutely necessary. In this way it might be possible to arrive at an average cost of 1s. per sq. ft. over the whole area of the glazing. Where glass can be permanently blacked out this could be simply boarded over, or painted. Another technique now has the approval of the various Ministries. This is to coat over the glass with bitumen emulsion, to embed scrim cloth in the bitumen emulsion, and then give a further coating of emulsion. In circumstances just as are described, this latter technique has been adopted by a firm\* who have introduced and are now installing their "Mestycroft" system of light obscuration shutters.

tend to create a sucking down of the wind at a position behind the parapet and thus down-draught in the flues. Secondly, that the trouble is more pronounced with the top floor fireplaces would seem to suggest that the shortness of the flue or lack of sufficient bend are contributory factors. The provision of down-draught preventing cowls would be of assistance where the trouble is due to down-draught, but the use of these cowls on flues with insufficient normal draught will not alleviate the trouble in any way. The most up-to-date reference to flue design and construction is contained in "The Principles of Modern Building," Vol. I, by the Building Research Station, obtainable from H.M.S.O.\*

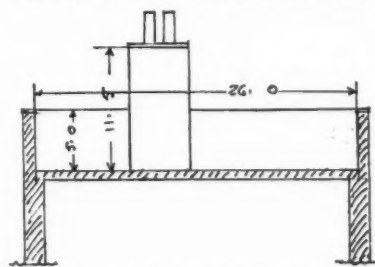
**Q201** QUANTITY SURVEYOR, LONDON. — What proportions of Carborundum type of material should be incorporated in a GRANOLITHIC FLOOR for non-slip purposes?

With a granolithic floor the proportions of non-slip material to be added integrally to the mix vary from two to four pounds per square yard, depending on the thickness of the granolithic, on the wear likely to be experienced and on the degree of non-slip required. An alternative method of specification is where the non-slip aggregate is to be worked into the surface immediately after the granolithic is laid and for this purpose the usual specification calls for two and a quarter pounds of non-slip aggregate per square yard of floor surface.

**Q202** ARCHITECT, HERTFORDSHIRE. — Is there any method of OBSCURING FACTORY ROOF LIGHTS which complies with the various regulations and costs less than 1s. per sq. ft.?

It is doubtful if any system of controllable light obscuration is available at 1s. per sq. ft. Fixed systems such as the wedge and board system\* could be used, and if internal blinds are permitted these also should be possible within the cost, but with some Ministries internal obscuration methods are not permitted. The most feasible solution would appear to be by cheapening the portions of the work which can be permanently blacked out (and if necessary increasing the amount of such work),

**Q203** ARCHITECT, NEAR EDINBURGH. — About four years ago I completed a three-storey building, of which the two upper stories accommodate dwelling houses. The building has a flat roof, which is used by the tenants for drying clothes. The roof flat is surrounded by a brick parapet wall, 5 ft. high—the height being a precaution for the safety of children. A number of the CHIMNEYS—particularly those of the top floor fireplaces—HAVE BEEN GIVING TROUBLE, in some cases down-draught and in some sluggish draught. Successive experiments made with all kinds of cans and cowls have failed to effect a cure. Cans and cowls which corrected a blow-down with a wind from the east have failed with a wind from the west, and so on. The building is on a high site, and its roof is well above the roofs of all surrounding buildings. In diagram, the roof section is as shown in sketch.



I am now wondering if the pocket made by the high parapet is causing the wind actions that are causing the trouble. Can you offer any suggestion? Can you also refer me to any monograph based on scientific tests of smoky chimneys?

The details given in the enquiry suggest that the trouble arises from two causes. First, site conditions: the position of the high parapet in relation to the chimney stacks would

**Q204** ARCHITECT, HARROGATE. — By what percentage did BUILDING COSTS at the end of the last war differ from those of 1914?

Graphical representations of the course of building costs, cost of living and building wages for the period 1914-1919, compiled by H. J. Venning, F.S.I., were given in the special supplement in the double number of *The Architect and Building News*, January 19, 1940, and copies are available, price 1s., from Gilbert Wood & Co., Ltd., 2 Breems Buildings, E.C.4.

**Q205** ARCHITECT, MIDLANDS. — What firms supply precast CONCRETE BLOCKS FOR CIRCULAR SILOS for green silage? Are there any recent publications on farm silos?

Two publications of interest in this work are issued free by two organizations†, both giving general information and details of construction. Inquiries made as to the names of manufacturers of the special form of concrete blocks used have not been so successful. No standard form of block would seem to be available; but the blocks are simple to produce for any individual silo and capable of production by any firm of radius concrete kerb manufacturers. In the production of the block there is only one major departure from the radius kerb technique and that is the recessing of the longitudinal surfaces of the block to accommodate the horizontal rod reinforcement necessary in silo con-

\* H.M. Stationery Office, York House, Kingsway, London, W.C.2, price 10s. 6d. A shortened note on the Cure of Smoky Chimneys by the Building Research Station was published in THE ARCHITECTS' JOURNAL for August 18, 1938. (A copy of this has been sent to the enquirer.)

† The Cement and Concrete Association, 52 Grosvenor Gardens, London, S.W.1. The Imperial Chemical Industries (Fertilizers), Ltd., Imperial Chemical House, Millbank, London, S.W.1.

\* By C. F. Anderson and Son, Ltd., Harris Wharf, Graham Street, London, N.1.

\* Messrs. Southern, Ltd., Bold Saw Mills, Widnes, Lancs.

struction. It is suggested, therefore, that for supplies of suitable blocks, local firms producing radius kerbs

should be approached. (The names of several such firms have been sent to the inquirer.)

## CURRENT PROBLEMS

*This article concludes the series on*

# TEMPORARY AND SEMI-PERMANENT BUILDINGS

BY EUGENIO FALUDI AND GODFREY SAMUEL

## 8: SERVICES

**W**End this series of articles with some notes on services: Drainage, Water Supply, Heating and Lighting. It must be remembered, however, that on any particular job decisions must generally be taken on such matters at the very outset, as the siting and method of construction adopted are largely determined by them.

The elements comprising the several service installations in temporary structures should be:

(a) Composed as far as possible of light unbreakable materials, especially for portable buildings;

(b) Joined together, where possible, in such a way that slight movement in the building does not cause damage;

(c) Made up in standardized and prefabricated units as far as possible;

(d) Hidden in the structure where possible, especially in better-class work, for the sake of appearance and of cleanliness.

### I. DRAINAGE

This comprises three elements, the disposal of soil, of waste water and of surface water.

#### A. EXTERNAL WORK

Here soil and waste water will generally share the disposal system, but it is seldom advisable, even if allowed by the by-laws, to include surface water. In portable buildings external drainage work is unnecessary, chemical or even earth closets being preferable to water, and waste water being disposed of in a ditch or purpose-made soak-away. Elsewhere there are four alternatives:

(1) Connection to the local authority's sewer: only preferable if the run is short.

(2) Connection to a septic tank: generally the most satisfactory.

(3) Connection to a cess pit: seldom to be recommended.

(4) Connection to an incinerator: more hygienic and in large schemes capable of combination with a central-heating system.

Designs for septic tanks are well known, but local authorities often have different views on the subject. Two chambers are usually required, and the most economical arrangement is to make them contiguous, though this is not always

allowed. Walls should be in 9-in. brickwork, covers in cast iron, or, better for appearance, in precast concrete with a few inches of surface soil on top. Seals must be provided. The tank should be 30 yards or so from the building and adequate overflows are required. The position will be largely determined by the gradients of the site.

Pipes are generally required to be in earthenware, but for really temporary work some stronger material such as iron or precast concrete may be preferable provided the jointing and internal finish are of good quality. Asbestos-cement pressure pipes can also be used. A fall of 1 in 30 for pipes of 3 in. internal diameter, 1 in 40 for 4 in., etc., is necessary.

Rainwater from roofs is often a valuable secondary source of water supply, and can be directly connected through a separator or stored in butts. In the latter case overflows must be provided to drip clear of the building and butt. The provision of gulleys and drains depends on the nature of the soil. With absorbent soils such as sand or gravel and suitable gradients, surface water will dispose of itself. With such subsoils as clay a surface drainage system is required. This can sometimes be of open jointed land drains, but in the worst cases it must be tight-jointed and taken to a ditch or specially dug soak-away.

#### B. FITTINGS AND INTERNAL WORK

Chemical closets of the commode type require frequent emptying and charging. Some improved types ensure complete chemical disposal, others drain off liquids. A sealed underground tank, connected to a second seepage tank at least 15 ft. away from the building, is an alternative sometimes worth considering.

When water closets are used, the fittings should be as unbreakable as possible, and connections should allow for movement. Seats of plastic material are generally worth while.

Baths and sinks in more temporary work should be clear standing for cheapness, and because jointing of panels or cupboards is often unreliable in such cases. Showers in ranges should have a common channel trapped at the end. Basins in ranges do not really need individual traps for this kind of work,

and the common waste pipe can be trapped beyond the last junction.

The soil and waste system must be vented. A one-pipe system, with a single anti-siphonage pipe connected to each trap, sometimes has advantages even for one-storey work.

In the United States experiments have been made with prefabricated "water units"—bath, sink, basin, etc., all made up in one piece, if necessary including a partition. An example is the "Dymaxion" design. This is brought into the building at an early stage in erection, and connections are made later. The idea of a one-piece "stomach" for the building deserves further examination, especially with a view to adoption in post-war domestic work.

Where pipes are laid under concrete floors, they should be provided with removable trench covers.

### C. RAINWATER GOODS

Here again, no provision for rainwater disposal is necessary for portable buildings if sufficient projection is given to the eaves and the ground slopes away from the structure. Where gutters are required, they can sometimes be combined with eaves beams, e.g. in certain types of prefabricated concrete design. Normally, however, they should be half-round sections of iron or steel or of asbestos-cement. The latter material has the advantages of requiring less maintenance, and, at the present time, of not using metals required for more urgent purposes.

On large buildings rainwater heads are necessary, and we believe that it is now at last possible to obtain them in a plain straightforward design in asbestos-cement.

Downpipes should also be in this material, rather than in iron or steel, for the same reasons. The fear sometimes expressed that they will be too easily broken appears to us exaggerated. In special cases where there is such a risk, spouts, about 2 ft. 6 in. to 3 ft. in length, supported on light brackets, can be used as an alternative to metal, where layout, nature of subsoil and gradients are suitable.

### II. WATER SUPPLY

Except in those rare cases where there is an unfailing spring or well on the spot, it usually pays to bring water some distance from a main supply rather than to sink a well and pump. Storage tanks are generally insisted upon by supply companies. In unbuilt areas they should be of ample capacity, as temporary connections from the main supply may fail for short periods. The quantity of water required per person per day varies from 20 to 40 gallons according to circumstances.

Where buildings are grouped together, it will generally prove worth while to provide a common storage tank, even though this may mean a feed of larger bore to the individual buildings. This

tank can be in the roof of one of the buildings, provided sufficient head of water can be obtained. (A minimum of 4 ft. is desirable for showers.) Otherwise, it can stand independently supported on a steel, concrete or brick structure, perhaps used for other purposes as well.

Adequate insulation of both tank and pipes is of primary importance, unless they are inside a really well-insulated building. Any apparent economy in this direction is likely to prove false. For very temporary work, felt or even straw may be used instead of the more usual permanent methods. For tanks, granulated cork, slag wool, glass wool, etc., are suitable alternatives.

Internal storage tanks are generally placed in the roof of the building. With flat roofs they can sometimes be installed in the upper parts of cupboards or service rooms, unless a high-level w.c. cistern or shower fitting requires a greater head, in which case they must be housed in a special superstructure on the roof.

Pipes should be produced in ready-made lengths as far as possible, especially where repeating units are being erected. Completely inflexible joints should be avoided. In portable buildings good quality rubber pipes have advantages in flexibility and speed of installation that may justify any extra expense. Iron pipes must be avoided where the properties of the water are likely to cause damage or furring; in some cases the provision of a water softener may be economical.

Hot-water plumbing raises similar problems to those of cold water, and there is the additional problem of the position of the heater. A concentration of fittings is always advisable. Although central hot-water heating may seem economical at first sight on general grounds, in practice local heating often proves to be of greater advantage.

A common water heater for several buildings is seldom justified on account of the great quantity of lagging required and the complications involved in carrying pipes over or under the arteries of circulation.

### III. HEATING

The arrangements required depend largely on the type of fuel available. Even where fuel is easily obtained, it is generally worth while, except in the most temporary storage buildings, to spend available funds on efficient insulation rather than on increased heating.

Fuels may be of different kinds:

#### A. SOLID FUEL

Wood, coal, anthracite, coke, etc., can be burned either:

(i) In an open fire, undesirable in temporary buildings on account of the rather elaborate brick construction normally necessary in addition to other special precautions, but sometimes required for psychological reasons; or

(ii) In a closed stove, usually the

simplest system for small isolated buildings. In such cases flue pipes must be taken up through the roof (or, less satisfactorily, the wall). These can be of sheet metal, which is, however, liable to move, or of cast iron, more rigid but like all metal elements undesirable at the present time, or again of asbestos cement (of better quality), liable to breakage,

however, if exposed to rough usage. Soot doors are always required.

In every case the heating system must be kept well clear of all inflammable materials. Pipes should be held at least 9 in. from all wood or similar work by metal stays packed with slag wool. Where they pass through the roof they must be protected by such non-inflam-

## HOUSE IN DUBLIN

**GENERAL**—Built by the architect for his own occupation, the house was designed to be roomy and comfortable for his small family, and at the same time sufficiently compact and labour-saving to be run by one servant.

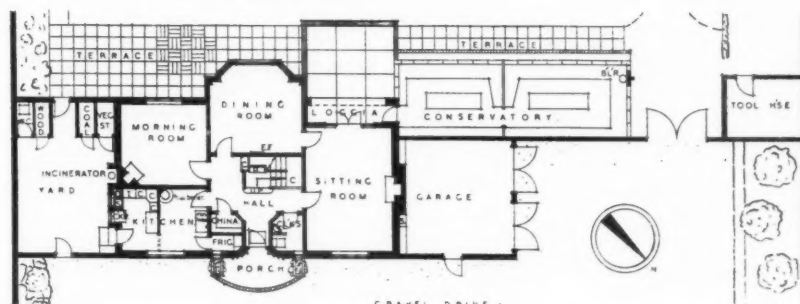
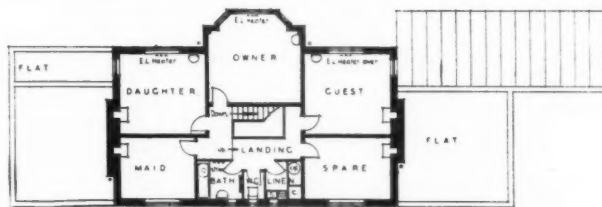
**SITE**—An open, level, three-acre plot, on a main road near the city. At the back, the south-west aspect affords a good view of open country to the Dublin mountains, and this, together with heavy traffic on the road front, influenced the planning of principal rooms.

The semi-formal garden is laid out around a big elm which stands near the back of the site. The dining-room is planned on the axis of this tree, and the rest of the house is similarly laid out to make the best use of the garden.

**CONSTRUCTION AND FINISHES**—14-in. brick walls, built in the local Dolphins Barn stocks, specially selected "overburnts" being used for facing. Timber casement windows are fitted and the roof is finished in Voss green slates. Floors are mainly timber, except in the kitchen and cloak-room, which are terrazzo finished, and in the bathroom unit, where composition is used. Hall is floored in hard-wood blocks. Internal walls are papered in living-room, plastic painted in hall and staircase, and flat oil finished in bedrooms. Flush doors are used throughout. In the living-room a stainless steel fireplace is set in a travertine marble mantel.

**SERVICES**—Gas cooking. Hot water by Ideal boiler and immersion heater. Electric heating and lavatory basins in principal bedrooms.

**COST**—£3,000, including conservatory and garden layout.



GROUND FLOOR PLAN SCALE

DESIGNED BY WILLIAM A. DIXON

mable and insulating material as asbestos wood board (not asbestos-cement), with an air space between, and a suitable collar must be arranged below the outlet to fit tightly over the roof covering.

Similar insulating material should be placed behind the stove where it is close to a wall, and the type and position of fixings must be such as will avoid the conduction of heat to any timber or other inflammable material behind. With wood floors, some form of concrete hearth is required.

Adequate provision should be made for fuel storage, and this is often underestimated. It is generally best arranged outside the main structure, but can sometimes be arranged with greater accessibility under the floor.

#### B. OIL

This may be used either in a boiler for hot-water heating, usually too costly a system for temporary work; or in a portable stove, the cheapest and simplest of all arrangements, as no flue is needed. There is, however, an unpleasant smell and a risk of the stove being upset, and the method should only be adopted in very temporary buildings.

#### C. GAS

This may be worth considering for use with a flue or with the type of more modern flue-less fire, as well as for hot-

water heaters, in cases where a main supply is readily accessible. In timber buildings there is, of course, some risk of fire, and in much temporary work risk of leakage through slight structural movement.

#### D. ELECTRICITY

For portable buildings and for more permanent timber buildings this is the best system, as it involves less risk of fire, does not need a flue and allows great flexibility in the channels of supply. In many cases it may be the most expensive form of heating, but as electric lighting is nearly always needed, there is no great difficulty with the installation, and the expense is often worth while.

Electric fires of the pivoted reflector or radiating panel types are probably most satisfactory. They should be placed high, e.g. over doors, to be out of the way of traffic.

The problem of cooking apparatus differs only in degree from that of general heating, the heat being more intense and strictly localized. The same observations apply.

#### IV. LIGHTING

For isolated portable buildings, oil or acetylene lamps may be desirable, but normally an electric installation is needed. A main supply is generally available, but in certain cases a separate

motor must be provided, preferably housed away from living accommodation.

Main switches and fuse boards should be placed in accessible positions, but not where they are likely to be damaged.

Wiring can be in conduit (screwed or slipped), in lead-covered cable, or in rubber-covered cable. The first is preferable in more permanent work, being the least liable to damage. For purely temporary work lead-covered cable is often adequate, provided the runs are kept clear of dangerously exposed points. Rubber-covered cable is more expensive, but installation costs are lower.

The system must, of course, be properly earthed, and three-pin sockets are desirable. The normal features of a well-designed installation, balanced loading, etc., apply to temporary as to permanent work.

Fittings should be as far as possible of plastic material, on account of the need for metals elsewhere.

If a telephone is required, provision should be made for wiring with the general electrical work, especially where hidden conduits are being used. A wire-less installation can also be incorporated in the building.

In exposed positions lightning conductors should be included.

THE END

## P R I C E S

### RATES OF WAGES

Rates of wages remain unchanged, and will not be reviewed again until May of this year. As noted last month, the percentage increase in cost of labour for Central London since pre-war days is 6.35 per cent. for labourers and 4.76 per cent. for craftsmen.

### MATERIALS

The list of basic materials, which follows, shows the approximate percentage differences between prices published in August last and prices on January 31, and February 29, 1940. As mentioned previously, these percentages include the increased cost of delivery in London, except for steel joists, which are priced "ex mills," and Fletton bricks, which are priced delivered to "King's Cross Station." Timber has not been included in the list for the reasons given previously.

	Increase at end of Jan., 1940 Per cent.	Increase at end of Feb., 1940 Per cent.
Portland cement	+ 9.8	+ 9.8
2-in. Unscreened ballast	+ 17½	+ 17½
Fletton bricks (at station)	—	—
Roofing tiles	+ 7½	+ 7½
Steel joists (basic sections)	+ 3	+ 7
Lime (Greystone)	+ 14.3	+ 14.3
Sheet lead	+ 50	+ 50
Iron rainwater goods	+ 3½	+ 12½
Iron soil pipes	+ 3½	+ 12½
Copper tubes	+ 23.4	+ 25½
White lead paint	+ 21.2	+ 21.2

### GENERAL POSITION, MARCH 1

From the different percentages given it will be seen that it is difficult to state how much building costs, as a whole, have increased, although general statements—often misleading—do appear in the Press from time to time. For instance, the statements may be based on the use of timber in peacetime proportions, although for certain types of Government work timber may be used in much higher proportions, and for other jobs the use of timber may be reduced to a minimum. Rather than accept such general statements it is better to consider labour, materials and specialists' work as three separate items.

It will be seen that labour costs have risen by approximately 6 per cent. (in Central London) and that ordinary building materials for a normal brick job have probably not risen, as a whole, by more than 10 per cent. The total cost of normal builders' work (excluding buildings in which a lot of timber is used) has, therefore, risen by something between 6 per cent. and 10 per cent. and probably by 8 per cent., as the value of labour and materials in most jobs is about equal. Against this must be set any exceptional keenness in tendering.

Specialists' work, including such things as sanitary fittings, wall tiling, ironmongery (and internal plumbing if this is at all extensive) may very likely make the total increased cost considerably more than 8 per cent. above pre-war prices, but it is not possible to state how much specialists' work has risen in price as a whole. The specialists concerned, however, are usually very willing to give approximate quotations and thus the total increased cost of building for any particular job can be obtained with some degree of accuracy.

O. A. DAVIS, P.A.S.I.

(Davis & Belfield).

## THAT FLOORING JOB HOW TO OVERCOME wartime restrictions

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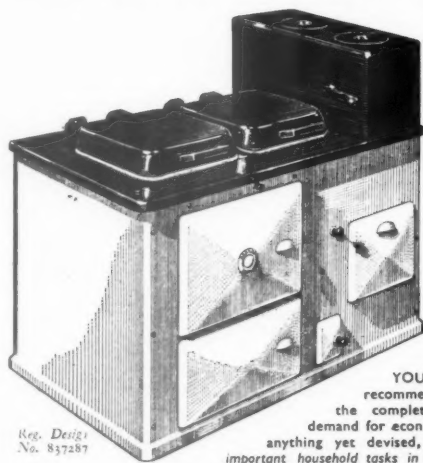
**A FEW RECENT CONTRACTS**  
Automatic Telephone & Electric Co., Liverpool. Dudley Nisbet (Arch.). Rootes Securities (Aircraft), Speke, Liverpool.  
London Passenger Transport Board, Edgware Road Station. Ad.e. Button & Partners, Ruislip.  
Cooke, Troughton & Simms New Factory, York. C. W. Needham, F.R.I.B.A., M.T.P.I., C. R. Thorp, A.R.I.B.A.  
Church House, Westminster. Sir Herbert Baker, R.A., F.R.I.B.A.  
Press Association New Building, Fleet Street. Smee & Houchin (Archts., Surveyors).  
Amalgamated Dental Co., Poland Street & Brighton.  
Laboratories at Wembley. Dr. L. Levy, M.A. (Cantab), F.I.C. & Donald W. West, A.I.C.

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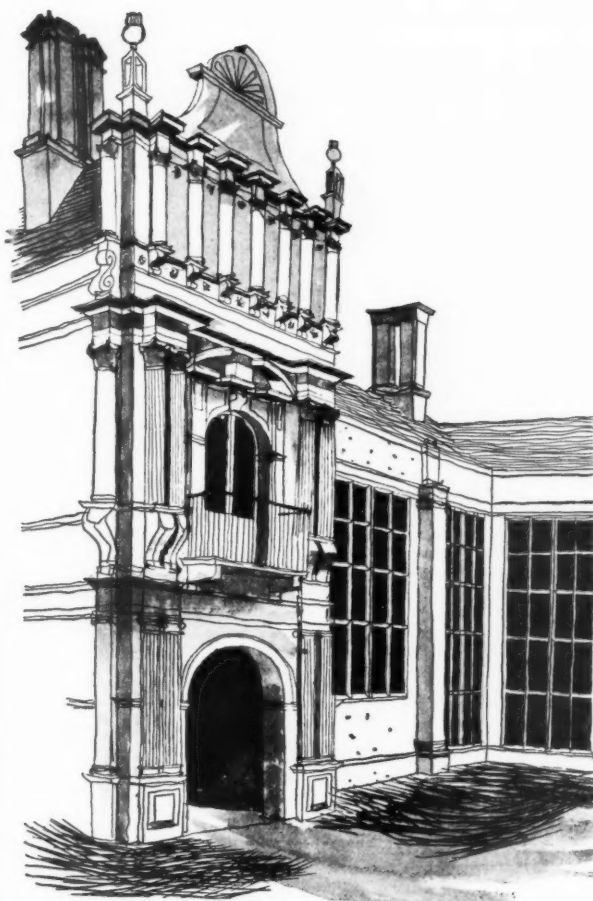
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**COMBINING COOKING & WATER-HEATING**

(Controlled by Federated Foundries Limited)



KIRBY HOUSE, Northamptonshire, was built between 1570 and 1575—a time when English architects were finding new inspiration in the work of the Italian Renaissance. The design is attributed to John Thorpe. Italian influences are strongly marked in the doorways and porches; but the basic elements of wall, roof and window reveal a more cautious transition. Kirby House is one of the earliest English buildings conceived in the Classic tradition.

FINE BUILDINGS NEED FINE PAINT

## Duresco

THE KING OF WATER PAINTS

THE SILICATE PAINT CO.: J. B. ORR & CO. LTD., CHARLTON, LONDON

## MANUFACTURERS' ITEMS

A new plate glass is announced by Pilkington Brothers, Ltd., for shop windows, show-cases, counter guards and interior fittings. Its main advantages are claimed to be that while in no way impeding the transmission of daylight it has a colour-tone in harmony with the goods displayed; it eliminates the faintly greenish colour which has always been associated with and has been the main disadvantage of ordinary plate glass; and it thus presents an opportunity of displaying goods to their full colour advantage. Where desired, the colour of goods, instead of as hitherto suffering deterioration, may be enhanced by a careful selection of the correct tone of glass. The new glass will be exhibited at the Building Centre, from Wednesday, March 13, to Friday, March 15, 10 a.m. to 5 p.m.

Two types of Spectralite are available:

*Spectralite "A."*—A benevolent neutral shade in which all trace of green is eliminated; in fact, it is very slightly pink in its reflection, though to the uninitiated appearing quite clear and white. It is most suitable for the display of goods sold by the perfumer, chemist, etc.

*Spectralite "B."*—A slightly deeper tone of pink though not appearing pink except by contrast with ordinary plate. This shade of Spectralite enhances the appearance of the goods of the greengrocer, pastrycook, baker, provision dealer, butcher, pork butcher, etc. It will be noted that all goods in this category incline in colour to reds, pinks, browns or yellows and, therefore, are seen at their best under the influence of very pale pink lighting transmitted through the colour tone of Spectralite "B."

Interesting experiments to find the most

suitable form of protection for sandbag revetments have recently been carried out by the District Engineer of a main line railway company. Various systems were tested, including cement wash, creosote emulsion, cement spray, cement pressure grout and, finally, a cement mortar apron. The last method adopted (states the Cement and Concrete Association) appears to be the most successful.

It is stated that the cement-mortar apron method is extremely simple, and can be carried out by unskilled labour. The example seen under test had been erected by placing a  $\frac{3}{4}$  in. ordinary wire mesh over the top and sides of the sandbag revetment. The netting was then secured by driving a needle through the revetment and passing a wire from one side to the other, the wires being staggered about 1 yard apart.

When the netting had been wired together, a cement compound, 3 : 1 mix and approximately  $1\frac{1}{2}$  in. thick, was plastered over the entire area.

In addition to the permanent protection thus provided, tests have revealed that the cement compound does not shatter upon impact. It is stated that the protected sandbag filling is capable of withstanding greater shock than other forms of revetment.

## THE BUILDINGS ILLUSTRATED

**NEW CINEMA, TOWCESTER, NORTHANTS** (pages 255-260). Architects: Sir John Brown and A. E. Henson. General contractors, Underwood and Weston. Sub-contractors and suppliers included: Trussed Concrete Steel Co. Ltd., reinforced concrete: Excelsior Patent, Stone Co., Ltd., artificial stone: Richards (Leicester).

Ltd., structural steel: D. Anderson and Son, Ltd., special roofings: Pearce and Cutler, Ltd., glass: Carrier Engineering Co., Ltd., central heating, boilers, etc.: Grensells, Ltd., electric wiring and fixtures: A. J. Hunt, Ltd., sanitary fittings: Dryad Metal Works, door furniture: Henry Hope and Sons, Ltd., casements: Bryan's Adamanta, Ltd., plaster: Birmingham Guild, Ltd., metalwork: P. Jaconello, Ltd., marble and terrazzo tiling: W. W. Turner & Co., Ltd., carpets, curtains and seats: Accurate Check, Ltd., ticket issuing machine: Kalee, projectors and sound equipment: Minimax, Ltd., fire extinguishers: Callender's Cable and Construction Co. Callender cables were used throughout for special lighting and electrical equipment.

**NEW CATHOLIC CHURCH AT NEW-BRIDGE, MON.** (pages 262-264). Architect, P. D. Hepworth. General contractors, J. G. Thomas and Sons. Sub-contractors and suppliers included: Art and Book Co., Ltd., church fittings: Adams & Co. (London), Ltd., doors: Bratt Colbran, Ltd., fireplaces: Comyn Ching & Co. (London), Ltd., ironmongery: Davis, Bennett & Co., Ltd., sanitary fittings: Gillett and Johnston, Ltd., bell: Gillham and Jones, Ltd., electric light fittings: J. W. Gray and Son, Ltd., lightning conductor: Granwood Flooring Co., Ltd., church flooring: P. C. Henderson, Ltd., sliding door gear: Improved Central Heating Co., central heating: Sidney Laughton, carpets: H. H. Martyn & Co., Ltd., fibrous plaster: Morris Singer Co., metal windows: A. R. Mowbray & Co., Ltd., oak tables and font cover: William Pickford, Ltd., wrought ironwork and electric light fittings: Ratner Safe Co., Ltd., safes: Roberts, Adlard & Co., Ltd., roof tiling: Setchell and Sons, Ltd., paving: Shropshire, Worcestershire and Staffordshire Electric Power Co., electrical installation: J. Whitehead and Sons, Ltd., marble pulpit, altars, font, and consecration crosses: Edmond Burton (sculptor), foundation stone.

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