THE TRAVELLERS' CLUB, AND THE REFORM CLUB (left), Pall Mall, have evoked much unfavourable comment from the strict adherents to the Classic tradition. But later observers have been less severe, finding much to praise in the generous proportions of doors and windows and the nobly conceived porches and balustrades. Architect was Sir Charles Barry, whose designs were subsequently chosen, in open competition, for the new Houses of Parliament (1835).

THE ARCHITECTS' JOURNAL

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

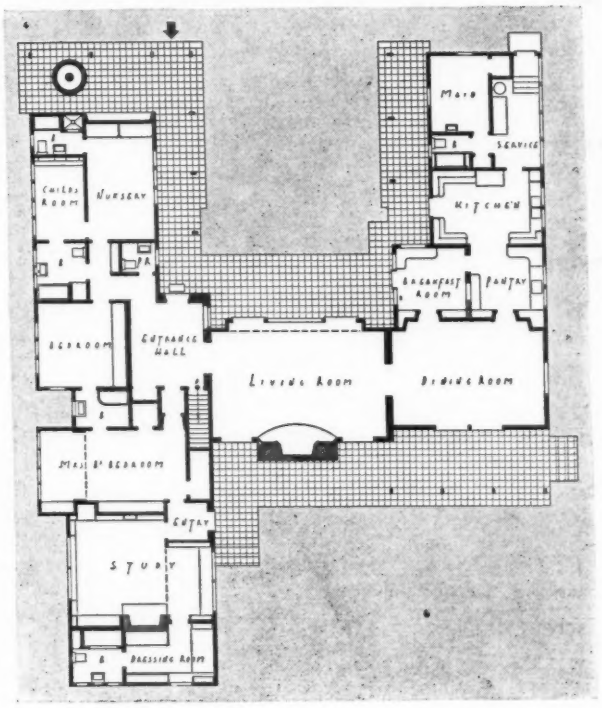
THURSDAY, NOVEMBER 14, 1940. NUMBER 2391 : VOLUME 92

PRINCIPAL CONTENTS

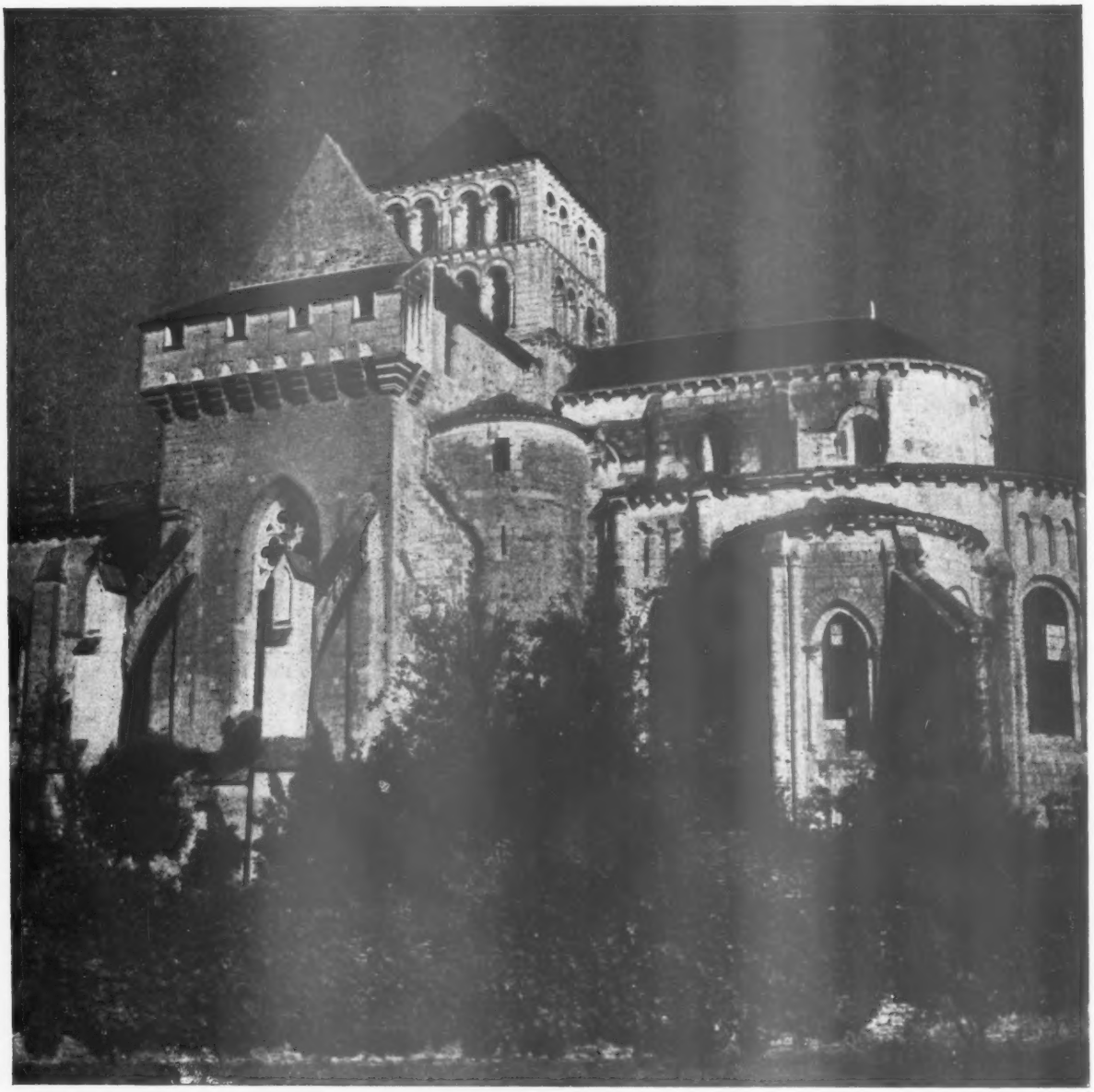
Owing to the paper shortage the JOURNAL, *in common with all other papers, is now only supplied to newsagents on a "firm order" basis. This means that newsagents are now unable to supply the* JOURNAL *except to a client's definite order.*

To obtain your copy of the JOURNAL *you must therefore either place a definite order with your newsagent or send a subscription order to the Publishers.*

RECONSTRUCTION OF HOUSE IN CALIFORNIA

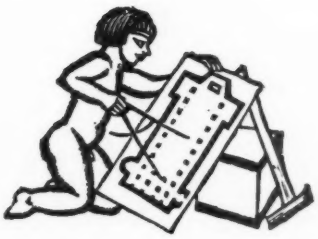


This house at Tarzana, California, was recently re-built from the designs of Paul Laszlo. It is of frame construction on continuous R.C. footing. External walls are finished with three coats of stucco on galvanized wire mesh. Roof is finished with Roman tiles and the windows are wood sash casements.



ABBEY CHURCH

The south side of the Abbey Church at St. Jouin-de-Marnes, Deux Sevres, showing the fortifications.



SHELTERS AND MR. MORRISON

LAST week Mr. Herbert Morrison made his first broadcast statement as Home Secretary and Minister of Home Security. It was an important occasion. Mr. Morrison has a great record of work for Londoners and Londoners have great faith in him, and his broadcast was to describe the Government's proposals for protecting Londoners against the night bomber.

Mr. Morrison made it plain that substantially there is to be no change in official shelter policy. Here and there tunnel or other strong shelters are to be built. Otherwise Mr. Morrison takes the view of his predecessors in office. More small shelters are to be built, better equipment is to be provided in such large shelters as exist, and the policy of building new bomb-proof shelters in any considerable numbers is to remain without official approval or assistance.

Two points in Mr. Morrison's broadcast are of special interest. The first is his statement that—

> Two years ago I pleaded for as much of it (deep shelter accommodation) as possible. Whatever the merits of that controversy, everyone will agree that we must fill the gaps in our shelter provision by what means we can . . . No appreciable amount of this deep shelter, even in the most favourable event, can be ready until this winter is over. This fact I cannot alter.

These statements can be read to imply that Mr. Morrison agrees with those who now suggest that if a system of large bomb-proof shelters in dangerous areas had been built before the war none of our present troubles would have arisen.

The contention is only true in so far that for our present troubles much worse ones would have been substituted. Consider: three years ago, when our shelter policy was decided, the potential danger was the day raid in mass or, more probably, in smaller formations, three or four times a day. In daytime most people work and therefore the basic aim of any practicable shelter policy for a nation at war must be the provision of the greatest protection which is compatible with the minimum interruption of work. In the far-off days before Munich when policy was decided it seemed to many people inhuman to think of loss of working time when lives were at stake. But it had to be thought of, and without general admission, by those responsible.

It was then decided that the provision of widely spaced, large bomb-proof shelters for the populations of dangerous areas would mean defeat if the shelters were fully used in daytime: and if they were not going to be used there was no point in building them. The protagonists of strong shelters believed that workers in dangerous areas could be divided into "key" workers (policemen, telephone operators, power-station operatives and so on) and ordinary workers, and that the latter both could and should leave off work for sufficient time in raids to ensure their complete safety. This contention is valid for one raid, perhaps for two days of raids. Thereafter, as we now know, it does not matter much whether one's work is cooking a family's dinner, typing letters or running a munitions factory—loss of working time is equally disastrous and must be cut to a minimum.

It was primarily for this reason, though many other reasons played a part, that a policy of light, small shelters, as near as possible to the buildings they serve, was adopted. That policy has not been properly carried out, but it is difficult to see how anyone can contend that loss of working time in London caused by daylight raids would not have been immeasurably greater if London had had bomb-proof shelters every half-mile and nothing else.

The defeat of day-raids and the enemy's change-over to night raids has, however, changed the situation. At night most people don't work and therefore the main advantages of dispersed shelters cease to be operative.

On the other hand there is a very real psychological need for greater safety at night than in daytime, and certainly there is a very urgent need for well equipped shelters in which the inhabitants of the most crowded and vulnerable areas can sleep in the certainty that, if not perfectly safe, they are at least very strongly protected.

The second interesting point in Mr. Morrison's broadcast, and a disappointing one, is his neglect of the possibilities of adapting framed buildings for this purpose. He referred to the great resistance such buildings offer to bombs, suggested that their first and second floors might be used as "safety floors," but implied that if they were used for sleeping shelters they would be used with little added protection.

Many architects who regard the "Deep Shelters for All" cry with as much suspicion as Mr. Morrison, will think that this does not go far enough, and the little way it does go is dangerous. It seems axiomatic that the larger a shelter the safer it should be; and only in large shelters can adequate heating, ventilating and sanitary facilities be provided. It would at least seem probable that a great many modern framed buildings could be turned into very strong shelters, with only modest demands on scarce building materials, by casing them up to fourth-floor level with three feet of mass concrete, faced with brickwork as shuttering, and spanning between these new walls with protective ceiling slab of two feet of reinforced concrete.

Sleeping accommodation so protected could not be provided for everyone, but it could be provided for a substantial fraction of those who live in most crowded and most vulnerable areas and are unable to help themselves. These facts at least seem to justify a survey of how many such buildings exist, how many they could accommodate at night, the areas they could serve and the materials, labour and time needed for their additional protection.

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

NOTES & TOPICS

A RECENT letter to *The Times* by Sir Charles Bressey asked that preparations for the replanning of London after the war should begin at once. And a later letter from the President of the R.I.B.A. has backed up the suggestion.

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All architects will agree: preparations should begin at once. But immediately one has thus agreed to preparations, the difficulties of securing agreement on what the preparations are to prepare for begin to come to mind in single spies and in battalions.

*

What, for instance, does this simple phrase "the replanning of London" really mean? To the ordinary citizen it means vaguely making London a better place to live in: better workplaces, better houses, better everything. But overlying this basic meaning there is in his mind a series of pictures of a brand-new city rising from the debris, of grand shining streets, tall buildings and glittering vistas.

*

To Sir Charles, replanning London also means making it better, but he has naturally a clearer view of how it could be done. He believes that all rebuilding and redevelopment after the war should be brought into conformity with a key plan, or master plan, such as his highway development scheme. He suggests that a skilled body should watch the extent and location of all raid damage in order that advantage should be taken of that damage to make the highway scheme more efficient and to remodel badly planned areas on a much wider scale than was practicable when the scheme was prepared.

*

It seems plain that Sir Charles is right in holding that the replanning of London, if it is to have any good result, must be based on a master plan and that unless this master plan and its broad local applications are worked out before the feverish period of reconstruction begins, it will never be worked out at all—people won't wait for it.

*

But the next question, inevitably, is what the master plan should be—and of course the master aims which lie behind the master plan. Sir Charles Bressey plumps for a master road plan: the master aims being presumably the achievement of a perfect road traffic system and an "as good as possible" local redevelopment between the new or improved main arteries.

*

He may be right. A fine system of roads, especially when plotted on a map, is a master plan which the public can grasp easily and firmly, it has great attractions for a motor-mad age and it would be extremely useful when executed. It may well be that we would do well to grasp at the very real advantages which a road master plan for the new London would bring. It may be that if we aim higher we may in the end achieve much less; for it is only to be expected that after the war there will be a very general dislike of big ideas and big means of accomplishing them, and a big idea will have to be very easily grasped and its results seem very alluring to have much chance of being carried out.

*

But architects and town planners should bear in mind, at least at this stage, that the construction of a new road system, even with some redevelopment around it, does not rise very high as a master aim for the replanning of London. There are indeed quite sane people who think that motor vehicles, other than commercial and transport, are an unnecessary nuisance within five miles of Charing Cross.

*

Are there no bigger and better things that could be achieved in the replanning of London—things that would mean more to Londoners and less to the prosperous commuter? I think there are. For instance, the master aim for the new London might well be the construction of a system of parks containing, in part of each, the schools, hospitals, administration and public recreational buildings of the surrounding districts, and, in the rest, space for open-air activities of all kinds. The present inhabitants of the sites of these parks could be put in new St. Heliers and Becontrees and be brought to work by fast Tubes.

*

This may not be a very good master aim. As it only took me five minutes to think of, it probably is not. But it serves to illustrate my main contention, which is this:

*

The aim of any replanning of London is to make it a better place to live in for everyone and in every way. In order to overcome the opposition which is certain to be met, the main plan by which it is intended to realize this aim must be easily understood by the ordinary man, and thus the changes in London's existing ground plan which its execution would entail should be few and large rather than multitudinous and niggling.

*

Sir Charles Bressey's highway scheme has this relative simplicity which I believe essential for the master plan. But it promises little to the ordinary Londoner save the ability to move about more quickly above ground. Therefore the first stage of preparation for replanning should be, in my view, to evolve a master plan which, while being as simple as Sir Charles's, does promise a very great deal more to the ordinary man—at work and at play, sick or young, and not merely when he's in a bus.

THE SHOPKEEPERS

Napoleon, or whoever it was who referred to us as a

Nation of Shopkeepers, spoke more truly than he knew. This is borne out today by the importance of our export trade, the publicity attending the bombing of well-known London departmental stores, and the determination throughout the country that business shall be as usual wherever possible.

*

Nowhere is this determination more in evidence than in a little market town through which I passed the other day. The stalls were up and their owners doing a big trade. The market place was thronged with buyers, near-buyers, and just goopers, and, apart from a sprinkling of khaki and vendors tempting the populace with gas-mask and identity-card cases, there was little evidence to show that there was a war on, although the countryside around has had its share of H.E.

*

Attention was on the matter of the moment : " I'm not askin' fifteen bob for 'em ; nor even twelve—I'm givin' 'em away ; nine bob, that's all. . . . So I ses Are they fresh I ses, and he ses Yes he ses, so I ses O. . . You, sir, have you dropped arches ? . . . Ladees, 'ave you bought anythink by yourselves ever without askin' your solicitors ? . . . "

*

At another town a few miles away the inhabitants were gathered in conversational clutches. A lone raider had flown unexpectedly out of a low bank of clouds at lunchtime the day before.

*

The vagaries of blast are more obvious in an isolated raid like this than where the bombing is continuous. The track of blast waves can be followed up streets and down alleys, but there seemed no doubt that in many cases the breakage of windows depends upon the actual fixing of the panes (leaded lights, as I have observed before, escaping damage.) A smashed shop window some distance away, one among many unscathed neighbours, presumably meant that the glass was under strain of some kind before the event.

THE VICAR WHO KNEW WHAT HE LIKED

I happened last week to pass through Bourton-on-the-Water in the Cotswolds. It is, of course, a show village in that district of lovely villages, but I had not visited it since schooldays.

*

A serene village, free from the sophistication of Broadway, it is dominated by the tower of the parish church, a fine, square, full-blooded, eighteenth century tower, with a rusticated base, Ionic pilasters, stone corner urns and a lead-covered cupola. From the road the rest of the building is hidden—fortunately so, perhaps, because it is mostly Victorian Gothic.

*

Inside the door a leaflet is posted for the information of visitors. It was written in 1931 by the rector of the time, and is a magnificent example of the architectural prejudice so commonly found in the ecclesiastical mind.

*

" The history of this church is a sad one," he begins. (But not sad in the way you might suppose.) " In 1785 a Lady Parishioner presented a large sum of money to the parish for the rebuilding of the church in the Italian style which was in vogue at the time . . . Happily, however," he continues complacently, " in 1875 the Georgian nave was demolished and rebuilt in the Gothic manner—a work completed in 1891 to the designs of Sir T. G. Jackson, well-known for his admirable work in Oxford."

*

The tower is dismissed as " not beautiful . . . but uncommon," and he concludes by saying " the font is probably only of eighteenth century origin."

*

Everyone is, of course, entitled to their own views, however ill-informed they may appear. To churchmen, churches of the seventeenth and eighteenth centuries are hideous—did not, for instance, the last Bishop of London not so long ago suggest demolishing most of those in his diocese ? (St. Paul's, of course, was " different " and could remain.) It is true also that few vicars have had the knowledge or taste to forbid the defiling of churchyards with Italian marble tombs or of churches with church furnishers' furnishings. That, too, is unfortunate. But views are one thing and information is another, and it is misleading to hand out personal (and frankly ignorant) prejudices as if they were the considered judgments of an authority.

*

I was pleased to see that some cynic had underlined the word " happily " in the vicar's description and also the adjective " admirab'e," referring to the spiky, stripey work of Sir T. G. Jackson at Oxford. Evidently one or two of my predecessors had managed to withstand the vicar.

THE OPPORTUNIST

An architect acquaintance had sat down beside me in a bus, and we had chatted for ten minutes or so. He told me he was living in a small house he had built near a very rustic Surrey village. It was a very simple house, I remembered—one thin oblong with a pitched roof, one big chimney, a garage at right angles, and a loggia just a tiny bit Tecton.

*

" Well, you won't," I said at length and inevitably, " have had many bombs down your way ? "

*

" No," he replied—" only three. They were dumped by a scooting Luftwaffe along my hedge a fortnight ago."

*

" Do much damage ? "

" Only four windows broken, but they twisted the house proper. The chimney is three inches out of plumb, the solid ridges courses project beyond the cavity wall, window frames are twisted, the loggia has a hump and the garage doors form a parallelogram. Oh, yes—and the ceilings are cracked and a short wall is wonderfully pock-marked and some tiles are off."

*

" H'm . . . What can you do about all that ? "

" I know exactly what I'm going to do—either at or before the end of the war. I'm going to get the village builder to put in leaded lights and wood frames, patch the walls with old bricks and the roof with old tiles, thatch the garage, alter the loggia into an arbour, and plonk 3 by 2's all over the ceilings. It'll cost me," he added, getting up, " under £150 all told. And I . . . bet . . . you, I clear £250 on the whole cost of the house from first to last. It's a gift—and I never did like the house very much, though I never told my wife."

ASTRAGAL

NEWS

SOUTH WALES INSTITUTE OF ARCHITECTS

A lecture illustrated by lantern slides on "Concrete as an Alternative to Timber Construction," was given at the Technical College, Cardiff, on November 5, by Mr. Edric Neel, M.A. (CANTAB.), A.R.I.B.A., of the Cement and Concrete Association. The lecture was arranged jointly by the Central (Cardiff) Branch of the South Wales Institute of Architects and the Welsh School of Architecture. Mr. W. S. Purchon, M.A., F.R.I.B.A., Head of the Welsh School of Architecture, presided over a representative gathering of architects and students of architecture.

Mr. Neel dealt with the need for the conservation of tensile materials—substitution of reinforced concrete for structural steel—need for standardization ; effect of standardization on plan and elevation ; the qualities of *in situ* concrete and precast concrete ; and the application of concrete to structure and finish of building work being carried out at present—factories, housing and hutting.

A hearty vote of thanks was accorded to the lecturer on the proposition of Mr. John W. Bishop, A.R.I.B.A., Chairman of the Central Branch of the South Wales Institute of Architects, and seconded by Mr. G. C. Quilliam, B.ARCH., A.R.I.B.A., A.M.T.P.I.

FACTORIES

Following is the memorandum prepared by the Garden Cities and Town Planning Association on Building of Factories in Small Towns, etc., referred to on page 370 of last week's issue :

1. As a result of air attacks on factory concentrations, a need for rapid building of new factories, dispersed and in smallish groups, has arisen and is likely to increase. These will be wanted for :

(*a*) Firms bombed-out or evacuated, and engaged in war contracts, export, or other essential work.

(*b*) New or expanding businesses on war contracts or sub-contracts.

(*c*) Storage of materials or equipment.

2. It is desirable that such new factories should be in the smaller towns or larger villages, *not* in large aggregations or their suburbs. It is most undesirable that they be hastily placed in rural areas where their consequences might often interfere with food production.

3. Advantages of placing new factories in existing small towns are, besides those of dispersal :

(*a*) Local initiative, labour and materials can be used, with speed and economy. Potential factory sites could speedily be selected by the Local Planning Authority who have an intimate knowledge of their areas.

(*b*) Workers can be housed or billeted with minimum loss of travelling time. (Non-industrial evacuees could be moved to make room.)

(*c*) Public and social services can readily be expanded and adapted.

4. If local initiatives are fully used, the central organization is simplified. But it must cover the following matters :—

(*a*) Decision as to towns and districts to be used and choice of local authority or other agency to be given facilities.

(*b*) Technical and commercial advice to such agencies. A few experts in sectional factory building could advise local architects and surveyors and avoid many mistakes.

(*c*) Approval of acquisition of sites and expenditure on buildings. Fixing rentals, etc.

(*d*) Suggestions to local authority as to billeting, evacuation or re-evacuation.

(*e*) Suggestions to transport authorities as to local revisions of their services.

(*f*) Suggestions to local authority and welfare agencies as to provision of public services and social facilities.

In many cases (*d*), (*e*) and (*f*) would be left to the local agencies if advance information of needs is given.

5. Letting of factories could be left to the local agencies, with an obligation to consult the Ministry of Supply as to firms to have priority. No need to wait for actual lettings before building : the factories should be sectional and adaptable. Factories in course of construction to be notified to all Government Departments concerned with production.

6. The central Direction, however controlled, should be in close liaison with the Ministry of Supply, the War Departments, the Ministry of Labour, and the Works and Buildings Priority Committee, and in frequent touch with other Government Departments, e.g. Transport, Health and Agriculture.

7. The scale of operations to be fixed from time to time by the Ministry of Works and Building and the Treasury, and funds made available to the Direction on that scale. There might be a limit on commitments in any one area to ensure adequate dispersal.

8. These notes do not pretend to administrative exactitude. They are merely suggestive of a possible method for rapid action.

INSTITUTION OF STRUCTURAL ENGINEERS

The following members have been elected :

Graduateship : N. T. A. Beavan, Bath (x); C. E. Brown, Gidea Park, Essex; L. Clements, Sompting, Sussex (x); H. J. Cook, London; D. A. Hughes, North Harrow, Middlesex (x); J. Conner Inverurie, Aberdeenshire; J. W. Martin, London; R. C. Moore, Stafford; N. J. Roostan, London; W. Taylor, Huddersfield; and R. T. Walters, Derby.

Associate-Membership : A. L. Arnold, Weymouth, Dorset; N. E. Back, South Croydon, Surrey (xx); W. H. Bartlett, Bristol (xx); V. Baxter, Leconfield, Yorks; F. B. Bott, Neath, Glam.; R. T. Cook, Twickenham, Middlesex (xx); K. P. D'Aintree, Sale, Cheshire; J. K. Dancer, Stourbridge, Worcs; K. G. Dash, London (xx); S. Fairey, Hinchley Wood, Surrey; W. A. Fairhurst, Newton Mearns, Renfrewshire; A. J. Francis, Upton-on-Severn, Worcs (xx); W. G. N. Geddes, Stockton-on-Tees; F. A. Gerard, Manchester; R. F. Godman, Croydon, Surrey; J. Gray, Manchester (xx); J. C. Gray, Ayr, Scotland; F. M. Green, Solihull, Warwicks; H. G. Hale, Stockton-on-Tees (xx); A. Harker, Stoneleigh, Surrey; J. H. Higgins, London; A. G. R. Hill, Pontypool, Mon. (xx); E. Hodgson, London (xx); H. A. Hodson, Birmingham; C.-H. D. Howitz, London; B. D. Jones, London; J. C. Kilburn, Sale, Cheshire; J. A. Lecky, London (xx); P. B. MacFarlane, Glasgow; N. G. McLean, Hassocks, Sussex (x); A. F. Mason, Chelmsford, Essex (xx); J. B. Neil, Liverpool; F. Norman, Reading, Berks (xx); W. E. Parsons, Ilford, Essex; W. Pickering, Leeds (xx); N. C. Sidwell, Hatfield, Herts; F. Simpson, Stafford (xx); J. W. Stagg, London; N. R. Tembe, Stafford (xx); C. G. Thirlwall, Doncaster (xx); H. W. Thrower, Harrogate, Yorks (xx); W. A. Tilbrook, Coventry (xx); J. G. Veryard, London (xx); A. V. Waddell, London; R. C. Westbrook, Edgware, Middlesex; F. S. Wilson, Stockton-on-Tees (xx); B. N. Wright, Wallasey, Cheshire.

(x) = Transfer from Studentship.
(xx) = Transfer from Graduateship.
Note.—Each candidate has passed the examination appropriate to his grade of membership.

CORRECTION

In the Appendix to the Building Research Station's Note on Anti-Scatter Treatments for Glass, published in our issue for October 24, the name and address of the third firm, given as "Black Bros., Ltd., Stoney Street, Manchester," should read "Black Bros., Ltd., Stoney Street, Nottingham."

IRON AND STEEL CONTROL

The Minister of Supply has made the Control of Iron and Steel (No. 13) Order, 1940. It came into force on November 1, 1940. Under this Order new maximum prices for iron and steel products are instituted, and those laid down in the Control of Iron and Steel (No. 8) Order, as amended by Nos. 10, 11 and 12 Orders, are withdrawn.

The new maximum prices fixed under the Order represent an increase of 35s. a ton on billets, sections, joists and rails, and of £2 a ton on plates, with corresponding adjustments in the prices of finished products such as tubes, bolts and nuts and wire. The greater part of these advances in price, as in the case of advances previously made since the beginning of the war, is to meet payments into a central fund which is used to equalize the cost of imported steel and raw materials with the price of similar home products. In particular, the need to augment the central fund is the result of the increasing quantities of imported steel now arriving from the United States. Some allowance, amounting to about 5 per cent. on present prices, has been made to meet certain increases in home production costs.

Copies of the Order may be obtained from H.M. Stationery Office, York House, Kingsway, London, W.C.2, or through any bookseller.

R.W.A. SCHOOL OF ARCHITECTURE

The above School of Architecture has removed, for the war period, to the Royal West of England Academy, Queens Road, Bristol, 8.

ANNOUNCEMENTS

The temporary address of Messrs. Gardiner and Theobald, chartered quantity surveyors, is 45 Albion Road, Sutton, Surrey. Telephone No. Vigilant 1305.

Messrs. Gunton and Gunton have re-opened their Liverpool office at H.23 Exchange Buildings, where they would be pleased to receive trade catalogues.

Mr. Geoffrey C. Wilson, F.R.I.B.A., having joined the Royal Engineer Services for the duration of the war (with the intention of resuming practice afterwards), the partnership of Messrs. Tatchell and Wilson, FF.R.I.B.A., has by mutual consent been dissolved as from June 30 last. Mr. Sydney Tatchell will practise in the name of Sydney Tatchell and Son, at Bank Chambers, 32 Strand, W.C.2. Telephone No. Temple Bar 4726.

A.A.S.T.A.

"This Annual General Meeting views with resentment Mr. Herbert Morrison's recent statement to the effect that those who advocate deep shelters are a species of fifth columnist, particularly in view of his previous advocacy of 100 per cent. protection ; and urges the immediate construction of bomb-proof shelters as advocated by the A.A.S.T.A. for the past three years."

This was the resolution carried unanimously by the annual general meeting of the A.A.S.T.A., following an address by Mr. V. L. Nash, A.R.I.B.A., retiring President, at a meeting of the Association on Saturday last.

"There is today," said Mr. Nash, "a dangerous tendency to 'Utopianism'—particularly in official quarters, which want to encourage thought about planning after the war while leaving present difficulties of air-raid protection and re-housing of victims unsolved." Mr. Nash stated that the Association had every right to be proud that every prophecy it had made about A.R.P. and evacuation for the past three years had been proved only too lamentably true. Single-handed among the country's architectural organizations the Association had striven by every means in its power to deflect the disaster which it could see looming over the people as a result of the Government's attitude.

The A.A.S.T.A. had refused to prostitute its technical honesty by supporting Government policy on A.R.P. The Government did not listen to technical advice. "What prevents proper schemes being carried out?" asked Mr. Nash. The answer lay in the vested interests of the building materials industry, which were afraid to expand plant, lest in the future the demand for materials be lessened and prices reduced.

"Only the technical ignorance of the public enables demands for proper protection to be countered by speeches darkly hinting at invasion, the imminent invention of secret weapons, or the efficacy of gas masks."

Commenting on Miss Wilkinson's aim to make every shelter a club, Mr. Nash said that no amount of welfare organizations could make up for the structural insecurity of the shelters at present provided, which in many cases would not even keep out the rain.

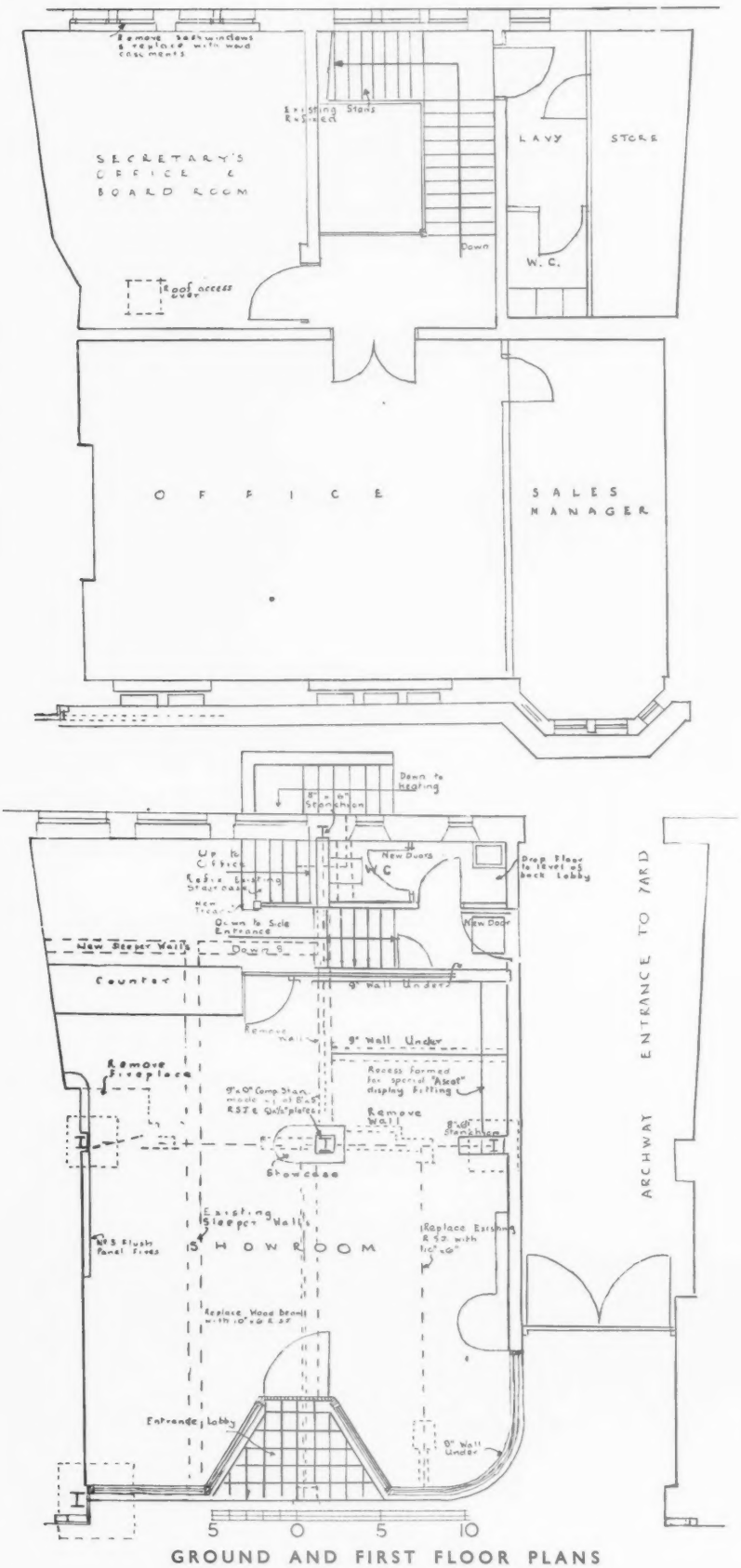
The officers for the coming session, elected at the meeting, are : President, Colin Penn, A.R.I.B.A. Vice-Presidents : H. L. Barton, A.R.I.B.A.; F. N. Brayshaw, F.F.A.S.; J. E. Dickson; A. G. Ling, A.R.I.B.A. Council : Miss J. Blanco-White, A.R.I.B.A.; J. Conn; R. E. Cooper; R. I. Greatrex; F. P. Harrison; B. Haward, A.R.I.B.A.; H. S. King; R. D. Manning, A.R.I.B.A.; P. J. Marshall, A.R.I.B.A.; F. J. Maynard, A.R.I.B.A.; V. L. Nash, A.R.I.B.A.; D. E. Percival, A.R.I.B.A.; J. E. Pinckheard, A.R.I.B.A.; J. W. Poltock, A.R.I.B.A.; C. L. Puckering; T. C. Ralph; R. L. Townsend, A.R.I.B.A.; W. L. Vinycomb, A.R.I.B.A.; S. H. West; J. M. Wilson, A.R.I.B.A.

GAS SHOWROOMS, DURHAM

DESIGNED BY
CORDINGLEY AND McINTYRE

Above and right, two views of the existing premises : below, before reconstruction.

GENERAL—The original building with heavy stone façade was primarily an office for the City of Durham Gas Company and had three small windows only at high level for display purposes. The clients desired as large and open a showroom as could be obtained.



GROUND AND FIRST FLOOR PLANS

PLAN—Access for motor vehicles to the back of the premises was to be retained and all the ground floor space devoted to the showroom. On the first floor the secretary's office was renovated and the old board room, which was in use as a store room, was restored as the general office. A portion of this was partitioned off to form the sales manager's office.

Entrance doors and general view of showroom.

NEW SHOWROOMS, CITY OF DURHAM GAS

Counter and stainless steel railing in showroom

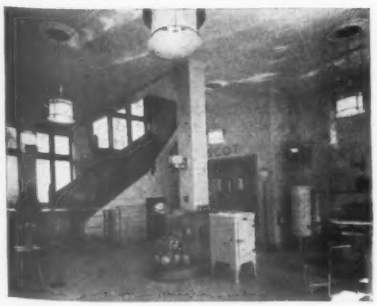
CONSTRUCTION—The whole of the ground floor, except the back wall, was removed and steel framing inserted as a support to the first floor which has not been altered structurally.

EXTERNAL FINISHES—The fascia and side piers are of cream travertine and the stall riser of black granite with secret fixings. The lobby floor is paved with travertine tiles and the ceiling is fibrous plaster. The fascia letters are built-up bronze. The word "Gas" on the glass is in cellulosed teak. The door, in oak, is covered with bronze metal externally with the etched glass panels set in a stainless steel sub-frame. The pull handles are black with stainless steel mountings. All sashes and rails are bronze metal on oak cores and the glass is $\frac{5}{16}$-in. plate fixed with hardwood beads.

INTERNAL FINISHES—Floors are of cream terrazzo and the walls are of hard plaster with gloss finish. The counter, showcase and all other woodwork are of oak. The railing and gate to the counter are of stainless steel.

SERVICES—Lighting is by gas. A stainless steel grille is provided over each ceiling fitting and is connected to a main flue. The light is operated by gas switches. The heating boiler is gas-fired. Radiators are used generally. Ceiling panels were used in the front of the showroom.

General contractors were F. W. Goodyear and Son ; for list of sub-contractors and suppliers, see page xiv.



Showroom

General office

Secretary's office

COMPANY • BY CORDINGLEY AND McINTYRE

SINGLE-STOREY WARTIME FACTORY DESIGN

Following is Bulletin No. C12, just issued by the Research and Experiments Department of the Ministry of Home Security.

INTRODUCTION

A main object of air attack is to paralyse production. By dropping high explosive and incendiary bombs the enemy seeks to demolish or burn out factory buildings, ruin the plant and kill, maim, or at least demoralize, the workers. Fortunately for the defence, wartime designers can do much to make factories highly resistant to collapse and difficult to fire, damage can be localized, and the steadiness of the workers reinforced by giving them cover at hand. The intelligent development of the design methods advocated is regarded as an important counter in maintaining production despite air attack.

Serious as has been the structural damage caused by high explosive bombs to certain factories, the effects of high explosives are not so deadly as the effects of fire. Up to the present, far more steelwork has been destroyed by fire than by high explosives.

The simplest way of minimising fire damage is to limit the combustible materials in the factory to the essential minimum. This applies also to the roof, where timber purlins or any form of slates or tiles on boarding, should on no account be used.

Correct planning of a factory can play at least as big a part in minimizing bomb damage as correct structural design.

The tendency towards very large buildings, which is so marked today, should be reversed. In the event of a direct hit by a large bomb, all the glass and roofing material in the building, almost irrespective of its size, will be destroyed. Even in a small building, the explosion will to some extent be confined by the walls and roof and adjacent buildings will be relatively undamaged.

It therefore follows that it is preferable to sub-divide a factory into as many units as possible, rather than to concentrate everything into one large building. This has the additional advantage of minimizing the area likely to be destroyed by fire. Moreover, it may be possible to arrange production in several parallel lines, so that if a link in one line is destroyed it can be by-passed and production need not be seriously interfered with.

PRINCIPLES OF DESIGN

By far the most common type of factory for wartime production is the single-storey building, and this Bulletin is concerned with the principles of design applicable to this type.

The first principle is that all loads should be carried by a framework of steel or reinforced concrete. Load-bearing walls are dangerous, because an explosion can demolish instantly long lengths of walling, bringing down with them all that rests on them.

So far, little experience of the behaviour of reinforced concrete frames has been obtained. It is known that a reinforced concrete member is more severely damaged by a direct hit than a comparable steel member. It may therefore be impossible to eliminate collapse entirely in reinforced concrete framed buildings. The evidence so far available suggests, however, that where reinforced concrete is used, the most satisfactory way of minimizing damage is to divide the framework into as many discontinuous units as possible, thus localizing any collapse that may occur.

In the meantime, this Bulletin is addressed primarily to the problems of design in steel.

STEEL FRAMING

The second principle is that the steel frame should resist collapse, notwithstanding the sudden removal of any one main member. This is not so rigorous as it sounds. Near the explosion, the load is generally relieved by the roof covering being blown away, and there have been a number of cases where direct hits have severed either the rafter or the main tie of a steel roof truss without even producing a measurable sag.

The chief risk to roof steelwork arises from the violent displacement of a stanchion foundation and the consequent shearing of the stanchion cap connection leading to collapse of roof trusses. This risk is eliminated if two simple precautions are taken. The cap connection of the stanchion to the roof member should be made stronger than is usual in order that it shall not be sheared off, even if the stanchion base is shifted 4 or 5 inches by a near miss. This precaution is particularly necessary in the case of trusses or beams framing into external stanchions. In addition to the effects of ground movement, such stanchions are liable to be subjected to a considerable horizontal blast pressure applied to them by whatever wall construction is adopted. Provided their cap connections are adequate, however, the worst effect of this blast will be to bow out the stanchions without causing any major damage, or collapse. In addition, the roof girder or valley beam should be spliced so as to be continuous. This will ensure that, even if a stanchion is destroyed, the valley beam is adequate to carry the dead load only of the roof (without the sheeting) over two bays. These precautions will not serve if two adjacent stanchions are destroyed, and a stanchion spacing of at least 30 ft. each way is desirable to prevent this.

An explosion inside a factory forces the roof upwards and the steelwork should be designed to resist this by using angles rather than flats for all tension members, and by attention to the roof covering as suggested in Sec. 5.

Generally speaking, the experience of recent air raids has indicated* that the roof types recommended in Wartime Building Bulletins Nos. 1 and 4 are the best possible from the point of view of resistance to air attack, provided that they are fully steel framed. The following points should, however, be borne in mind in relation to the individual types; the modifications suggested below are being made to the type designs, and will be given in Wartime Building Bulletin No. 10.

Type B.—Sheeted roof consisting of symmetrical roof trusses carried on valley beams.

Experience shows that it is only by the destruction of a stanchion that any collapse of this type of roof can be produced. This danger can be eliminated if the valley beam splices are designed to develop such a strength that the dead load only of the roof (without the sheeting) can be carried over two bays.

Type C.—Sheeted roof consisting of symmetrical "umbrella" trusses cantilevering on either side of apex lattice girders.

This type was included in the Bulletin in preference to the more usual north light type, solely with a view to its inherent resistance to collapse. If full advantage is to be taken of this, minor amendment to the original design is necessary. The lattice girders should be strengthened to enable them to act as continuous girders.

Even if the precautions outlined above are taken, there is the possibility that fire or other unforeseen occurrences will bring down a portion of the steelwork. In this event it is essential that the collapse should be localized, and should have no tendency to spread and involve the adjoining undamaged steelwork. The only form of spreading collapse to which the above types are liable occurs with Type B, and may happen if a number of adjacent trusses in the same bay collapse. The purlins may then apply an excessive horizontal pull to the neighbouring trusses, pulling them over and producing a spreading collapse. This danger can be guarded against by providing at intervals in each bay wind bracing capable of sustaining any pull which the purlins can transmit.

* "Economical Type Designs in Structural Steelwork for Single Storey Factories." H.M. Stationery Office, London.

WALLS

The external walls of a wartime factory should be regarded as simply protective screens against weather and bomb fragments. The danger attendant on load-bearing walls has been mentioned already. Hence the external walls should consist of panels of the materials and thicknesses† specified in the Revised Code. Such laterally protective panels should not be built into the webs of steel stanchions, but should be butt jointed against the concrete or brick with which the stanchions should be encased. If the height of the panels is 6 or 7 ft. above the factory floor level, this will suffice for lateral protection. In the space between the top of the panels and the eaves of the roof sheeting on steel framing should be fitted. Panels and sheeting should be so designed that blast damage shall not be transmitted by them to the framing. To ensure that the sheeting shall blow in harmlessly, it should be of asbestos-cement or other brittle material, with anti-scatter protection by means of wire or sisal netting, which may be of large mesh, securely fixed to the steel framing behind the sheeting. The use of corrugated steel sheeting is not recommended for walls, as although it will blow out harmlessly from a hit inside the building, it is liable to cause considerable buckling of the steelwork under the effects of a near miss outside the building.

If natural illumination is regarded as essential, the space above the dwarf walls may be glazed, preferably with a translucent flexible glass‡ substitute (see Bulletin C10). If glass is used it should be covered internally with wire netting not exceeding ½ in. mesh, securely fixed to the structure.

In non-essential buildings if load-bearing brick walls or piers are used to economize steel, similar principles of construction should be adopted. Load-bearing brick piers separated by panels with straight joints between panels and piers should be used in preference to continuous brick load-bearing walls. The height of the panels and the space between top of panels and eaves should follow the principles advocated above for framed structures. The panels should be of the materials and thicknesses specified in the Revised Code.

The use of lightweight internal partitions to sub-divide a factory should be avoided. Such partitions are particularly liable to blast damage and if glazed or sheeted with a brittle material they are a serious source of danger to personnel.

Substantial internal partitions, however, can be designed to afford a considerable measure of protection. If they are built the full height of the shop they will provide useful fire stops and may limit blast damage to the roof. They should be framed in steel or reinforced concrete independent of the main structure.

ROOF COVERING

(*a*) Protected Roofs (Type A of Wartime Building Bulletin No. 1. Flat Roof incorporating monitor lights and giving overhead protection by a 4-in. reinforced concrete slab.)

The little evidence so far available on the behaviour of this type of roof under the effects of direct hits and near misses indicates that it should afford considerable protection to the factory from debris thrown up from bomb craters. It may even give some protection to plant against the effects of those light bombs which, being instantaneously fused, explode when they strike the roof. Such a bomb would merely blow a hole about 5 ft. square in the roof with relatively little damage to the interior of the factory.

The effect of a large bomb exploding inside a factory is, however, likely to be much more serious. The reinforced concrete roof slabs will undoubtedly be lifted over a fairly wide area. It is possible that they may also be displaced

[*Continued on page 398*

† "Air Raid Shelters for Persons working in Factories, Mines and Commercial Buildings." Revised Code—H.M. Stationery Office, price 6d.

‡ Flexible Substitutes for Glass, Research and Experiments Department, Ministry of Home Security.

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SYSTEMS AND PRACTICAL APPLICATION OF STEEL ROOF TRUSSES (forms of chords)

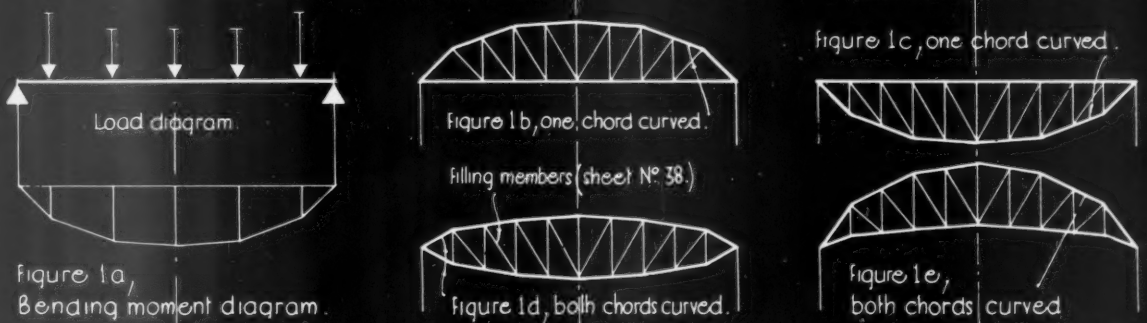

FIGURE 1: VARIOUS THEORETICAL SHAPES OF TRUSSES SUITABLE FOR A GIVEN LOADING

EXAMPLES OF TRUSSES MODIFIED IN SHAPE TO CONFORM WITH PRACTICAL BUILDING REQUIREMENTS

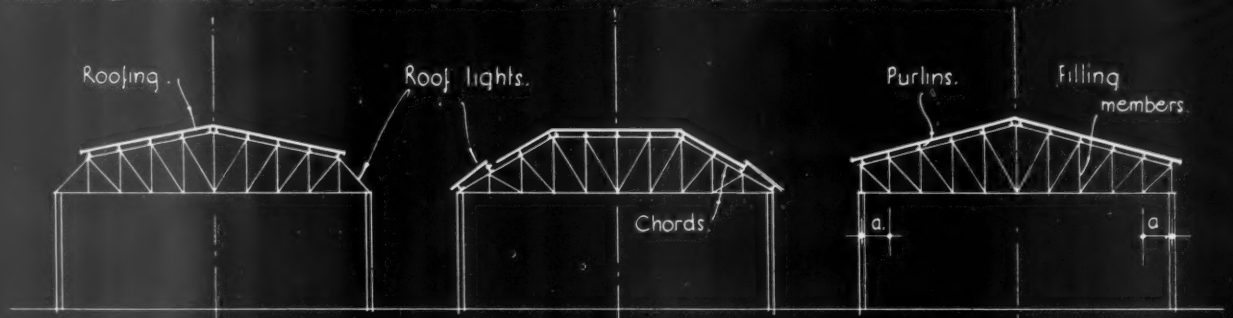

FIGURE 2: The two trusses are approximately ideal in form

FIGURE 3:

FIGURE 4: Adaption of truss in Fig. 3.

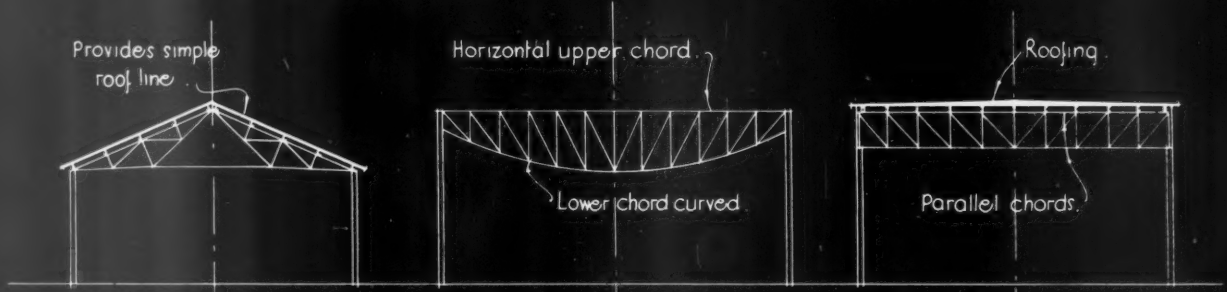

FIGURE 5: Fink truss for small spans.

FIGURE 6: Best form of truss for heavy loads

FIGURE 7: Adaption of truss in Fig. 6.

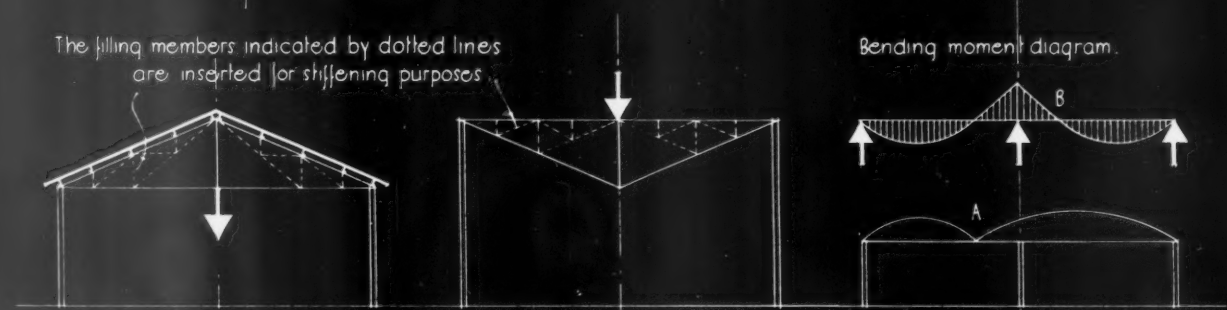

FIGURE 8a: Reasonable shapes of trusses for central loads only

FIGURE 8b:

FIGURE 9: Truss continuous over 3 or more supports

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INFORMATION SHEET: STEEL FRAME CONSTRUCTION: N°37.

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INFORMATION SHEET

• 809 •

STRUCTURAL STEELWORK

Subject : Steelwork for Roof Construction, 5 : Systems and Practical Application of Steel Roof Trusses

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.

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

This Sheet is the thirty-seventh of the series, and illustrates the systems and practical application of steel roof trusses, with particular emphasis on the form of the chords.

Theory of Trusses :

Trusses can be considered as beams from which the parts which are not heavily stressed have been cut away, leaving only the minimum of material required to withstand the loads.

Practical Arrangement :

As a beam has to take bending as well as shear forces, the truss must be able to do the same. Actually it is found that a truss is suitable if it consists of a number of straight pieces of material forming triangles. Several straight pieces meet at a node, which, in practice, is constructed by means of a gusset plate riveted to each of the members. The force in each member of the truss fixes the amount of material required, and is greatly dependent on the shape of the truss. Different shaped trusses for the same purpose may vary greatly in weight, and although the shape of a truss may be influenced by architectural as well as static considerations, every designer should begin by evolving the truss which is mechanically the best and adapt it to practical necessities.

Form :

The form of truss which is statically the best is one in which the chords enclose an area similar to the bending moment diagram, i.e. one in which the distance between the upper and lower chord everywhere retains the same proportion to the ordinates of such diagram. Where the load varies (live load) the diagram can be constructed in accordance with an average load, usually equal to the dead load, plus half the live load. In Figure 1*b*, *c*, *d* and e various shaped trusses are shown formed to conform with the bending moment diagram 1*a*, and it will be seen that in Figure 1*b* and *c* one chord is curved, while in Figure 1*c* and *d*, both are curved.

Filling Members :

With a uniformly distributed load the filling members (diagonals and verticals) of such a truss are not stressed at all, but if the load is not uniformly distributed they will be stressed according to the intensity of the variation. (For the best arrangement of filling members see Sheet No. 38.)

Depth :

In the chords, the forces for a given load are the smaller the deeper the truss, and deeper sections may be chosen accordingly, but it can easily be seen that at the same time the lengths of at least one chord and of the filling members become greater so that the advantage is compensated with over-deep trusses. The optimum depth/span ratio for roof loads is about $\frac{1}{5}$, while a greater depth/span ratio will sometimes be economical for heavy loads.

The theoretical forms shown in Figure 1 are frequently impractical. For instance, a straight line upper or lower chord might be required, or an upper chord following the shape of a roof surface. The closer to the theoretical form an actual truss can be constructed the more economical it will be.

Practical Shapes :

Figures 2 to 9 give examples of practical trusses. Here the design of the chords is emphasized and alternative arrangements for filling members are given in Sheet 38. Figures 2 and 3 give roof trusses which approximate to the ideal form. The steep slope can be used for glazing. The form given in Figure 4 is almost as good, and it will be appreciated that if the member '*a*,' which is not stressed, is considered as being non-existent, the form is practically equivalent to that in Figure 3.

The Fink truss, Figure 5, makes for a simple straight roof line, but is so different from Figure 1 that it makes an economical construction only if the spans are very small.

Trusses which have to take heavy loads, and which often have to have a horizontal upper chord (for instance crane girders) are better formed as shown in Figure 6 with a curved lower chord, than as in Figure 7 with parallel chords. If a load occurs only in the centre of a truss, the form shown in Figures 8*a* and 8*b* would be the most reasonable.

If a truss is continuous over three or more supports its formation in accordance with the bending moment diagram leads to an arrangement involving the use of hinges at certain points. See Figure 9. Care must be taken in such cases not to include too many hinges, as otherwise the stability of the structure may be affected—e.g. in the case shown in Figure 9 only one hinge can be included at point A or B, but not both, while adherence to the shape of the bending moment diagram necessitates some depth of truss at the central support.

Previous Sheets :

Previous Sheets of this series dealing with structural steelwork are Nos. 729, 733, 736, 737, 741, 745, 751, 755, 759, 763, 765, 769, 770, 772, 773, 774, 775, 776, 777, 780, 783, 785, 789, 790, 793, 796, 798, 799, 800, 801, 802, 804, 805, 806, 807 and 808.

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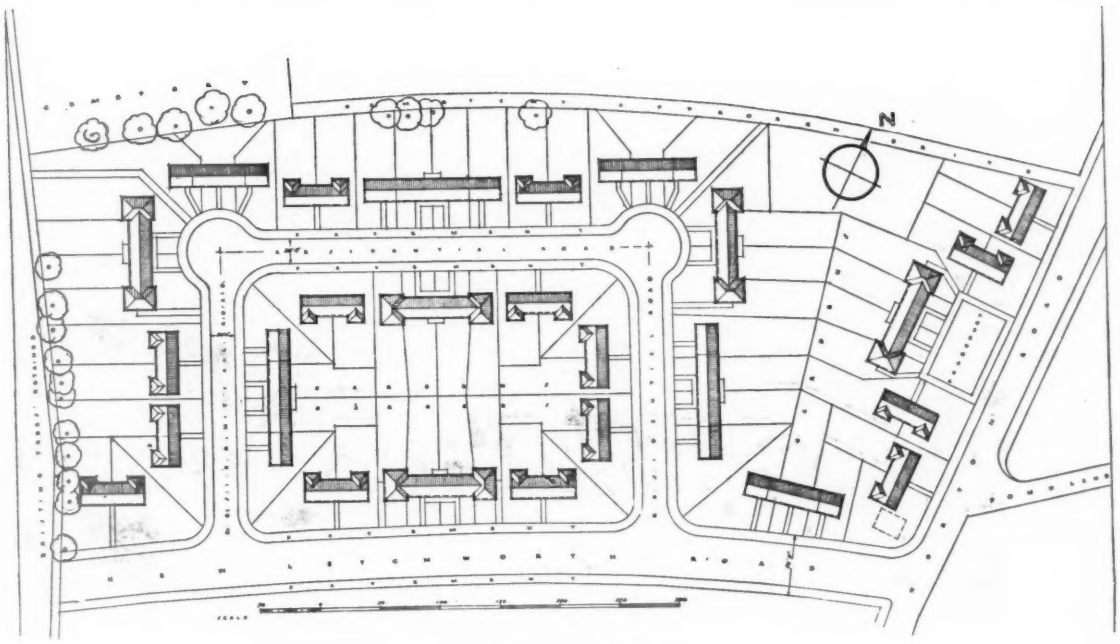
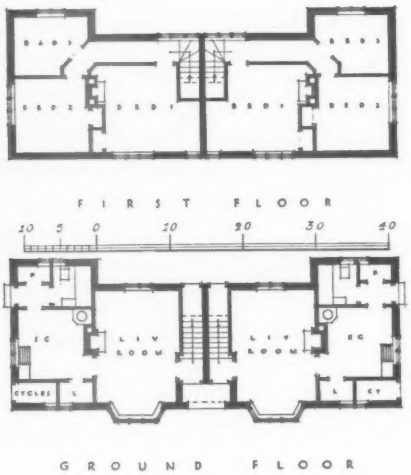


LAYOUT PLAN

HOUSING SCHEME, BALDOCK

DESIGNED BY E. R. BINGHAM HARRISS (HARRISS AND HARRISS)

GENERAL AND SITE—The layout of this scheme at Baldock, Herts, was dictated largely by a stipulation that a 50-ft. road had to be formed along the south side of the site, to be continued ultimately to Letchworth. The estate is bounded by open ground on the south, west and north sides and by Norton Road on the east. The Council required houses planned at ten to the acre, all having living-room, scullery, three bedrooms, bathroom and w.c., fuel and cycle store.

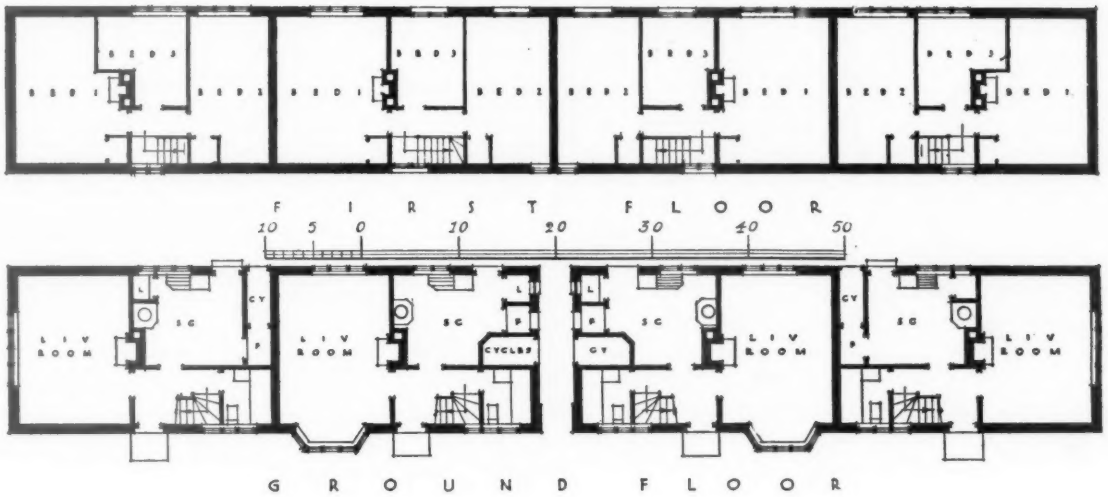


TWO-HOUSE BLOCK

View from a service road

CONSTRUCTION AND EXTERNAL FINISHES—External walls are of 11-in. cavity construction with facing bricks to all elevations. The houses in Norton Road are of cream Burwell bricks, in view of their eastern aspect. The remainder of the scheme is built of darker bricks, with three coloured blocks to link up with the Norton Road blocks. Roofs are of dun-coloured pantiles and dark brown concrete tiles on felting. Wood "stormproof" casements are fitted and there is T. and G. boarding to joists on ground floor.

HOUSING SCHEME, BALDOCK, HERTS



FOUR-HOUSE BLOCK

INTERNAL FINISHES AND EQUIPMENT—Walls and partitions, plastered throughout (excepting scullery), bath, w.c. suite and lavatory basin are in green with blue belge panel to bath and black seat and cover to w.c. pedestal. Two bedrooms in each house have hanging cupboards.

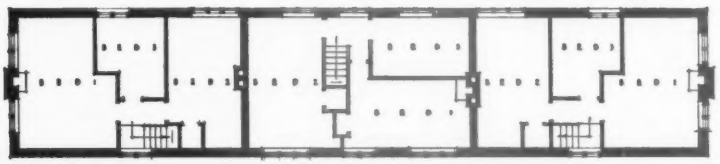
SERVICES—Electric lighting is standard throughout, with power and gas for alternative cooking in scullery. Electric points are fitted for wireless, living-room and sweeper or electric fire on landing. Hot water calorifier systems have been installed.

DESIGNED BY E. R. BINGHAM HARRISS

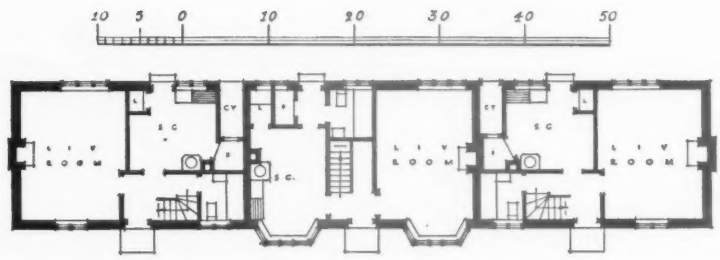
HOUSING SCHEME

DESIGNED BY E. R.

THREE-HOUSE BLOCK



FIRST FLOOR



GROUND FLOOR

GARDEN LAYOUT—The gardens are enclosed by concrete posts and wire, and hedging has been planted along all frontages; in addition, shrubs and ornamental flowering trees, of various kinds to bloom at different seasons, have been selected and planted under the architect's direction.

[*Continued from page 394*]

slightly and fall back into the shop instead of on to the supporting steelwork. Should this occur the roof slabs would do even more damage than the bomb and this eventuality must be guarded against at all costs. The best safeguard would be to anchor the slabs to the steel framework. Such anchorage need not be of any great strength but it should be designed to withstand an uplift pressure on the roof of at least 100 lb. per sq. ft. Alternatively the slabs may be linked together. A saving of steel could be effected if the slabs were designed to be continuous, such continuity being provided by additional top reinforcement placed in position and grouted in after the slabs are erected.

(*b*) Sheeted Roofs (Types B and C of Wartime Building Bulletin No. 1).

Roofs are less subject to external blast from a near miss than are walls. The objection to the use of corrugated steel for walls does not, therefore, apply to sheeted roofs, for which it is the ideal covering. The area of sheeting likely to be destroyed by a direct hit is about fifteen times as great for asbestos-cement as for corrugated iron. The spacing of hook bolts usual with corrugated steel sheeting, about one to every 6 to 8 sq. ft. of roof, is sound. With this spacing the hook bolts being slightly weaker than the purlins, the sheeting will be blown off without damaging the purlins. With a closer spacing of hook bolts, the purlins would be liable to extensive damage and with a wider spacing an unnecessarily large area of sheeting be stripped. Proprietary forms of sheeting consisting of flat or corrugated steel sheets coated with a waterproofing compound behave in a similar manner to corrugated steel. The resistance of asbestos-cement sheeting to blast can be considerably increased by reinforcing it, preferably with light gauge sheet steel. Such sheeting reinforced with fabric tape has a considerably greater resistance to impact loads than unreinforced sheeting. No evidence is, however, so far available as to the areas of reinforced asbestos-cement sheeting likely to be damaged by the blast from a direct hit.

Insulating board lining under sheeted roofs should on no account be used. Under a direct hit such a lining does not save the roof sheeting and causes extensive damage to the roof steelwork. Unlined roof sheeting fixed in the usual way is capable of being blown off without damage to the steelwork. The presence of the lining, however, results in an excessive uplift being applied to the steelwork and may cause very extensive damage to it.

ROOF GLAZING

A main cause of delay in returning to full production in bombed factories has been extensive damage to roof glazing, which has all to be repaired before night-work can be resumed. For this reason, it is most desirable that roof glazing should be entirely eliminated from new factories, work being carried out solely by artificial light.

For ease of conversion in peacetime it may be desirable to make arrangements for future glazing to be inserted. This can be done by designing a normally glazed roof and replacing the glass by flat sheets of weatherproof material. Such materials should be similar in strength and elasticity to the sheeting used on the roof.

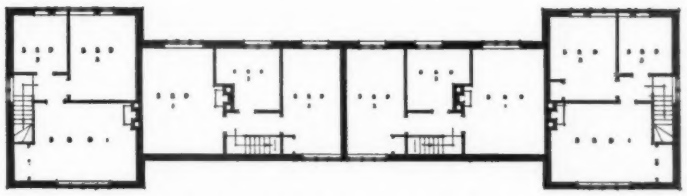
If it is considered essential to maintain natural illumination the minimum amount of glass, or preferably of flexible glass substitute, to give the required lighting should be used.

Provided that wired glass is used and is supported by battens fixed between the glazing bars, it is possible that it may remain weatherproof under fairly severe blast. Even with these precautions, however, the danger of falling glass is not eliminated, and wire netting, which may be of a fairly coarse mesh, should be securely fixed beneath the glass. If unwired

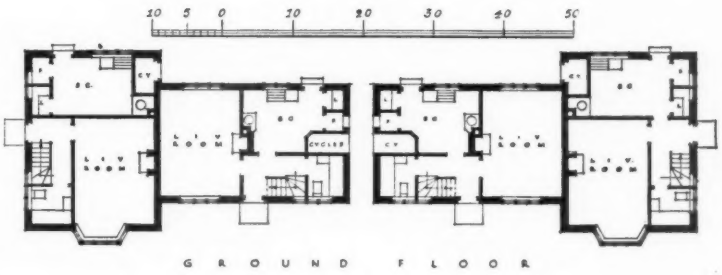
BALDOCK, HERTS

BINGHAM HARRISS

FOUR-HOUSE BLOCK



FIRST FLOOR



GROUND FLOOR

COST—Cost of each house was £360, including fencing, hedging and trees.

General contractors were Messrs. H. Fidler and Sons, Ltd.; for list of sub-contractors and suppliers see page xiv.

glass is used, wire netting of not more than ½ in. mesh should be provided underneath it.

SERVICES

Gas, water and electricity services are particularly liable to bomb damage. In many cases cast-iron and other buried pipes have been fractured by ground movement at a distance from the bomb explosion. Sometimes the fracture has not been discovered until the plant has been started up again, and a further delay in production has occurred until the services have been repaired.

In new factories, this danger can be largely eliminated by isolating the service pipes from the effects of ground movement. The principle should be to provide an air space between the pipe and the surrounding ground. This can be done in several ways. The pipes can be laid in ducts, or in certain cases guard trenches can be provided on each side of important service pipes.

ADDITIONAL MEASURES FOR THE PROTECTION OF PERSONNEL AND PLANT

In view of the danger of air attack without warning and of continuing work until the last minute after the alert signal has been received, it is essential that the air raid shelters provided for personnel should be at hand. Wherever possible shelters should be in the form of covered trenches under the floor of the shop with entrances suitably traversed at frequent intervals. Where it is impossible to have the entrances to shelters very close to the place of work, emergency protection must be provided as set out in A.R.P. Memorandum No. 16, "Emergency Protection in Factories."

Where the structure has been designed as described in this Bulletin, cover in the form of dwarf walls below benches will provide the worker with satisfactory protection.

The protection of plant is vital and can be provided simply. Individual machines should be protected against blast and splinters wherever possible by traverse walls, at least as high as the machine, and where practicable by a substantial roof.

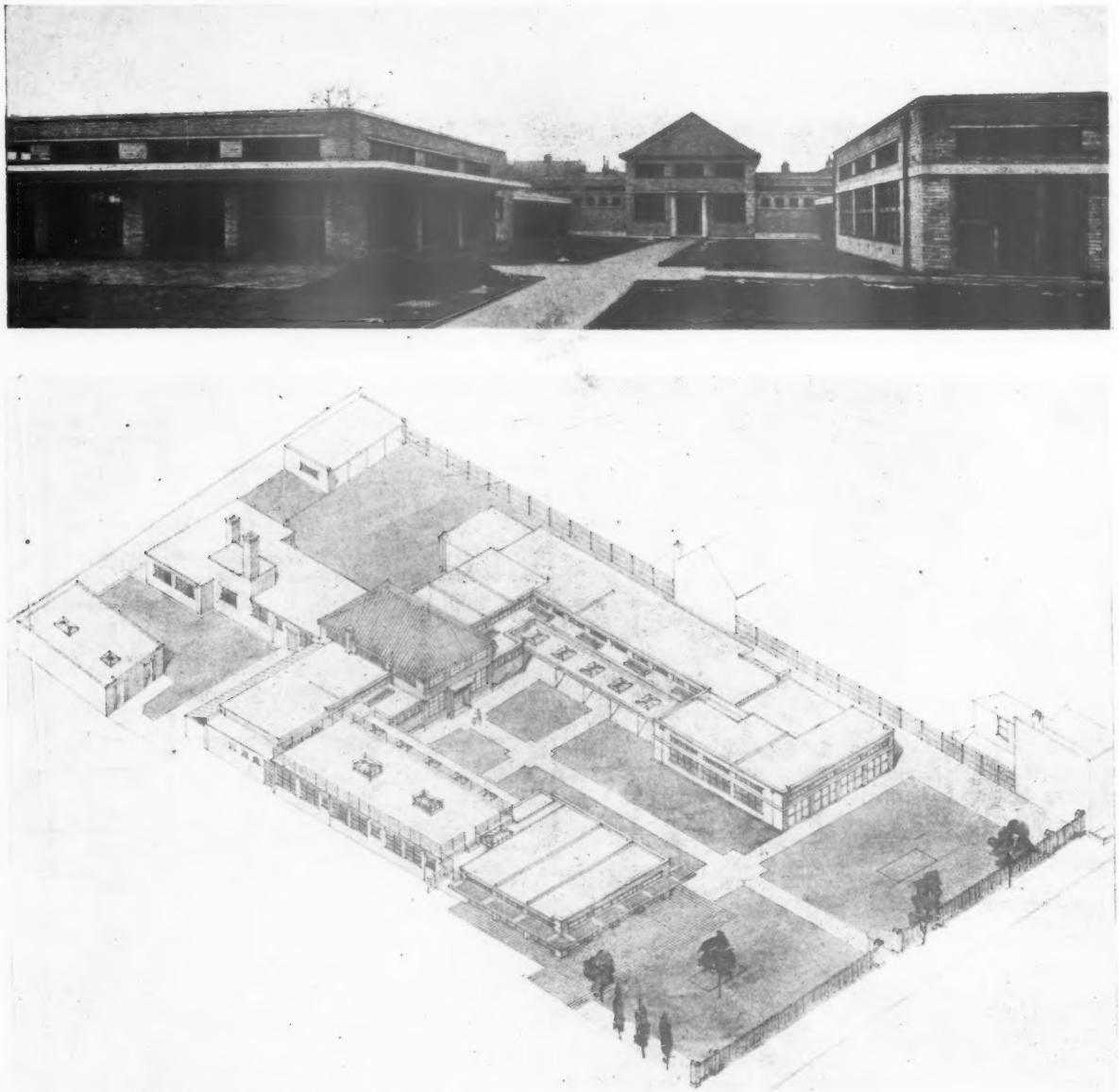
ROYAL SOCIETY OF ARTS

Following lectures have been arranged by the above society:

Ordinary Meetings — December 4: "Problems of Building Reconstruction," by D. E. E. Gibson, M.A., A.R.I.B.A., A.M.T.P.I., City Architect, Coventry. December 11: "Road Transport," by J. S. Nicholl, C.B.E. (of Messrs. McNamara & Co., Ltd.). January 15: "Women in Industry," by Miss Caroline Haslett, C.B.E., Director of the Electrical Association for Women and President of the Women's Engineering Society. February 5: "Design and the Manufacturer," by E. W. Goodale, M.C. (of Messrs. Warner and Sons, Ltd.). February 26: "Private Estates and Forestry," by Major C. P. Ackers, J.P., M.A., B.SC. March 5: "Display Sense," by E. W. Grieve, R.D.I., Display Manager, Messrs. Harrods, Ltd.

Cantor Lectures—Monday afternoons at 1.45. November 18, 25 and December 2 (three lectures): "Recent Developments in Internal Combustion Engines," by Professor S. J. Davies, D.SC., PH.D., M.I.MECH.E., Professor of Mechanical Engineering, University of London. January 20, 27 and February 3 (three lectures): "Some Problems of World Economic Development," by Sir David Chadwick, K.C.M.G., C.S.I., C.I.E., Secretary of the Imperial Economic Committee.

MUNICIPAL MEDICAL CENTRE



View from south (top) and axonometric from south-west

SITE—The site is about one acre in extent.

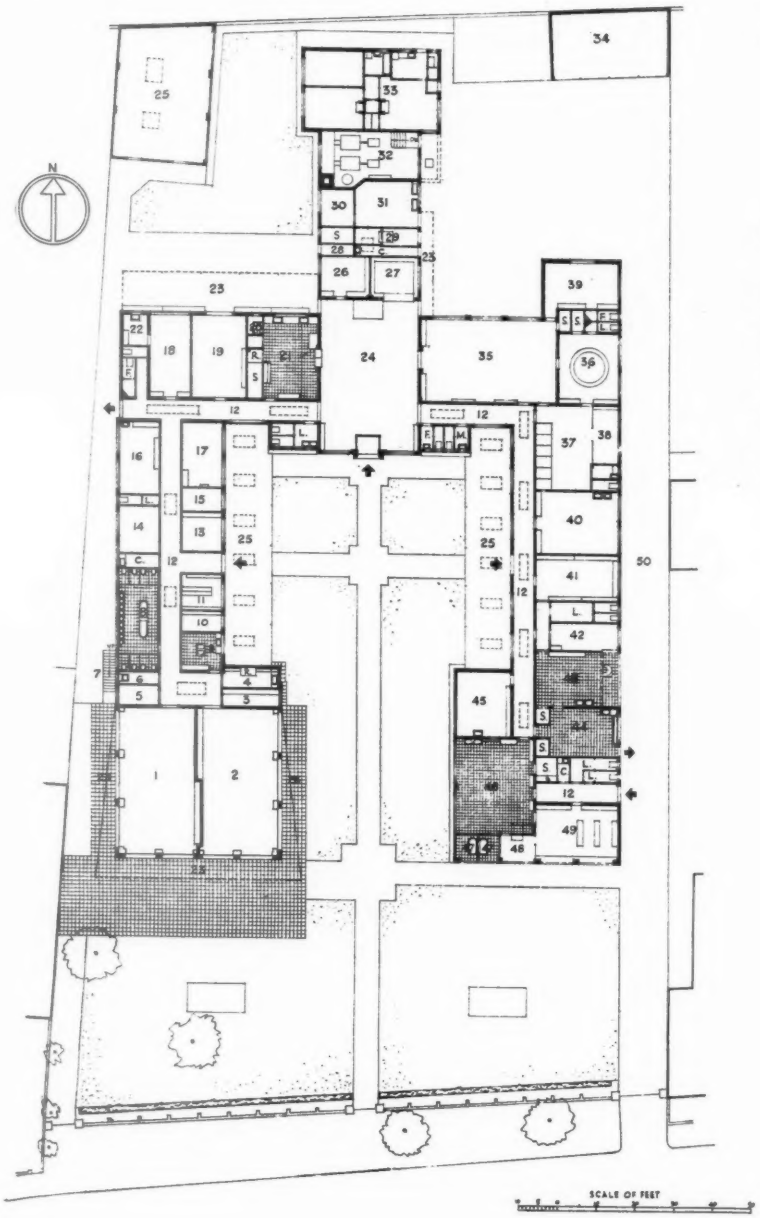
PLAN—Accommodation is provided in six sections, as follows: 1, Ante-natal, infant and toddlers' clinics; 2, dental clinic; 3, artificial sunlight clinic; 4, minor ailments and specialist clinics; 5, day nursery; 6, administration, heating, laundry, disinfection, and caretaker's flat.

CONSTRUCTION AND FINISHES—External walls are 11 in. hollow. The main damp course is of soft temper copper, and 4-lb. lead is dressed over all lintols and projections. Parts of the building are of steel frame construction and certain foundations are of reinforced concrete. All roofs are flat except that of the lecture-waiting hall; they are constructed of precast reinforced concrete beams, insulated and asphalted. Top lights are of glass-concrete or metal skylights and lanterns, having opening lights operated by screw gear. The roof of the lecture waiting-hall is tiled with green glazed interlocking pantiles, and forms a screen to the chimney stacks of the heating chamber and flat. Windows are mainly of steel, horizontally pivoted or hopper-opening. The cheeks to all hoppers are glazed. Clerestory windows are opened by screw gearing. All steel windows and lanterns are rust-proofed. Floors throughout are of concrete on a hard-core filling, those of large rooms being reinforced. Generally the floor finish is of Burma teak wood blocks. Bath rooms, dental surgery, treatment room and kitchen floors are of asphalt tiling—a material comparatively new in this country, but which has been extensively used in America. The lecture waiting-hall and playroom floors are of ¼-in. rubber on a sponge base, over asphalt. The light treatment room floor is of cork tiling. Lavatories and w.c.s are paved in terrazzo.

SERVICES—The internal service pipes and connections are

AND DAY NURSERY

DESIGNED BY THE BOROUGH ENGINEER'S ARCHITECTURAL STAFF



KEY

1 : Toddlers' playroom. 2 : Babies' nursery. 3 : Linen room. 4 : Milk room. 5 : Cots. 6 : H.M.C. 7 : Stairs to roof nursery. 8 : Toddlers' toilet and bath. 9 : Babies' bath. 10 : Babies' cloaks. 11 : Toddlers' cloaks. 12 : Corridor. 13 : Office. 14 : Waiting-room. 15 : Isolation room. 16 : Medical officer. 17 : Matron. 18 : Staff dining and rest room. 19 : Toddlers' dining-room. 20 : Larder. 21 : Kitchen. 22 : Staff cloaks. 23 : Covered way. 24 : Lecture and waiting hall. 25 : Perambulators. 26 : Superintendent's office. 27 : Dispensary. 28 : Meters. 29 : Steam disinfector. 30 : Drying room. 31 : Laundry. 32 : Heating chamber. 33 : Caretaker's flat. 34 : Garage. 35 : Weighing-room and A.N. waiting. 36 : Light treatment room. 37 : Dressing room. 38 : Records and testing laboratory. 39 : Staff room (H.V.). 40 : Medical officer. 41 : Waiting-room. 42 : Dental surgeon, private. 43 : Dental surgery. 44 : Recovery room. 45 : Medical officer. 46 : Treatment room. 47 : Bath. 48 : Record office. 49 : Waiting-room. 50 : Roadway. L : Lavatory ; w.c. F : Female staff lavatory. M : Male staff lavatory. C : Cleaner. S : Store. R : Refrigerator.

Top, toddlers' room ; centre, babies' nursery; bottom, lecture and waiting hall.

of copper and gunmetal, with capillary joints. All are encased in chases in the walls, having flush movable covers. All pipes are insulated to protect from damage by frost. The waste from each sink or basin has a re-sealing trap with screwed access cap and linings. The wastes are concealed in the floor. The heating chamber is situated at the rear of the site near the caretaker's flat. The heating installation is on the low-pressure hot water system fed by twin boilers. Automatic stokers are installed. The installation is designed on the parallel flow principle, the main pipes being contained in waterproofed concrete ducts along the corridors, and the branch room circuits are out of view. Radiators are of the Neo-hospital type, supported on built-in brackets and recessed in the walls. Behind each radiator on external walls is a ventilator, grille, baffle and adjustable damper operated by quadrant gear. The playrooms, light treatment room and toddlers' toilet are heated by Ray-rads in the ceilings, suitably insulated from the roof over.

COST—£20,200. Price per ft. cube, 1s. 5d. Total cost, including site works, consultants' fees, etc., £27,275.

General contractors were W. H. C. Heath and Sons ; for list of sub-contractors and suppliers see page xiv.

SOME QUESTIONS ANSWERED THIS WEEK

★ *COULD you tell me whether Purbeck (Corfe) stone roofing slabs are now quarried and if craftsmen are available for laying them? -* Q588

★ *WITH reference to the restriction of engagement Order, is an architect or quantity surveyor at present engaged by a Government department at liberty to apply for or take up another appointment? - - - - - -* Q590

★ *I HAVE been appointed to assess air raid damage to a number of churches. In such claims, can you tell me (1) the minimum details necessary; (2) the method of approach (measuring); and (3) 1939 prices on such method?* Q591

THE ARCHITECTS' JOURNAL

INFORMATION CENTRE

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

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

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

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

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

Any questions about building or architecture may be sent to:

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

or ring the Architects' Journal Information Centre at

REGENT 6888

Q587 EDUCATION ARCHITECT.—*A large number of WINDOWS IN various SCHOOLS have been treated with a splinterproof paint to resist splintering of the glass in the event of an air raid, but, in view of the recent reports on the inefficiency of this material, consideration is being given to the provision of anti-shatter netting. I should be glad to receive your advice on the three following points—(1) an easy method for removing the paint without damage to the surrounding painted woodwork, (2) would the efficiency of the netting be impaired if the paint were not removed? and (3) a formula for a clear varnish for application on top of the netting to prevent it peeling in the event of condensation on the glass.*

Regarding the removal of the present splinter-proof coating on the glass, the type of remover necessary will depend upon the nature of the coating. Splinter-proof coatings have various bases—for example, rubber, cellulose and liquefied plastic—and one material may not necessarily be a solvent for all three types. Also it is quite possible that the undercoating of the particular solution used may contain rubber, and the sealer a cellulose medium. It is suggested, therefore, that the manufacturers supplying the original solution should

be approached, and their recommendations invited as to a suitable means of removal. Alternatively, the Quickstryp Chemical Co., Ltd., 20 and 22 Wilton Street, Bradford, Yorks, is a specialist firm of paint remover manufacturers, and may be prepared to offer a range of samples of their products to try out on the site. In the ordinary way an agent successful in removing the lacquer film may be expected to damage any paintwork with which it may come into contact, so that in the removal measures a small sheet metal shield should be used to protect the ordinary paintwork of the frames. If it could be guaranteed that the adhesion of the present lacquer coating to the glass will not lessen, and the lacquer coating in itself will not become brittle, then obviously the anti-shatter netting could be applied over the treated glass as existing. But in the event of deterioration of the present lacquer film or only the lessening of its adhesion to the glass, the usefulness of any superimposed netting must also be less since the netting can only be effective in holding the shattered glass in position when it is adhering closely to the glass. Most firms supplying anti-shatter netting provide a sealer solution, which renders the finished job washable or at least spongeable and resistant to surface condensation. If any difficulties are experienced in obtaining supplies of a sealer of this type, application should be made to The Herts Pharmaceuticals, Ltd., Bessemer Road, Welwyn Garden City, Herts; or Messrs. Cellon, Ltd., Richmond Road, Kingston, Surrey.

Q588 ARCHITECT, LONDON.—*I should be much obliged if you could tell me whether Purbeck (Corfe) STONE ROOFING SLABS are now quarried and if craftsmen are available for laying them. The case is the restoration of an old building. If the quarry is permanently closed for these slabs, I suppose they could be obtained from farm buildings in the district.*

We believe that it will be possible to obtain supplies of Purbeck stone roofing slabs from Messrs. Haysom and Sons, Ltd., Railway Depot, Swanage, and this firm will be in touch with local craftsmen experienced in the laying of this form of roofing.

Q589 STEEL CO., SCOTLAND.—*We are at present drawing up a SCHEME FOR A CLEANSING AND FIRST AID CENTRE for the works staff, and have come up against the problem of waterproofing the 14-in. outer wall. We have considered the possibility of a 15½-in. cavity wall, but doubt if this is allowed under the A.R.P. Regulations, and bitumen on the inside of the wall, we understand, is unsuitable since it absorbs gas, and is difficult to decontaminate. There is also the question of lining the timber partitions which we propose erecting. Is a wallboard of, say, the "Masonite" type suitable and readily obtained? According to information we have, walls of a cleansing station, particularly the lower six feet, should be finished with smooth surfaced impervious materials which can be washed and decontaminated. This suggests the use of glazed bricks as being the most satisfactory, but we would prefer a cheaper method, e.g. plaster, and if you could give us a suitable mix, we would be much obliged. Regarding the use of windows in the building, we take it that a fixed type of casement is best, but are doubtful as to the best type of putty to be used. Any information or assistance you can give us to clear up these points would be much appreciated.*

Much of the information desired is contained in "Specification of Materials and Fittings to be used in the Erection of New and Adaptation of Existing Buildings for Cleansing Stations for A.R.P. Personnel," and copies of this publication are obtainable gratis from Home Office A.R.P. Publications Department, Horseferry House, London, S.W.1.

The following is the paragraph on walls :—

"All external walls (except those to air locks) should be built in local stocks of flettons, 13½-in. thick if solid, or 15½-in. hollow. Those to air locks may be 9-in. thick. They should be built in cement mortar and finished fair face externally. Concrete external walls 12-in. thick may be used in lieu of brickwork, in localities where concrete *in situ* is as cheap as brickwork."

On wall finishes :—

"All walls including air locks should be rendered in cement and sand (1–3) ½-in. thick, trowelled to a smooth and even surface, and treated with a solution of silicate of soda whilst green. The rendering should be finished to a height of 6 ft. 6 in. from the floor, with a coved skirting at the bottom to facilitate cleaning. The walls above the rendering to be flush pointed and treated with cement slurry."

On internal partitions :—

"All partitions except to stores and where otherwise shown on the plans are to be 6 ft. 6 in. high, composed of 26-gauge plain galvanized iron sheets on 1½-in. angle iron framing. The sheets to be fixed vertically and kept 6-in. clear from the floor."

And on windows :—

"Standard metal windows 2 ft. high, any desirable length, fixed direct to walls should be used. They should be fixed tight up to the underside of the flat roof, giving a sill height of 6 ft. 6 in. from the floor. They should be glazed with 26 oz. sheet glass (O.G.Q.) and have one opening light."

As to the alternative construction suggested, there is a decontaminatable asphalt known as Antigasphalt, produced by The Limmer and Trinidad Lake Asphalt Co., Ltd., Steel House, 11 Tothill Street, S.W.1. On wood framing the Masonite or hardboard type of material could be used for partitions, and could be treated with a gas-resisting paint available now from most paint manufacturers. Asbestos-cement sheets can also be used for this purpose, and since they can be hung on asbestos-cement tubes, they present some advantages over any method involving wood framing. Masonite or other forms of hard fibre boards are still available, particularly where the work is of a priority class.

Q590 ARCHITECT, YORKS.—*With reference to the RESTRICTION OF ENGAGEMENT ORDER, is an architect or quantity surveyor at present engaged by a Government Department at liberty to apply for or take up another appointment?*

Under the Restriction of Engagement Order a technician engaged in work of national importance should seek permission of his departmental chief or employer before applying for another appointment, since before taking up the other appointment the permission of the present employers will be necessary.

Q591 ARCHITECT, ESSEX.—*I have been appointed to assess DAMAGE TO a number of CHURCHES under War Claim, and must get on the right lines from the start to save unnecessary work —there is little money available for fees. In such claims, can you tell me (1) the minimum details necessary; (2) the method of approach (measuring), and (3) 1939 prices on such method? It is fairly obvious that a bill of quantities cannot be supplied, but what is to take its place? I am sure it would be most interesting and helpful to your readers if you could publish approximate 1939 prices on some quick measuring method on, say, walling, windows, roof, stone work, tracery, furniture, etc., that would meet the need of the first Government claim forms. Also is there*

such a thing published as a dictionary of Ecclesiastical Architecture?

At the outset it will be necessary to peruse the reports "War Damage to Property: Government Compensation Scheme: First and Final Reports," obtainable from His Majesty's Stationery Office, York House, Kingsway, London, W.C.2, price 2d. each net. Then from the District Valuer a copy of Form V.O.W.1 should be obtained and studied, since this form, when completed, forms the basis of the claim for compensation. The damage is to be assessed on building prices obtaining at March, 1939, and in the issue of the ARCHITECTS' JOURNAL of September 5 last a complete schedule of detailed prices of this period was given. As to the basis of assessing War Damage to Property there are two alternatives, (1) the cost of reasonable reinstatement estimated by reference to the level of building costs prevailing in March, 1939, credit being taken for old materials, or (2) the diminution in market value, i.e. the difference between the market value of the property in its condition immediately before the damage occurred and its market value in its damaged condition, the value in each case to be calculated on the basis of market values prevailing in March, 1939—whichever is the less. This second basis, however, does *not* apply to churches, hospitals, etc., which have no market value in the ordinary sense of the term. The best method of approach in determining the cost of reasonable reinstatement is a difficult matter on which it is impossible to make a general statement. The church may be modern or very old, and the damage superficial, local (say, a vestry wall down) or general. A careful examination and the experience of the assessor must decide how much of the structure must be taken down before rebuilding begins and thereafter the claim must be calculated under three heads: demolition, structural rebuilding and special items (repairs to heating, church furniture, etc.). As to a method of quick measurement, the March, 1939, prices detailed in the issue of the JOURNAL previously mentioned could be lumped together just in the same way as the items of the quantities are lumped together in whatever system of short quantities are adopted. For instance, stone facing, brickwork backing and plaster as one item, roof slating, battens, felt, boarding, rafters and general woodwork of the roof all as one item. The experience of the assessor must again prevail in the building up of such composite prices and the making of all allowances made necessary by the item description. A dictionary of the items used in Ecclesiastical Architecture is contained in Volume I of "English Church Architecture" by Barnes, and the "Dictionary of Architecture" by T. D. Atkinson—both volumes are available from the Loan Library of the Royal Institute of British Architects, 66 Portland Place, London, W.1.

SHELTERS

A striking condemnation of the shelter policy outlined by Mr. Morrison recently and comprehensive alternative proposals for bomb-proof shelters are contained in a letter sent on November 6 to Mr. Herbert Morrison by the A.R.P. Co-ordinating Committee.

The main points from the letter are as follows:—

The Committee, recalling Mr. Morrison's previous advocacy of bomb-proof shelters, regrets that he proposes no basic changes in A.R.P. policy, and expresses concern particularly at the shelter position. The dispersal policy of small shelters, on which the whole official scheme is based, is completely fallacious. For a given expenditure large shelters are far safer than small ones. Mr. Morrison's rejection of the idea of the universal provision of deep shelters will cause widespread misapprehension, for he took no account of the other forms of bomb-proof shelter, which are not deep, but which must play a large part in any national programme.

The committee's proposals are for fully bomb-proof protection, the form to vary from area to area in accordance with the local possibilities.

Each of the following types of shelter will have to play a part:

Reinforced concrete shelters, entry above or below ground and holding up to 1,000 people each. The Haldane shelter is an outstanding example of this type.

Large multi-storey reinforced concrete shelters for densely populated areas. Each can hold many thousands of people at a very economical figure for cost and materials. The reason given by the Government for rejecting this type of shelter (difficulty in reaching them in time) has been refuted by the experiences of the London Tubes.

Adaptation of further existing tunnels as shelters, and their extension. New tunnels from the London Tubes could reasonably be expected to provide additional accommodation for some 10,000 to 13,000 people per week.

New tunnels where soil and conditions are favourable. The Easington Rural District Council has started a system of tunnels in the nearby limestone hills at a cost, inclusive of lighting, mechanical ventilation and sanitary conveniences, of about £8 per head.

With regard to facilities in existing and new shelters, a strong case is made not only for bunks, but for mechanised ventilation, far better sanitation, canteens, first aid and isolation rooms and provision for the disinfection of clothing and bedding. All these are essential if the health of the nation is to be safeguarded from the spread of disastrous epidemics.

With regard to the materials necessary for shelters, there must be a drastic modification in the priority system (only 11,000 tons of steel out of a productive capacity of 13 million tons was allocated to A.R.P.). The manufacture of Portland Blast Furnace Cement should be introduced which, with certain other steps, could raise production by some 75 per cent., although the resistance of certain vested interests would have to be broken down.

There should be a considerable decentralization of the warning system and the powers of observation of roof spotters should be supplemented by information from the official and properly equipped listening posts.

The letter closes by referring to the terrible urgency and need for the policy it advocates. Time and again the committee has pressed for steps which would have saved untold suffering and loss of life. The Prime Minister has told us to prepare for the campaigns of 1941 and 1942, yet, if present policy is continued, 1942 will find us still without even the basis for adequate protection. But a virile imaginative policy could rapidly change the position.

The committee, referring to its responsibility to the local authorities, trades unions and other bodies who have endorsed its proposals, asks to be immediately informed of the result of the consideration of its proposals.

TRADE NOTES

Flexible Glass Substitute

Messrs. A. and F. Parkes (Nottingham), Ltd., of Anglo-Scotian Mills, Beeston, Notts, have recently marketed the Nuart window replacement net which, it is claimed, transmits maximum light and distorts and interferes with clear vision to a satisfactorily small degree. Following details of this new flexible glass substitute have been supplied by the firm:

"Being a triple filet net, made on a foundation thread of strong Egyptian yarn and thoroughly impregnated with a high quality cellulose acetate lacquer, Nuart is thoroughly weather and waterproof both sides. It is also windproof when fixed with the special Bostik adhesive cement supplied. This cement, suitable for wooden or metal window frames, effectively seals the edges of the material.

"With its exceptional tensile strength and complete impregnation with lacquer, Nuart net will retain its light-transmission value, will not craze, and will not readily become brittle through the action of wind, rain and sun, even in exposed positions.

"Whilst capable of resisting the strongest wind pressures, when fixed by the above method and large areas sub-divided by wooden bars, Nuart net is usually dislodged whole by blast and can thus be readily replaced.

"Nuart net is 'non-flam'—under intense heat it will burn sufficiently slowly to offer perfect safety."

The net is made in two qualities—No. 8 (light) and No. 17 (heavy). In white, biscuit, green, black and camouflage (brown/green). Delivery—white from stock, colours in seven days.

The firm are also advertising their anti-splinter net which, it is claimed, has held plate glass sheets weighing 2 cwt. splintered by blast, the shattered but unsplintered glass remaining attached to the net.

Nuart is included in the list of anti-scatter treatments for windows, recently approved by the Department of Scientific and Industrial Research. Full details are obtainable on application to the firm.

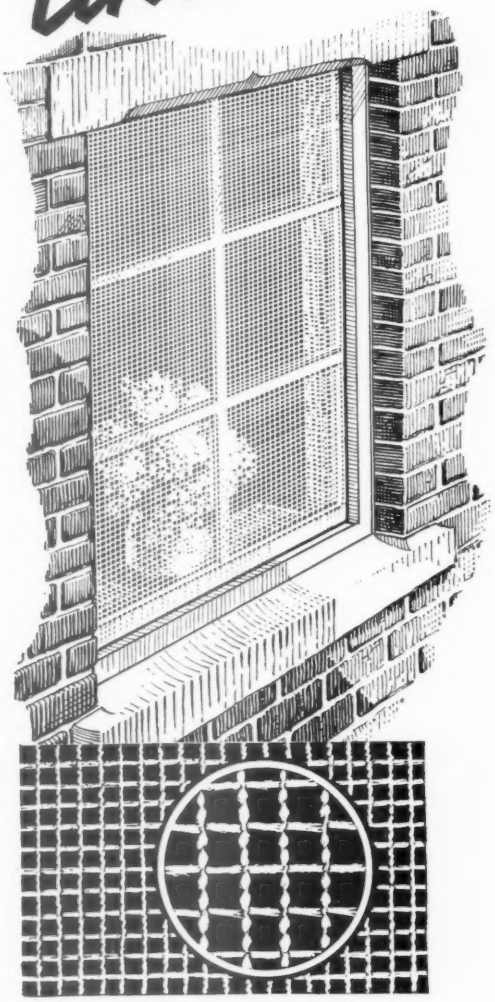
Shutters

Steel louvre shutters are the subject of a four-page leaflet just issued by Henry Hope and Sons, Ltd. These shutters have been designed to provide reliable protection for windows. The shutters are constructed with louvres, made of rolled steel, 6 in. wide

And now

A FLEXIBLE GLASS SUBSTITUTE

with ALL the points you demand for EFFICIENCY



How NUART differs

The above diagrammatic drawing shows the unusual 3-ply structure of NUART Net. It is a TRIPLE FILET, i.e., three threads of two-fold yarn both warp and weft, which gives it exceptional tensile strength. The Cellulose Acetate Lacquer is applied in liquid form by a new process, so that the net is thoroughly impregnated and is equally efficient both sides.

NUART Window Replacement Net is made in two qualities—No. 8 (Light) and No. 17 (Heavy). In WHITE, BISCUIT, GREEN, BLACK AND CAMOUFLAGE (BROWN/GREEN). Delivery—WHITE from Stock, COLOURS in 7 days.

✓ TRANSLUCENCY

NUART Window Replacement Net transmits maximum light, distorting and interfering with clear vision to a satisfactorily small degree.

✓ WEATHERPROOFNESS

Being a TRIPLE FILET Net, made on a foundation thread of strong Egyptian yarn (see diagram on left), and thoroughly impregnated with a high quality Cellulose Acetate Lacquer, NUART is thoroughly weather and waterproof BOTH SIDES. It is also windproof when fixed with the special "BOSTIK" Adhesive Cement supplied. This cement, suitable for wooden or metal window frames, effectively seals the edges of the material.

✓ LIFE

With its exceptional tensile strength and complete impregnation with Lacquer, NUART Net will retain its light-transmission value, will not craze, and will not readily become brittle through the action of wind, rain and sun, even in exposed positions.

✓ RESISTANCE

Whilst capable of resisting the strongest wind pressures, when fixed by the above method and large areas subdivided by wooden bars, NUART Net is usually dislodged whole by blast and can thus be readily replaced.

✓ INFLAMMABILITY

NUART Net is "non-flam"—under intense heat it will burn sufficiently slowly to offer perfect safety.

NUART WINDOW REPLACEMENT NET

and

ANTI-SPLINTER NET

Also of exceptional tensile strength, NUART Anti-Splinter Net has held plate glass sheets weighing 2 cwts. splintered by blast, the shattered but unsplintered glass remaining attached to the net. Experience and improved methods have enabled us to quote a very competitive price. Can be supplied in 36" and 40" widths in rolls of 40/5 yards. Also now made in 2" strips in 40/5 yd. rolls, suitable for large windows in public buildings, schools, etc. NUART is included in a list of Anti-Scatter treatments for windows approved by the Scientific and Industrial Department of Building Research. Supplied to many Government Departments, Municipal Authorities, Hospitals, etc.

Samples, prices and full particulars of methods of fixing on application to Sole Manufacturers :

A. & F. H. PARKES (NOTTM.) LTD.
Anglo-Scotian Mills, Beeston, Notts.

and of any desired thickness. They are pivoted top and bottom and coupled together for easy operation by a single handle.

Firm state : "The peculiar advantage of these shutters lies in the fact that while they afford protection against splinter and blast, they also provide against the escape of light at night without interference with normal blinds and curtains. They can be operated when desired through a fixed window, or by simply opening the lower sash of a sliding sash. Where casements occur which open outwards and it is necessary that these should be opened and closed occasionally, the shutters must be placed on the inside.

"These shutters are of great value for such buildings as police stations, fire stations, wardens' and first-aid posts, offices of water, gas and electrical companies, and generally where important work has to be carried on daily, and particularly where work must be carried on during an air raid."

Appointments

Mr. R. A. Kirkby has been appointed chairman of the Glenboig Union Fireclay Co., Ltd., Glenboig, and Henry Foster & Co., Ltd., Backworth, in succession to Sir Ronald W. Matthews, J.P., who has resigned owing to extreme pressure of work. Sir Ronald Matthews, however, retains his seat on the boards of these two companies.

Mr. Alexander McKendrick, who was formerly joint Managing Director of the Glenboig Co. with Mr. Kirkby, now becomes sole Managing Director.

These two companies are subsidiaries of General Refractories, Ltd.

THE BUILDINGS ILLUSTRATED

NEW SHOWROOMS, DURHAM CITY GAS COMPANY (pages 391-393). Architects: Cordingley and McIntyre. General contractors were F. W. Goodyear and Son. Sub-contractors and suppliers included: Richardson and Greenwell, structural steel; Steffanutti (Terrazzo), Ltd., patent flooring; A. Davies & Co. (Shopfitters), Ltd., showroom windows, entrance, marble-work, and bronze lettering; A. R. Poole and Sons, Ltd., central heating; John Harper & Co. Ltd., boilers; W. H. Fairclough, plumbing; Shaw, Knight & Co., Ltd., sanitary fittings; N. F. Ramsay & Co., Ltd., door furniture; Rustproof Metal Window Co., casements; J. W. Sawrey Gill, furniture; G. D. McPhee, painting and decorating.

HOUSING SCHEME, BALDOCK, HERTS (pages 395–399). Architect: E. R. Bingham Harriss (Harriss and Harriss). General contractors were H. Fidler and Sons, Ltd. Sub-contractors and suppliers included: Newsum, Sons & Co., Ltd., stormproof windows and joinery; Broad & Co., Ltd., sanitary fittings and tile fireplaces; Bysouth, electrical work; Geo. Wright, Ltd., "Servall" grates; A. W. Paterson and Son, calorifiers and ironmongery; Charles Turner, Ltd., paint; Hersburgh & Co., Ltd., pantiles and concrete tiles; John Pigg, ornamental trees and shrubs; Fison, Packard and Prentice, Ltd., "Burwell White" bricks.

MUNICIPAL MEDICAL CENTRE AND DAY NURSERY (pages 400-401). The building was designed by the Borough Engineer's Architectural Staff and incorporates the requirements of the Medical Officer of Health (Dr. G. Hamilton Hogben, M.R.C.S., D.P.H.), in the planning of the building and the choice and layout of equipment. Members of the architectural staff particularly engaged on the work were Mr. H. E. Askey, L.R.I.B.A., Chief Architectural Assistant, and Mr. V. A. Jolley, A.R.I.B.A., Senior Architectural Assistant. The quantity surveyor was Mr. J. H. Smyth, F.S.I.; the heating consultants, A. H. Barker and Partners; the Clerk of Works, Mr. C. D. Meakins, and the general foreman, Mr. F. H. Wilson. General contractors were W. H. C. Heath and Son. Sub-contractors and suppliers included: Rapid Floors, Ltd., precast roof beams; J. A. King & Co., Ltd., "Glas-crete" lights and canopy; Rippers, Ltd., Ventilock windows and doors; Horsley, Smith & Co., Ltd., woodblock and "Tiletex" floors; Stitson, White & Co., Ltd., sanitary fittings; G. M. Hammer & Co., Ltd., built-in furniture, etc.; Crittall Manufacturing Co., Ltd., steel windows and screens; Haywards, Ltd., dental surgery window, lantern lights and patent glazing; Engert and Rolfe, asphalting; Fretwell Heating Co., Ltd., heating installation; Tottenham Borough Council, Works Dept., electrical installation; Tottenham Borough Council, Parks Dept., garden work; Robert Adams, Ltd., floor and overhead door springs, mortice locks, door handles, kicking plates, door furniture; St. James' Tile Co., Ltd., terrazzo; Carter & Co., tiling and cills; Richardson & Co., patent stone; Lockerbie and Wilkinson, Ltd., metal lockers; Accordo Blinds, Ltd., blinds; Armstrong Cork Co., cork flooring; A. Offer and Son, plastering; C. and T. Painters, Ltd., painting; Redferns Rubber Works, Ltd., rubber flooring; R. W. Whittle, Ltd., tubular steel furniture; Hanovia, Ltd., "Sollux" and "Centrosal" lamps; Cory Bros., Ltd., surgical instruments and equipment; Burgess's (Tottenham) Easiwork, Ltd., Aga Heat, Ltd., and Frigidaire, Ltd., kitchen equipment; J. Bury & Co., Ward's Stores (Tottenham), and Edgleys, Ltd., furniture.