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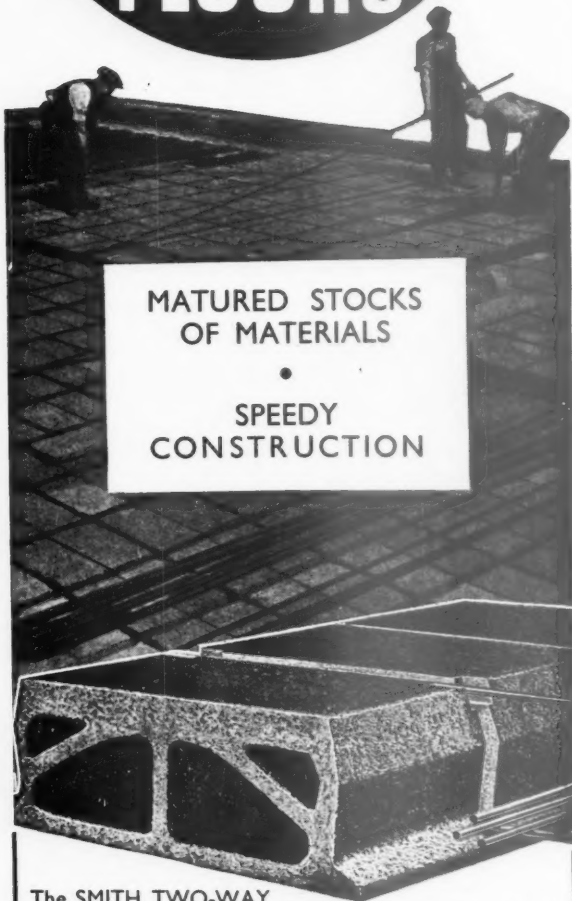
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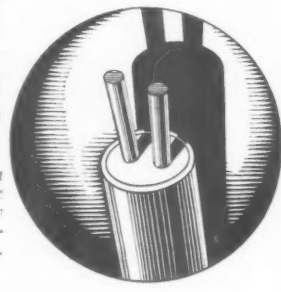
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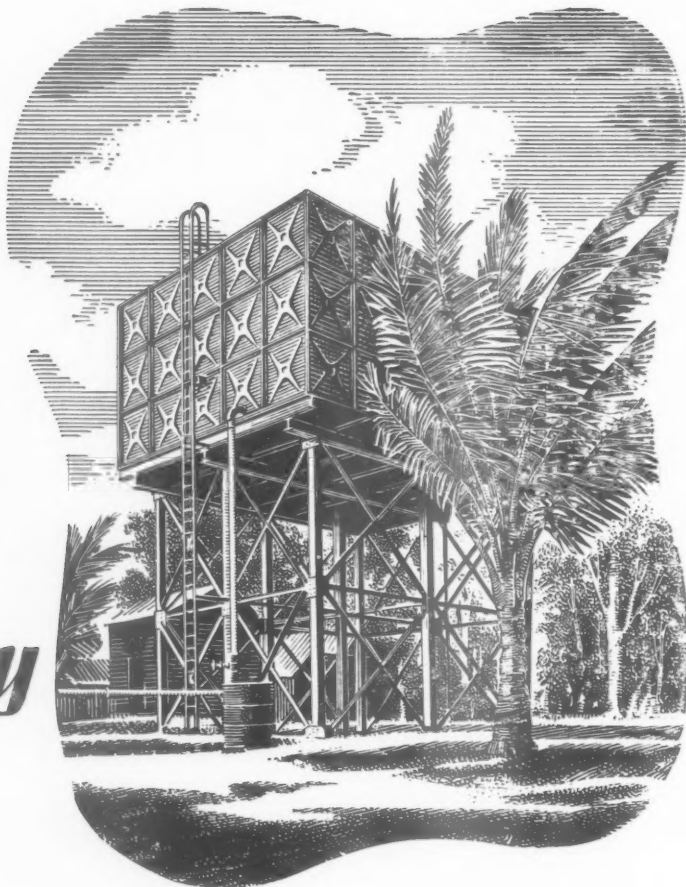


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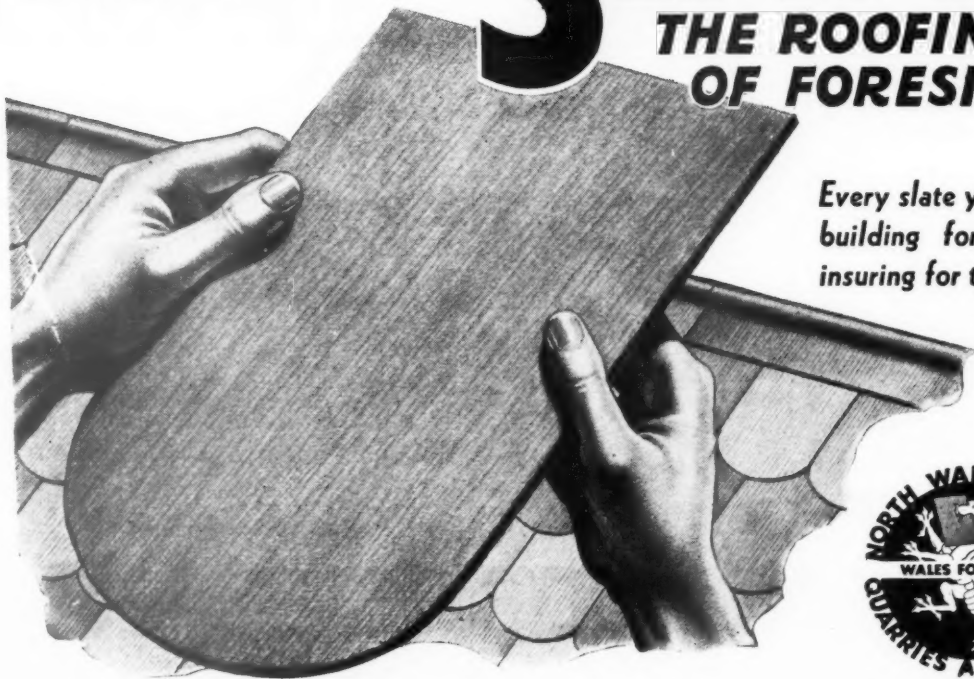
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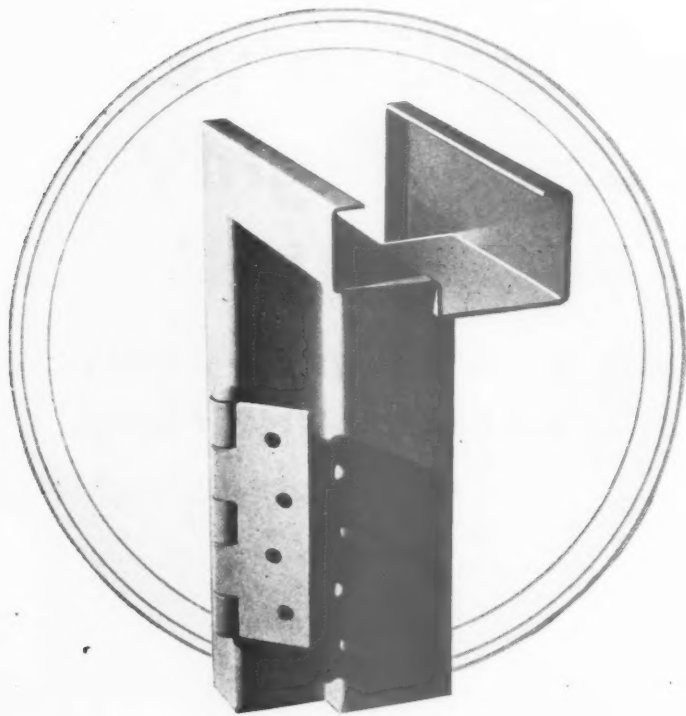
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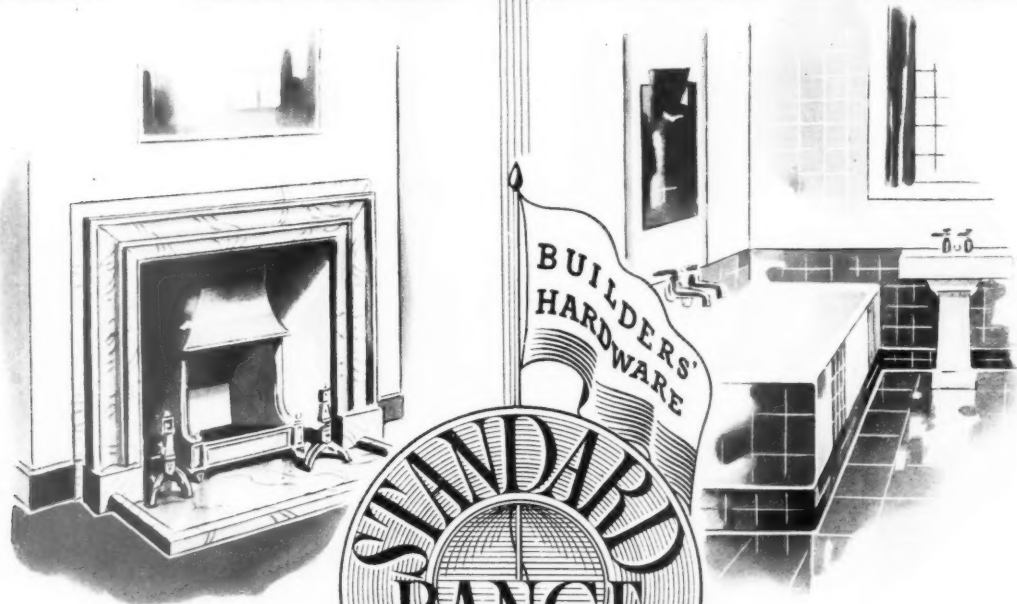
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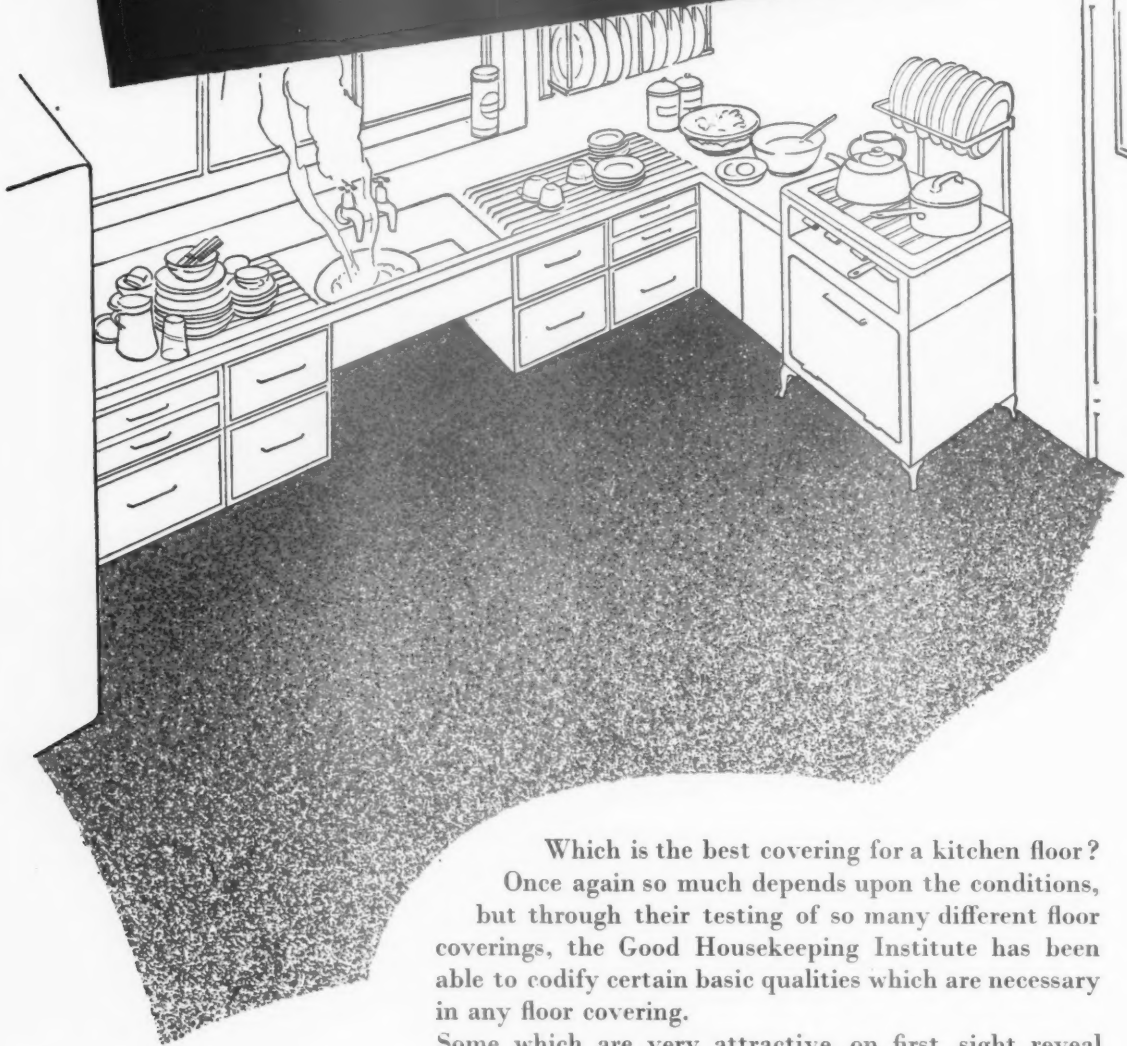
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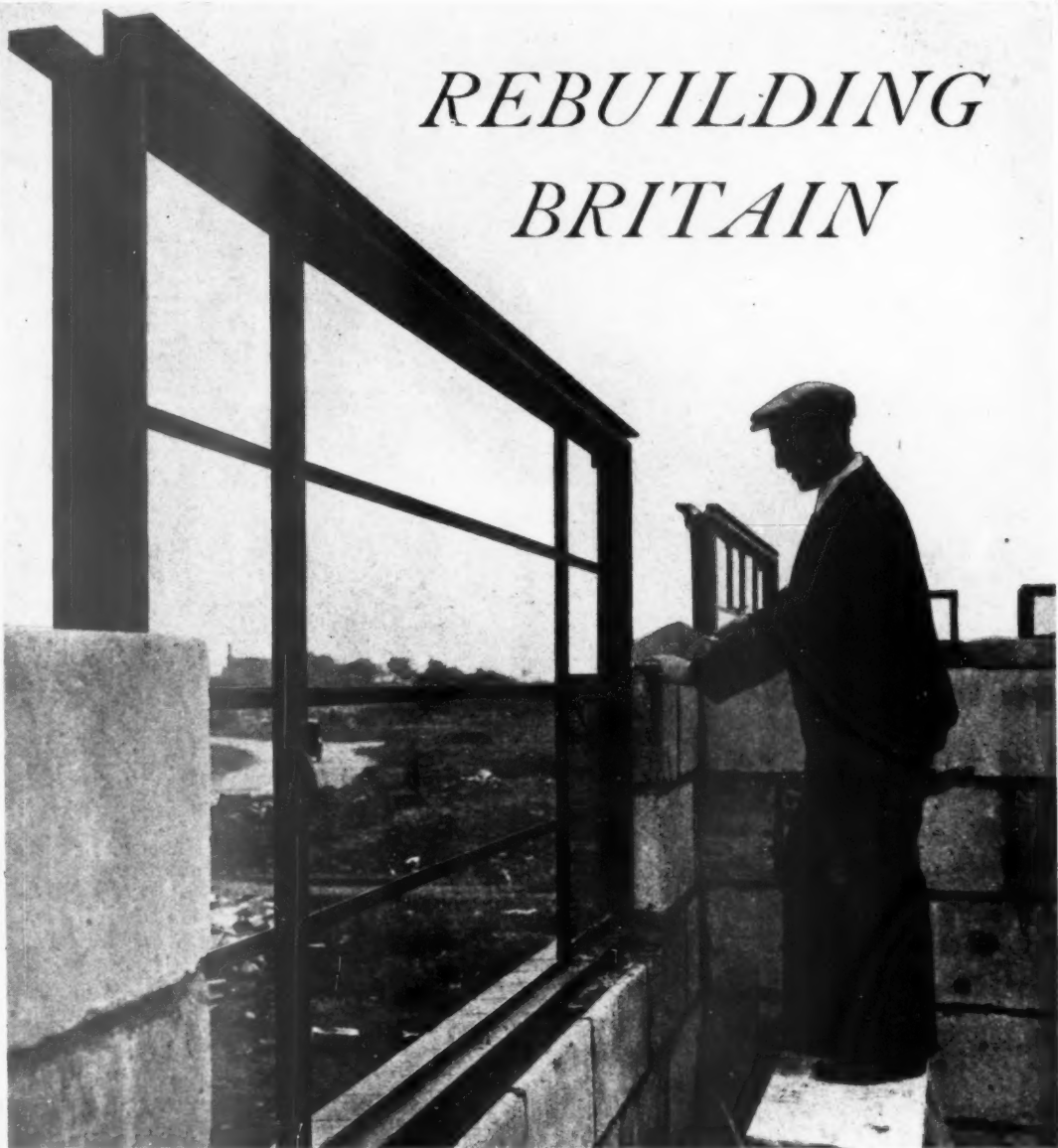
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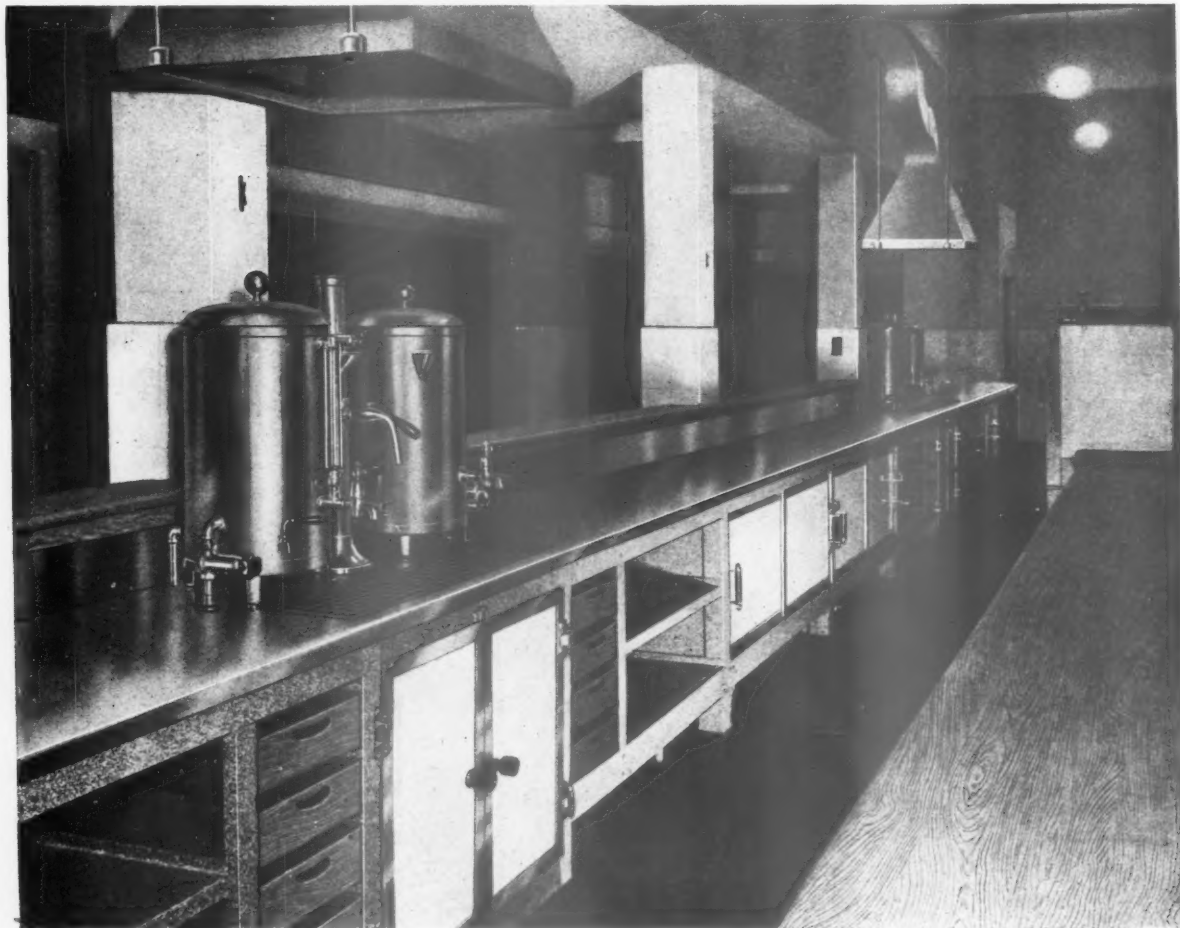


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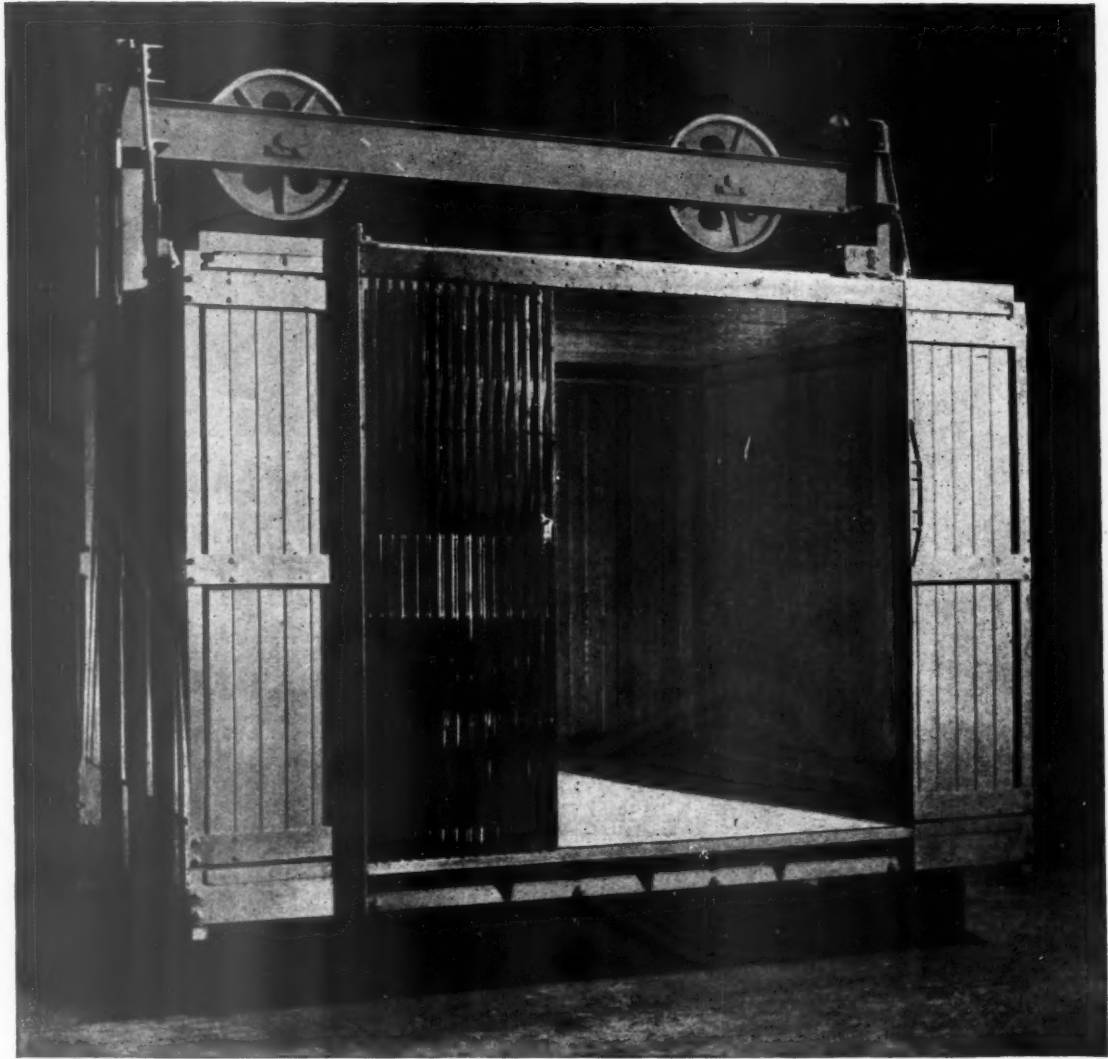


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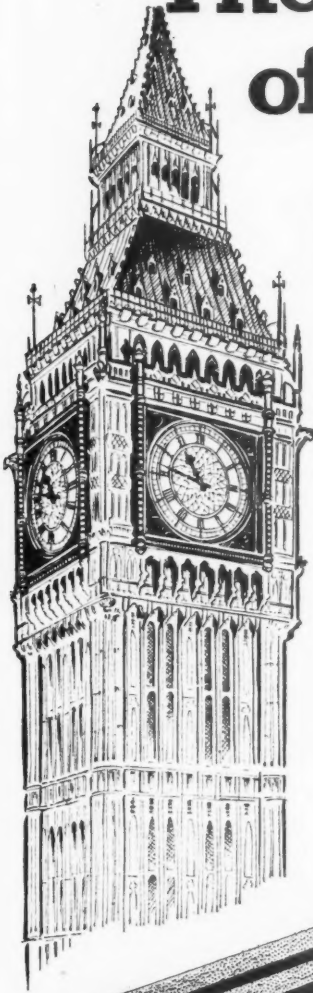
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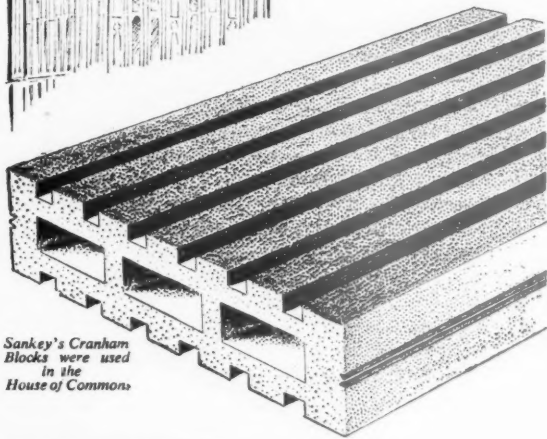
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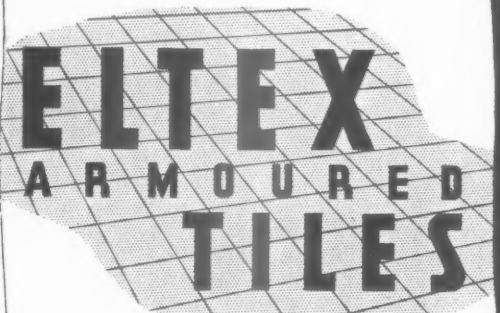
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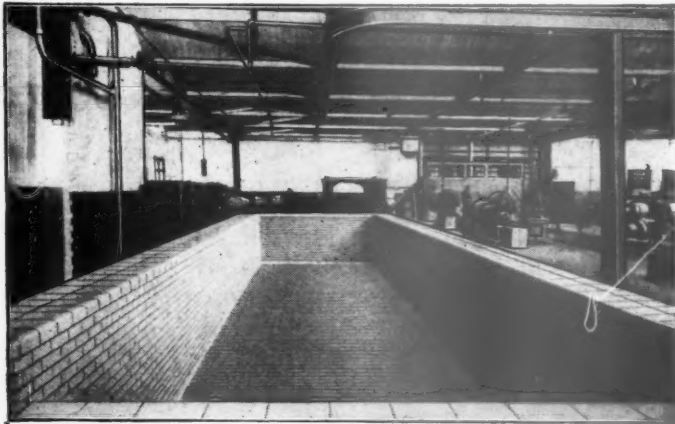
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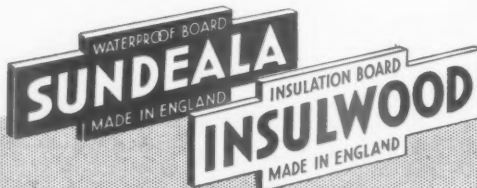
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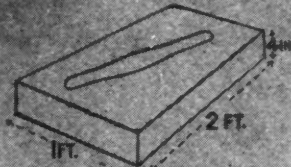
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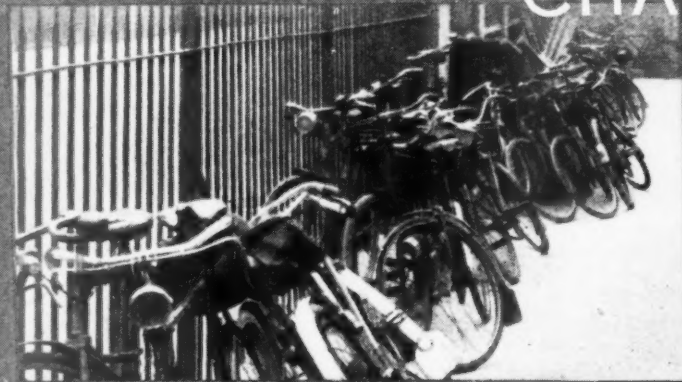


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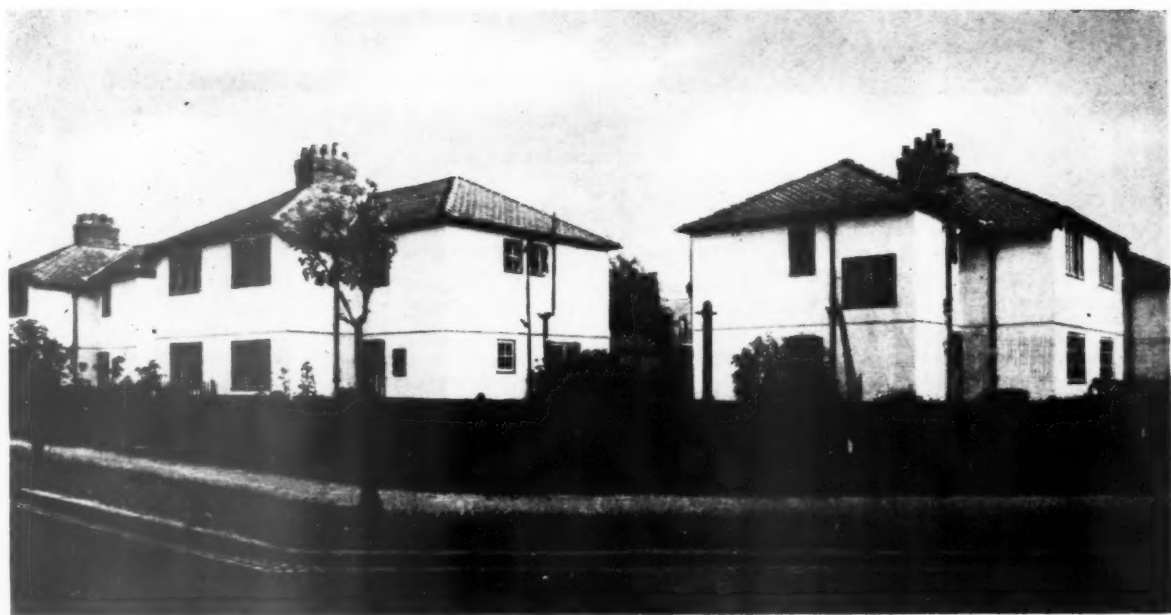
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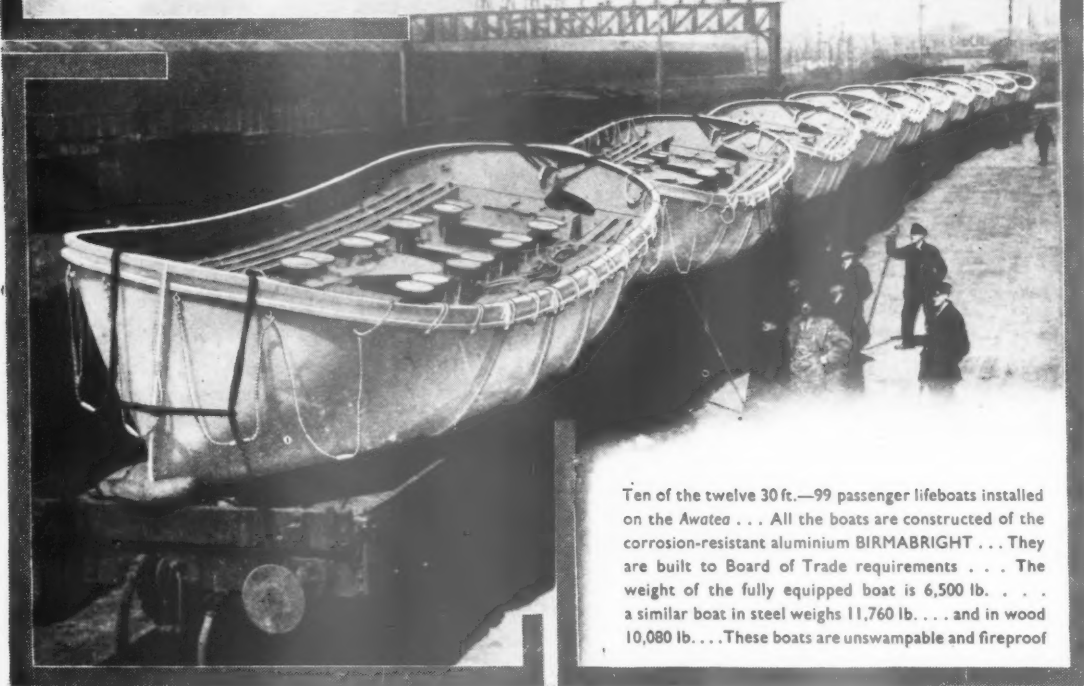


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In common with every other periodical this JOURNAL is rationed to a small part of its peacetime needs of paper. Thus a balance has to be struck between circulation and number of pages. We regret that unless a reader is a subscriber we cannot guarantee that he will get a copy of the JOURNAL. Newsagents now cannot supply the JOURNAL except to a "firm order." Subscription rates: by post in the U.K. or abroad, £1 15s. Od. per annum. Single copies, 9d.; post free, 11d. Special numbers are included in subscription; single copies, 1s. 6d.; post free, 1s. 9d. Back numbers more than 12 months old (when available), double price. Volumes can be bound complete with index, in cloth cases, for 15s. each; carriage 1s. extra. Goods advertised in the JOURNAL, and made of raw materials now in short supply, are not necessarily available for export.

NEWS

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DIARY FOR FEBRUARY

Titles of exhibitions, lectures and papers are printed in italics. In the case of papers and lectures the authors' names come first. Sponsors are represented by their initials as given in the glossary of abbreviations on the front cover.

DICKLEBURGH, Diss. *Twenty Women at Home Exhibition.* (Sponsor. HC) FEB. 3-8

ERITH, KENT. *When We Build Again* Exhibition. At the Electricity Showrooms. (Sponsor, TCPA.) FEB. 3-5

Post-war Planning. A conference organized by the Town and Country Planning Association in conjunction with the Erith Borough Council, to be held on February 5, at Electricity House, Pier Road, Erith, beginning at 3 p.m. The Mayor of Erith (Councillor G. R. N. Farquhar, J.P.) will welcome the delegates and take the chair. 3 p.m. Chairman: The Mayor. 3.10 p.m. Sir Stephen Tallents, Public Relations Officer to MOTCP, will speak on: *Planning and the Public.* 3.40 p.m. Councillor S. G. A. Mantle, Chairman of the North-West Kent Joint Town Planning Committee and of the Housing and Town Planning Committee of the Erith Borough Council, will open the discussion. 4.20 p.m. E. E. Hoadley, Chairman of the Council of BEDA, will speak on: *Electricity in the Home.* 4.50 p.m. Councillor G. W. H. Luck, Member of the London and Home Counties Joint Electricity Authority and Chairman of the Electricity Committee of the Erith Borough Council, will open the discussion. The conference will close at 5.30 p.m. Conference fee, 1/6 per delegate (payable on afternoon of conference). The following resolution will be submitted: This conference (a) registers its general support of the National Planning Basis drafted by the Town and Country Planning Association; (b) urges the Government, in conjunction with local authorities, to adopt a replanning and rebuilding policy which includes: sufficient decentralization of industry and business from crowded centres to allow of the latter being rebuilt with houses and gardens for families and ample open spaces; good design and layout of buildings and roads; the safeguarding of agricultural belts around and between towns; and the provision by means of new towns and extensions of country towns for all who cannot be satisfactorily housed in the big centres; and (c) urges the government to speed up the needed legislation for guidance of the location of industry, acquisition of land for planning and development, and dealing with the compensation-betterment problem. FEB. 5

LIVERPOOL. *Prefabrication.* Film show and discussion. At the Allied Centre, 1, Basnett Street, Church Street, Liverpool. (Sponsor, ABT, Liverpool Area Branch.) 3.30 p.m. FEB. 5

LONDON. *Colour in the Home.* Exhibition at the Royal Academy, Piccadilly, W. There are units representing dining, sitting, nursery and bedrooms, colour in everyday ware, and

some building materials such as paints. There are also suggestions for the interior decoration of civil aircraft. (Sponsor, British Colour Council.) FEB. 3-26

Design in the Home. Exhibition at Geffrye Museum, Kingsland Road, E.2. Arranged for CEMA from the collection of the V and A Museum. The exhibition includes old and modern English pottery, textiles, cutlery, silverware and glass. 10 a.m. to 4.30 p.m., excluding Sundays and Mondays. FEB. 3-5

County of London Plan. Light Touring Exhibition, prepared in collaboration with LCC by Ernő Goldfinger and Ursula Blackwell. At 13, Suffolk Street, S.W.1. FEB. 3-12

RIBA Exhibition of Paintings and Etchings by William Walcot. At the RIBA, 66, Portland Place. Walcot died in June last. His outstanding achievement, which is fully represented in the exhibition, was the production of expert gouache and etched restorations of the Architecture of Greece, Rome and Egypt. Walcot, in his later years, concentrated his interest largely on town planning as applied to London. Much of his work in this field was shown in the recent exhibitions of the County of London and is reproduced in the Report on the County Plan. The RIBA exhibition includes a scheme for short-circuiting the Thames to facilitate the planning of the central area. The exhibition also includes a considerable number of other water colours, pencil drawings and etchings of recent years. FEB. 3-19

Nationalization of Land. Debate during an evening arranged by the AA Students' Committee. At 34-36, Bedford Square, W.C. 6 p.m. FEB. 8

Swedish Factory Made Timber Houses. Exhibition of photographs and drawings lent by The Swedish Timber House Export Association of Stockholm. At the Building Centre, Maddox Street, W.1. 10 a.m. to 4 p.m. (Saturdays 1 p.m.) FEB. 3-26

Exhibition of drawings of Landscape, Seascape, Industry and War subjects. By E. B. Musman. At the AA, 34-36, Bedford Square, London, W.C.1. Mr. Musman's drawings are in water colour, pastel, pen and wash, and pencil. Most of them have been done since September, 1939, as a relaxation from wartime duties. Weekdays 10 a.m. to 6 p.m., Saturdays until 2 p.m. FEB. 8-26

Film Evening. Films selected by Paul Rotha, who will give an informal talk. At 34-36, Bedford Square, W.C.1. 6 p.m. (Sponsor AA.) MAR. 14

NEWPORT. *Rebuilding Britain Exhibition* At Museum and Art Gallery. FEB. 3-5

Though no feature in the JOURNAL is without value for someone, there are often good reasons why certain news calls for special emphasis. The JOURNAL's starring system is designed to give this emphasis, but without prejudice to the unstarred items which are often no less important.

★ means spare a second for this it will probably be worth it.

★★ means important news, for reasons which may or may not be obvious.

Any feature marked with more than two stars is very big building news indeed.

In a petition and counter-petition regarding the extension of a sawmill, HUSBANDS OPPOSED THEIR WIVES at Edmonton.

The wives signed a petition supporting a timber merchant's appeal against the Council's refusal to allow him to extend his mill. But when the husbands came home from work, they objected—signed a counter-petition. This was said at a town planning inquiry when the land the timber merchant wished to build on was described as the last local natural beauty spot preserved since Edward III's reign.

Salvage stewards in each of the London Stores ensure that NO SALVAGEABLE MATERIAL IS WASTED.

One West End store, which is salvaging an average of 8 tons of paper a month, has not bought any new paper and board packing material for over twelve months, as a result of the careful re-use of old material. Few of the London stores keep their general correspondence beyond nine months—several beyond six. In one case this has resulted in the releasing of over half a million letters for salvage. One of the stores does not keep copies of orders for more than a month, while another sends a reminder every three months to all departments to clear out accumulations in desks and files. What can be achieved by the combing out of old records is shown by the results at one Kensington store, who were able to dispose of over 100 tons of old records a year.



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Though we are today the largest scaffolding organisation in the country, we still remember that 30 years ago we were very 'small fry.' In 1913 we invented tubular steel scaffolding and in those early pioneer days the little jobs were quite gratefully undertaken . . . they were very important to us then, they are still very 'important' to us today. We give to the little job the same care and attention to detail as we give to the big job . . . and we always will.

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from AN ARCHITECT'S *Commonplace Book*

A ROYAL APPEAL FOR MASS-PRODUCTION IN HOUSING. (*The Duke of Windsor speaking to architects at the Guildhall on November 22, 1934, when Prince of Wales*). I want to request your great profession not only to lessen the cost of those living conditions but to raise their quality and their amenities. . . . I am sure that the principles of mass-production can be applied to housing. . . . Carry the principle of mass-production over to architecture and the building trade . . . in no other way will it be possible to raise the living conditions of the great majority of our people.

Work is to be resumed at once TO COMPLETE THE NURSES' HOME at Queen Charlotte's Maternity Hospital, Hammersmith. Since September, 1941, the building has been requisitioned for the storage of furniture. As a result, the nurses have had to be accommodated in the hospital itself and the use of 40 lying-in beds has been denied to the public. This early resumption of work is due to the ready co-operation of Government departments and the local authority after the urgent appeal by the hospital for licences to procure building materials. According to *The Times*, to complete that part of the home now in the hands of the builders will take about seven months, when another 40 beds at least will then become available to the public. This will qualify the hospital for the £30,000 promised by the Bernhard Baron Trustees on condition that the work was completed by the end of this year. This, together with a grant by King Edward's Hospital Fund for London and other donations covering the £42,000 required, ensures the beginning of this development free from debt.

Grantham House, Grantham, has been GIVEN TO NT with 18 acres of land through which the River Wytham runs. The gift has been made by the Misses Sedgwick. Dating from the fourteenth and early fifteenth centuries, Grantham House stands immediately east of St. Wolframs Church. The gift assures to posterity a fine view of the church and a large open space in the centre of the town.

The total of £20,000 for the BATTLE OF BRITAIN MEMORIAL in Westminster Abbey has been reached and passed. Surplus funds will be given to the RAF Benevolent Fund. The memorial will be placed in a Chapel of the Abbey and will be known as the Royal Air Force Chapel. A committee has been set up to administer the fund and to collaborate with the Dean of Westminster in plans for executing the work after the war. Professor A. E. Richardson, A.R.A., is a member of the committee.

★
The Government has decided NOT TO CLOSE THE QUARRIES near Hadrian's Wall, at Haltwhistle. This assurance was given by Mr. George Hicks, Parliamentary Secretary to MOW. Speaking at a conference at Haltwhistle, he said the Government will not contemplate any scheme for the closing of two whinstone quarries, which does not provide alternative quarrying

employment for the 300 men now engaged in producing stone vital for the war effort. NT, together with the Ministry, said Mr. Hicks, are particularly anxious to preserve Hadrian's Wall, which runs 73 miles from the Tyne to the Solway—a fine specimen of Roman beauty and the finest memorial to the military greatness of the Roman Empire. A preservation order lays it down that there shall be no further destruction of the wall or disfiguration of the amenities of the countryside. But, Mr. Hicks said, the question of employment is paramount. With a spirit of co-operation and willingness and by negotiation it might be possible to arrive at a solution where no one will be injured by the operation of the preservation order and the wall will be preserved. One of the quarries, he pointed out, will be practically worked out at the end of 1944; the other quarries will be permitted to work for 5 years.

The South Monmouthshire village of SADBROOK HAS BEEN SOLD for £23,000. The village was purchased by an anonymous buyer and has a shipyard, post office, school and 118 houses. It is nearly 37 acres in extent and overlooks the Severn Estuary, and is near the site of the proposed new Severn bridge. Its sale was caused by the death of Mr. Charles Hay Walker.

★
The RIBA DENIES HOLDING UP THE CRYSTAL PALACE COMPETITION. The RIBA states: Negotiations took place between the RIBA and representatives of the Crystal Palace Trustees and CEMA and agreement was reached as to the terms of a competition. It was, and still is, the opinion of the RIBA that the present time is not appropriate for the holding of large-scale architectural competitions of this nature, when so many of the ablest young architects are serving their country in the Services, and therefore would be unable to take part. Nevertheless, the RIBA is prepared to give every assistance if it has been decided to proceed with the competition now.

The London and Home Counties Joint Electricity Authority has CHALLENGED THE POST-WAR ELECTRICITY PROPOSALS of the Incorporated Association of Electric Power Companies. By 22 votes to 4, the authority decided to send to the Ministry of Fuel and Power and the Electricity Commissioners its report challenging the proposals. The companies, in a recent memorandum, oppose purchase by local authorities. They suggest that if Parliament should decide on public purchase, the companies should not be liable to such action before 50 years. The report of the

authority contains figures showing that public authorities provide cheaper electricity for domestic users than the companies.

★
You are going TO BUILD AN ENORMOUS NUMBER OF HOUSES Lord Portal told the NFBTE. The programme for the twelve years after the war, he added, is well advanced. Lord Portal, Minister of Works, was speaking at the annual meeting in London of the Federation. Examples of the building industry's achievements, given by Lord Portal were: £1,000,000,000 worth of new construction for the Government in four years; £600,000,000 worth of airfields to support the largest combined air force that had ever operated; 260 new hospitals, with beds for over 130,000 persons; hostels for 300,000 transferred factory workers. Much of this, Lord Portal said, would be a permanent addition to our national assets.

★
During the last two or three months I have read some of the Scott, Uthwatt, and Beveridge reports. If you ask me if I am going to apply the doctrines of these gentlemen I should say: CERTAINLY NOT. — Lord Woolton. Lord Woolton, Minister of Reconstruction, who was addressing the Anglo-American Press Association of Paris at a luncheon in London, continued: We shall pass their evidence through the mind of Government; we will digest what they have suggested; we will see how what they have suggested fits into the whole picture of the world we are planning. We are indebted to them for their great wisdom and their great efforts, and when the time comes the Government will declare its own policy for dealing with these problems. We want Government responsibility and not delegation to committees. I am prepared to take full measure of responsibility for such actions as come from my Department, or through me from the Government, without reference to the support of any committees that have sat in the past. Yet I cannot speak too highly of the gratitude I owe these gentlemen. Without their efforts I do not think I could have begun to understand in so short a time the magnitude of the problems which they have surveyed over many months. What do the people of Britain and the people overseas want when the war is over? They want a home to come back to, and they care more about that than anything else, and that is what we are determined to give them at the earliest possible moment when the supplies of labour and material enable homes to be built. That is more important than all these nobler schemes of reforming the new world. You do not want a Minister of Reconstruction who is living in the clouds. We want industry on its own feet, employment which comes out of the ordinary economic life of the country, and not from Government action. I am, indeed, full of optimism for the future.



Swedish Prefabricated Timber House

An exhibition of Swedish prefabricated timber houses opened in London yesterday, from which the above photograph is taken. It shows a standard type of bungalow, with the high stone plinth and semi-basement necessitated by the northern climate, in a typical Swedish

setting. This week's leading article deals with the exhibition, and points out the possibility of importing these houses after the war to ease the housing situation, while a special article by an expert in their adaptation in this country appears on pages 101-105.

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Mr. Alfred C. Bossom, M.P., said we are FACING A BIGGER BUILDING PROBLEM than we, or probably any other nation, has ever faced.

But, he added, I am an optimist as to the outcome. Mr. Bossom was speaking at a luncheon of the Federation of Master Builders. To find out the full extent of our building problem in the years after the war, Mr. Bossom suggested that each Regional Commissioner should be requested to get in touch immediately with the local authority of his area and get, within say 30 days, certain definite facts about the needs of the area, such as the number of houses in need of repair and which are worth while repairing; the best estimate of the number of new small houses required; the number of new flats to be provided; and a rough idea of the building operations that must be undertaken within the first five years after the war. With this and other information, it will be within the ability of our officials, working in conjunction with the building industry, to make a practical time and progress schedule, nation-wide, which will show what is required. Then it will be possible to decide whether all the structures can be made appropriately of permanent type or whether a number will have to be temporary. He believed it will be wise to consider licensing temporary houses built for a specific number of years, 5 or 10 at the maximum. Serious consideration might be given to the licensing of smaller permanent buildings. We are becoming more communal in our developments. He recommended that the Government should set up a commission to decide whether it will not be advantageous to put up houses on a basis of, say, 25 years, and have them financed accordingly, and at the end of that period to make it possible for a renewal of the licence for an additional 10 years, then a further 10 years, and so on.

★

Professor C. H. Reilly has been appointed TO RE-PLAN BIRKENHEAD.

He has chosen as his colleague to help him Mr. N. Aslan—a former student of the Liverpool School of Architecture—whose scheme for the replanning of the City of London was published in the JOURNAL for December 9.

Mr. John Maud is to be SECOND SECRETARY TO LORD WOOLTON.

Acting second secretary of the Ministry of Food, Mr. Maud is a war-time civil servant. Previously he was Master of Birkbeck College, University of London.

In the House of Commons Mr. Henry Willink, Minister of Health, stated that ONE HUNDRED AND FIVE FARM WORKERS' COTTAGES were finished by December 31.

On 2,397 other farm workers' cottages, work is proceeding, said Mr. Willink. Of these 1,279 are roofed in or in a more advanced stage. Information so far available as to finished costs relates to 54 cottages only, all of the parlour type. The average all-in cost is £994 per cottage. Of this £39 10s. represents cost of land and £954 10s. construction, including roads, water supply, and architect's fees.

SWEDISH TIMBER HOUSES

AN exhibition opened yesterday at the Building Centre in London of photographs and drawings of Swedish factory-produced timber houses. The pictures have been lent by the Swedish Timber House Export Association of Stockholm (Svensk Trähusexport) which represents about 70% of the Swedish timber house industry.

Though the timber house is traditional to Sweden, being suitable for the climate and made of readily obtainable material, the first prefabricated timber houses were not manufactured there until the middle of the last century. Sweden was, however, the first country in Europe to go in for pre-assembly of building sections. Now prefabricated timber house production is a major Swedish industry.

The exhibition is timely and valuable for two reasons. First it is good propaganda for prefabrication. This is needed now that prefabrication is the question of the moment in building circles—not because it is an end in itself but because it makes for *speed of erection and mobility*, fundamental considerations at this juncture. In the exhibition we see that nearly all these houses possess integrity of design and a certain charm. They never give the impression of being mean and cheap—adjectives too often associated in people's minds with factory-made dwellings. The solid plank wall type is, indeed, not cheap. At present, for various reasons, it costs as much as brick building, but it is, of course, very much quicker to erect.

The second point of importance, which the exhibition raises, is that of suggesting a possible source of supply of house parts for this country immediately after the war. To supply the houses we require as quickly as possible we shall need all the help we can get, not only from our own industries, but, where available, from abroad as well. The supply of houses from Sweden would, of course, be limited. We have it on good authority that given adequate notice Sweden could send us several tens of thousands of houses per annum. Compared with the four million required this is not very much. Nevertheless it is a possible and positive help that should certainly be considered by the authorities in this country, in particular for use during the first year or two after the war when the housing situation will be serious and when our own industries will not have achieved full momentum.

The most common Swedish timber house is the solid plank wall type in which the core is built up of good quality timber in the short waste lengths of the saw mills. There are other lighter Swedish types such as that developed by Erik Friberger, which is composed of framed-up panels, and the system recently designed by Sven Markelius. The solid wall types, however, are the ones which will probably be available in large quantities. These would be less suitable for demountable housing than the light-weight system, and their best use in this country would seem to be as permanent dwellings on sites, especially in rural areas, not likely

to be used in future for any other purpose than housing. The question of cost is, of course, important but only if regarded realistically, that is from the point of view of real wealth and not merely of purely financial cost. If Sweden is willing to supply us with housing parts on a reasonable basis of real wealth exchange, that is the primary consideration. An article appears elsewhere in this issue on Swedish timber houses written by an architect who has had first-hand experience in their erection in this country, and it is interesting to note that the cost of the actual imported wall sections of a house is only about a third of the total cost. Finally it should be pointed out that if a quantity of factory-produced Swedish timber houses were imported immediately after the war, adapted and properly designed for conditions in this country by British architects working in conjunction with Swedish technical experts, useful experience would be gained in this field of construction. Timber is perhaps the most suitable and flexible material for prefabricated housing, and in its use for this purpose Sweden has much to teach us. Moreover, the architectural standard of these houses is on the whole high. If their general æsthetic character were maintained, and perhaps even improved, in spite of adaptation, a valuable precedent in design would have been set.



The Architects' Journal

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N O T E S
&
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A BOUQUET FOR THE BUILDERS

Lord Portal told last week, at the annual meeting of the National Federation of Building Trades' Employers, the extent of the work carried out by the building and civil engineering industries during the war, when he congratulated the Industry on its war effort.

One fact he revealed was that airfields worth £600 million have been carried out. I suspect that these were not put in hand until America came into the war, and the great Anglo-American all-round-

the-clock bombing policy had been planned. There is, therefore, all the more *kudos* gained. An article in the *Daily Mail* recently gave some interesting facts. There is hardly a site now left in the country suitable for an airfield, the article said, which is not already used for the purpose. The total area covered by airfields would fill the Counties of London and Middlesex. If you fly from London to Liverpool nowhere are you out of sight of at least four aerodromes.

In the midsummer of 1940 a shocking state of affairs existed. A hundred thousand men were unemployed, yet the Industry had twice the amount of work in hand that it could cope with. MOW got to work in October of that year, and by organizing allocation of work, and materials, the chaos was conquered.

£1,000 million worth of new construction for the Government has been carried out in four years, Lord Portal stated, including 260 new hospitals with beds for more than 130,000 and hostels for 300,000 transferred factory workers. As Lord Portal pointed out, much of

this will be a permanent national asset. The War Damage Commission, too, has dealt with nearly three million cases of repairs, and a year ago the expenditure on these had reached £100 million.

There has always been relatively little friction in the building industry, and this tradition has been maintained during the war. It is a remarkable thing that all this work has been done with almost no industrial disputes.

Government Departments are the chief Aunt Sallies of the Press. Sometimes the flinging of rhetorical brickbats at the authorities is justified, but when we hear these facts and realize the magnificent feat of organization involved, we can offer no less a bouquet to MOW than Lord Portal has handed to the Industry.

BEATRIX POTTER

The death was announced recently of Beatrix Potter, well known in the North of England as a fine sheep farmer and experienced judge of ewes, but better known to most of us as the creator of Pigling Bland, Jemima Puddleduck, Mrs. Tiggy-Winkle, Squirrel Nutkin, Peter Rabbit, the Flopsy Bunnies, and a host of other beloved figures of nursery days. Those familiar little square books with their overworked, dry-brush-water-colour illustrations have none of the brisk highly-coloured zest of the contemporary children's book, but their charm is irresistible, and their characters are as immortal as Robinson Crusoe or Alice in Wonderland. During the blitz it was rumoured that the original Beatrix Potter blocks had been destroyed. Let us hope that the publishers are not tempted, as a result, to try and bring the books "up-to-date." I should hate to see Mrs. Tiggy-Winkle in sophisticated lithograph.

SWEDISH LANDSCAPE

The exhibition of timber houses at the Building Centre will bring pleasant memories to those who have spent a holiday in Sweden. Summer visitors there always see the country at its best. They might be less delighted with the

climate if they had to face the long grey weeks of autumn and early spring or the interminable winter night of the north. However, the short, bright summer is adequate compensation.

★
Though the countryside tends to be a monotony of pine trees and outcrops of grey granite, the typical scene can be very beautiful. Imagine a still lake surrounded by pine forests broken here and there by a cluster of silver birches. In the brilliant atmosphere of a summer's afternoon the picture is intensely dramatic and almost unreal. Outlines are sharp and crisp, and the colours as bright as Neon lights. A focal point will be a timber farm house—a vivid spot of purple-red broken by white window frames and doors. This typical colour of Swedish country buildings can probably be seen in no other country, except perhaps in that other Sweden called Minnesota, USA, where the Scandinavian émigrés build their farm houses to remind them of home. The colour comes from a kind of paint obtained, I believe, as a by-product of the Falun copper



mines. It contrasts and harmonises extraordinarily well with the dark green of the conifers.

★
In my landscape there is another building perched high up on the other side of the lake and half hidden by trees. This is the manor house, with its projecting porch, built of timber, of course, but painted white or perhaps pale buff or grey. It is the type of house which you see below. Built in the eighteenth century, this example is now the country home of Hakon Ahlberg, the president of the Swedish architects' association. Comparing it with the modern factory-made timber dwellings, you will notice how small has been the change in character over the years.

BEACHCOMBER'S CORNER

"Charlie Suet is working on the new prefabricated houses, with television set, room for Government forms, laboratory for chemical foods, dogs' living-room, cats' bedroom, birds' swimming pool and glass sink wired for sound. The houses fold up, a dozen to a bundle. They are hygienic, self-rotatory, pre-sun-drenched, fish-proof, functional, æsthetic, emancipated and group-minded." (*Beachcomber in the Daily Express.*)

ASTRAGAL

A Swedish eighteenth century country house of timber, mentioned by Astragal above. Left, general view of the entrance front. Below, the porch on the back elevation. Photographs by F. R. Yerbury.



LETTERS

G. M. Kallmann

F. J. Osborn

Our Leader Writer

Hugh H. McTaggart

Prefabrication

SIR,—I forward to you extracts from a letter written by Sub-Lt. T. W. Atkinson in America, in which he reports on a discussion at Harvard and generally on trends of prefabrication design in the U.S.

For your information I would add that T. W. Atkinson belongs to that young generation in architecture whose career should have begun when war broke out. Instead service took him abroad and he seems to have been singularly fortunate inasmuch as this gave him the chance to make contact with a number of American architects it has always been his wish to meet. His observations, though not written for publication, are perhaps of more than personal interest and may in some way contribute to the discussion.

G. M. KALLMANN

London

The extracts referred to by Mr. Kallmann are as follows:

"... I attended a meeting at Harvard in which Gropius expounded his philosophy (if such one may call it) of prefabrication. As you may know Gropius has invented a new prefab. system which is to say the least ingenious. Of course it is a timber system and that alone rules it out for us. Also it is the old panel dry erection type of thing with no real consideration for internal services. (Neutra told me that when architects first began to think in terms of mass production, all the lines were closed to them except those of wall panels and the like, and it wasn't because of actual belief that in this field lay the answer). Actually most of that generation of architects still think in terms of the packing-case house, whilst I have come more and more to the opinion that progress in mass production

will not be made along these lines or that of traditional prefabrication thought prevalent in England.

The meeting was really to culminate in the exposition of this wonder of the modern mind, the Gropius scheme. It ended more in stalemate. Gropius looked great and tragic as if after all these years he was beginning to lose conviction and he did own that transport costs (it cost \$275 to transport the small house from Boston to New York) almost outweighed advantages gained. The usual argument that crops up, that is the comparison between the fall of automobile costs as against rise in house building costs, was truly burst open by Catherine Bauer, who pointed out that the figures were not taken from the time when autos were first mass produced (you will find no decline in cost then) but from the time when they were first made back in the 'nineties and also that the equipment of houses has increased enormously. Further, that the comparison was misleading because the cars could largely transport themselves after they came off the assembly line.

The younger architects who are not bound to any dogma of prefabrication are beginning to see that the real key to the problem does not lie in the packing-box quality of a house but in the equipment. The trend is definitely (and this should apply even more so to England) towards what might best be called combined service units, either kitchen or bathroom or combined bathroom kitchen units which are brought to the site and only require an installer and not all the plumbers and electricians who slow up a job so much; the result, the entire elimination of site plumbing and the like. The first sign of the new trend was of course the Buckminster-Fuller pressed steel bathroom, crude as it was. The more up-to-date designs can be seen in the 194 house number of *Forum* (September 1942) and the entries for the California Arts and Architecture competition which Eero Saarinen won. Saarinen goes so far as to make the bedroom one of these pre-assembly units. Aesthetically I think they are right because one of the most disconcerting things I have noticed about prefab housing is the way it sits just off the ground with no real feeling of stretching out towards the garden. This foundation trouble is something which cannot be avoided as long as one thinks of prefabrication as a philosophy rather than a technique to achieve something. Where it has been avoided it has been done at enormous trouble. Prefabrication over here does not seem to have proved cheaper than ordinary construction. It is difficult though to get figures. Its great advantage has been the speed of erection which after the war except for rehabilitation purposes is not a major requirement. The main results of this combined service unit is that one can get a very high equipment standard for a lower cost and at the same time where one wants it achieve flexible housing. I don't believe that this will in the long run eliminate the possibility of having complete pre-assembly, but it will be the general trend for some time to come. Full pre-assembly is at the moment quite uneconomic unless the scheme involves a large enough amount of units to justify a site factory, which is not often the case in England. The answer is of course, as usual, that the particular circumstances demand different considerations, in some cases involving considerable pre-site work, in others very little except for the service units. Catherine Bauer and I formed a pact not to talk of "prefabrication" any longer but only of "rationalization in building."

When I first came over I was naturally most interested in prefab. structures and of all countries this should be the most suited, with large timber resources and an almost universal use of timber for domestic buildings as an accepted tradition. Also a type of building industry that is more suited to the work than any other and yet, as I say, even though they have had 10 years of quite considerable experience

of such work the results are disappointing and what is more unconvincing. There is enormous scope for those who can see just how far pre-assembly can go economically and I think aesthetically, and then if it is taken beyond that point the result is costly failure. Much more promise is to be found in site organization in many ways. I have seen a war housing scheme which was built in half the time of a complete prefab. scheme simply because the contractor built his roads and base foundations and used the roadsides as material dumps, and so could carry on right through the winter while the prefab. scheme was bogged up. Gropius very rightly, I think, pointed out how important it was to get manufacturers to agree on definite modules in production through some central bureau. He also said how he has found the thing we have found in England, the opposition of the trade unions to rationalized building, and this is just part of the fight we have ahead of us. . . ."

TCPA and London Plan

SIR,—Though we still don't agree, your readers now have the data to decide for themselves. The further points raised by your leader-writer are of interest, but they emphasize the unreality of using exact calculations of family sizes in housing policy. What we ought to do is to provide houses that will be big enough to suit most households throughout a series of internal changes. We should neither compel removals (except in cases of overcrowding), nor prevent them when people want to move. A good housing policy will always leave some spare space in the majority of houses, and a margin of spare houses. Most houses in a housing scheme in normal times should thus be "under-occupied," and a minority at the limit of permissible crowding. But during the housing shortage some local over-occupation must unfortunately be tolerated.

I like your leader-writer's idea of an extensible house. But is it practicable for any but completely detached houses? This correspondence has been about central London, where I think the majority of new houses will be in terraces.

I also agree with him that adequate housing might reveal that "families" are smaller and more numerous than pre-war statistics showed. This, however, doesn't alter the practical position. The real difference between us is that he is worried about working people having a spare room or so, while to me it seems quite a desirable state of affairs and not more wasteful than constant removals.

Welwyn Garden City

F. J. OSBORN

Our Leader Writer writes :

The real difference between Mr. Osborn and us is that, while Mr. Osborn wants to force 1½ million people to leave London, in order to provide material for additional garden cities, we want to arrange things so that as many as possible of those who wish to remain where they are can do so in comfort.

We both agree that overcrowding should not be allowed. But we differ about our definition of overcrowding. Mr. Osborn considers that flats are necessarily a manifestation of overcrowding and writes as though it were impossible to have a spare room in a flat. We consider that flats, since they economize space, and therefore reduce housing costs, are an obvious method of avoiding overcrowding, provided they are designed with this object in view, and that they should not be arbitrarily prohibited without the public being given an opportunity to see what life in a properly designed flat can be like. Until this has been done we feel that the question of how population should be distributed cannot be finally decided and therefore the provision of 80 per cent. dwellings in the form of 12 houses to the acre should not be made the starting point of all town-planning schemes. The LCC plan

which proposes to provide a mixture of flats and houses in central areas, the remainder of the county being devoted almost entirely to houses, seems to us eminently sensible—the only possible procedure in fact for any body genuinely anxious to discover what the public wants. It is nonsense to say the public don't want flats; the public don't know what flats are for. With one or two possible exceptions, we have no flats in this country—only tenements. One of the exceptions is Kensal Rise, built by the Gas Light & Coke Co., with Maxwell Fry as architect and Miss Elizabeth Denby as housing consultant. In the few short years of its existence before the war the experiment proved itself to be an unqualified success. With its club-room and restaurant where friends could be entertained, its stage, nursery school and carpenters' shop, it was rapidly becoming a much needed social centre for the surrounding district. The difference between flats and tenements is important but it has nothing much to do with density. We agree with Mr. Osborn in disliking tenements. A house standing in its own garden has certain advantages that should only be surrendered as part of an attempt to obtain greater advantages by other means.

The idea of planning dwellings to allow for greater flexibility is not as Mr. Osborn suggests limited to completely detached houses. In fact it presents greater technical difficulties if housing is provided in this form, if one takes existing building technique into consideration. The process of converting houses into flats is practical and familiar. The reverse process, that of turning small flats into large flats or maisonettes or houses, would obviously be very much easier, particularly if buildings were designed with this end in view. Several schemes have already been worked out and published showing how hostels might be designed for conversion first into flats and later into houses. In LCC flats before the war it was common practice to include occasional bedrooms that could be connected with either of two dwellings. In the grounds of the world-famous sanatorium at Parmio, Aalto designed terrace housing for the hospital staff in which the whole of the first floor is devoted to rooms, any of which can be used in connection with any of the dwellings below. As it is likely that we will have to give way on standards of accommodation immediately after the war the possibility of further development along these lines is worth exploring, particularly in view of the fact that once the post-war emergency is past, the standard of accommodation demanded per person is likely to rise very rapidly as hours of work are shortened and the school-leaving age raised. The higher the standard rises the more difficult it will become to think in terms of a "hold all" house.

Mr. Osborn agrees that adequate housing might reveal that families are smaller and more numerous than pre-war statistics showed but states that this does not alter the practical position. We feel that it may do and to a very important extent, because it is more necessary, as a first step, to provide every family that needs a separate dwelling, with accommodation suited to their present needs, including family houses for families that can fill them, than to provide part of the population with four-bedroom houses, many of which may be much too large.

Standard of Timber

SIR,—THE ARCHITECTS' JOURNAL issue for December 23, page 457 footnote. The universal standard of timber in the United Kingdom is the Petersburg Standard of 165 cubic feet. In an average working-class house in this country we use 2½ Standards per house, including windows and doors.

HUGH H. MCTAGGART

Edinburgh



THE ARCHITECTS' JOURNAL LIBRARY OF PLANNED INFORMATION

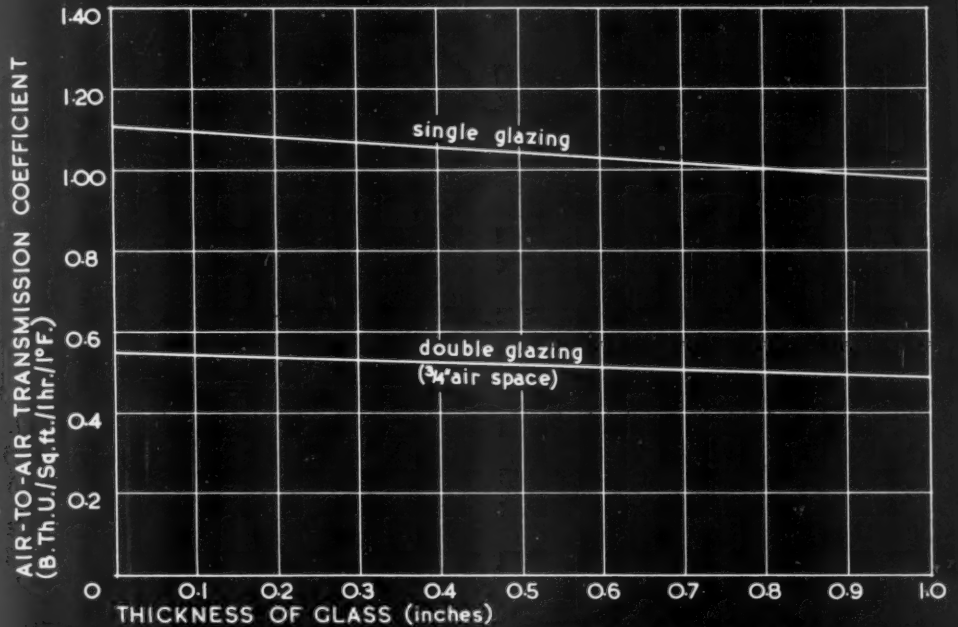
HEAT TRANSMISSION THROUGH GLAZING : CONDUCTION.

Assumed surface resistances :

Internal 0.70

External 0.20

Air space for double glazing taken as 3/4".



GRAPH SHOWING EFFECT OF GLASS THICKNESS AND COMPARISON OF SINGLE AND DOUBLE GLAZING.

CONSTRUCTION		RESISTANCE (including surfaces)	AIR-TO-AIR HEAT TRANSMISSION B.Th.U./Sq.ft./Hr./°F.
BRICK WALLS	4 1/2' brick	1.56	0.64
	9' brick and rendering	2.25	0.44
	11' cavity	3.33	0.30
	1'-1 1/2' brick	2.70	0.37
CONCRETE	6' concrete (ballast)	1.85	0.54
TIMBER	1' timber : 2' gap : 1/2' fibre board	4.43	0.23
	1' " : 2' " : 5/8' timber	3.63	0.27
LIGHTWEIGHT CONSTRUCTION	asbestos cement	0.87	1.15
	corrugated iron	0.83	1.20
	asbestos cement and fibre board	3.56	0.28
GLAZING	1/8' glazing	0.92	1.09
	1/4' glazing	0.93	1.08
	1/8' double glazing and 3/4' air space	1.83	0.55

TABLE GIVING THE RESISTANCE AND OVERALL TRANSMISSION FOR TYPICAL WALLS AND FOR GLAZING OF VARIOUS TYPES. (Based on Fuel Emergency Bulletin, No.12, March 1943).

Information from Chance Brothers Ltd.

INFORMATION SHEET: GLASS 7.

Sir John Burnet Tait and Lorne Architects One Montague Place Bedford Square London W.C1.

INFORMATION SHEET

• 927 •

GLASS: No. 7

Subject: Heat transmission through glazing :
Conduction.

General:

This Sheet is the seventh of the series dealing with glass and glass products, and sets out the fundamentals of calculating heat transmitted through glazing by conduction.

Glazed areas, in general, offer low resistance to heat transmission since they allow radiant heat to enter in summer, and to escape by conductivity in winter.

The resistance to escape of heat by re-radiation from the inside of a building is great, as glass is opaque to long-wave radiation. Moreover, the highly polished surfaces of glass offer considerable resistance to heat dissipation in still air, so that the transmission of heat may be controlled by intelligent design.

Sheet No. 8 of this series deals with heat transmission by radiation.

Calculation of Heat Transmission through Glazing by Conduction:

Single Glazing: Transmission through a glazed area takes place in the same way as with any other medium. The inside surface is warmed in general by radiation and by convection of the air inside, the heat is transferred to the outer surface by conduction through the glass and there dissipated to the outer air by convection and re-radiation to the outside.

The rate of transfer at the surfaces and through the material may be expressed in terms of the thermal resistances encountered. Assuming S_1 is the resistance of the inner surface, S_2 is the resistance of the outer, and R is the resistance of the glass itself, then the overall air-to-air transmission coefficient is given as $1/(S_1 + R + S_2)$ in B.Th.U./sq.ft./hr./1°F.

Typical values of S_1 and S_2 are:

Surface resistance (internal) in still air (S_1)	...	...	...	...	0.7
Surface resistance (external) for gale conditions (S_2)	...	...	...	...	0.0
Average for external winter conditions (S_2)	...	...	...	...	0.2

Thermal Resistance of glass (R) = $\frac{\text{Thickness in inches}}{\text{Thermal conductivity/in.}}$

Thermal Conductivity of glass
= 8 B.Th.U./sq.ft./hr./1°F/in.

For $\frac{1}{8}$ in. glass, $R = \frac{\frac{1}{8} \text{ in.}}{8} = 0.016$

Thus, the overall air-to-air transmission coefficient for $\frac{1}{8}$ in. glass is given by:
 $1/(0.7 + 0.016 + 0.2) = 1.1$ B.Th.U./sq.ft./hr./1°F

Owing to the fact that the thermal resistance of the glass itself in the thicknesses normally used is very small, increasing the thickness has a negligible effect on the overall resistance of the pane. The effect on the total transmission coefficient due to increases of the glass thickness, may be seen from the first graph on the face of this Sheet.

Double Glazing: Although changing the thickness of the glass has a negligible effect on the transmission of heat through a pane, the use of separated panes, as in double glazing, is important since the thermal resistance of an air space is high.

The effect of a double-glazed window in comparison with single glazing may be seen from Fig. 1.

The thermal resistance of the air space between the glass panes increases with the separation up to about $\frac{3}{4}$ in., above which it is virtually constant. The resistance of a $\frac{3}{4}$ in. air space has been determined experimentally as 0.90.

The value of R for a double-glazed window of $\frac{1}{8}$ in. glass is therefore:

$R = 0.016 + 0.90 + 0.016 = 0.93$

The air-to-air transmission coefficient is then:
 $1/(0.7 + 0.93 + 0.2) = 0.54$ B.Th.U./sq.ft./hr./1°F

It is of interest to compare this with the value for a $4\frac{1}{2}$ in. brick wall, for which the values of S_1 and S_2 are respectively 0.8 and 0.2 and the resistance of the brick is $4\frac{1}{2}/6$ or 0.75. The air-to-air transmission coefficient on the same basis as for glazed windows is then:
 $1/(0.8 + 0.75 + 0.2) = 0.57$ B.Th.U./sq.ft./hr./1°F. Thus a double-glazed window has a heat transmission coefficient comparable with a $4\frac{1}{2}$ in. brick wall.

Glazing Bars: It is usual to neglect the glazing bars in calculating the transmission of heat by conduction through a window, as their transmission coefficient does not differ sufficiently from that of the glass to affect the result.

Figured Glasses: Heat conduction does not depend primarily on the shape of the surface, so the calculation for loss through glass by conduction can be made without reference to the pattern.

Previous Sheets:

Previous Sheets of this series on Glass are Nos. 914, 917, 919, 922, and 925.

Issued by: Chance Brothers Limited.

Address: Glass Works, Smethwick, Birmingham.

Telephone: West Bromwich 1051.

Telegrams: Chance, Smethwick.

PHYSICAL PLANNING

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Since the article on Industry by Colonel M. D. Methven, billed to appear this week, has had to be postponed, we are publishing Professor H. H. Read's article on the important subject of Mineral Working. Professor Read is an F.R.S., F.R.S.E., F.G.S., D.Sc., and an A.R.C.Sc. He is Professor of Geology in the University of London: Imperial College of Science and Technology. He has published memoirs and papers dealing with the geology and petrology of the Scottish Highlands.

THE JOBS TO BE DONE

Britain's greatness as an industrial nation was largely founded on the use of her vast mineral resources. Man's power of using these has greatly extended with the development of mechanical power and it is therefore more than ever necessary that we should consider what our resources are, where they are, how long they will last and whether we are using them in the best possible way. These questions are not merely a matter for industrialists, they are of the utmost concern to all who are connected with physical planning. The Kennet Committee on the Restoration of Land Affected by Iron Ore Working wrote, in its report published before the present war, "the damage has hardly begun, there is yet time to remedy and prevent the worst of the evil. Over how many parts of our countryside, economically wasted, and ruined to the eye, we see scribbled the words *TOO LATE*. We can still redeem these areas from that." In this week's article Professor Read outlines the magnitude of the field of mineral workings in which planners and industrialists must co-operate.

WE MUST PLAN THE EXTRACTION OF MINERALS

by Prof. H. H. Read

widespread ignorance

Man lives on the surface of an earth made up of rocks. His food is obtained through agricultural operations on that surface; the apparatus of his civilization is produced from raw materials taken from below it; his very existence, so far as he progressed, may depend on his ability to make a safe hole in it. The surface of the earth controls his material comforts—its quality as scenery may minister to his higher needs. Man should thus be profoundly interested in the nature and history of the earth's crust. For his contemplation, there can be no grander theme than the three thousand million years of earth-history. This contemplation is the science of geology, and it would accordingly be expected that a knowledge of geology would be widespread amongst all citizens and especially among the governing classes, the planners and all persons charged with taking thought for to-day and to-morrow. In this country and

especially in England, this is not the case, for there is a profound ignorance on geological matters amongst all classes, government and lay alike. The professional geologist finds evidence of this in almost every session of the Brains Trust. Such ignorance may in that milieu do little harm, but an astounding and melancholy record of the waste of money and, still worse, of man-power, through the neglect of geological information in high quarters, could be produced. These present remarks are put together to bring to the notice of planners the importance of their being aware of the impacts of geology upon their deliberations.

three major groups

The records of the history of the earth's crust are presented in the rocks. Rocks, to the geologist, mean the individual units of material making the crust. One great group of rocks are the sediments, such as limestones, sandstones and clays—records of quiet deposition in varied environments; another group is the igneous rocks,

THE EAST MIDLAND IRONSTONE FIELDS

- Quarries
 - Mines
- Size of symbols is a rough measure of relative importance*
- Extent of workable ore
 - County boundaries
 - K Kettering
 - W Wellingborough



This map shows the extensive Jurassic iron ore deposits of the East Midlands, which stretch from North Oxfordshire, through Northamptonshire, Rutland and East Leicestershire to Lincolnshire. The black dots represent the sites of the present workings, which are likely to spread to the parts of the field as yet undeveloped. Much of the ore is covered by an over burden of younger rocks, whose removal by large mechanical shovels contributes one of the most serious planning problems, since the unwanted material is dumped in great spoil heaps, usually in "ridge and furrow" form, which defy simple restoration to agriculture or other uses.

as for example, granite, which have consolidated from a melt; both these groups may be transformed through the agency of high temperatures and pressures into metamorphic rocks, such as slates and the like. At many periods in earth-history, these varied materials have been compressed, crumpled, folded and fractured. From their manner of formation and from their subsequent history, it is clear that the rocks will show immense variety in their characters and distribution. Each small portion of the crust comes to have a special individuality resulting from its geological history; no man can change this individuality. Planners have to realize that the distribution of the rocks is fixed for our time. Britain, as a glance at a small-

scale geological map could show, has a great variety of rocks—a fact responsible for the abundance of our scenic contrasts. Some of these rocks are of importance in the national life—these are the mineral deposits—this term being used here in a wide sense to indicate a deposit of a rock or mineral which is worth working. Such mineral deposits, following from their history, are unevenly distributed through the country and this fact, combined with the quality of the deposit, is of great significance to the planner. I attempt a classification of the British mineral deposits from the planner's point of view, but of course there are certain deposits which do not readily fit into the scheme. Three major groups are proposed:—

First Group.—Large units, fixed in position, capable of being planned, or replanned, as regions. Examples are coalfields, iron-ore fields.

Second Group.—Small units, fixed in position, no choice of other sites, but often of great importance to national industry. Examples are fluorspar, barytes.

Third Group.—Small units, but usually amounting in aggregate to very large total production, not rigidly fixed in position and with some choice of sites. Examples are chiefly from materials used for building, road-making, etc., and are largely rocks in the geological sense.

Statistics of mineral production, extracted from the *Report of the Secretary of Mines for 1938 (1940)*, arranged under these three groups are given in the Table:—

MINERAL PRODUCTION, GREAT BRITAIN, 1938

GROUP ONE.

LARGE UNITS, IN REGIONS, FIXED IN POSITION

Coalfield Products	Tons	Value £s.
Coal	227,015,308	188,821,521
Fireclay	2,589,464	883,743
Oil Shale	1,551,346	563,688
Iron-ore	338,195	306,868
		<u>£190,575,820</u>

Iron-Ore

West Coast		
Hematite	795,053	917,877
Cleveland		
Jurassic	1,513,726	584,741
Midland		
Jurassic	9,212,217	1,585,951
		<u>£3,088,569</u>

GROUP TWO.

SMALL UNITS, FIXED IN POSITION

Tin Ore	3,172	348,761
Lead Ore	38,134	354,718
Zinc Ore	19,144	74,504
Copper Pyrites	70	1,261
Chromite	466	471
Gold Ore	18,188	12,192
Tungsten Ore	218	42,435
Arsenic White and Soot	65	742
Iron Pyrites	4,282	676
Fluorspar	33,331	36,104
Gypsum	1,092,395	514,464
Barytes	76,318	130,591
China Clay	585,888	777,640
Mica Clay	3,668	2,424
China Stone	48,383	72,349
*Potter's Clay	220,453	200,953
*Moulding Sand	770,910	133,056
*Silica Stone, Gannister	600,495	217,279
Glass Sand	124,931	27,089
Chert	4,218	16,544
Slate	283,538	1,927,278
Alum Clay	1,856	
Bog Ore, etc.	6,454	
Celestine	4,596	
Diatomite	2,159	78,155
Ochre	5,882	
Petroleum	145	
Fullers Earth		

* These products fall in part in Group Three.

GROUP THREE.

SMALL UNITS, WITH GREAT TOTAL PRODUCTION, SOME CHOICE OF SITES

	Tons	Value £s.
Igneous Rocks	11,434,691	3,670,667
Chalk	10,167,988	689,451
Flint and Chert	231,130	44,471
Limestone and Dolomite used in smelting	2,796,619	483,014
Limestone, used in cement, road-making, etc., chemical industry, etc.	16,060,039	3,306,944
Clay, Shale	26,601,991	2,173,684
Gravel, Sand	21,974,399	2,871,016
Sandstone	4,346,035	1,726,752
Grand Total Value		<u>£214,978,531</u>

minerals and planning first group

I proceed to comment upon the items in this list, drawing attention to such aspects as I consider might be of interest to planners. I hasten to state, however, that I am a geologist and not a planner.

I begin with the great regional units of my Group One—the coalfields, the iron-ore fields and the salt fields. In most cases these are old-established mineral industries and replanning or rehabilitation is more required than planning. With regard to the coalfields, the blots left by unrestricted exploitation have to be dealt with. Examples of these are such matters as (1) the disposal of waste, both ancient and modern, the camouflage of tip-heaps and bings, and the possibilities of avoiding surface dumping generally, (2) the housing problem; many miners' houses were erected a century ago with an expected life of the adjacent pit of some 20 years—the pit is now finished but the houses are still there and occupied—I cannot say lived in, (3) the restoration of worked-out areas, now often a wilderness of derelict pits, tip heaps and slums; in such areas, and potentially in many active coalfields also, subsidence adds to the mess. (4) Recent outcrop-working of coal raises many new problems in restoration. A second point in connection with planning in coalfields is concerned with the extension of coal working into new and mainly agricultural districts. The possibilities of extension of existing coalfields or of the opening-up of new coalfields are matters fairly well known to the geologist. For example, the extension southwards and eastwards of the exposed Yorks, Derby and Notts field and the discovery of the completely concealed coalfield of Kent depended upon geological information. The planner, I suggest, should be interested in the possibilities of new or extended coalfields so that he can be ready before it is too late. A third aspect of coalfield planning is that connected with the disposal of the coal, whether for local or distant industries, for home use or export. Studies of the trends and changes in such disposal for each field over a period of years are necessary for intelligent anticipation of the consequences of such movements.

Turning to the iron-ore fields, the old-established fields such as the West Coast Hematite area of Cumberland and Lancashire and the Jurassic area of Cleveland present opportunities for replanning in some ways similar to those of the coalfields. The great and expanding exploitation of the Jurassic ores of the Midlands brings, however, special problems. Here open-cast working in a farming area has raised in acute fashion the problem of restoration of the land to its prime use. Whether mining rather than open-cast working would be preferable requires careful study of such matters as the disposal of waste, the possibility of subsidence and so on. One last point concerning this ore-field is planning for exhaustion. The establishment of complex townships based upon a

wasting asset is, I trust, receiving the attention of the planners. Problems of the *saltfields* are largely those of local importance such as the consequences of subsidence. Such problems, of course, arise in all areas of shallow workings and the geologist and mining engineer have obviously to be consulted.

minerals and planning second group

My Second Group, *small units fixed in position*, is made up of several different categories. First are the *metallic ores*, tin, lead and so forth, worked in lodes or veins at smallish mines already well established. If the planner decides these products are required, then he has to accept the position and tidy up these fixed locations as best he can. Certain *non-metallic products*, e.g. fluorspar, barytes and gypsum, are becoming of increasing industrial importance. With the expansion of the building industry, inevitable after the war, the exploitation of such ancillary raw materials as gypsum for instance is likely to increase enormously. These minerals are however of very restricted distribution and little or no choice of the working sites is offered. The *china clay* set of mineral products is fixed in position by the distribution of the granites of S.W. England and is well established; tidying-up and rehabilitation are the planner's best outlets here. The *refractory set* of rocks—moulding sand, ganister, etc.—permit of some choice of working sites though often the special qualities of the products are developed in circumscribed beds or areas. The other minor minerals of Group Two, if required, have to be worked at their restricted outcrops. There is one last word about *slate*; its place in a group fixed in position might be questioned, seeing that vast areas of slaty rocks occur in various parts of the country. Two points have to be considered, however. Only slate of the very highest grade should be worked and this is of restricted occurrence; secondly, something like 95 per cent. of the slate quarried in slate quarries is waste—it seems best to concentrate the dumping of this waste material in a few spots.

minerals and planning third group

The rocks listed in my *Group Three*, worked in a great number of smallish pits and quarries and providing very great total outputs, provide plenty of scope for the planner. We may look into certain aspects of this branch of the mineral industry. These products are largely used in building, road-making and allied employments, so that their production is likely to increase. Certain of them, such as some of the igneous rocks, e.g. the monumental granites, or some of the limestones, e.g. those used in cement-making, do not present much choice of site,

due to a restricted geological occurrence or restricted development of their special lithological characters. The other rocks of this group mostly occur in beds which outcrop over considerable areas; for example, the Chalk has a very extensive development in eastern and south-east England. There is thus some choice of site, controlled in some measure by other requirements depending on the industrial application of the products. Restoration following the quarrying operations is concerned in most cases with single pits.

Certain special problems arise in connection with gravel working. As a glance at the Table will show, the output of gravel and sand amounts to nearly twenty-two million tons annually; it is obvious that wartime needs, for factory building and especially for aerodrome construction, must have materially increased this figure. Much of this production comes from the old alluvial deposits flanking the rivers. Many of these deposits form flattish terraced-like expanses, eminently suitable for factory or housing sites; the gravel beds are often associated with other alluvial and superficial deposits of special types and values. For instance, gravel may underlie brickearths of great value for intensive cultivation and market-gardening. The working of such gravels leads to the destruction of valuable and irreplaceable assets—instead of the garden is produced a lake that nobody in particular wants. The annual gravel production from the counties round London is over ten million tons—and the results of uncontrolled gravel working are visible to all from any train-window.

geologists and planners

I hope it has become clear from the foregoing that the geologist may have information to offer of importance to the planner. It is evident that mineral working presents problems of several different categories, permitting of a variety of solutions—but the solution must be influenced by a realization of the fundamental geological control. It is somewhat late in the day to make a plea for a realistic consideration of the conservation of our natural resources. We must, all the same, endeavour to "arrange" that the mineral deposits of this country are so worked that one asset is not destroyed to obtain another, that we see the whole picture both of the large and the small units, and that these gifts are treated respectfully and thankfully.

(Next week's *Planning Review* will include a description of maps in preparation at the Ministry of Town and Country Planning. The description will be illustrated with a map, provided by Professor Read, showing the location of gravel pits in Middlesex, the problem of which is discussed in this week's article under the third group of minerals).

PLANNING REVIEW

FIRST HOLIDAY HOME

The sale is now nearly completed of Wall Hall, Aldenham, the home of the late J. Pierpont Morgan, to the Hertfordshire County Council. It has been decided to run Wall Hall, which has 40 main bedrooms, a library capable of seating 300 people, and 1,200 acres of farm and parkland, as a holiday home where intellectual exercise can be combined with games and recreation. This will be the first residential holiday college for adults planned by a local authority.

TRANSPORT

Mr. Noel-Baker, Parliamentary Secretary to the Ministry of War Transport, in a reply to Mr. Gammans (Cons.) stated that the rate of execution of a highway programme must be adjusted from time to time to general economic conditions; but without imposing any undue rigidity the following order of priority will be a good guide during the transitional period:

- (1) Overtaking the arrears of maintenance.
- (2) Resumption of works closed down during the war is still desirable.
- (3) Works essential to public safety or to the reconstruction of blitzed areas and works of special value to areas in urgent need of new industrial development.
- (4) Elimination of obstructions to traffic on important roads such as weak or narrow bridges, level-crossings and the linking-up of improved sections of roads on important traffic routes.
- (5) Other works of improvement of high economic value.

In a leading article on January 26 *The News Chronicle* agreed with Mr.

Noel-Baker that the remodelling of our road transport system must depend in the first instance on our proposals for town and country planning, for the location of post-war industry, and for the re-organization of our agriculture. The article points out that this problem throws us back once more upon the big central issue which the government has not yet faced: the dependence of almost every item in our reconstruction programme upon physical replanning.

UTHWATT REPORT

Lord Brocket, Chairman of the Land Union, in a letter to *The Times*, has stated his belief that the law can be made strong enough to prohibit the development of land without putting the land itself into the strait-jacket of State ownership.

CITY PLAN

At a luncheon at the Mansion House given by the Lord and Lady Mayores to the members of the Common Council and other governing bodies in the Metropolitan area, Captain George Elliston, M.P., said that the City's plan for reconstruction would very soon be published, and that the chairman of the Town Planning and Improvements Committee, Mr. Claud Dennis, would find his name in the correspondence columns of *The Times*, when he would have to stand up to every form of criticism. Lieutenant-Colonel C. W. Whitaker believes that when the expected report and plan for the City is produced all will be very surprised at the amount of work which had been done, and that there will be just as much satisfaction as with the plan for the county.

NEW LITERATURE

Journey to Work: K. Liepmann, PH.D. (LONDON). The International Library of Sociology and Social Reconstruction. Kegan, Paul, Trench, Trubner & Co., Ltd. 1944. 15s.

Rent Restriction Act, 1920-29: Summary of the main provisions. Department of Health for Scotland.

Our Housing Objective: The Rev. Charles Jenkinson. Design for Britain Series, 23. J. M. Dent & Sons, Ltd. 6d.

Local Rates and Post-War Housing: Shena D. Simon. Design for Britain Series, 33. J. M. Dent & Sons, Ltd. 6d.

Urban and Rural Housing: Series of League of Nations Publications, II. Economic and Financial 1939, II. A, 2. Reprinted June, 1943. 3s. 6d.

Food and Agriculture: Report and Summary of the Liberal Food and Agriculture Sub-Committee. Liberal Publication Dept., 8, Gayfere Street, S.W.1. 4d.

Municipalities and the Post-War: Special Committee on Planning. American Municipal Association, 1313, East 60th Street, Chicago, Ill.

Rebuilding South Africa: South African Architectural Record, September 1, 1943.

Measures for Smoke Prevention in Relation to Plans for Post-War Reconstruction: Proceedings of the London Conference, 1943. National Smoke Abatement Society; 1s.

The Countryman's College: The Story of Impington Village College. Britain Advances Series. Published for the British Council by Sir Isaac Pitman and Sons, Ltd. 1s.

A pamphlet, *Planning for Reconstruction*, has been published by The Architectural Press, price 1/-. It appeared as a special number of *The Architects' Journal* on October 28th, 1943.

PLANNING REVIEW

MIXED RENTAL NEIGHBOURHOOD NEAR WASHINGTON, D.C.

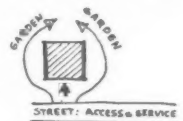


This project is based upon the belief that neighbourhoods which include provision for a variety of family types and personalities will possess greater vitality than those to which we are accustomed in present-day cities where building heights and densities decrease towards the outer rim, and where the different residential zones consist mainly of single-type accommodation. It is an independent design by five architects, Mary Coldwater, V. Demars, C. Koch, J. Johansen and P. Stone, all of the Technical Division of the National Housing Agency, U.S.A., and it was published in The Architectural Forum, October, 1943.

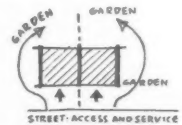
PLANNING

Attempts to rebuild cities through the negative restraints of height and area zoning, rather than through positive planning, have been based on the need to provide for equitable development of small individual lots. The result is a tendency towards uniformity within zoning districts. Under present regulations, for instance, it is not possible as a rule to mix high blocks of flats with single family houses, yet this might be highly desirable. The full use of the possibilities of large scale development requires a new approach to zoning, with regulations based principally on overall density restrictions. If the social variety of the present day inner area of cities and the amenity of the outer area were spread, the social and economic stratification which result from zoning would tend to disappear. It seems likely that a variety of family types and personalities, akin to that of a small town, would lend a new vitality to the neighbourhood community, and that this in turn would result in stronger civic consciousness in the city as a whole. In this scheme sites for detached houses, which might be individually built, are left on the roughest and most thickly wooded south slope, which is ideal for this kind of development. In the case of larger individual lots, this section could be developed with narrow gravel roads, and the character of the landscape would thus be preserved. For the use of each of the sub-neighbourhood groups of houses there is provided (in a green strip) a block centre—a simple one-room house which could be used for a variety of co-operative activities. Sites for all terrace and semi-detached houses have access to green strips, through which pedestrian paths lead to the central open space. Adjoining this parkland, sites are provided for a public elementary school with public library, and a fairly complete commercial centre. A restaurant, swimming pool, cinema and theatre are also proposed. Existing houses along one of the minor boundary streets are worked into the scheme.

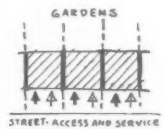
orientation is to be maintained, without undue expenditure per flat for lifts, an open access gallery seems to be the solution. Flat blocks have been placed where the best advantage can be taken of views, and where the woods are thickest. One block is shown with 12 stories and the rest with eight. The areas to the south would be partly cleared to let in the breeze, and for use by tenants. Areas to the north, which will be in shadow much of the time, will be left with little alteration. The following diagrams show some considerations in the site planning of homes:



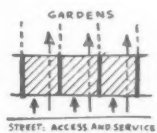
DETACHED HOUSE: Complete flexibility in location of service areas, garden, garage. Extravagant in land and utility uses compared with other types.



SEMI-DETACHED HOUSES: Most advantages of detached house. Allows greater distance to adjacent houses for side yard privacy.

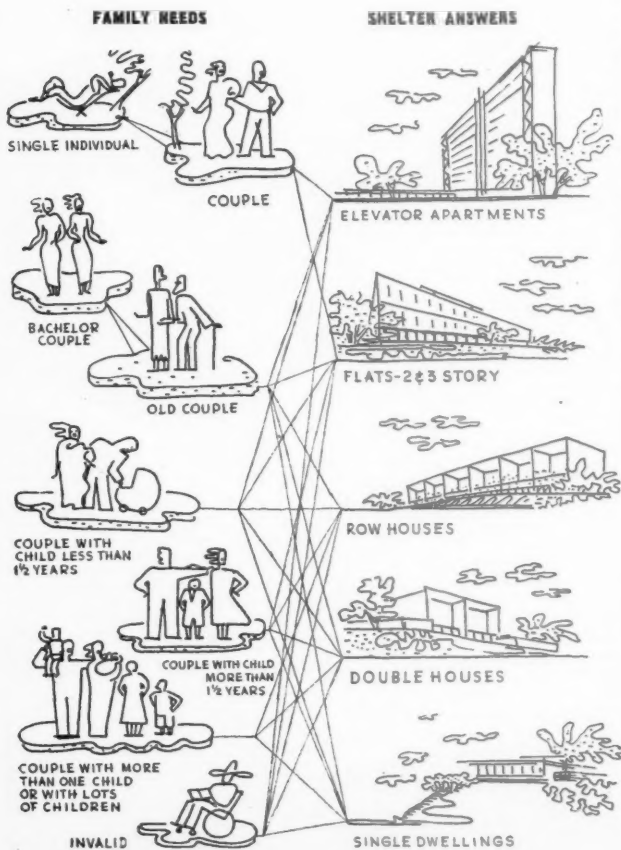


TERRACE HOUSE: Economical in land coverage and utility costs. All service from front unless back alleys are provided (duplicating streets and destroying privacy). Garages must be located at end of terraces.



RAISED-TERRACE HOUSE: Allows direct access to garden and alternate locations for service areas. Gives porte-cochere access to house from car. Design affirms use of street side as car entrance—garden side as pedestrian entrance.

The new residential neighbourhood shown above covers an area of about 175 acres, and is located on the edge of the District of Columbia, 15 to 20 minutes by car from the business centre of Washington. It is designed to accommodate just over 1,000 families. The chart below shows family types, their needs, and the various dwelling types which can satisfy them. The scheme provides some of the accommodations (but not all possible combinations) suitable to each family type, with the larger proportion for 3- and 4-person families.





Left, a shop, with living accommodation over, made of prefabricated timber sections, in a Swedish provincial town. Below, sketch, ground floor and basement plans of a standard timber bungalow.

S W E D I S H

FACTORY-PRODUCED TIMBER HOUSES

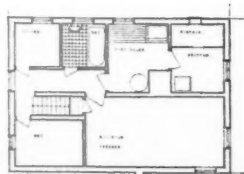
BY CYRIL SJOSTROM, A.R.I.B.A.



An exhibition showing the evolution of the Swedish timber dwelling from forest to building site and from the early primitive log construction to the modern factory product is being held at the Building Centre, London, until February 26, and at the Building Centre, Glasgow, in March. The following article is illustrated with photographs from the exhibition. The author, who has acted as consultant architect to the Swedish manufacturers who exported the parts for some 200 houses erected in Scotland immediately before the war, explains the design and construction of the typical modern factory-produced Swedish timber house and shows how it could be adapted for use in this country, giving figures of cost. (See A.J., Dec. 30, 1943, pp. 485-486 for an example of a Swedish timber house type adapted for use in this country).



GROUND FLOOR PLAN

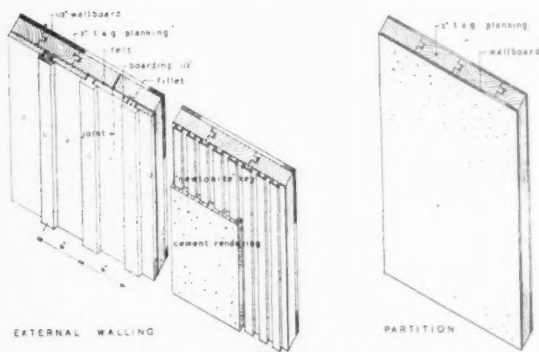


BASEMENT PLAN

Great changes took place in timber building during the 19th century. In America and Canada balloon-frame construction gradually replaced the more wasteful and less rational log construction, but in Sweden the development took a different line. Frame construction in Sweden is generally confined to huts, barns and non-

habitable buildings, while a tongued and grooved plank bearing wall became the structural system generally adopted for dwelling houses. The plank wall, generally used horizontally in Central Europe, was applied vertically in Sweden.

These three forms of construction —stud-framing on the American



Left, the Scano I system for single-storey houses. Below, the Scano III system for two-storey houses. Bottom, a house in Sweden by Sven Markelius shows that standard sections do not restrict free design.

Continent, pre-cut and slotted horizontal planks in Central Europe, and vertical planks in Sweden—became the prototypes for most prefabricated or pre-cut timber systems of construction in these respective regions.

The first prefabricated timber houses, primarily intended for emigrants to America for erection on arrival, were manufactured in Sweden about the middle of the 19th century. It is worth noting that the first company to be formed in America, for the sale of pre-assembled timber sections, Messrs. Hodgson Ltd., was formed in 1852. It was not, however, until after 1920 that prefabrication came into its own in Sweden. It is at present one of the major industries, supplying over 40 per cent. of all detached and semi-detached dwellings on housing estates and in rural areas.

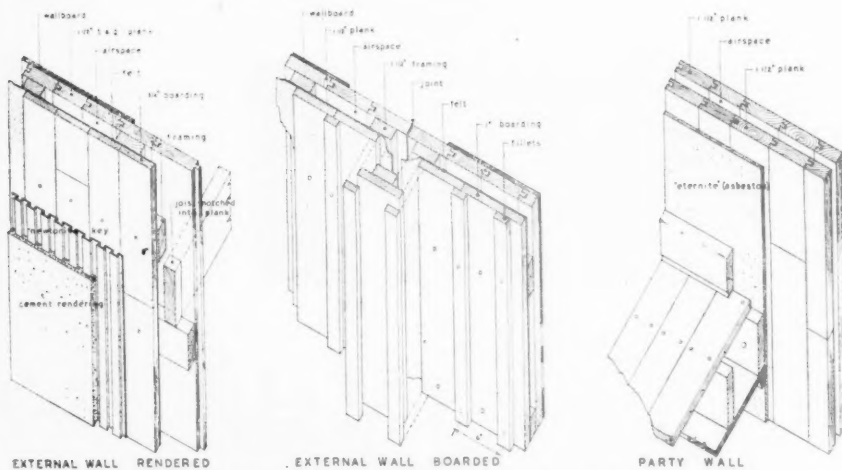
The standard of building in Sweden, as can be seen at the exhibition, is undoubtedly higher than anywhere in Europe. For climatic reasons, walls are given an exceptionally high insulating value and double windows are always provided. At the same time the average working-class kitchen is provided with a stainless steel sink, refrigerator and ample cupboards. Living rooms generally have parquet flooring and central heating and hot water are provided. The boilers are generally housed in a cellar, which also contains storerooms, a workshop or garage and laundry facilities.

The principal reason for the cellar is that foundations have to be sunk 3 ft. below ground to escape damage by severe ground frost, and the ground floor and cill level have to be raised above the snow line for obvious reasons. This necessitates base walls which hardly need be raised to give headroom when serving as retaining walls to the cellar. We are more fortunate in this country, and the cost of cellar excavations is seldom justifiable over here.

The tendency in construction of Swedish prefabricated timber houses during the last quarter of a century has been to reduce the amount of site work, to introduce more scientific and rational methods of construction, and to improve the organization of labour and production in the factories. In addition, the workmanship, finishes and fittings have been improved and better thermal and sound insulation provided.

The quantity of timber in walls has not been reduced. (The Ibo system of 1926, for example, contains less timber than present-

SCANO I . SINGLE STOREY HOUSES.



SCANO III CONSTRUCTION , TWO-STOREY HOUSES.

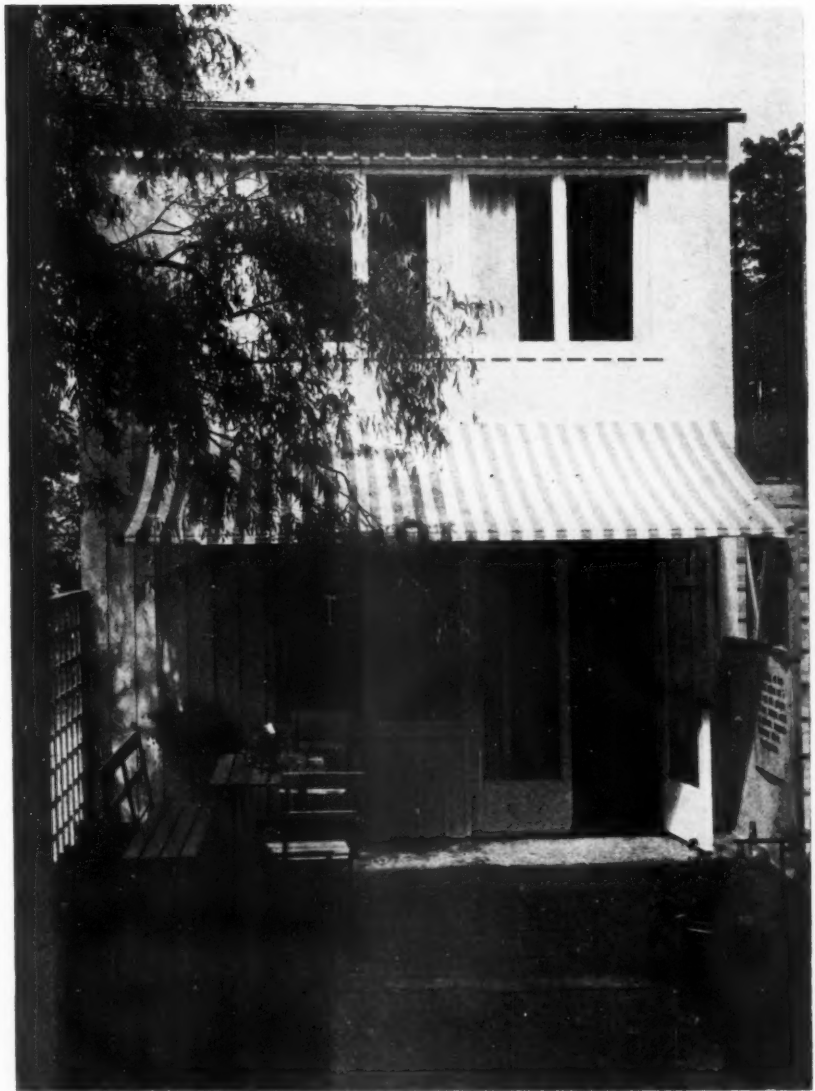


day solid plank wall constructions.) One of the reasons why it is economically possible to use so much timber in walls is that the tongued and grooved type of construction enables short lengths to be utilized.

The manufacturers in Sweden, who market pre-fabricated timber houses, do not claim a reduction in building costs as compared with brick buildings. They stress the better quality of the timber house, saving in fuel, low maintenance costs, and the fact that they are warm in winter and cool in summer. Additional advantages are the speed of erection and the dry method of construction. Soundly constructed timber houses will last almost indefinitely, even in a damp climate such as experienced in parts of Britain or the west coast of Sweden. A slight drawback is the higher fire risk insurance rate, usually 2s. 6d. as compared to 1s. 6d. per £100 per annum for brick buildings in this country, and the fact that the spread of fire by conflagration renders the timber house less suitable for densely developed urban areas.

In Scotland, the authorities, faced with a tremendous housing shortage even before the war, foresaw that the building of timber houses would go a long way towards solving their housing problem. As a direct result of this, timber sections for some 200 houses were shipped from Sweden and erected in different parts of Scotland immediately before the outbreak of war.

The type of construction generally in use in Sweden was found to be

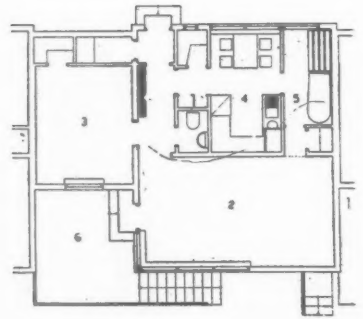
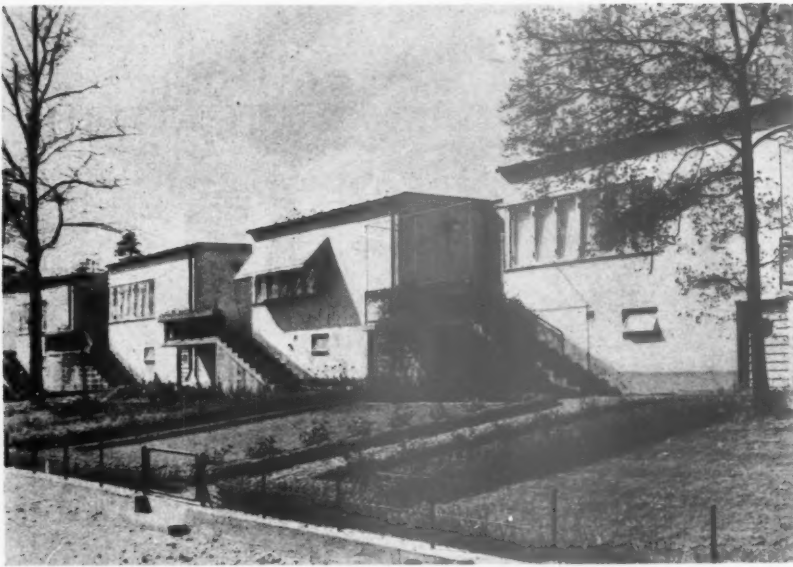


Above, the garden front of a prefabricated timber terrace house (three rooms, kitchen and bathroom) designed by the architectural office of the Swedish Co-operative Society, and shown at a pre-war exhibition in Stockholm. Below, co-operative working-class houses (two rooms, kitchen with dining alcove, and bathroom).



unnecessarily heavy and expensive to suit conditions in this country, and the systems of construction developed were the Scano I and Scano III for single- or two-storey houses respectively (page 102). The wall sections were delivered complete with windows and doors, and in the case of the two-storey buildings, the largest sections were 17 ft. 6 in. high, 8 ft. wide, weighing *circa* 8 cwt. No cranes or derricks were used in the erection. Joists, rafters, sarking, boarding and skirtings were delivered cut to length, notched and prepared ready for assembly.

The extent to which pre-assembly was carried out was governed



Terrace house types. Top left, family houses for the workers at Kvarnholmen, the Co-operative Society's industrial centre outside Stockholm. Top right, plan of one of these houses; 2, living room; 3, bedroom; 4, kitchen and dining alcove; 5, bath and wash-room; 6, terrace. Though the sections of these houses are of timber and prefabricated, the exteriors of the walls are rendered. Above, a terrace of small houses. Here the exterior is of the typical vertical timber boarding. Below, a bachelor hotel built by the Co-op. at Gustavsberg. The restaurant with its different exterior treatment is at the near corner.



mainly by two considerations: (a) the distance of transport, and (b) opposition mainly from conservative elements in T.U. circles, had a more extensive form of prefabrication been employed.

No exceptional difficulties were encountered in the transport and assembly of wall sections. The Scottish workers were quick to grasp the essentials of the system and the erection was supervised by a technician. The main difficulty was to impress upon the local contractor the necessity of keeping the sections covered by tarpaulins before erection and the need for reasonably careful handling. Practically all the flaws that have appeared are a direct result of sections being allowed to remain uncovered on the damp ground, thus becoming saturated, which in drying out caused shrinkage, warping and the flaking of paintwork.

Assuming a sound design and construction and care being exercised in assembly, the maintenance costs of prefabricated timber houses are surprisingly low, both in this country and in Sweden. The exact amount depends chiefly on initial expenditure, whether red cedar boarding, a preservative, paint or external plaster is used. The amount would also depend on severity of exposure and whether, for æsthetic reasons, paintwork, for instance, is renewed more often than necessary.

The procedure to be adopted in the case of two semi-detached cottages in the Glasgow area was as follows: the wall sections arrived coated with linseed oil and two coats of paint were applied when erected. A third coat of paint was to be applied within one year and subsequently stripping and two coats every 10 years. (Windows, doors, downpipes, etc., would require more frequent attention.) The actual pre-war cost of two coats of paint on the walls of the two cottages was £2 12s. and therefore the maintenance of wall surfaces would be merely a matter of shillings annually. One should not overlook the fact that condensation on internal surfaces, causing damage to wall finishes, would be avoided in properly constructed timber dwellings.

As post-war building costs generally are liable to fluctuate and cannot be predicted with any accuracy, it would be presumptuous to attempt to guess the probable future building costs of prefabricated timber houses. The increase in the price of timber, amounting to some 30 per cent. in Sweden since the outbreak of war, will not affect the final costs of prefabricated timber houses as much as might be supposed. The cost of the solid timber walls and partitions represents only 15 to 17 per cent. of the total building costs.

To give an idea of cost of specific items, the figures (1938) for a typical semi-detached three-room

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bungalow, conforming to Scottish standards, are listed below :

	£	s.
1. Excavations, foundations, base wall, chimney stack and party wall	51	0
2. Timber sections, windows, doors, partitions, joists, boarding, ironmongery, transport and customs duties ...	150	0
3. Erection of timber structure	30	0
4. Expert supervision	7	5
5. Wallboard and fixing	21	10
6. Cedar shingles to roof	19	10
7. Sundries	12	15
8. Plumber and sanitary fittings... ..	47	0
9. Painter	11	3
10. Glazier... ..	2	2
11. Electrician	5	15
Total	£358	0

The total floor area of the above building was 663 sq. ft., which represents a pre-war cost of 10s. 8d. per sq. ft. Two-storey dwellings were generally found to be slightly cheaper, assuming that the design was suitable for prefabricated construction.

The question of suitability of design for any given system of prefabricated construction cannot be over-emphasized. Timber prefabrication, especially of the solid bearing wall type, gives greater flexibility than almost any other known system, as adjustable jig-



Top, a typical living room in a prefabricated timber house. Above, a middle-class villa.

tables will provide any width of section and the vertical joint between sections is concealed, nevertheless building costs are vitally affected by the plan-shape and exterior design.

The system of construction does not render the employment of a competent local architect an expensive luxury for design purposes. His knowledge of local conditions and requirements is a valuable

asset, but a close co-operation between him and technical advisers who are familiar with factory production is essential.

Fears that monotony would ensue from timber prefabrication are hardly justifiable; the exhibition should dispel any such misconceptions and, anyhow, good civic design is not achieved by giving a different character to every individual house in a row.

INFORMATION CENTRE

The function of this feature is to supply an index and a digest of all current developments in planning and building technique throughout the world as recorded in technical publications, and statements of every kind whether official, private or commercial. Items are written by specialists of the highest authority who are not on the permanent staff of the Journal and views expressed are disinterested and objective. The Editors welcome information on all developments from any source, including manufacturers and contractors.

PHYSICAL PLANNING

1371 Soil Vitality and Planning

THE LIVING SOIL. E. B. Balfour. (Faber and Faber, 1943, 12s. 6d.) Important book with wide planning implications. Evidence of importance to human health of soil vitality with special reference to post-war planning.

If mankind cannot devise and enforce ways of dealing with the earth, which will preserve the source of life, we must look forward to a time—remote it may be, yet clearly discernible—when our kind, having wasted its great inheritance, will fade from the earth because of the ruin it has accomplished. For example, on 56.4 per cent. of the land surface of the USA, a quarter or more of the soil has been lost. The total loss of fertility has been estimated at 30 to 50 per cent. of the total originally available. The amount of soil annually reaching the sea is between 500 and 1,000 million tons, representing 2,000 million dollars' worth of plant food, or twenty-one times the amount annually removed in crops.

Erosion is increasing very rapidly almost all over the world. Probably more soil has been lost since 1914 than in the whole previous history of the world. By means of sewerage schemes the people of the United States and of Europe are pouring into the sea, lakes and rivers, and into the underground waters, from 5,794,300 to 12,000,000 pounds of nitrogen, 1,881,900 to 4,151,000 pounds of potassium and 777,200 to 3,057,600 pounds of phosphorus per million of the adult population annually, and this waste we esteem one of the achievements of our civilization.

The prevalence of sickness and disease among men, domestic animals and cultivated plants continues to increase, though medical skill has reduced the numbers of those who die. Certain hill tribes of India, the Eskimo, the Red Indian farmer, the people of Tristan da Cunha and the Chinese peasant have marvellous health and physique and are immune to many diseases. They have very different diets, occupations, race and climate, but they all return all the wastes of their community to the soil.

As one of many experiments one-half acre was heavily fertilized with cow dung, the other half with chemical fertilizer and both plots seeded down with the same cereal. Both plots had good crops with strong straw and well-filled heads. The seeds were kept separate, and two groups of rats from the same families were divided in equal halves. The group fed from the chemically fertilized plot showed every evidence of malnutrition; those fed from the farmyard manured plot had a perfectly normal healthy growth.

If the nation's health depends on the way its food is grown, then agriculture must be looked upon as one of the health services, in fact, the primary health service.

If health demands adequate supplies of humus for the soil, then means must be found to provide it. If this involves, among other measures, the complete re-organization of existing sewage and town waste disposal

plants, then local authorities must put the needs of the soil first.

If all farmyard manure and other farm wastes were manufactured into humus outside the field, this alone would absorb over 300,000 additional workers. Two men can make enough compost for 200 acres (5 tons per acre, 1,000 tons per annum). With agricultural wages at £3 per week, the cost would be just over £300 per year. Many 200-acre farms already spend more than this sum in artificial fertilizers and poisonous sprays.

All elements of life migrate into other forms of life. It is man, not nature, who wastes material in this cycle of life. It is man who causes soil-exhaustion by taking and not returning. The chief problem which faces the next generation, the generation for whom we are presumably seeking peace, is that of bringing agriculture and industry into some sort of balanced relation.

MATERIALS

1372

Plastics

A SURVEY OF PLASTICS. L. Livingston Smith. (The Engineer, December 17, 24, 31, 1943, pp. 491-492, 511-512, 529-530.) Lecture at The Institution of Mechanical Engineers on December 10, 1943.) Characteristics of plastics. Survey of plastic products. Unfilled resins, moulding powders, laminated sheet, mouldings containing unidirectional fibres, plastics in combination with wood.

The term plastics is loosely applied to a wide collection of industrial products; some of them are entirely synthetic and some are modified natural products of long standing. These products can be easily formed to shape at some stage in their manufacture, but finally become rigid products which may be the very reverse of plastic as the term is understood by an engineer. The current usage of the term appears to be confined to materials made from synthetic or semi-synthetic organic compounds of a resinous nature.

The characteristic property of resinous compounds is that they can be formed into films, fibres, etc., and it has been shown that this is associated with molecular weights of thousands, as compared with the tens and hundreds met with in classical chemistry.

The reaction to temperature of synthetic resins provides the basis for a generally accepted division of plastics into two classes: thermo-plastic and thermo-setting. A thermo-plastic resin is one in which softening with rising temperature is a reversible process, i.e. a product hardens on cooling, but may be softened by heating an indefinite number of times. A thermo-setting material is one which is changed by the application of heat to a product which cannot subsequently be softened by heating.

The range of plastic products arising from the combination of different resins with fillers in different processes is wide. There is an almost infinite number of possible combinations of

resin and filler. The more important products are:

(1) Unfilled resins. Resins are seldom used unfilled where strength is the main requirement.
(2) Moulding powders. A substantial part of the plastics industry in this country is based on moulding powders. A large proportion of the moulding powders used are of the thermo-setting type. Mouldings made from powders have no great strength and are inherently brittle.

The outstanding advantage of moulding powders is the extreme ease of production of mouldings which are made to close dimensional tolerances in one operation. As compared with metals, mouldings are extremely light: they do not corrode and are electrical insulators. It is thus possible that engineers will be able to use mouldings in many instances where they previously used metal castings, with a resulting saving in weight and machinery, but no real application exists where strength is an important factor.

(3) Laminated sheet. Cellulose fibres may have a specific strength four or five times that of metals, and their incorporation in a plastic may produce a material of great strength. In laminated sheet the cellulose fibres may be included in the form of papers or fabrics.

(a) Paper-base laminated sheet. The best combination of mechanical properties results from a board having maximum density. A board made with high-density kraft paper pressed at 2,000 lb./sq. in., has a tensile strength, machine direction, of 16.5 tons/sq. in.

(b) Fabric-base laminated sheet. Laminated sheet prepared from fabric, although more expensive and somewhat less strong than that prepared from impregnated paper, is often used in preference to the latter because of its reputed greater resistance to shock. Laminated sheet is readily obtainable in a wide range of thicknesses, machines easily, and is strong enough in relation to its weight to be considered as a stress-carrying material, and may be used as such where its cost (2s. 6d. to 7s. 6d. per pound) is not prohibitive. One application is that of gearing where the elimination of noise is important.

Laminated plastic is not necessarily confined to flat sheet, but tubes and structural shapes can be made from impregnated paper or fabric.

Panelling of cellular construction can now be produced commercially from impregnated paper.

(4) Mouldings containing unidirectional fibres. One of the main objectives of plastics research is to devise means of utilizing the high specific strength of cellulose fibres. Laminated sheets of paper or fabric can never utilize to the full these high specific strengths. If means can be evolved to fabricate structures so that the fibres can be made to lie in the direction of the principal stresses, very efficient structures may result.

(5) The use of plastics in combination with wood. (See Information Centre, Nos. 1224, 1244.) The marriage of the new synthetic resins with wood has given the latter a new lease of life for engineering purposes and, in addition to permitting more economical use of timber, has rendered it suitable for new uses.

(a) Resin-bonded plywood. Plywood in which the veneers are bonded together by synthetic resin is water resistant to a degree unknown in earlier plywood. Synthetic resins may be used in two ways: as film glues or as liquid glues. Film glue consists of a very thin paper which has been impregnated with a resin. The paper acts merely as a vehicle for the resin. Veneers in conjunction with film or liquid glues may also be used to fabricate complicated shapes in the form of moulded plywood.

One of the reasons for the temporary superseding of wood by metal in the construction of aircraft was the poor resistance to water of the plywoods then used. The advent of resin-bonded plywood has led to a partial reversion to wooden aircraft with a consequent easing of the problem of aircraft production. For example, the fuselage of the Mosquito



L. E. Walker, Photo

NELSON STREET, KING'S LYNN

A cobble-paved quadrangle, known as Hampton Court, bounded by 17th century cottages, provides a pleasant vista through the covered way. This entrance has a beamed ceiling, and from its centre hangs a solid iron cannon ball which was fired into the town by Cromwell's besieging troops when they occupied West

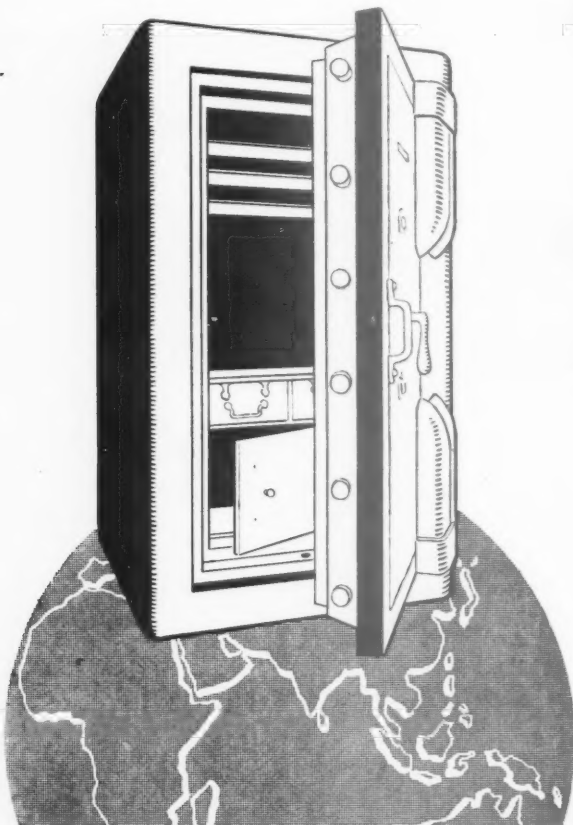
Lynn, on the other side of the river. Every building is in a state of siege, from the moment it is finished, but it will completely repel dampness if it is waterproofed by the use of Portland cement and 'PUDLO' Brand cement waterproofer, in accordance with the simple rules of good construction and sound workmanship.

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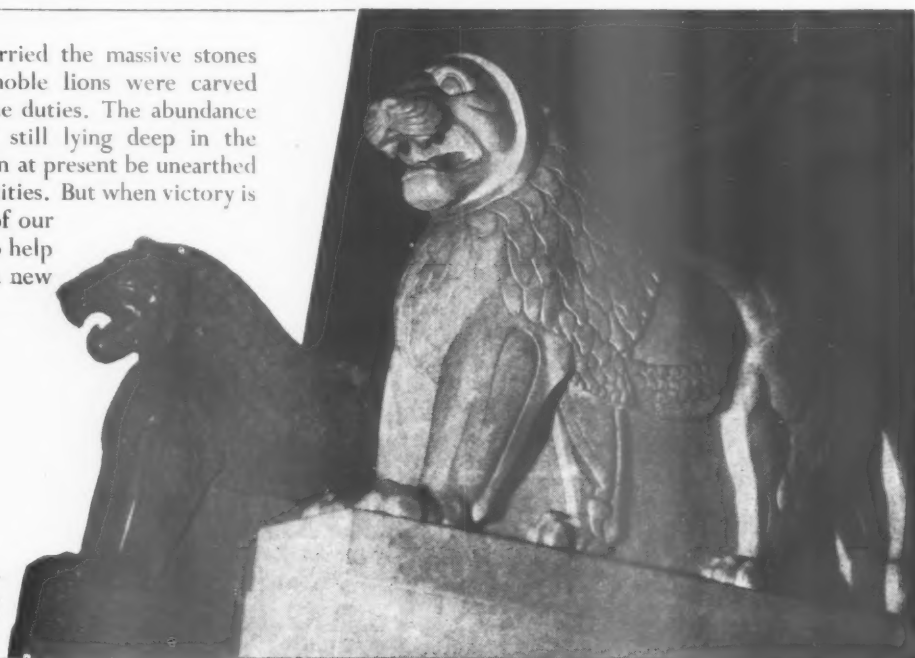


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aircraft consists of a sandwich, the inner and outer skins of which are resin-bonded birch plywood, and the centre, or "meat," of the sandwich consists of the very light balsa wood. Thus, while essentially a wooden aircraft, the Mosquito is made possible by the plastics industry in the provision of film-bonded plywood for the skins and synthetic resin glues for securing them to the balsa core.

(b) Compressed and impregnated laminated woods. The specific tensile strength of an average wood is about equal to that of duralumin, but as an engineering material it suffers from the following disadvantages which restrict it to secondary or temporary uses:

1. It is liable to swell and shrink as a result of moisture absorption.
2. It cannot be easily formed to shape.
3. It is very weak in shear parallel to the grain.
4. It is weak and lacks stiffness at right angles to the grain.
5. It is variable and subject to frequent defects, such as knots.

Most of these objections are minimized when wood is used in laminated form and, when logs are cut into veneers by peeling, the absence of waste as sawdust is an additional advantage. The veneers may vary in thickness from 1/200 in. up to 1/10 in. The final product may have the appearance of the original timber. On the other hand, the amount of resin and the pressure used may have been so high as to cause all the interstices in the wood to be filled up with resin, resulting in a dense hard product more like metal than wood.

Plastic products may be roughly divided into two groups. The attractiveness of the first is primarily ease of production of large quantities of insulating, non-corroding components, which are light in weight, but of no great strength. The second group, the reinforced plastics and laminated woods, in addition to being light and non-corroding, offer possibilities of considerable saving in weight. However, much more research is necessary to enable the full strength of fibres to be employed, to improve serviceability, and to facilitate cheap and easy production of small quantities.

QUESTIONS and Answers

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 help is available to any member of the industry. Answers are sent direct to enquirers 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. Questions should be sent to: THE ARCHITECTS' JOURNAL, 45, The Avenue, Cheam, Surrey.

1373 Old Church Design

Q I am designing a chest to contain choir surplices in a Church, which is to be presented in memory of a fallen airman. The Church is of varied architecture: Saxon, Norman and Early English. I am anxious that the chest should be correct from an ecclesiastical and architectural point of view. Can you give me a list of suitable books to consult on this subject? Can you, at the same time, recommend a book on Church Altars?

A We suggest the following:—
Ancient Church Chests, by F. Roe, published by B. T. Batsford.

A Picture Book of English Chests and Cabinets, revised edition, 1930, published by the Victoria and Albert Museum.

The Parson's Handbook, by F. Dearner,

published by The Oxford University Press.

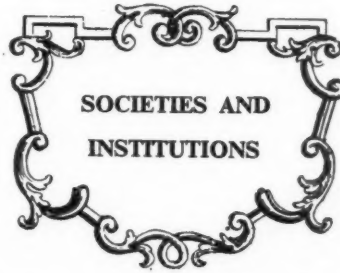
How to Build a Church, by Benedict Williamson, published by Ouseley.

1374 NCWGB and EAW

Q What are the addresses of the National Council of Women of Great Britain and the Electrical Association for Women? Are their publications free to planners?

A The address of the National Council of Women of Great Britain is Drayton House, Gordon Street, London, W.C.1, and that of the Electrical Association for Women, 20, Regent Street, London, S.W.1.

The monthly journals of both have to be subscribed for, but we understand that some other publications are free on request.



Speeches and lectures delivered before societies, as well as reports of their activities, are dealt with under this title, which includes trade associations, Government departments, Parliament and professional societies. To economise space the bodies concerned are represented by their initials, but a glossary of abbreviations will be found on the front cover. Except where inverted commas are used, the reports are summaries and not verbatim.

DIA

Alastair Morton

January 4, at the Royal Society, Burlington House. Luncheon talk under the auspices of the Design and Industries Association on GOOD DESIGN IN THE TEXTILE TRADE, by Alastair Morton.

A. Morton: What I have to say is both enforced and limited by my position as artist and manufacturer. The firm with which I am connected has been manufacturing furnishing fabrics for the past seventy years or more. These have been sold both at home and abroad to the most expensive sections of the trade and down to the lower middle class trade. We have catered mainly for what is known as the general trade, but in addition, from early in the century, when we worked with such men as C. F. A. Voysey, we have tried to develop our fabrics in step with the contemporary movement in architecture. The question of design has been a major issue throughout our history, as at no time have commercial and aesthetic success invariably gone together. I do

not agree with those who state that under present conditions good design necessarily pays—far from it. We have always produced the best designs we dare. They have always been produced at greater risk than commonplace designs and often at a loss. Though some of them have been very successful and have continued selling for many years, the best selling qualities both at home and abroad have frequently been designs of which we have not been particularly proud and have even been ashamed. We have kept on producing these better designed or more advanced fabrics because some of us have been determined to get some enjoyment out of our work, and others more sober-minded have thought they added to the prestige of the firm, which they undoubtedly have done.

The factors which sell a design to-day for furnishing are largely psychological. The great majority of people are aesthetically insensitive and are, therefore, conservative in their selection of design, depending on fashion and tradition and what they have had before. That means that the design must be in a socially accepted style, either traditional or contemporary, and traditional is the more popular. The colours must be within a certain fairly limited range. This is not only because the fabrics generally have to fit into some existing scheme, but in addition, because there seems to be an astonishingly small range of colours within which fashion oscillates slightly but the limits of which virtually remain constant over scores of years. The pattern of the design has to fulfil architectural functions such as providing areas of colour and centres of interest in repeats large enough to be effective but not too large for the size of modern windows. The drawing of the design has to be robust or sophisticated according to the class of people for whom the fabric is intended and on the style of contemporary fashion.

I consider all these factors as the technical specification of a socially acceptable design and of much the same character as the factors determined by the technical conditions of production. Within these conditions—and they do permit a certain latitude—a design can be fresh or hackneyed in conception, well or badly constructed. It can be good or bad. If these conditions are equally well fulfilled, a good design will sell as well as a vulgar one and in all probability will remain popular longer. There is undoubtedly a section of the population with an imaginative and selective taste. It is a small section, though larger than some would think, permeating all classes, and, therefore, unco-ordinated and difficult to cater for. It is this section that is always loudly complaining that there are no good designs on the market. It is this section that most manufacturers and shopkeepers say is so small and so scattered that they are not worth troubling about.

If this is the past from which we are emerging what are we to make of the future. Design should be a spontaneous expression of the life of the country. The position I have outlined, the fact that it can be, even needs to be discussed in such a manner shows a degree of artificiality, of disintegration in the mental life of society, amounting almost to lunacy. Is there a more sane foundation on which we can build in future? What are the factors of which we can make use?

In starting such a discussion it has been all too common for a dog fight to flare up between the champions of different sections, each accusing the other of lack of social responsibility or business acumen or aesthetic sensibility. Let us end this bickering once and for all by admitting that the whole cultural level of the country is appallingly low, that designer, art school, manufacturer and buyer cannot be singled out from the general body of the public for special blame either separately or collectively, that they are merely an average lot of people of largely the same mentality as any other cross-section of the public. The deterioration in industrial design is ascribed by many to the introduction of machine production alone without reference to any other

factor. This is very superficial. That the fall in standard of design is not due to machine production itself is I think strikingly shown in the textile trade. Here we have suffered, or behaved, as badly as any other, and yet the essential technique of production, particularly the weaving or printing of figured fabrics, has not altered in principle for many hundreds of years. In both the hand production of figured fabrics and in machine production the design is drawn out completely beforehand and reproduced either semi-automatically by hand or completely automatically by machine. In this sense there has been for hundreds of years a divorce between the designing and the process of production, which some people hold to be the distinctive characteristic of machine production and the main cause of bad design.

If it is true that the general deterioration in all cultural activities has been the expression of the decay and retreat of an old social order, we cannot have a sound foundation for good design in the future until a new social order is firmly established. If we are really interested in good design I think we soon come to see that we are concerned with no easy-going activity and that the roots of the problem lie deeper than it is sometimes convenient to think. If our vulgar and backward looking designs spring from a vulgar and backward looking society, the only business-like thing to do is to re-design society. That is long-term policy and fundamental.

I think that handwork of many types will always have a place in our activities in their own right. The emphasis in recent years has rightly been on the full development of machine production in every possible sphere in order to raise the standard of living of everyone, and it has been one of the main aims of those associated with the DIA to show that machine products can also be aesthetically satisfying. With this I agree, and further that the full potentialities of machine production, both socially and aesthetically, are only just beginning to be realized and that they will always be developing. But I do not think that the type of product which it is the essential nature of a machine to produce can fulfil all our needs. The products of a machine, of mass production, are essentially simple, functional and formal or neutral in character. This covers most of our everyday needs. But there is also a place for objects which are individual in character, not necessarily serving any function other than being pleasant to have about, such as a painting or a piece of sculpture for instance. And there are numberless gradations between these two extremes. It is not that machine production is necessarily monotonous and soul destroying and there is a need for an escape from it, nor is it that the products of machinery are ugly. It is merely that life is spontaneous as well as planned, individual as well as collective, and we must find expression for both. It is in this sense that there will always be a place for the handworker, not as a sentimental relic of the past, or as an escape from present-day realities, but as a genuine factor in a fully contemporary life.

I would now like to come to the question of art schools and the position of the designer in industry. It is suggested that new industrial design schools should be set up. The omniscient design specialist, design *führer* one might say, will either dry up after his first flood of inspiration or else he will develop into a financier—stylist—advertising agency ramp, of which there are already signs in America. Design is not something thought of in studios to be applied to manufacturing. It is a part of the manufacturing process itself. Some of the worst atrocities of last century were due to simple engineering jobs being made beautiful by the calling in of an outside artist. Some streamlining and styling to-day are not so dissimilar. These remarks refer perhaps more particularly to the designing of utility articles. Textiles are of more than a purely functional nature, and their design is of a different character. But the same principles operate. The natural place for a

designer is in industry itself, not as a specialist called in from outside, and our aim should, therefore, be to give design training to technicians from industry rather than technical training to artists from outside. Though, of course, in practice both courses will be necessary. It does mean, however, that design and technical training should be so closely linked, and that the main centre for design training should be within its own industrial area.

Finally, I would like to make a suggestion to the DIA. British public societies seem to fall into two categories. Those whose aim is to benefit trade and those whose aim is to benefit the poor. It has always seemed to me that the DIA has been trying to serve both these purposes, but that the success it has achieved lies in neither of them. The trade, both manufacturer and retailer, have a pretty shrewd idea of what it is to their profit to produce and sell without being told from outside. The public have a much more robust idea about what is good design for them than the DIA and do not appreciate what the DIA would have them buy. You cannot legislate for others in such matters. I suggest that the DIA should not pursue either of these types of activity, but should concentrate on the straightforward function of co-ordinating the dispersed mass of people, on the one hand, who want to know what well-designed articles are available, with, on the other hand, the dispersed manufacturers who want to find people for whom they can make good things. Official organization either by the Government or by the trade cannot be effective in the world of values. They cannot be responsible for good design but only for making the conditions from which good designs can spring.

LMBA

Memorandum

The London Master Builders' Association has issued its annual report. One section deals with a MEMORANDUM ON POST-WAR BUILDING sent to the National Federation of Building Trades Employers, with which it is affiliated, with a request that it be considered and forwarded to the Government. A summary is given below.

There are many matters likely to affect the building industry in the immediate post-war period which should be agreed within the industry; there are others on which the Government must decide. Decisions on both are necessary for a correct perspective in any plan or programme for the building industry after the war.

Retaining Key Men

The Government has said that it looks to the building industry for a quick get-away after the war.

We view with serious apprehension the present diminishing Government programme. The numbers of efficient men and staff in the industry have already been reduced to danger level. Any further withdrawals would reduce the trade to an ineffective level and render it incapable of a quick start on even a very reduced post-war programme. We warn the Government that any further call-up would be a real menace, and we urge that in order to enable men to be retained in the industry and to train apprentices now who will be so greatly needed later, a building programme should be arranged immediately and put in hand at once.

Licensing after the War

For the post-war period we recommend:
(a) All building work to be proceeded with at once should be licensed, bearing in mind the labour available in the country, and with due allowance made for men travelling from one

job to another, sickness, etc. To license for the total force apparently available would result only in a shortage of labour.

(b) For as long as is necessary, maximum prices for essential building materials should be fixed, having in mind the freeing of markets at the earliest possible moment. Maximum prices are the only control necessary for materials. When materials come into full supply, the market should be freed. Prices will then fall steadily.

On these questions we offer the following suggestions:

(a) Maintenance arrears should be got rid of now so as to relieve the industry for the post-war new building programme. This would put this class of work outside the licensing scheme. Maintenance thereafter might be limited for a period.

(b) Many owners of premises which have been totally or partially destroyed have been the greatest sufferers. They have not had the use of their premises, and have lost both the capital value and the annual income. If they so desire, and town-planning permits, they should be among the first to be allowed to rebuild.

(c) In any percentages of labour available for new building, we urge the Government to bear in mind that before the war more than 75 per cent. of the work carried out by the building industry was for private enterprise. In our opinion it is important that provision should be made for a very appreciable percentage of licensing to be available for this class of work.

In totally blitzed areas it may be necessary for the Government to consider temporary construction to get the people quickly rehoused, while the whole area is being replanned and new roads, sewers and other services are being constructed. Any such provision should very definitely be of temporary construction, to ensure that it is not retained indefinitely and so become slums.

Overtime

The building industry has repeatedly pointed out to the Government that it considers the excessive hours men have been forced by Government instruction to work during the war has been

- (1) totally unproductive;
- (2) the cause of serious loss of morale;
- (3) thoroughly uneconomical and most costly.

The trade unions and employers' organizations have agreed on a 44-hour standard working week, and we strongly advise the Government after the war not to interfere in what have so long been the happy relations between employers and employees. Further we recommend that the industry should not consider working overtime except where occasional and exceptional circumstances render it necessary for safety or other essential reasons.

Payment by Results

The payment-by-results scheme was imposed on the industry by the Government, and the basis of it was never agreed by the industry.

Before the war men were paid a reasonable and agreed rate for a reasonable rate of output. The Government basis destroyed the idea that a reasonable output should be given for an agreed rate of pay.

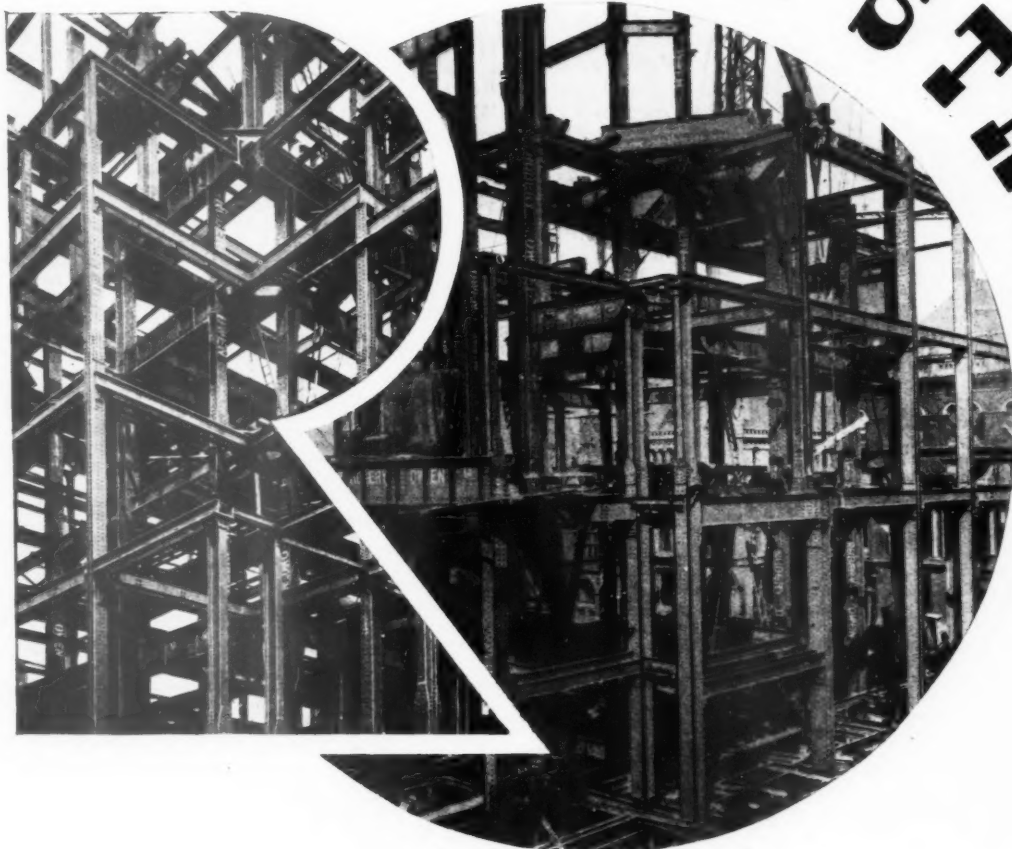
It is important to restore this, and the only means of doing so is by repeal of the Essential Work Order. Defence of the Realm Act Regulation 56 AB should be retained and amended so as to make provision for payment by results by agreement between employers and employees.

LMBA

Annual Meeting

January 20, at the Connaught Rooms, Great Queen Street, W.C.2. ANNUAL MEETING and luncheon of the London

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Master Builders' Association. H. C. Harland, F.I.O.B., last year's President, was unanimously re-elected President for 1944. Guests at the luncheon included Lord Portal, Sir Hugh Beaver, George Hicks, M.P., and Leslie Wallis.

Lord Portal: I warn you not to expect disclosures, but I will be speaking in the House of Lords early next month, and you may well find comfort in my words there.

If you look at the question of controls to-day, they are needed when commodities are in short supply. If a commodity is not in short supply I do not see why a control is needed. Directly you get out of difficulties, I imagine, after the war, certain things can be taken off entirely and others will have to be continued for a time. We are responsible for materials, and you are lucky in the building trade in that all the materials you want are ready at hand. I hope that bricks will remain popular. Brickworks have been closed down, but they have been maintained so that they can be opened up as quickly as possible. The cement industry has been kept going, and there should be no difficulty with it. We are keeping a special eye on the question of timber.

Wages have gone up in your industry practically 30 per cent., and they will have to remain up to the standard they are now. We have to look to every new method we can to cut cost of fittings so that you will be able to build a great number of houses in this country.

A question with which we are concerned is the programme for post-war, and that programme is in an advanced position. It is to meet a transitional period of two years and an additional settling period of 10 years. The difficult period is the transitional one. The problem in all this is timing.

On the question of working hours, it is our purpose as soon as possible to get men working

normal hours as soon as possible. The only thing we can do about that is to put a ceiling on the number of hours the men work.

NCBMP

Post-War Materials

The following letter has been received from Mr. J. L. Gibson, Secretary of the National Council of Building Material Producers, relating to the Report of the Joint Conference of the RIBA, the National House-Builders' Registration Council and the Building Societies' Association (published in last week's issue of the JOURNAL) and POST-WAR SUPPLIES OF BUILDING MATERIALS.

SIR,—Many of your readers will doubtless have perused with interest the report of the Joint Conference of the Royal Institute of British Architects, the National House-Builders' Registration Council and the Building Societies' Association, as also the following extract from the leading article in *The Times* of the 12th instant:

An alarming prediction is made in the report . . . "Economics, planning restrictions and labour difficulties are likely to involve an inevitable time lag of anything up to two years before building can really get into its stride," states the report; and it adds, that within two years the building materials industries should be able to organize maximum production. Two years is a long time for the mobilization of an industry which will, by common agreement, hold a key position in the general reconstruction programme. If the position is as serious as this, if the physical reconstruction

of war-stricken Britain is to be so long deferred, whether for lack of governing decisions, or of the right kind of planning, or of the supply of materials, there will be a rude awakening.

In this connection, Sir Malcolm Stewart, Bart., President of the National Council of Building Material Producers, addressed a letter to the Editor of *The Times* which appeared on January 19 as follows:

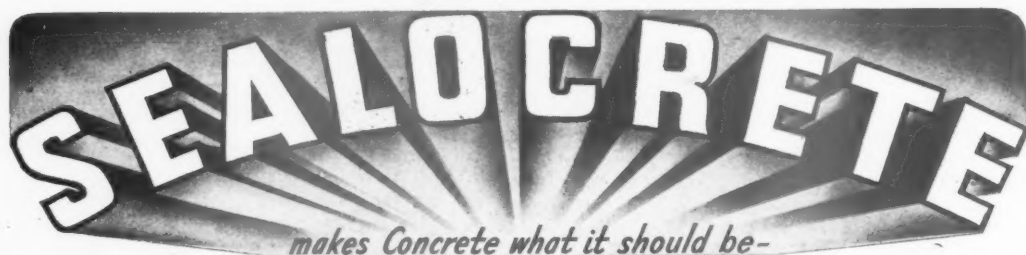
"To the Editor of *The Times* . . .

SIR,—In your leading article of January 12 you deal with a report on housing after the war, issued on behalf of the Royal Institute of British Architects, the Building Societies' Association and the National House-Builders' Registration Council. Although there clearly exist, at the present time, certain limiting factors in respect of immediate resumption of large-scale housing construction after the war, may I say, as President of the National Council of Building Material Producers, that production of building materials is unlikely to be one of these factors?

"An inquiry which we conducted in the summer of last year, among a wide and representative range of producers, elicited the fact that, given adequate labour, output of building materials could with rapidity be restored and considerably extended while the building programme is getting into its stride. Thus sufficient materials should be available to meet the estimated requirements of the Government programme so far as these can be deduced from the White Paper Cmd. 6428.

Yours faithfully, P. MALCOLM STEWART,
National Council of
Building Material Producers,
2, Caxton Street,
Westminster, S.W.1."

J. L. GIBSON, Secretary.



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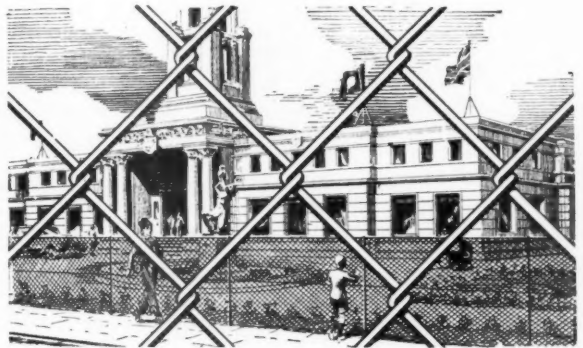
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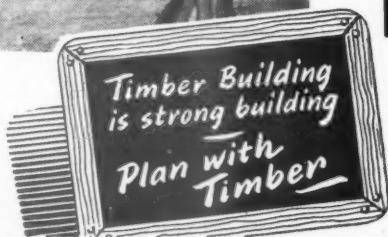
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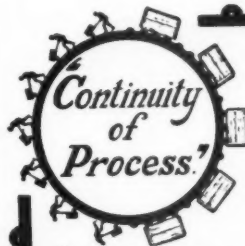
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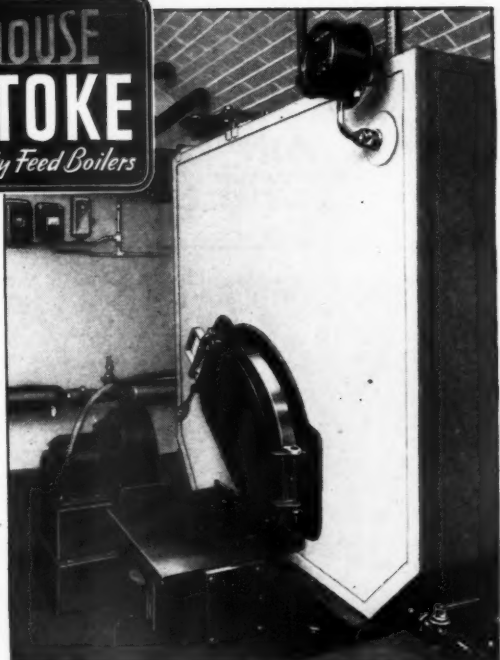
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