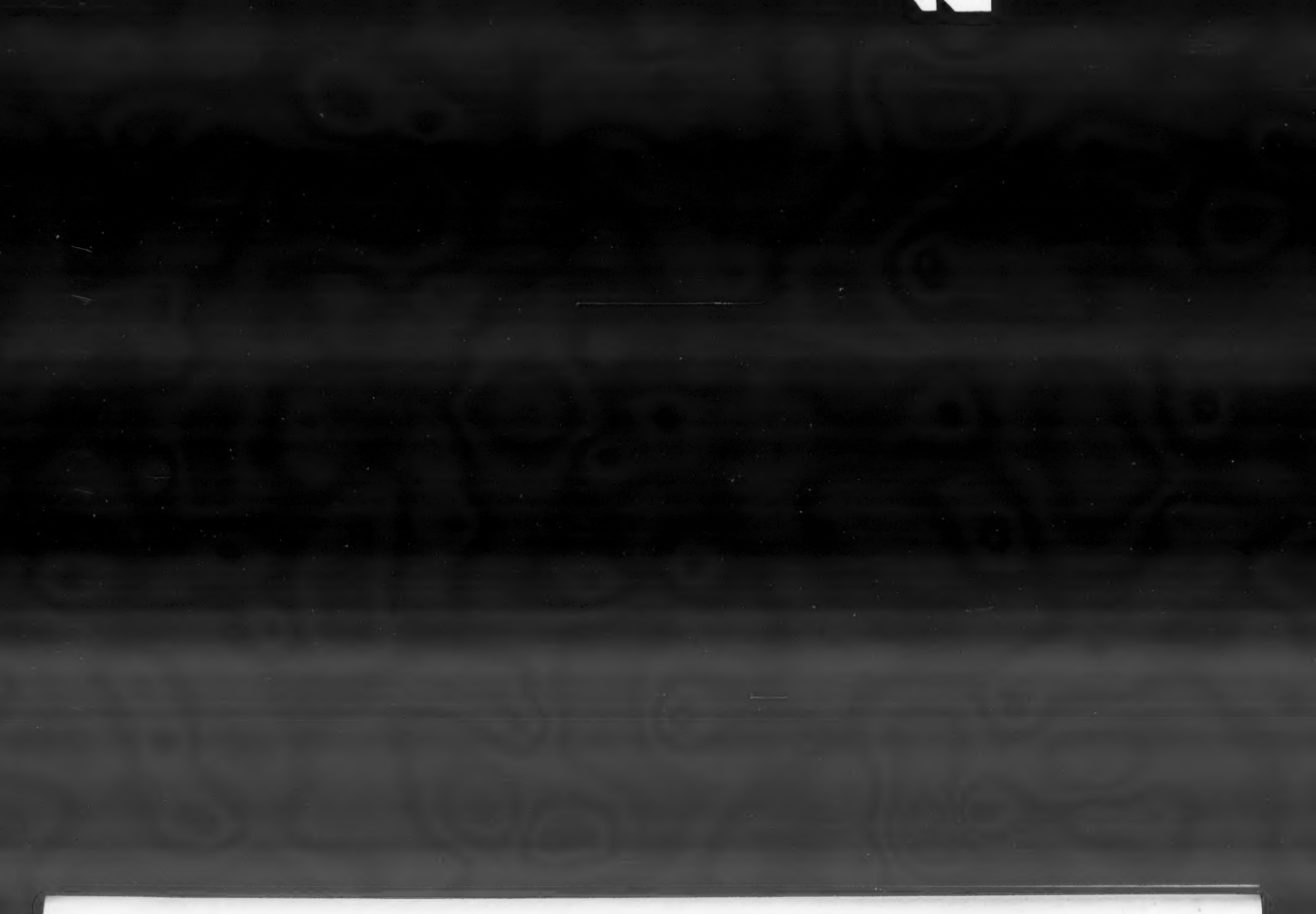
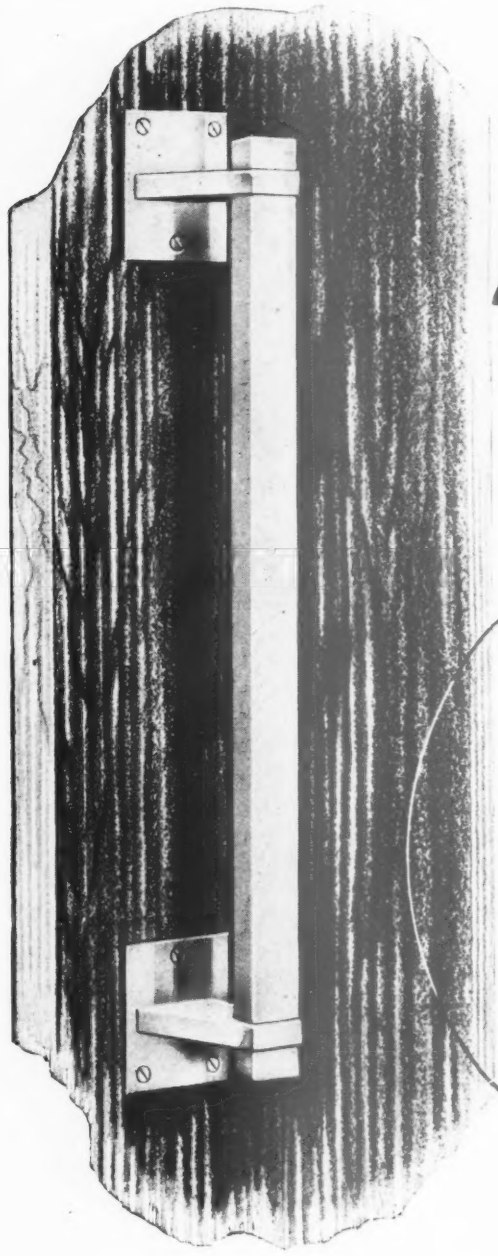
Alphabetical Index to Advertisers

For Appointments (Wanted or Vacant), Competitions Open, Drawings, Tracings, etc., Educational Legal Notices, Miscellaneous, Property and Land Sales—*see* pages xxxviii and xl.





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There is no accessory more important than Fire Fighting Equipment: it *must* be there ready for immediate use. But modern architects have devised many ingenious arrangements for recessing and blending it into the scheme. Many photos of such arrangements are available and will be gladly sent upon request.

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Is she from Sadler's Wells or is it a Soho dish? Neither: 'Ballotini' are actually tiny glass balls, varying up to $\frac{1}{4}''$ in diameter. The smallest ones, which look like salt, are used as reflectors and employed in large quantities for the facing of cinema screens*. The bigger ones have a more serious job to do—they are used for the storage of plasma for blood transfusion. These are only two of the surprising ways in which specialised glassware is meeting current needs. Our Research Department is finding others and gladly collaborates with those manufacturers who are curious about what glass can do. **P.S. for Cine-enthusiasts: Many Hollywood films are photographed through British lenses made from Chance Optical Glasss.*

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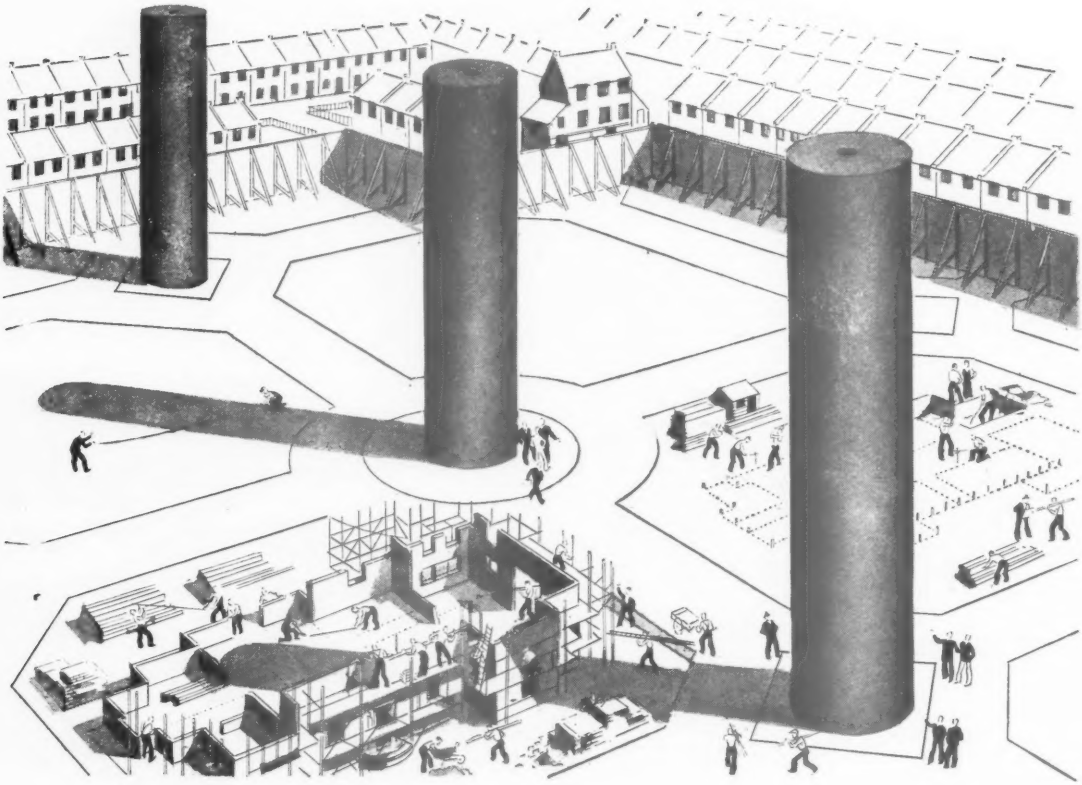

PILLARS OF THE POST-WAR WORLD

Pneumatic drills . . . mechanical excavators . . . power rammers . . . concrete mixers . . . a noisy but joyful harmony heralding the commencement of the gigantic task of reconstruction: heralding, too, the most extensive use of Sisalkraft that even that supreme building paper has known.

For Sisalkraft will be needed in vast quantities to fulfil a hundred functions in Britain's reconstruction programme. To seal porous subsoils . . . ensure even hydration of concrete-mix . . . provide efficient sarking for roofs . . act as a damp-proof lining under floors . . . protect work in progress and as a damp-proof covering for materials in transit. These and numerous other uses will demand the sterling qualities of Sisalkraft.

Sisalkraft is not an emulsion impregnated sheet of brown paper. It is an unusually strong material (practically untearable), a fusion of pure bitumen and two sheets of extra-tough Kraft paper reinforced with crossed Sisal fibres ; that is why Sisalkraft is consistently used by Government Departments, Municipal Authorities, and Public Works Contractors . . . and why Sisalkraft Standard Grade for post-war use will play such an important part in future reconstruction plans.

Write to-day (enclosing 1d. stamp) for full technical details.

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The primary function of Wimpeys' laboratory staff is to exercise rigid technical control over the materials used for each contract. Frequent tests, continued throughout the job, ensure that the predetermined standard is fully maintained. Specific problems (concerning soil mechanics, for instance) are also submitted to the laboratory by the men on the site.

Architects have long been familiar with Wimpeys' reputation for sound and speedy construction. It is not so well known, however, that the smooth progress and high quality of every Wimpey job are largely due to the work of analytical chemists, research engineers and other technicians at headquarters. From start to finish of a Wimpey contract, the quality of the building materials is under constant control by the laboratory staff. Tests are continually being made on concrete cubes, on cements, ballasts, sands and gravels, on soils and asphalts. These tests and others, all conducted in close collaboration with the men on the site, ensure that the materials used in every Wimpey building are right for the job.

The work of the laboratory is only one aspect of Wimpeys' scientific approach to the problems of building construction. For over sixty years, Wimpeys have taken a leading part in developing methods by which efficient, economical construction can be predetermined. It is these methods which enable the firm to offer an exceptional service as building contractors.

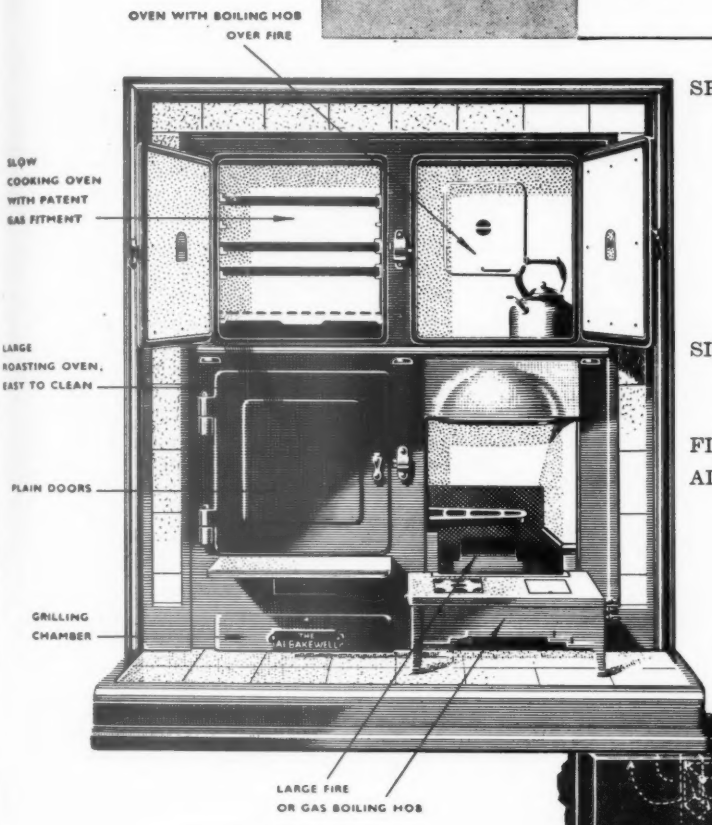
The post-war years will find Wimpeys well equipped for every branch of modern building — from hotels and cinemas to civic centres and labour-saving houses for the people.

WIMPEY

GEORGE WIMPEY AND COMPANY LIMITED
TILEHOUSE LANE, DENHAM, MIDDLESEX

NEW-FASHIONED VISIBLE HEAT

EXAMPLE — THE "AI-BAKEWELL" GRATE



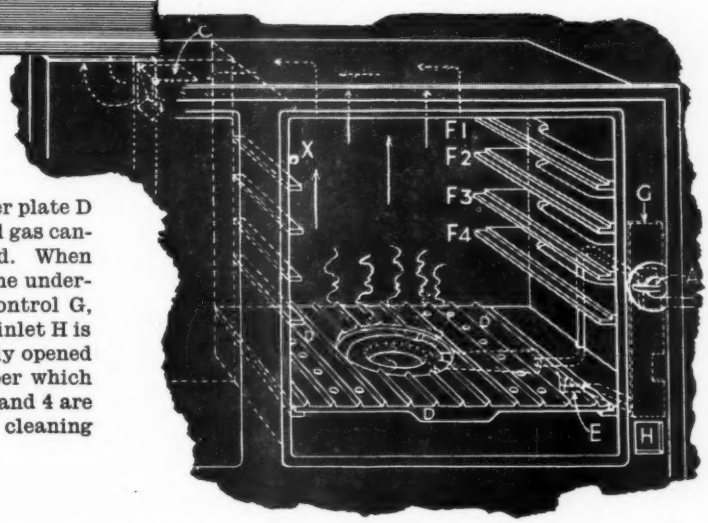
SPECIFICATION: A Combination Grate with ample cooking, grilling and boiling space. Of cast iron construction throughout, with fire parts specially strengthened at points subject to wear. Two large cooking ovens with removable bottom plates. The top left-hand oven and hob is fitted with a patent safety detachable gas fitment for gas cooking when solid fuel is not used. Boiling oven over fire heated by direct flue. The grate has self-contained flues, obviating need for constructing brick flues.

SIZES:

Grate overall	38″	wide x	48″	high	
Top oven	15½″	,, x	17″	,, x 15″	deep
Bottom oven	15½″	,, x	17″	,, x 15″	,,
Fire	14″	,,			

FINISHES: Vitreous enamel, black or colours.

ADVANTAGES: The provision of a patent gas fitment to the oven and hob allows this grate to be used when solid fuel is not required during summer months. The oven can thus be heated either by gas, by direct flue from the fire, or by gas and flue simultaneously with *absolute safety*. A gas fitment, serving as a table trivet to fire when not in use, is fitted in front of the fire. The grate is easy and simple to operate, convenient, compact and easy to clean.



When using solid fuel and gas is not needed, the burner plate D is stored in the compartment under bottom oven, and gas cannot be turned on, the tap being automatically locked. When the burner plate D is placed in position, the lug on the underside engages in notch E so operating the gas tap control G, which releases the tap A. With the same action, air inlet H is opened, thus C at the top of oven is also automatically opened to permit escape of unburnt products. X is a damper which should be closed only when baking pastry. F1, 2, 3, and 4 are shelf carriers which are removable and facilitate the cleaning of the oven.

ONE OF THE MANY CONTRIBUTIONS TO THE POST-WAR HOME THAT WILL BE MADE BY

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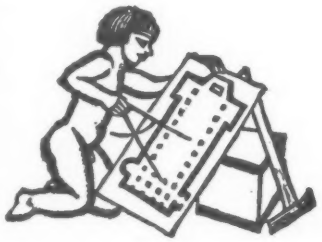
In common with every other periodical this JOURNAL *is rationed to a small part of its peace-time needs of paper. Thus a balance has to be struck between circulation and number of pages. We regret that unless a reader is a subscriber we cannot guarantee that he will get a copy of the* JOURNAL. *Newsagents now cannot supply the* JOURNAL *except to a "firm order." Subscription rates: by post in the U.K. or abroad, £1 15s. 0d. 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.*



DIARY FOR MARCH APRIL AND MAY

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.

BILLINGHURST. *Living in the Country Exhibition.* (Sponsor, H.C.) MAR 15-APRIL 8

BOURNEMOUTH. *TCPA Conference.* MAR. 18

Your Inheritance Exhibition. At Y.W.C.A. (Sponsor, HC.) MAR. 21-28

CHISWICK. *When We Build Again. Exhibition and Film.* At the Town Hall. (Sponsor, TCPA.) MAR. 11-18

DAGENHAM. *Homes to Live In Exhibition.* At South-East Essex Technical College. (Sponsor, BIAE.) MAR. 13-25

DERBY. *Homes to Live In Exhibition.* At the School Museum. (Sponsor, BIAE) MAR. 9-APRIL

HULL. *Display of Films on Various Industries in which Design plays an Important Part.* At the College of Arts and Crafts, Hull. (Sponsor, Group for the Encouragement of the Arts and Civic Design). 3.30 p.m. and 6 p.m. MAR. 22

LONDON. *Etchings, Engravings and Drawings Exhibition.* By Fellows and Associates of the Royal Society of Painter-Etchers and Engravers. At RWS. Galleries, 10 a.m. to 5 p.m. Saturdays 10 a.m. to 1 p.m. MAR. 9

Design in Daily Life Exhibition. At Heal's, 196, Tottenham Court Road, W.1. (Sponsor, BIAE.) Weekdays, 9 a.m. to 5 p.m. Saturdays, 9 a.m. to 1 p.m. MAR. 9-11

The Present Discovers the Past Exhibition. At the Geffrye Museum, Kingsland Road, E.2. Photographic exhibition arranged by the Institute of Archæology and distributed by CEMA. The exhibition shows how an understanding of the problems of modern life can be helped by seeing something of the difficulties of everyday existence in the past. Ancient and modern agriculture, domestic life, materials, tools, roads and instruments of war are compared, scientific methods of excavation are described and the concluding section deals with the part played by the State and by the public in this connection. Daily, 10 a.m. to 4.30 p.m., excluding Sundays and Mondays. MAR. 9-11

Exhibition of Drawings illustrating Suggestions for the Replanning of the City of London. By Kenneth Lindy and Winton Lewis. At 75, Eaton Place, S.W.1. (Sponsor, IAAS.) 10 a.m. to 5 p.m.; Saturdays, 10 a.m. to 1 p.m. MAR 9-18

Dr. Dudley Stamp. *Decentralization in Relation to the Scott Report.* At Abercorn Rooms, Great Eastern Hotel. 1.30 p.m. (Sponsor, TCPA) MAR. 10

Film Evening. Films including *World of Plenty* 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

Quantity Surveyors Meeting. General meeting of Members of the Chartered Surveyors' Institution, qualified as quantity surveyors. At 12, Great George Street, Westminster, S.W.1. Subject for discussion introduced by Alfred Harris (Member of the Quantity Surveyors' Committee) *Post-War Problems for the Quantity Surveyor.* 4.30 p.m. MAR. 15

Miss Sylvia Pollak. *Living and Planning.* At 13, Suffolk Street, S.W.1. (Sponsor, HC). 1.15 p.m. MAR. 14

Dr. L. Dudley Stamp. *Planning and Agriculture.* At Essex Hall, Essex Street, W.C.2. (Sponsor, TPI.) 2.30 p.m. MAR. 16

L. H. Hardern. *The Planning of the Gas Industry.* At 1, Grosvenor Place, S.W.1. (Sponsor, TCPA). 12.45 p.m. MAR. 16

P. Schiller. *An Analysis of the Load on a Modern Electricity Supply System.* At Institution of Electrical Engineers, Savoy Place, Victoria Embankment, W.C.2. 5 p.m. MAR. 16

Dr. Kathe Liepmann. *The Journey to Work.* At 13, Suffolk Street, S.W.1. (Sponsor, HC.) 1.15 p.m. MAR. 21

R. S. F. Simson. *The Work of the Haywards Heath Housing Society.* At 13, Suffolk Street, S.W.1. (Sponsor, HC.) 1.15 p.m. MAR. 28

Professor C. H. Reilly. *Planning London.* At AIA, 84 Charlotte Street, W.1. 7.30 p.m. MAR. 29

LUTON. *Rebuilding Britain Exhibition.* At the Museum. (Sponsor, BIAE) MAR. 9-11

MIDDLESBROUGH. *Rebuilding Britain Exhibition.* At the Public Library. (Sponsor, BIAE.) MAR. 18-31

MOLD, FLINTSHIRE. *Twenty Women at Home Exhibition.* (Sponsor, HC.) MAR. 16-APRIL 18

Living in the Country Exhibition. (Sponsor, HC.) MAR. 16-APRIL 16

RISCA, MONMOUTH. *Octavia Hill Exhibition.* (Sponsor, HC.) MAR. 16-31

THETFORD. *Twenty Women at Home Exhibition.* (Sponsor, HC.) MAR. 9-31

NEWS

THURSDAY, MARCH 9, 1944
No. 2563. VOL. 99

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.

During the quarter ended December 31 last LOANS TO LOCAL AUTHORITIES totalling £1,480,115 were sanctioned by MOH.

The loans were as follows: Housing, £811,563; municipal services (including clinics, sanatoria and mental hospitals), £132,969; swimming pools, playing fields, recreation grounds, open spaces, etc., £17,064; water supply, £148,444; disposal of waste products (sewerage and sewage disposal and refuse destruction), £100,050; education services, (including libraries and museums), £58,281; air raid precautions, £23,615; roads and bridges (including private street works), £29,480; other services (including loans to defray contributions, etc., under War Damage Act, 1941-43), £158,649.

Droitwich Town Council has approved a site for use, after the war, as an AERODROME FOR SMALL AIRCRAFT.

The site is at Egg Hill, off the Kidderminster road, outside the borough boundary, and covers an area of 58 acres. Councillor H. L. Chatterley said that the only people who will want to use the aerodrome will be a few very influential visitors. It will not benefit the town, and invalids will not like the noise. He suggested that a town's meeting should be held. Councillor W. G. Taylor said that an aerodrome is bound to benefit the town if they put aside a piece of ground for the time when air travel becomes common. If people can come to Droitwich by aeroplane they will do so. They are going on with a scheme to make Droitwich one of the country's health centres.

BRITTLE?

HARD?

If a material can stand up to the tramping of thousands of feet day after day, week after week, month after month and year after year; if a few bars of it can support part of the weight of a loaded bus or lorry; if it can be run over by hundreds of thousands of tons of traffic day and night for years, how brittle is it? It's more hard than brittle. It's a material with a long life, an old material, a tried material and yet as modern as anything the laboratory has produced this century, for it has acquired new finishes and new properties. It is cast iron, which has greater resistance to corrosion than either wrought iron or steel, and has enormous strength in compression.

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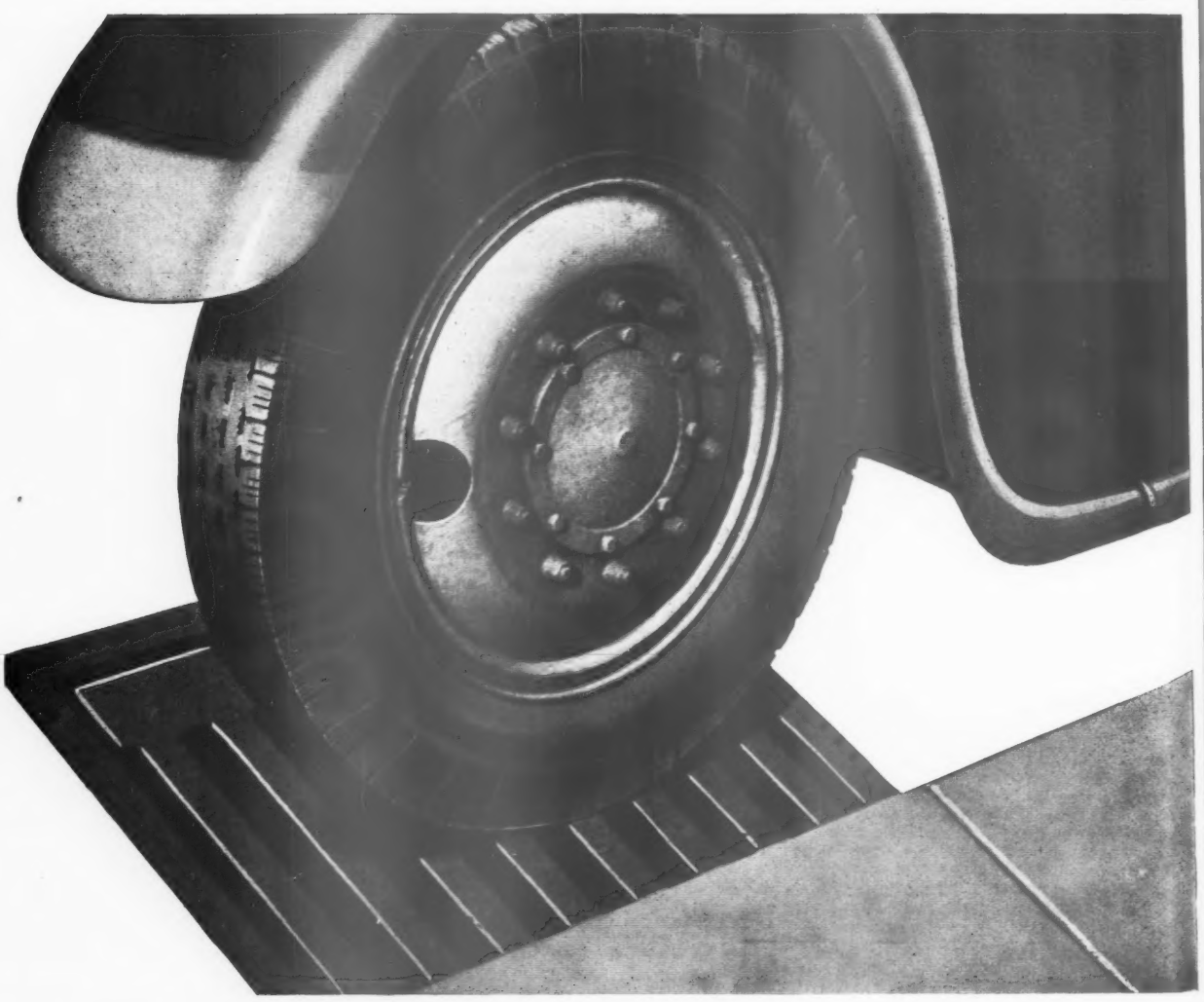


CAST IRON CAN TAKE IT

from AN ARCHITECTS' *Commonplace Book*

ST. PETERSBURG FANTASY. [*From* Valse Des Fleurs : A Day in St. Petersburg and a Ball at the Winter Palace in 1868, *by Sacheverell Sitwell* (Faber & Faber)]. The builder of Tsarskoe Selo was the Empress Elizabeth. Many of the rooms are in the rococo of her period, with the Russian flavour. A profusion of gilding, barbarian in its extravagance, doors and ceilings that are beautiful and splendid. A room of which the entire panelling is formed of amber, in homage to the Baltic and its sandy shores ; and a hall of lapis lazuli with a parquet of ebony inlaid with wreaths of mother-of-pearl. . . . Rastrelli was architect of this fantastic building. Its peculiar note is struck at the outset by the colouring of the external walls, a concession to barbarian taste, which was not content with brick or stone. The special purpose was against the monotony of snow, but it is as Russian in invention as the cathedral of St. Basil and its coloured domes. From this are descended the painted facades of the Admiralty and of so many buildings in St. Petersburg of the time of Nicholas I. This hybrid Italian has become the vernacular of Russia ; of foreign instigation, but as typical of Russia as the Russian cuisine or the classical ballets of Petipa.

In Scotland it is possible that some six thousand emergency houses can be provided by the MASS CONVERSION OF WAR-TIME HOUSING.

Mr. Joseph Westwood, M.P., Under-Secretary of State for Scotland, told a conference in Stirlingshire that the speediest methods of carrying out the work are now being investigated so that they can provide proper amenities and conveniences. The Government is also examining the provision of a temporary house with a limited life. Experiments are in hand using and testing various types of materials to find what form of construction and what type of material best suits the Scottish requirements. It is hoped to have a prototype house suitable for prefabrication and mass production ready in the late spring of this year and in actual production. If temporary houses of this sort are built, the Government is determined they should be erected under proper control by the local authorities and licensed for a limited period. They will thus avoid having these houses on their hands long after their use has been met, as happened after the last war. The Scottish requirements are estimated at between 450,000 and 500,000 houses which do not take into account the fact that changes of location of industry and development of industry in various areas will make additional demands.

The Oxdrove on Preston Down, Hampshire, one of the most ancient rights of way in the country, is NOT TO BE PLOUGHED UP.

The Oxdrove is said to be between 5,000 and 6,000 years old and originates at the prehistoric site of Avebury, in Wiltshire. Preston Candover Parish Council and Basingstoke Rural Council have long contested the decision of the Hampshire War Agricultural Committee to plough up this ancient right of way, and they have now won their battle.

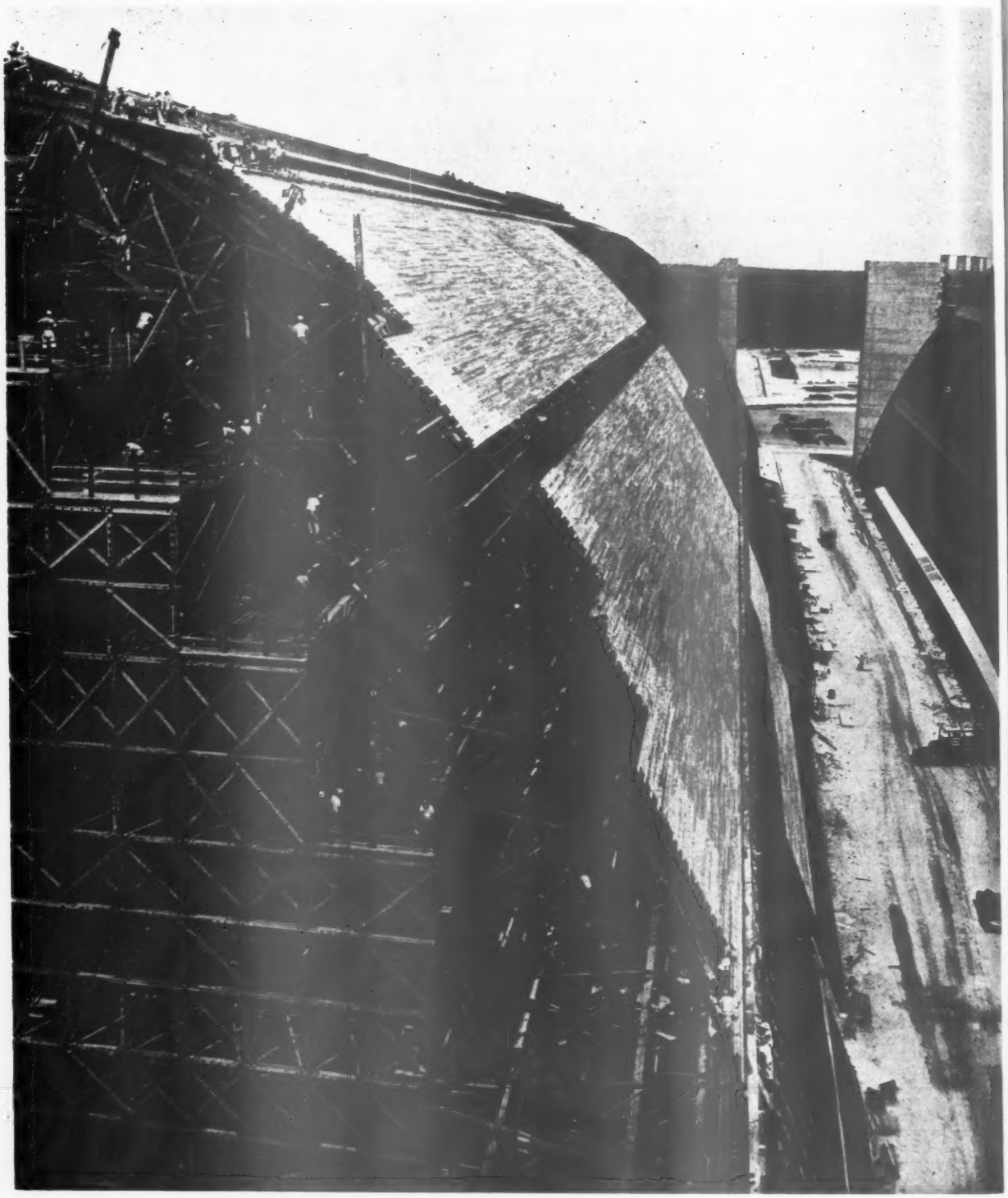
Entries are invited for the following SCHOLARSHIPS AT THE AA School of Architecture.

The Leverhulme Scholarship.—This scholarship provides the opportunity for students who could not otherwise afford it to obtain qualifying training over a period of five years for the profession of architecture. It is of the value of £1,000, and its provisions are as follows : (1) Payment of tuition fees (£75 per annum) ; (2) an annual allowance of £10 to cover subscriptions, working materials, etc. ; (3) maintenance allowance of £10 per month ; (4) an allowance of £20 for travel in the British Isles during the fourth year ; (5) an allowance of £40 for travel abroad during the fifth year. Candidates must be of British nationality, must not be below the age of 17 years, and should have reached School Certificate standard. They may be required to sit for a written examination on general subjects and to come before a selection committee for an interview. *The Minter and Sir Walter Lawrence Open Entrance Scholarships.*—These scholarships, value £75 12s., entitle the holder to free tuition for the first year course at the AA School of Architecture, and they are open to candidates under the age of 19 years on July 1 of the year in which they compete. All entries must be accompanied by a portfolio of drawings, and must reach the Secretary of the AA, 36, Bedford Square, London, W.C.1, on June 1 in each year in the case of the Leverhulme Scholarship, and on July 1 in each year for the Open Entrance Scholarships. Application forms and further particulars may be obtained from the Secretary of the Association, to whom all communications should be addressed.

Last week the LCC discussed an AMENDED HOUSING SCHEME FOR STOKE NEWINGTON.

The site at Woodberry Down, Stoke Newington, provides for the erection of 1,790 dwellings at an estimated pre-war cost of £1,191,000. It is of 64 acres and lies in a bend of the New River adjoining two large reservoirs. Most of the dwellings will be in five-storey blocks, with a few of eight storeys, the remainder being in two-storey houses and some maisonnettes with flats above. Lifts will be provided in the five- and eight-storey blocks. A small area will be reserved for aged persons, and an open belt of land 50 ft. wide will border the New River. Mr. F. Rye suggested that as the site adjoins reservoirs it will be a landmark for an enemy in any future war. He suggested flats of not more than three or four storeys. Mr. C. W. Gibson (chairman of the housing committee) argued that the site is suitable for the experiment of eight-storey flats. The Council will be compelled to put up flats, and he could not agree to delay.

Instructing the young in the appreciation of good design at the Design in Daily Life *exhibition, organized and circulated for CEMA by the British Institute of Adult Education. The purpose of the exhibition is "to show objects of daily use produced under modern conditions, which are well and truly made, and therefore have a claim to be considered works of art," and to foster the belief that good design is not necessarily a luxury. The exhibition, one of CEMA's* Art for the People *series is now on view at Heal's, Tottenham Court Road. The exhibition closes in London on Saturday next when it will tour Edinburgh, Glasgow and other Scottish centres.*



World's Biggest Timber Structures

An immense hangar for the US Navy's anti-submarine balloons now patrolling the South Atlantic coast is here seen under construction. So enormous are these Blimp hangars that ten football games could be played at once inside one of them. Built of flame-proof timbers, which have been chemically treated, they release a large amount of steel for other purposes. They are the largest wooden structures in the world, the arches being 246 ft. across and 1,000 ft. long. They each require 3,000,000 ft. of timber and cost about £500,000. On the left can be seen the timber scaffolding which is moved along as each section is completed. The revolutionary developments in timber construction during recent years, especially in the USA, are well expressed in these buildings, and were explained in a lecture recently given by Mr. P. O. Reece, in the series arranged by the Architectural Science Board of the RIBA. The lecture, extracts from which are given on pages 196-198, receives comment in this week's leading article.

Plans for building a riverside PROMENADE AT DATCHET have been prepared by the Parish Council.
The riverside promenade, proposed to be built after the war, will stretch from the village to Victoria Bridge, the boundary with Windsor. The land over which the promenade will be built belongs to the Commissioners of Crown Lands, and is opposite the grounds of Windsor Castle. The parish council has sent its plans to the Commissioners of Crown Lands. They will soon be put before the King. The promenade, a mile long, with lidos, is planned to attract holiday-makers to the Thames Valley. The promenade will link up with a new extension to Windsor's own riverside promenade, already made possible by the King. The entire length (one will be able to walk through riverside gardens when these two schemes are completed) will be four miles.

In the House of Commons, the Parliamentary Secretary to MOS stated that it is essential that SALVAGE OF WASTE PAPER should continue until further notice on the greatest possible scale in all areas.

★

There are 491 entries in the HOUSING COMPETITION organised by the Northamptonshire Federation of Women's Institutes.
The competition is for the best design for a pair of family cottages for rural workers. Mr. Darcy Braddell is the assessor. An exhibition of the designs, and a model of the winning design, will be held at Northampton from March 21—April 1. The Duchess of Gloucester will open the exhibition.

NT has bought CHIPPING CAMPDEN MARKET HALL.
The Market Hall is of Jacobean date and is supported by open stone arcades resting on a cobbled floor. The open roof is richly timbered. The Market Hall was the centre for the wool trade that made Chipping Campden until the late seventeenth century so wealthy a place. It was with great concern that the Campden Trust learned that the Market Hall was in imminent danger, and it is through their vigilance and instrumentality that NT has been able to buy the building with the help of its Midland Counties Trust Fund.

Gloucestershire County Council has decided that the most suitable site for a ROAD CROSSING OF THE SEVERN ESTUARY is between Aust Cliff and Beachley Peninsula.
At Beachley Peninsula the road could be connected with the proposed trunk road by-passing Chepstow and crossing the River Wye. The committee favours the construction of a multi-span bridge with dual 22 ft. carriageways, subject to satisfactory arrangements being made, and recommends that the proposals should be submitted to the Ministry of War Transport.

THE ASB LECTURES

THE development of modern structural materials has so far received too little consideration by architects. The attachment to "brick, mortar, stone"* is so deep rooted that it prevents many architects from making the best use of the new materials. There is a lag between building technique and architecture, and as Mr. Hartland Thomas expressed it in his talk which closed the recent Architectural Science Board Lectures at the RIBA, "an unconscious inability to think in terms of the new material or the new problem so that the habitual appearance is carried over into the new conditions." This results in waste of materials and missed opportunities in planning and design. The time has come for architects to "acquire enough of the scientific outlook and become sufficiently well acquainted with the theories and experiments that lie behind the results, to assess the value to architecture of the many different products and methods that are presented to our notice." It is the purpose of the ASB lectures to help architects to do this. Those who heard the recent series, which gave valuable information on the use of the most important modern structural materials, will agree that they fulfil their task well. For the information of those who were unable to attend the series, an abstract from the first lecture on timber is published in this issue (page 196) and abstracts from the others on welded steel and concrete formwork, as well as Mr. Thomas's philosophical summary, will follow.

Structural steel and reinforced concrete have revolutionized building technique and therefore architectural design. This is true also of timber to a far greater degree than many yet realize. Though timber is one of the oldest materials, the improved knowledge of its properties, obtained by scientific research in the last few years, the invention of new mechanical devices for connecting timber members and especially of new adhesives, has brought about a renaissance of its structural use. Large span girders and arches in laminated wood are no less revolutionary, compared with traditional building forms, than a steel framed building compared with masonry. An old material used by skilled craftsmen throughout the ages has now been so developed that it can be considered a new material, opening fresh and stimulating possibilities for architects and engineers. But it cannot now be used with rule of thumb methods; hence the need of scientific information on new timber techniques such as is to be found in the ASB lecture on timber developments.

Timber will be in short supply for the duration and possibly for a time after the war. Nevertheless its importance in post-war building is beyond doubt. It is in any case essential to make the best use of the timber that is, or will be, available in this country. One of the factors which will encourage its best use is the valuable research work on stress grading carried

*See A. J. Leader, August 19, 1943, pp. 121-122.

out by the Forest Products Research Laboratory at Princes Risborough. Stress grading gives quality control of timber, but much yet remains to be done to make this grading really effective.

The policy in Great Britain during the war has naturally been to restrict the use of timber as far as possible. In the USA the opposite tendency has prevailed and many buildings, originally designed in steel, have been carried out in timber, or reinforced concrete, or the combination of both. Thus the shortage of steel in the USA has stimulated research and the creation of new forms of timber construction undreamt of before the war. This heralds a new era of architecture which will be based on steel, concrete *and* timber.

The JOURNAL has repeatedly reported on the use of timber in housing* and the Information Centre has closely followed the results of research and new ways of using timber, particularly in the USA.† We shall continue to keep our readers *au fait* with research and technical progress in this, as well as in other subjects, for though knowledge about new timber uses cannot be applied here to any large extent at the present time, its ultimate value is beyond dispute.

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

NOTES & TOPICS

LANDSCAPE MINING

A documentary film was shown in London last week which has been produced by a famous firm of building and engineering contractors. Called *Landscape Mining*, it tells the fascinating story of open-cast, or outcrop, coal mining by which the civil engineering industry working for the Government has secured many millions of tons of coal without calling on the depleted ranks of the skilled miners.

*

Some thirty or forty feet below the green fields in many parts of the country, mainly in the coal-mining districts, lie useful seams of fair quality coal which can now easily be obtained, thanks to mammoth machines, *and* without turning the land into a desert of dead mounds of mud. The film shows how this is done.

*

First, we see the untouched farmland on which a group of men are surveying and prospecting. Laboratory tests and analyses of what they have discovered are then made. Great excavators and scrapers, mechanical titans, next go to work and remove the overburden of top soil and clay. One of these is called the Walking Dragline, which is footed with huge rafts enabling it to walk in an uncanny way like some fearful dinosaur. It weighs 150 tons and consumes at each greedy gulp of its iron jaws three tons of earth.

*

The coal seam is at last revealed. The coal is dug out by more machines and transported by lorry to the nearest rail-head. The mountains of earth are then levelled out and the excavated pit is filled in. At this stage bulldozers lend their weight. Finally the vegetable soil is restored and the farmer occupies his land once more, receiving compensation from the Government. Far from being harmed in any way, the land is actually improved by being disturbed, as it is broken up, aerated and drained to a great depth. Moreover, previous awkward contours can be evened out exactly as the farmer wishes.

*

From the point of view of long-term physical planning this outcrop mining is not important, for (and I have this from Major-General Appleyard, Director of Opencast Coal Production at MOW) there is at the present rate of production no more than three to five years further supply of opencast coal available.

*

But in landscape design this process of moving millions of tons of earth in an incredibly short time, has obvious possibilities. How the shades of the eighteenth century landscape gardeners must envy us these tools that could create such fantastic, picturesque and artificial hills and dales of any shape and size we like simply at the touching of a lever. Land sharawaggi* by machine becomes a possible art of the future.

ON BARRACKS AND BLUSHES

Recently I visited, for the first time, a place somewhere in England that can only be described as a military station. It is now in a US Army training area and Americans inhabit the barracks and buildings that once housed our troops. The place, from internal and external evidence, dates from the post-Boer-war period. It can only be described as a military station because it is quite incredible how completely the plans under which it was built have ignored every planning idea that was current even then.

*

There are some shops, casually scattered in the best seaside manner. There is even a village public-house, re-built by the brewers to cope

* December 30, 1943, pp. 485-486; February 3, 1944, pp. 101-105; February 17, 1944, pp, 139-140.

† Information Centre Nos. 1118, 1139, 1140, 1141, 1146, 1212, 1224, 1239, 1244, 1318, 1330, 1331, 1340, 1372, 1381, 1393. Also Nos. 1402 and 1403 on page 195 of this issue.

*Sharawaggi: a Japanese word meaning "not being regular," or according to Sir William Temple, writing in 1685, a Chinese term for irregular gardening, resuscitated by Christopher Tunnard in his *Gardens in the Modern Landscape* (Architectural Press, 1938); used in the Architectural Review of January in an article *Exterior Furnishing or Sharawaggi: the Art of Making Urban Landscape* which calls for the Picturesque as opposed to the Classical approach to town-planning, "intricacy as against easy visibility."

with the naturally expanded trade, and which is about the best building in the village. And there are the Government erections. It is not so much that the period was a bad one. The main buildings, headquarters and officers' messes lack any trace of imagination, and what imagination there was then was not very widespread. The shocking thing is the squalor and monotony of what were the married quarters for the non-commissioned officers and men. Long rows of narrow, ugly, ill-lit and ill-designed terrace houses, dropped haphazardly along the sides of a small valley. No gardens, no amenities, just a collection of two-up-and-two-down that a Lancashire mill-town would blush to have allowed, even in 1905.

*

It is difficult to know what conclusions to draw. Anything was good enough for the Army? Government buildings in Whitehall were one thing, living accommodation in the country another? Or that officers were entitled to houses and other ranks to slums? The general ensemble has not escaped the eyes of the Americans. One said to me, with something of contempt in his voice: "Our Regular Army had some pretty swell houses in their stations before the war." If only one felt confident that the Service Departments are incapable of doing the same kind of thing again.

POETS' CORNER

MUSWELL HILL

Upon a site that might have served
As some cathedral chalice,
Victorian builders raised aloft
The Alexandra Palace.
It is not right to view the Past
And judge its works with malice
But would some nobler mind recast
The Alexandra Palace.

C. T. Yelland

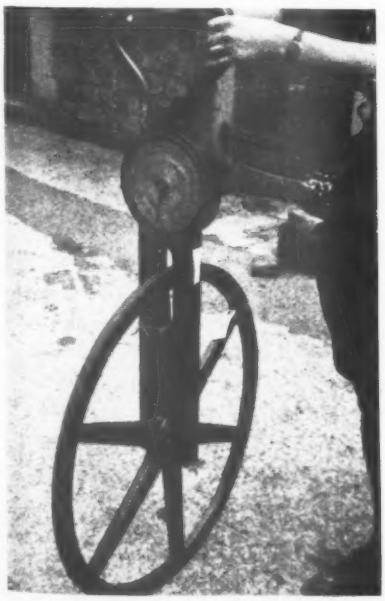
AN OLD WAYWISER

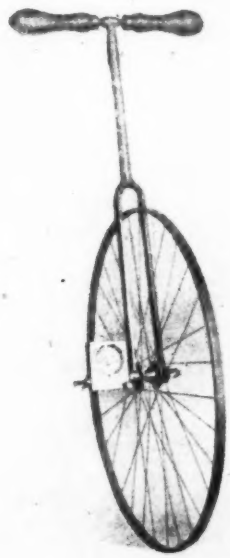
The waywiser, or land wheel, is an instrument used since Roman days for measuring distances by counting and recording the revolutions of a wheel of known circumference. The wheel is geared to a registering mechanism with dials and pointers which record the number of links, poles, chains, furlongs and miles traversed. (I have learned all this from the Keeper of the Science Museum.) The instrument was in common use in the early part of the last century and below on the left is a waywiser of that time which was recently up for auction in Derbyshire.

*

Compare its design with that of the modern waywiser on the right taken from a contemporary catalogue of surveying instruments. Both are equally functional, the one in mahogany and the other in steel, and yet how clearly do they express two entirely different ages which are but a century apart.

ASTRAGAL





Left, a mahogany waywiser, or land measuring wheel of the early nineteenth century, recently auctioned in Derbyshire. Right, its modern counterpart. See Astragal's note above.

LETTERS

Ernst Fuchs

J.M.H.

Percy E. Thomas, P.R.I.B.A.
(President, Architects' Benevolent Society)

Physical Planning

SIR,—The more Planning with all it implies becomes front-page news in the press and develops to a popular movement, the greater is the danger that its notions will become slogans, empty slogans, devoid of any significance.

It is our task, the task of the experts to be on the alert; that is why the series of articles on Physical Planning in your JOURNAL is to be welcomed.

But the term Physical Planning is not being preferred because Town Planning "is going out of fashion," but because it is the more adequate expression; it is not "less exact," but it is more honest. It is far-reaching in one respect and admits its limits in another respect. It indicates that the arbitrary boundaries between town and country, between cities and shires are obstructions to planners and that the "raw material of the planner should be the resources of an entire region," of a logical whole.

Physical Planning stresses the shortcomings compared with Social and Economic Planning and it therefore honestly admits that it will never be able to "offer us freedom from the endless struggle for food and shelter," an aim which can only be achieved by the integrated social, economic and physical planning.

Melbourne, Victoria. ERNST FUCHS

Rural Houses

SIR,—Mr. M. W. Jones' comments on the Bernard Lowe plans, February 10, are the first good constructive comments I have seen on this subject for a long time.

From the point of view of one who has also lived a good many years in an agricultural cottage in the Cotswolds, I would deplore the general planners' attitude that the bathroom

MOW'S PITCH MASTIC FLOORS

The use of pitch, a material indigenous to this country, in the place of the usual imported asphalt, has been successfully developed for flooring during the war by eight specialist firms, sharing their experience, and working under MOW. The biggest job has been the laying of 31 hospital floors covering 328,000 sq. yds. A good hard surface impervious to water is produced which wears better than magnesite. Unlike bitumen, it resists oils and fats. The pitch is laid to a thickness of $\frac{5}{8}$ in. in 6 ft. bays, directly on to the concrete if of good finish or on to felt, paper, a layer of cement, or a sprinkling of dry powdered pitch mastic if the base is uneven. The surface can be highly polished, but as it abrades easily it must be kept polished. Coloured mastics can be produced though at present the cost is more than double that of the usual black, which is 6s. 6d. per yard as against 7s. for asphalt flooring. This material may well be useful in post-war building, for example as a kitchen floor covering in place of the usual tiles or linoleum.

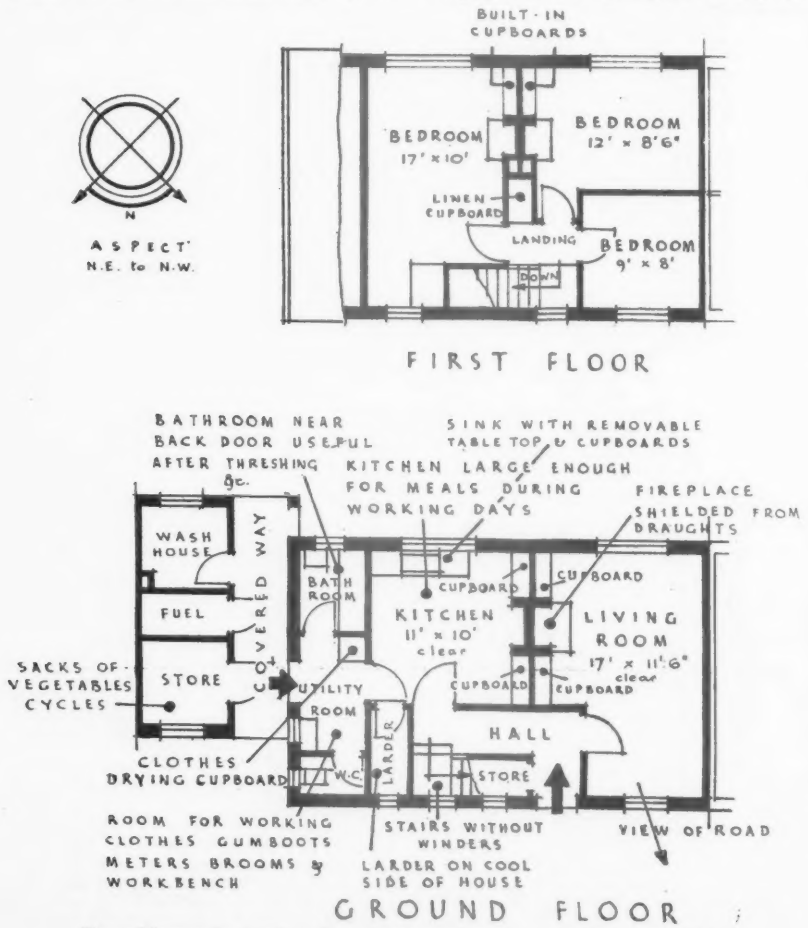
should be on the ground floor. You cannot induce the farm labourer or his sons to wash in the bathroom, when tradition has it that the kitchen sink is used. The bathroom is the property of the wife and small children, and must necessarily be on the bedroom floor. The only possibly redeeming feature of planning it on the ground floor is from economy of construction.

Judging Mr. Lowe's plans, and working now in a Ministry where agricultural cottages are a very constant topic of action, discussion and consternation, I cannot help but think that the needs of prospective tenants would be better met by the local architects and builders in each case, who are more aware of the local habits, and have their future housed families to face after the job is done. The ministerial results, pure from a townee's aspect, are not a seventh heaven for the type of people they are to house, and from anyone's point of view, surely two lavatories, one upstairs and one down, are essential ?

Anyone who has lived with land workers knows positively that the kitchen-living-room is inevitable, particularly where there are children ; and very few agricultural workers are childless.

The idea of the agricultural cottages is, after all, to give the worker the maximum comfort from his own point of view, at the lowest cost to the country ; and not to instruct him, to his own inconvenience, how it is considered he would be more comfortable should he conform to certain changes from his usual habits.

Chelsea. J.M.H.



Plan of houses for rural workers, by Bernard Lowe. See letter from J.M.H.

ABS Half-Crown Fund

SIR,—I am glad to be able to tell you that my Christmas appeal on behalf of the Architects' Benevolen Society, for which you so kindly gave space in your JOURNAL, has, up to date, produced donations amounting to £873 8s. 6d. —over £100 more than previous appeals.

As this appeal is made in alternate years only, the Society depends much on the funds thus raised to determine the scope of assistance which it is possible to give to those in need during the coming two years, and this response is most encouraging.

I would like to thank all those who have so generously contributed towards the Fund, and thus enabled the Society to face the calls which may come, with confidence that we may be able to help.

I would also like to express my gratitude to you for the publicity you were so good as to give to my appeal, without which, owing to the paper shortage, many donors might not have heard of our needs.

PERCY E. THOMAS,
President,
Architects' Benevolent Society

London

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THE ARCHITECTS' JOURNAL LIBRARY OF PLANNED INFORMATION

ABBREVIATED DESCRIPTION OF ROLLED GLASSES.

TYPE AND CLASSIFICATION	NAME	LIGHT TRANSMISSION	TINTS AVAILABLE	WEIGHTS (lbs/sq ft approx.)
(B)	ROUGH CAST OR DOUBLE-ROLLED ROUGH CAST PLAIN ROLLED (also known as Ribbed Rolled and Hartley's Rolled)	80% approx.	White only	1lb 3oz for 1/8" 2lb 10oz for 3/16" 3lb 6oz for 1/4"
FIGURED ROLLED (B) formal patterns	FLEMISH, SMALL	85%	White and 12 standard tints. See table on the reverse of this Sheet.	
	FLEMISH, LARGE			
	FLEMISH, DEEP			
	WAVENE			
diffusion patterns	STIPPOLYTE	85%		1lb 8oz for 1/8" 3lb 8oz for 1/4"
	GLISTRE, SMALL			
	GLISTRE, LARGE	80%		
	MONTENE			
	DEWDROP	75%		
	PATTERN "G"			
REEDED FIGURED-ROLLED (B)	REEDED	83% approx.	White only	1lb 14oz – 2lb for 1/8" 2lb 12oz – 2lb 14oz for 3/16"
	BROAD REEDED			
	MAJOR REEDED			
	CROSS REEDED	83% approx.		2lb 4oz for 1/8" 2lb 12oz – 2lb 14oz for 3/16"
	CHEVRON REEDED			
CATHEDRAL (B) non-formal patterns	DOUBLE ROLLED	85%	White and 67 standard tints	1lb 8oz for 1/8" 2lb 8oz for 3/16" 3lb 8oz for 1/4"
	STIPPLED			
	MOTTLED			
	ROUGH			
semi-formal patterns	No 2 HAMMERED			
	GLASGOW HAMMERED			
REINFORCED (D)	WIRED ROUGH CAST Square or Hexagonal mesh	75%	White only	3lb 4oz for 1/4"
	WIRED DEWDROP	70%		
	WIRED PATTERN "G"			

QUALITY : All these glasses are made in one quality only.

TOLERANCES : The possible variations in thickness for all the tabulated glasses are : 3·4 mm to 3·8 mm for 1/8" : 4·8 mm to 5·5 mm for 3/16" : 6·4 mm to 7·0 mm for 1/4".

Information from Chance Brothers Ltd.

INFORMATION SHEET : GLASS 9 : TYPES OF GLASS I.
Sir John Burnet Tait and Lorne Architects One Montague Place Bedford Square London W.C.I.

THE ARCHITECTS' JOURNAL
LIBRARY OF PLANNED INFORMATION

INFORMATION SHEET

• 932 •

GLASS: No. 9

Subject: Rolled Glass.

General:

This Sheet is the ninth of the series dealing with glass and glass products, and describes Chance Brothers' rolled glasses. The term Rolled Glass covers those glasses which are made by rolling either on a table or between rollers. The process may be intermittent or continuous, i.e. the glass may be produced either as individual slabs or in a continuous length which is cut up when sufficiently cool.

Light Transmission:

A mean percentage figure is given for each type of white glass, for $\frac{1}{4}$ in. thickness and for diffused light incident on the plain surface.

Tints:

Where indicated in the table, glasses are also available in a range of tints. The standard means of classification is indicated in the table below and is based on the principle that the title gives an indication of the colour, whereas the number indicates the depth of the colour in that tint. The names are so chosen that their initial letters are all different and it is sufficient to specify that the glass required should be C_2, P_3, and so on. The depth of colour increases with the number, 1 being the lightest and 6 the darkest normally made. It should be understood that the transmission figures shown in the table can only be approximate as there are inevitable and unavoidable variations between one melting and the next, but as the transmission figures show, the difference between one number and another in a given series is not great, so that a glass which is darker than halfway between say 2 and 3, and lighter than halfway between 3 and 4, would be classified as 3.

Standard Tints for Figured Rolled and Cathedral Glasses:

It should be noted that during the wartime restriction period, Figured Rolled glasses are available only for those classifications which are underlined in the table, a total of 12 tints.

Flemish glasses are available in a special range of 13 pastel shades and are marked * in the table.

Grade No.	1	2	3	4	5	6
Name	Approximate percentage transmission for daylight					
Violet	80	65	50	20	—	—
Cobalt	80	*70	*40	3	1	—
Marine	80	60	35	25	5	—
Turquoise	80	75	65	45	30	—
Emerald	80	70	55	35	20	—
Green	75	*60	*50	*35	20	—
Foliage	70	60	50	40	12	—
Sage	*75	55	40	30	6	—
Olive	75	65	40	30	25	—
Yellow	80	*70	*60	*50	*40	35
Russet	*75	*70	65	60	55	40
Pink	70	65	*35	25	10	2
Amethyst	80	60	50	20	5	—

Maximum Sizes, Weights and Thicknesses:

The maximum sizes and standard thicknesses of the glass sheets available from stock are set out in subsequent Information Sheets dealing with each type of glass. The maximum sizes of tinted sheets are slightly smaller than those of white sheets.

Quality:

These rolled glasses are made in one quality only.

Further information on the following glasses will be found as below:

Previous Sheets:

Previous Sheets of this series on Glass are Nos. 914, 917, 919, 922, 925, 927 and 929.

Issued by: Chance Brothers Limited.
Address: Glass Works, Smethwick, Birmingham.
Telephone: West Bromwich 1051.
Telegrams: Chance, Smethwick.

PHYSICAL PLANNING

THE JOBS TO BE DONE

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index

The Job

Arthur Ling, whose article on Housing is published this week, is a B.A (hons. London), an A.R.I.B.A., and an A.M.T.P.I. In 1939 he was awarded the R.I.B.A. Hunt Bursary for the study of Housing and Town Planning and has visited many European countries for this purpose. He has worked mainly in the Town Planning departments of local authorities.

The enormous physical problem we will soon have to face of providing at least 4,000,000 homes has encouraged a natural tendency among technicians and planners to concentrate on developing the techniques of production and physical planning while paying insufficient attention to the underlying social and economic factors which will not only determine the standards but the whole success of their planning. In this week's article Arthur Ling stresses the need for planners to take this wider view of housing; he outlines our short and long-term housing needs, and covers the questions of social security, the powers of local authorities, amenities, and densities and the pattern of land values, in relation to housing.

WE MUST BASE OUR HOUSING PLANS ON SOUND ECONOMICS

by Arthur Ling

housing

Recent controversy has tended to over-simplify the housing problem into the single issue of houses versus flats. If this choice was all that had to be made, housing would indeed be a simple matter, but there are many more important and fundamental considerations which completely overshadow and determine this choice. A distorted approach to the housing problem will make its solution more difficult or produce no solution at all.

existing housing conditions

In looking forward to the future possibilities of modern housing we are apt to forget that the existing housing conditions are our starting point. Our immediate plans must be a step forward from these conditions otherwise they are likely to be unreal and impracticable. Large sections of the population are at present living in overcrowded and insanitary conditions. Taking the County of London as an example, the 1931 Census revealed that nearly two-thirds of the private families in the county (752,705 families out of a total of 1,190,030) were sharing accommodation in non-structurally separated dwellings* where, in many cases, the provision of bathrooms, w.c.'s, kitchens and water points, etc., was inadequate even for a single family. In certain boroughs the proportion was even higher—in Islington and St. Pancras over 80 per cent. of the families shared dwellings, and Stoke Newington, Paddington and Hackney all had more than 70 per cent. The average number of families in the shared dwellings over the whole of the County was 2.56, while 167,130 dwellings had four or more families in them. The number of families sharing increased during the years 1921-31, and, although since then new flats and houses have been erected, taking into account the loss by war damage it is unlikely that the position after the war will be materially better.

As regards overcrowding, 13.13 per cent. of the private family population of the London County were, in 1931, living more than two to a room. 47,343 persons were living more than four persons to a room, and there was one instance of eleven persons occupying a single room.

Overcrowding and sharing of dwellings is usually coupled with inadequate sanitary provision. It has been estimated that 60 to 70 per cent. of the w.c.'s in the Borough of Battersea are used by more than one family,† while an enquiry among 400 school-

* *Census, 1931*—London. Report by the Valuer to the Housing and Public Health Committee, 1935. Published by the London County Council.

† *Our Towns — A Close-up.* Oxford University Press, 1943.

children in Shoreditch, selected at random, showed that only 25 per cent. lived in houses or flats with separate w.c.'s for each family, and in 50 per cent. of the cases the closet was shared by a number of families ranging from 2 to 7.

A similar survey in Shoreditch in respect of water supply, heating and bathing facilities revealed that in 367 cases, 1 in 3 had no indoor water supply, and that 30 per cent. of the families had to carry their water up or down one or more storeys; in 402 cases nearly half of them had no means of heating water other than with a kettle, while out of a similar number only 14 per cent. had a proper bath, the remainder using a tub or having no facilities at all (two-thirds of the families came within the latter category).‡ Such conditions are found in many of our towns and ifi the picturesque country slums.

High densities involving flats in central urban areas are not necessarily undesirable provided advantage is taken of living close together to provide amenities and equipment not usually possible with houses. This is an example of eight storey flats in Stockholm.

the immediate programme

These details of how many of our people live emphasise the importance of realism in our approach to the housing problem. The prejudice against flats or temporary housing with proper sanitary - technical conveniences is hardly likely to be strong amongst those who are living in such conditions, as indeed is proven by the long waiting lists for accommodation in new municipal flats in urban areas. The success of the immediate housing programme will depend on the extent to which it alleviates overcrowding and insanitary conditions for the maximum number of people, not whether it fits in with a particular theory. New construction will make an important and lasting contribution, but there is a limit to the number of dwellings that can be erected annually and meanwhile much can be done by conversion of structurally sound buildings for use by several families. Even if there is only another ten or twenty years life to the building its conversion with proper bathing, kitchen and sanitary facilities would be worth while if the only alternative is that the families continue to share the building in its present state for that period. Temporary housing, too, will give a similarly relative improvement in housing conditions, and will meet urgent requirements until the programme of permanent housing gets in full swing; it will also be of particular value on sites which, in a long term planning scheme, are proposed for some other use such as open space; the sites can be used to meet the housing shortage without prejudice to their eventual use when the houses are dismantled.

‡ *Growing Up in Shoreditch.* Shoreditch Housing Association, Ltd., Toynbee Hall, 1938.

the long term programme

Working forwards from immediate needs does not require a deflection from the eventual aim of securing properly planned towns and countryside in relation to industries and natural resources. Provided decisions on national policy are made in time, the immediate programme can form the first instalment of the longer plan, but without such decisions mistakes and abortive work will result. The Ministry of Health's request to local authorities to prepare their first year housing programme is being acted upon without the guidance of a natonal plan. Its effect will be a general percentage increase in housing accommodation spread over the country in relation to the pre-war distribution of population. This means that questions such as the arrest of London's sprawl, the revivification of the depressed areas and the use of new war-time industrial undertakings—all of which involve a planned redistribution of population—are for the moment ignored. In the national interest it might be decided for instance that priority in housing on undeveloped land should be given to certain existing or new provincial towns where industries are established or are converted from war-time use so that the future expansion of towns and cities, which have already grown to disproportionate size, is curtailed, and their housing activities are restricted in the main to the reconstruction of slums and out-of-date property. The first requirement is, of course, a plan for industry, for population follows industry.

The housing problem is usually measured by the number of houses required, and it is convenient to report progress in these terms. Progress will, however, be finally measured by the extent to which these houses fit into plans for new towns or the extension of existing ones, either as complete communities, as neighbourhoods or at least as housing schemes. The 4,000,000 houses and flats built between the two wars sounds a remarkable achievement if considered by bulk, but, in fact, it was a tragic failure, measured in terms of haphazard development, jerry building, ribbon development and spoliation of the countryside. If we are to avoid such misspent effort we must begin to think of the housing programme not as 4,000,000 houses, but in terms of, say, two new towns of half-million inhabitants, 50 new towns or communities of 100,000, and 1,000 neighbourhood units, all complete with their essential social and technical services.

the provision of social amenities

The extent to which social amenities are provided in conjunction with housing has an important bearing on the question of density. High densities of population are usually considered to be un-

desirable, but this need not necessarily be so provided the advantages of living more closely together are fully utilized. Many of the blocks of flats in the West End of London, for instance, have a much higher density of population than the municipal flats in the East End, but they make better homes than those in the East End, because the standard of their equipment—central heating, lifts, etc.—is good, there are public parks and first rate amusements and shops nearby, and communal facilities such as restaurants, clubrooms, and sometimes nurseries are provided. It is easier and more economical to provide these social amenities with flats than with houses, which are spread out over a much larger area; but in almost all the flats erected by local authorities or housing trusts, so far, the standards of social amenities and equipment have been no better and often worse than those for houses. Moreover they have often been located in areas where there is practically no open space, and the surrounding development is of a slum character. In these circumstances there is naturally a prejudice against flats. The test of the desirability of a high density is not an abstract one in terms of figures above or below a certain maximum, but whether, in conjunction with the social amenities and equipment of the dwellings the development provides convenient and healthy living.

housing and social security

Labour saving devices, plumbing gadgets, district heating, refuse disposal systems, clubs, restaurants and the rest are all desirable amenities and services, but if they lead to an increase in rent, without a corresponding increase in income of the intending occupants, the result may well be to put the new houses out of income range of large sections of the population for whom they are intended. Alternatively if the increased rents are accepted the effect will be to reduce the amount available for food, fuel and clothes, and the value of good housing will be, to a great extent, nullified by a deterioration in health due to poor nutrition. The occupants may also be unable to meet the running costs of the new equipment and thus their object is defeated. The hackneyed tale of "coals in the bath," if it has any foundation at all, might easily be explained by economic reasons—that the people were unable to afford the fuel for heating the bath water, so the bath was useless as such.

One way of meeting the burden of high rents, often taken amongst the lower income groups, is the sub-letting of rooms to boarders or lodgers; this leads to overcrowding and eventually to a deterioration in housing conditions. Incidentally it makes a theoretical control of densities on a population per acre basis very difficult to operate. People occupy dwelling space according to their income, and this is often the main reason for overcrowding. It accounts to some extent for the higher average occupation per dwelling in local authority housing. Although adequate accommodation might be provided for all, if the rents are too high or if the income of the occupants is insufficient to meet the cost of upkeep or furnishings, there is likely to be considerable overcrowding in a proportion of the houses provided, while others remain empty.

In a London borough during the blitz a bombed-out family including four children were moved from what was their former home of two rooms into a house sufficiently large to provide accommodation without overcrowding; no increase in rent was made. When the re-housing officer called he found the family still crowded into two rooms, the four children and the parents sleeping in one room. It was clear that they could not afford to spend any more money on fuel or furniture to make the other rooms habitable. They had begun to chop up some of the cupboard doors for firewood; one is inclined to put this down to sheer hooliganism, but poverty is a compelling force. Housing and social security are interwoven problems which must be tackled simultaneously. The houses provided must be at rents which the people can afford without resorting to lettings or a reduction on other essential items of household expenditure.

In the past this problem has been met by a compromise in the form of a minimum government subsidy to housing authorities, combined with a reduction in housing standards to the bare essentials as regards both size of rooms and equipment. If we are to make a break with this cheese-paring policy we shall have to tackle it in two ways—by securing a general rise in the standard of living of the lower income groups by improved rates of pay, family allowances, etc., and by the provision of greater powers to local authorities to house for profit as well as loss, loans at low rates of interest and increased government subsidies.

powers of local authorities

In the past local authorities have been limited by law to non-profitable housing for the poorest sections of the working class while private enterprises have scooped the profitable. Moreover, private developers have had no responsibility for the overhead costs of development—for main roads, open spaces, schools, hospitals, main drainage, etc.; these being also non-profitable financially they have been left to the local authority who have had to rely on subsidies, loans and rates. In general, inhabitants of overcrowded areas cannot afford to pay either to purchase their own houses or the higher rents of houses in less densely populated areas. In the areas requiring reconstruction therefore, it will be necessary to build houses for letting at cheap rents. Yet it is in this class of house—usually with a rateable value of below £26—that the problem of rents has been greatest. From 1915 to the present day, these houses have been continuously subject to rent restriction. The difficulty is a vicious circle of private enterprise refusing to rebuild without an increase in rents and tenants unable to pay the increase. Reconstruction in essentially working-class areas is therefore an enterprise from which private initiative is inevitably almost wholly excluded. It is no longer enough for the community to accept part of the responsibility and part of the costs.

Given wider powers to local authorities to provide for the community as a whole the profitable would help to reduce the loss on the non-profitable, a generally higher standard of housing could be provided, and the class stigma of municipal housing would disappear. It would encourage too the development of complete communities or neighbourhoods, rather than isolated housing schemes for the poorest people.

densities and the pattern of values

Theoretically correct standards of density have to be applied within a social and economic framework which at the moment recognizes financial rather than human

An advantage of flat development is the saving in space which enables existing trees to be used as a pleasant setting for the dwellings. This is particularly well shewn in the above illustration of a group of three storey blocks of flats in the north of Copenhagen.

values. If one were building a new town on a clear site the most logical and healthy arrangement would be to locate the higher density housing on higher ground and near open space where the maximum of air, sunlight and amenity was obtainable, reserving the lower lying ground for lower densities. In the past the opposite process has taken place in our towns and cities. The best land for housing has been bought and developed with large houses, with an overall low density while the greatest overcrowding of dwellings and people has taken place in the low-lying land where fogs collect, and which is often subject to flood. Similarly the people's houses have been crowded together near railways or industries. The contrast is often accentuated by a comparative lack of open space in the less healthy residential areas.

The effect of this process is evident from a cross section through the rising ground of a residential area. A typical example can be seen at Wimbledon Hill, London. At the bottom of the hill are the high density working-class houses; half-way up the hill are the middle class semi-detached villas; and at the top adjoining the extensive open space of Wimbledon Common are the upper class, large detached houses in their own grounds. Similar examples can be cited for other towns. Class segregation in housing is very strong and attempts by a local authority to disturb it invariably meet with strong opposition from those affected. In a residential area of a higher income group this opposition is intensified by the knowledge that municipal housing provides only for the poorest sections of the community. If the local authority had power to build for all classes of the community the grounds for opposition would be less, and a general mixing up of classes and full use of the best housing sites for higher densities would be possible.

Superimposed on this class division of land, according to its amenities and contours, is the much stronger pattern of land and property values rising from the outskirts of a town to a peak at the centre with smaller peaks at the local shopping and business centres. This pattern has had a decisive influence on the location of density zones in town planning schemes. To some extent the effect of these land values, producing low densities on the edge and high densities at the centre, is in conformity with good town planning, for it is reasonable that the advantages of living near the main or local centres, with their shopping, amusement and cultural facilities, should be shared by the maximum number of people provided this does not lead to overcrowding or inadequate standards of light and air. The land values, however, are not static; with each re-building the values soar higher with a consequent demand for a higher density ceiling, and in these circumstances positive density control is made extremely difficult. A plan involving changes in density, reduction of population, the provision of new open spaces, etc., is difficult if not impossible to operate within the present framework of land values and land ownerships for the burden of compensation involved is on a scale that no local authority with its present powers can carry.

A redistribution of densities requires a redistribution of total costs, a shift of the burden from the individual or the individual authority to the community as a whole. It is a commonplace that poor authorities are those most in need of heavy expenditure. The effect of providing new open spaces, of reducing population, etc., seems certain to make needy areas poorer. It may, in fact, be necessary to abandon the whole conception of rateable values as the basis of local authority finance, and to substitute a new method, for unless the costs are spread equitably the local authorities that can least afford it will be invited to participate in a cut in their own rateable values or to impose higher rates—and they will not unnaturally refuse. They would be deceiving themselves if they pretended that housing was purely a technical problem in which such issues as houses versus flats were dominant.

Sound physical planning is the logical outcome of sound economic planning. Architects and planners cannot be indifferent to the social and economic causes of haphazard development and bad housing.

PLANNING REVIEW

LEISURE SPACE FOR CHILDREN

Mr. Albert Evans, Chairman of the Law and General Purposes Committee, Islington Borough Council, writing to *The Times* in connection with the problem of playgrounds for children (see Planning Review, ARCHITECTS' JOURNAL, 17:2:44), says he is advised that the War Damage Commission will not or cannot allow the use of cleared bombed sites for temporary playgrounds. So the sites are unused and the children play in the streets.

In an article entitled *Children Learn to Use Leisure*, by Phyl Griffith, in the *Daily Worker*, the problem of space for children's evening playtime is discussed. A recent survey of a London Borough showed that children are free from school after 4.30 p.m. Over 44 per cent. of the under 14's had mothers out at work, and 32 per cent. had fathers away from home. These children had to return to cold, empty houses, sometimes they were locked out. In some districts there are play centres for the children when they come out of school, but they are not enough. One London district has solved this universal problem by the provision of a Junior Club. The club provides recreation in surroundings that are more attractive than school buildings and there are fewer restrictions. The children welcome the change of atmosphere they find in the club, and they like being able to choose what they will do. There is dancing, gymnastics, drawing, painting and woodwork. They have elected a committee to plan programmes, and they run a weekly competition. There are 250 members who pay one penny a week membership fee. The under-sixes go home at 6 p.m.: the 6-10's at 7.30, and the over 10's at 8.30. There must be plenty of room for similar clubs in all our big cities. This club is run as a charity affair by a well-known public school. Why can't our educational authorities use some imagination and form clubs that invite our children to enjoy their leisure?

COUNTY OF LONDON PLAN

A special article in *The Times* entitled *Rehousing the Londoner* attempts to avert the danger of shipwreck to the County of London Plan arising through the squall which has blown up over one part of the plan—the proposal to rehouse over half a million people in districts outside London in order to give better living conditions to the three and a half million remaining citizens. Among the factors involved in the problem are the density at which urban populations should live, or at which they wish to live (by no means always the same thing); the ratio of flats to houses; and the location of the estates required to house the population considered surplus in any city. The residential structure of a town depends on three factors—the amount of land available for housing, the number of people who wish to live on it, and the composition and size of the families into which the population is grouped. The first two have received a certain amount of attention; the last has been so far disregarded, although in fact it governs the others. The author of the article shows that, in the case of London, by relating existing space to existing population, all could be rehoused at a reasonable density. But here the neglected third factor comes in, that of the composition of the family groupings in each area. An analysis of family sizes has a profound influence on the number of homes required in any area. It has an equally profound effect on the kind of homes which are wanted. The solution of the housing problem in large urban areas seems therefore to be flats for the majority of the one, two, and three person families and houses for the remainder. Is this possible in London? On the answer to this question hangs much of the future domestic happiness of working people and their families. If it is possible, it would be deplorable to give Londoners the impression that they are doomed, regardless of their wishes, to be housed in blocks of flats, however well designed. It will be seen that analysis into family groups simplifies, or rather re-arranges the structure of each borough into recognizable patterns and shows where and in what proportions the houses and gardens desired so eagerly by the families, whether in the east or west ends of London, can be provided, and where the flats, wanted with equal impatience, though by a different grouping of the population. Finally the land. To house the small families in flats at 70 to the acre (say 136 persons) and the larger families in houses at 20 to the acre (about 100 persons) would in fact require one-seventh less land than is now used to house the existing population—in other words, 6,000 acres of London at present covered by houses would be available either to enlarge the ratio of houses to flats or to provide larger gardens or other amenities—and there would be no need for a single new satellite town or even satellite estate outside the London boundaries.

NEW LITERATURE

Planning for Productivity: K. Lönberg-Holm and C. Theodore Larson. International Industrial Relations Institute. Room 704, 130 East 22nd Street, New York.

Old Houses: Planning No. 218. Subscription £1 p.a. PEP. 16, Queen Anne's Gate, S.W.1.

CANTEEN IN THE NORTH OF ENGLAND

BY RICHARD SHEPPARD AND J. SHUFFLEBOTHAM

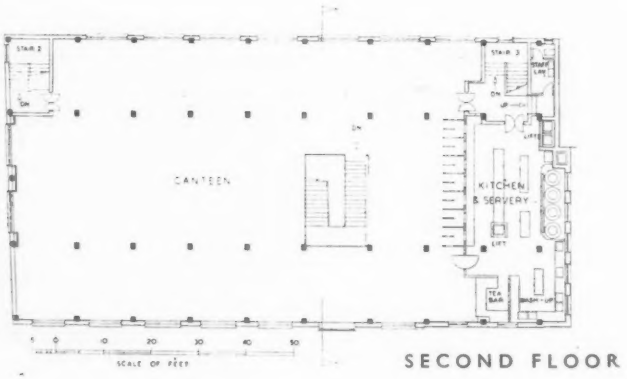
HILTON WRIGHT, ASSISTANT

GENERAL—The original accommodation required by the owners was for six hundred men. It was not intended to provide washing accommodation and other amenities on a large scale. It was, however, stipulated that accommodation for a further six hundred men might have to be added. During the course of the work the programme was expanded so that the canteen could feed twelve hundred men at a sitting. Full lavatory accommodation, decontamination centre and other A.R.P. arrangements were also incorporated.

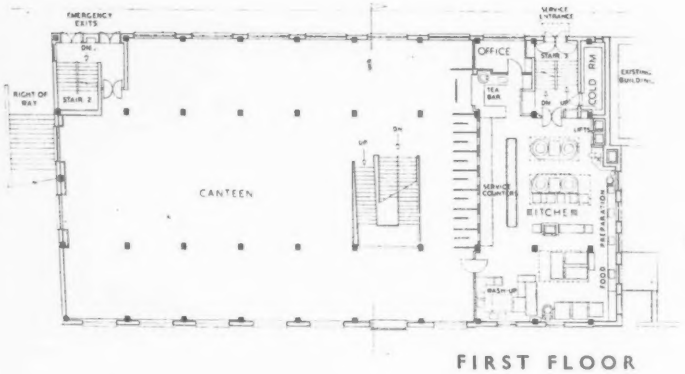
SITE—The site was the only one available. It is steeply contoured in two directions and abuts at the north end on existing buildings which were retained. The south end is bounded by a railway and a flight of steps which form a right of way. The main road is on the north-east side, and on the south-west is a narrow service road—a cul-de-sac. From point A to point B on the ground floor plan is a fall of 12 ft. 6 in. All services are in the main road and the approach to the canteen from the works is up the hill. The aspect is open to the south-east and south-west sides.

PLANNING—The main problem was to find a plan which would be satisfactory whether the extension was proceeded with or not. The site was really too small for the purpose, and the areas allotted both to kitchen and canteen had to be kept down to a minimum. It was decided that the first floor

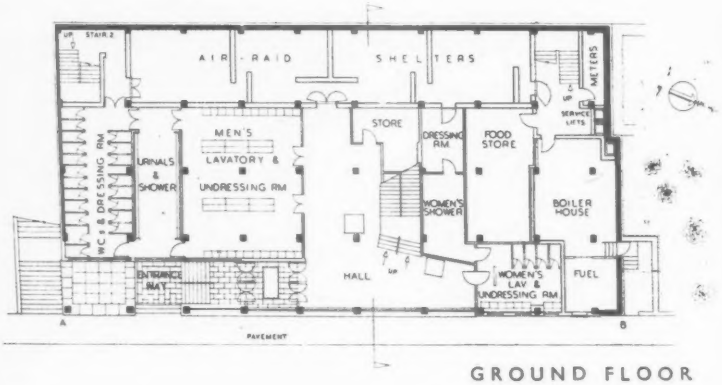
Top, the exterior. Left, the staircase taken at first floor level.



SECOND FLOOR

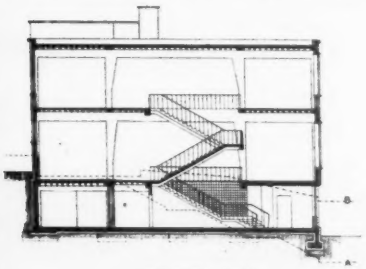


FIRST FLOOR

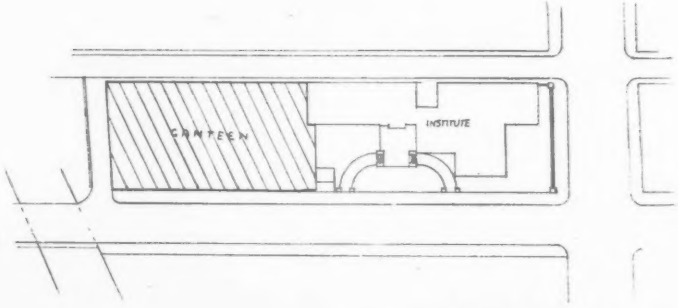


GROUND FLOOR

Above, details of the kitchens; right and below, plan of ground, first and second floors, and section.

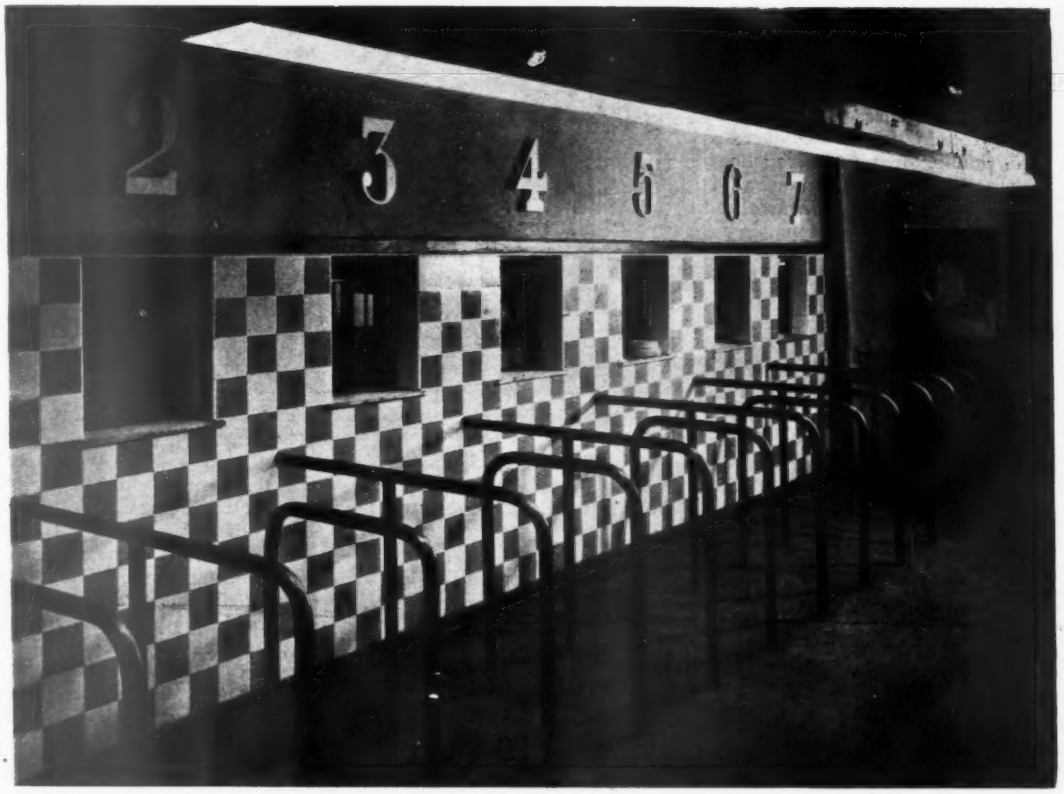


SECTION



SITE PLAN

Above, glass brick wall on the ground floor; below, chequer pattern tiling on the serving walls of the first floor canteen.



CANTEEN IN THE NORTH OF ENGLAND

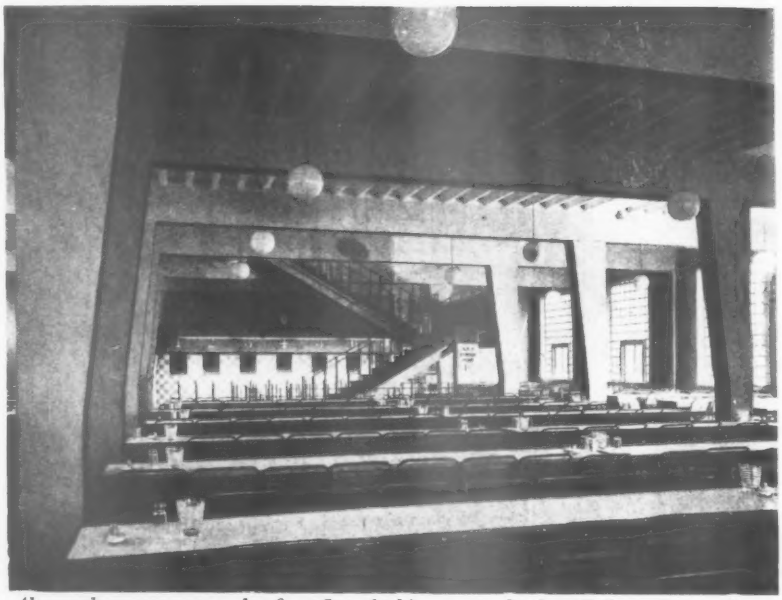
should incorporate a canteen and kitchen with an area of 5,100 sq. ft. and 1,400 sq. ft. respectively. The extra accommodation could be obtained simply by adding a further floor. The size of the structural frame and foundations was calculated to meet this. Lavatories, decontamination rooms and a boiler house were subsequently included, and the basement fully excavated. The problem of circulation became one of equating the rate of service at the hatches on each floor with the numbers coming up the principal stair. A hatch system of service was decided upon because of its greater speed and the possibility of more effective control. The system of paying before food is obtained at the hatches is only possible when limited menus are provided, as is the case here. Queuing spaces have been provided in the hall adjacent to the ticket kiosks to avoid the congestion which often occurs at the payment desk in the normal cafeteria system. This works well and twelve hundred meals are served in seven to ten minutes.

CONSTRUCTION — For various reasons—saving of steel, resistance to blast, hydraulic pressure in the sub-soil—a reinforced concrete frame was decided upon. The rest of the structure was designed to minimize the effect of blast. Clear glass in large areas is avoided except where opening lights are required, and glass concrete panels substituted. Brickwork is used as the infilling material throughout. The whole of the basement is tanked. The frame is simple and repetitive to avoid uneconomic use of shuttering metal. All main panels are transverse with longitudinal ties in the thickness of the floor. The frame stops within 4 ft. of the adjoining buildings to avoid point loads on the soil adjoining them, and the structure is continued up to them in mass brickwork. The first and second floors and roof are of precast concrete slabs. The roof finish is of fluxed pitch sanded felt.

FINISHES—Ground floor hall and stairs have granulated wood flooring tiles and distempered brick walls. The same flooring is used for the first floor canteen, while the flooring of the canteen on the second floor is coloured hardened cement screed. The walls of both canteens are distempered, with tile bands to table height, and tiled window cills. The service hatch reveals and surrounding wall face are tiled in a chequer pattern on the first floor, plain white on the second.

SERVICES—The kitchens have been so arranged that both canteens are served by one cooking operation, which takes place mainly on the first floor. In an emergency either floor could operate on its own. There is gas, electric and steam equipment that cooking can be maintained in the event of a breakdown of any one or even two of the services. Stores are in the basement owing to lack of space on the first floor. Three service lifts are provided. Heating is by means of unit heaters in the canteens. In a building used occasionally this gives an economical arrangement as the heating can be quickly stepped up. The lavatories and the hall are heated by radiators. All drainage—rainwater, soil and waste—is taken down internally in four ducts.

For names of contractors and sub-contractors, see page xxviii.

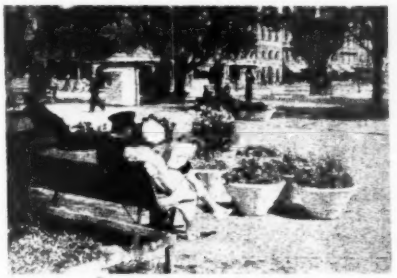


Above, the canteen on the first floor looking towards the tiled serving wall and staircase. A close up of the staircase appears on page 191. *Below, the tea bar.*

CANTEEN IN THE NORTH OF ENGLAND

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.



A portable garden in Stockholm; the painted seats form part of the colour scheme.

PHYSICAL PLANNING

1399 — The Daily Journey

THE JOURNEY TO WORK. *K. Liepmann.* (*The International Library of Sociology and Social Reconstruction. Kegan Paul*, 1944, 15*s*.) Material concerning daily journey to work previously only found in scattered sources. It is here assembled and discussed together with result of some specific statistical investigations undertaken by author.

Both the direction and the function of the daily movements are analysed.

The daily journey contributes to the mobility of labour, permits the flexibility of the industrial structure and cushions the effects of industrial change. It also helps to preserve the family unit.

On the other hand, it is expensive in terms of money, time and energy. Its cost is usually not taken into account in fixing wage rates, and it is doubtful whether the current assumption that low rent compensates for high fares is justified. There appear to be a good many instances in which rent and fares are, in fact, directly correlated.

For town planners, the most important aspect of the daily journey is the fact that it helps to maintain the separation of the place of work and of the home. The resulting inhibition of community life deserves careful study.

This separation is still new, and in time a new nucleation of community life may emerge.

1400 — New South Wales Report

POST-WAR DEVELOPMENT. (*Interim Report submitted by the Post-War Development Committee of the New South Wales Chapter, Royal Australian Institute of Architects.*) The report deals with national framework, building industry organization, codes and standards, the architect's contribution.

(1) *National Framework*

Necessity of a National Planning Board, the task of which is to be continuous National Planning. This Planning Board to consist of a Central Planning Authority, Regional Offices and groups of local authorities.

Amongst the main recommendations for physical National Planning are: the collation and completion of surveys, the public control of the use and treatment of all land, whether it is publicly or privately owned; a definite scheme of decentralization and the training and education of town planners and territorial planners; this is most important as there does not exist a single town-planning school in all Australia; the undertaking of water conservation schemes, as one of the governing factors in a national development of Australia; large-scale forestry work and prevention of soil deficiencies and erosion; the development of trunk communication facilities and power supplies; large-scale housing schemes ultimately to replace substandard houses.

(2) *Building Industry Organization*

A Parliament for the industry is recommended similar to the National Council in England. A Structural Research Body of the nature of the present Council for Scientific and Industrial Research is to be set up which can make the necessary research in design and development of new materials and methods of construction. In using prefabricated houses in Australia the relatively small market, and serious transport problems, have to be considered.

(3) *Codes and Standards*

Building Codes: each State to receive a building regulation applicable to the whole State instead of the various building regulations existing at present for every town and every suburb.

Neighbourhood Standards: a residential unit development to provide housing for which one elementary school is required.

The other clauses deal with Housing Standards, areas of rooms, ceiling heights, heating and insulation, natural lighting, elimination of noise and other technical and communal facilities.

(4) *The Architect's Contribution*

Suggestions: Architects' services should be obligatory on all building projects.

Proper town-planning legislation should be provided as a framework within which all buildings are erected.

Building surveyors should be fully trained architects. Attention is given to the town, country and regional planner for whom the more descriptive name of Territorial Planner is suggested. As the number of town planners in Australia trained theoretically for their work is hopelessly inadequate, their education and training becomes a major task.

1401 — Portable Gardens

SWEDISH PORTABLE GARDENS. *F. R. Yerbury.* (*Lecture reported in Architectural Association Journal, January*, 1944.) Large pots of flowers in Stockholm decorate streets and open spaces.

The new parks architect has introduced these portable gardens. The pots are about 18 in. high and 24 in. in diameter. When the flowers wither the whole pots are removed and replaced by others. Careful regard is paid to colouring and season and painted seats are incorporated in the schemes.

STRUCTURE

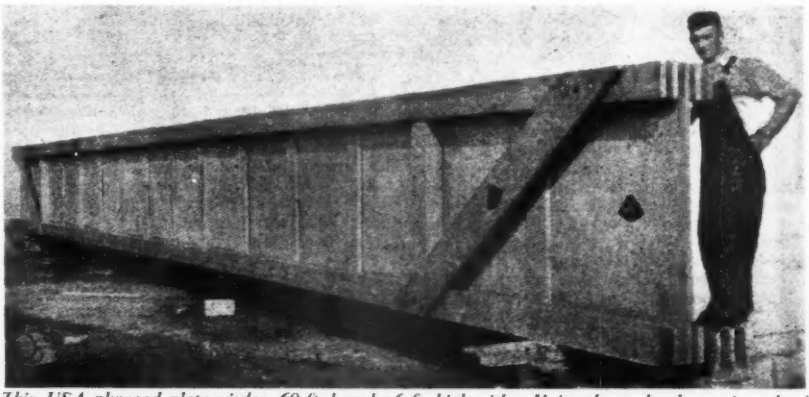
1402 — Plywood Girders

PLYWOOD PLATE GIRDERS FOR BUILDINGS. (*Engineering News Record, November* 4, 1943, *pp.* 690-692.) Girders with web a single thickness of plywood and flanges of dimension lumber used for numerous buildings in Detroit area. Lumber demands greatly reduced compared with conventional timber construction.

Girders with plywood webs and timber flanges have been used at over 80 projects in the Middle West and the Detroit area during the last year.

The girders are of extremely rigid construction, the deflection being less than 1/360 of the span at 1,200 lb./sq. in. extreme fibre stress, and easy to erect. The web consists of a single thickness of standard fir plywood with the outside grain vertical. The flanges consist of solid or laminated members of stock fir lumber on each side of the web. The flange timbers are glued to the web and at intervals dowels are added to assist in the distribution of the stress. A diagonal timber tension member is added at each end of the girders to transfer the tensile stresses from the lower to the upper flange. This diagonal eliminates the necessity of thickening the webs at the ends of the beam to resist shear. The diagonals are attached with split rings and dowels, glued in place. Available in spans varying from 10 to 60 ft., the girders are designed for a maximum fibre stress of 1,200 lb./sq. in.

When some of the members were tested they showed a maximum strength of 4,800 lb. sq. in. or a safety factor of four.



This USA plywood plate girder, 60 ft. long by 6 ft. high with a 1½ in. plywood web, carries a load of 1,200 lb. per lin. ft. See No. 1402.

For use with the plywood girders, joists of similar construction are manufactured. Use of plywood girders and joists permits the roofing or flooring to be nailed directly to the wide flanges without clip angles or special connections being required.

MATERIALS

1403 *Plywood in USA*

PLYWOOD. TECHNICAL DEVELOPMENTS IN USA. (*The Builder, Dec.* 24, 1943, *pp.* 517-18.) Summary of a report prepared by the US Bureau of Labour on the technological developments of plywood affecting war production.

Plywood, together with plastics, has emerged as one of the most versatile materials of the last few years. Its adaptability to a variety of purposes is the result of a great amount of research and commercial enterprise. Important developments have been achieved in (1) the construction of plywood, (2) the types of glues and adhesives used, and (3) the bonding methods.

The simplest form of plywood is assembled from three layers of ply. The faces are bonded so that the grain is at right angles to the grain of the core. Other types of plywood contain five plies; panels for aircraft and ship construction in general, 7, 9, 11 or 13 plies, the grains of the adjacent veneers being at right angles. The crossing of grains strengthens the wood in different directions and assures greater dimensional stability, warp resistance and uniformity than is found in solid boards. Laminated wood, constructed of veneer sheets so arranged that the grains are parallel, does not have the distributed strength of plywood but has greater tensile strength. Impregnated plywood is similar to plastic-bonded plywood, the plastic resin, however, not only serves as a surface bond, but completely fills the cells of the wood, thus giving it an added durability while retaining its tensile strength. A special kind of resin-impregnated wood is Compreg, in which the plies have been subjected to a pressure up to 2,000 lb./sq. in. (while only 200-400 lb./sq. in. pressures are normally used in making plywood). The product is a hard, homogeneous, strong material, almost like metal. To meet particular needs compressed wood may be varied in density by placing extra sheets of veneer between the plies where greatest density is desired. The whole assembly is compressed to uniform thickness. In laminated wood propellers, for instance, the greatest density occurs at the hub, where the stress is greatest, while the least density occurs at the tip of the blade where lightness is desired to reduce centrifugal force.

The most important development is the use of synthetic resin adhesives, capable of forming a permanent bond. Because of their exceptional durability and strength they may displace the conventional glues in operations where mass production justifies the installation of the required equipment. Phenolic and certain types of urea resins come under this heading. The bond obtained by them is insoluble in water and practically indestructible. The resin-film adhesives (Tego, etc.) may help to re-establish plywood as an aircraft construction material in providing the only practical means of utilising very thin veneers. A number of cold-setting resins have been developed for cases too complicated for a press. The problem of bonding thicker assemblies has been largely solved through the development of high-frequency electrostatic heating.

Perfect bonding of resinous adhesives depends not only upon uniform heat but also on the uniformity of pressure over the entire work surface—a simple matter on flat work but difficult on curved surfaces (such as aircraft fuselages and boat hulls). A dependable method of bonding curved surfaces, called "bag-gluing," was invented by Eugen Vidal in 1942. Strips of resined veneer are built upon the wooden form or mould which is to be reproduced. The covered form is then placed in an airtight bag, which, after all air is withdrawn, exerts a uniform pressure over the entire form.

In a great number of cases plywood has taken the place of metals in war production. The Mosquito bomber, well known for its speed and manœuvrability, is built of plywood (see also Inf. Centre No. 1372). Plastic-bonded plywood has characteristics that make it especially adaptable for marine construction. Phenolic resin glue is insoluble in water and resists dry rot and bacterial deterioration. Panels which are structurally strong and easy to work are available in unlimited size. They are best utilised in small boats.

Another interesting development is the use of plywood in the construction of pontoons and runways for temporary military bridges.

Prefabricated plywood housing units are now being transported from America for use by the Armed Forces overseas. These Victory Huts are so designed that they can be erected quickly and easily. They are insulated for protection against heat and cold, and have removable partitions. (For the use of plywood in prefabricated houses see Inf. Centre Nos. 1224, 1311).

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.*

1404 *Plywood and Resin*

Q *I have had the following question put to me by my brother in Africa and I should appreciate your reply:—*

"You may have heard that plywood is now being made with the separate plies bound by synthetic resin and that the complicated shapes used in aircraft are being shaped before the plies are bound together, after which the resin binder is applied and the whole pressed under heat to bind it together. How about right-angle corners? Are these too sharp for binding the individual plies? If not, how are the two pieces at right-angles ttached?"

A Plywood bound by synthetic resin can be bent to right-angles, and even sharper angles, before being bound together, and can be obtained ready-manufactured bent to almost any angle.

1405 *Copper Stain in Stone*

Q *How can one remove green stains, probably basic copper carbonate, arising from bronze statuettes which have caused much disfiguration to a stone base? Will you inform me of any treatment known to you which will eradicate these stains without damaging the stonework. A possible solution has been suggested to me by the treatment of the stonework with one of the recognized stone or cement paints. There appears to be, however, a risk of the reappearance of the green stains.*

Could you suggest any specialist firm who could undertake this work?

A There is no way in which the stain can be removed completely, unless it is a recent stain, as stains penetrate too deeply with age. The only way of removing the stain is to have the stone redressed, but much can be done by treatment with cleansing materials. To stop any further increase in the stain the statuettes should be cleaned and then lacquered.

Messrs. Szerelmey, of 277, Rotherhithe New Road, London, S.E.16, are fully experienced in this class of work.

SOCIETIES AND INSTITUTIONS

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.

RIBA

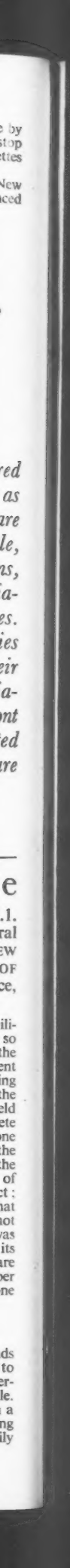
ASB Lecture

February 5, at 66, Portland Place, W.1. Lecture arranged by the Architectural Science Board of the RIBA on NEW DEVELOPMENTS IN THE DESIGN OF STRUCTURAL TIMBER, by P. O. Reece, A.M.INST.C.E., A.M.INST.M.& CY.E.

P. O. Reece: Even as science facilitated the use of steel, so the extending use of steel gave impetus to the further development of science. The two went together, until the terms Structural Engineering and Structural Steelwork almost meant the same thing. In the course of time the field was broadened to include reinforced concrete and then the alloys. At the present time one might be forgiven for thinking that the tendency is to include plastics almost to the exclusion of everything else. In the welter of new materials timber has suffered some neglect: scientific regard for it has been somewhat belated, and in this country at least it was not until after the last war that any attempt was made to undertake organized research into its possibilities. One result of this is that we are faced with the paradox that although timber is one of the oldest of our materials it is one of the newest in potentiality.

COMPARATIVE EFFICIENCY OF STRUCTURAL MATERIALS

As the range of available materials expands it becomes more and more necessary to establish a means of critical analysis to determine the proper uses of the materials available. So far it has not been necessary to establish a very rigorous system for structural engineering as general requirements have been so easily



Blue-print for betterment

No matter whether the cottage of the future is flat-roofed or pitched, whether the factory is single or multi-storey, structural steel will lend its strength, so well-proven during the war.

And remember — steel is a home product, made by an industry vital to the safety of the nation.

Our technical collaboration is at your disposal.

STEEL
STRENGTH
SECURITY

The British Steelwork Association

MEMORIAL OF VICTORY

Blenheim Palace, Oxfordshire: England's largest country house: designed by Sir John Vanbrugh (1664-1726) on estate presented by nation to Marlborough after famous victory at Blenheim, 1704. Vanbrugh's extremely individual style, employing Palladian, baroque and medieval motifs, has provoked severe censure and inspired warm praise. His maturest design is considered to be Seaton Delaval

YEARS of effort, peril, triumph have brought Vanbrugh's work into better perspective. With all his extravagancies, he understood better than any architect since the Roman Empire, the symbolism of military achievement; and Blenheim, in its enormous scale, its defiant gestures, its triumphant array of martial emblems, its singular blend of palace and fortress, is a supreme commemoration of Victory. He saw truly and made a house for giants and heroes . . . . . In the age of the first Churchill, victory expressed itself in building — a natural sequence, to be repeated in our own time. We hope that our national rebuilding will be as worthy of our victory . . . . . and count with confidence on playing a useful part in it.

met by steel or reinforced concrete. In the future, however, there is every indication that the competing claims of the light alloys and plastics will make such a system necessary. The competition of rival materials has been a marked characteristic of aircraft engineering for many years with the result that comparative analyses have become an accepted feature of design. It is significant that in such circumstances timber still holds its own in aircraft construction and this fact alone warrants an attempt to define the position of timber in the hierarchy of building materials.

In ordinary building construction the position is not quite the same as in mechanical and aircraft engineering where lightness of construction is the first consideration. Here lightness of construction has not the same importance and for the most part the ultimate criterion must be one of cost. The direct relationship between strength and cost is complicated by many factors, not the least important being the rapidity with which the relative costs of different materials can change through circumstances beyond the control of the designer. Because of this, it is desirable that comparisons between building materials should be made in two distinct stages, firstly by the strength-weight ratio and secondly in terms of weight and cost.

The superior flexural rigidity of timber makes it pre-eminently the material for all structural components which can fail through elastic instability—by buckling, bending or wrinkling rather than by the crushing of the material. Such components are slender lightly-loaded columns of solid, hollow or built-up sections ; long lightly-loaded beams ; the so-called Stressed Skin construction in which the space covering or panel filling material is utilized to stiffen up the framing as in certain types of flush door, plywood covered wall and roof units, aircraft, boats, furniture and fittings and the like, and in general all components which are lightly loaded in relation to their size.

This characteristic advantage that timber has is due chiefly to the effects of expansion to the higher moment of inertia developed by the lower density material when equal masses are compared. If we want to develop a larger moment of inertia with a given weight of material, we do it by spreading it over as big an area as possible. This spreading or expansion can be effected in three ways :—

1. Atomically, as in the relationship between duralumin and steel.
2. Microscopically, as in wood where the cellulose is distributed in the thin walls of the cell cavities and
3. Geometrically, as in a rolled steel joist or steel tube.

In examining comparative strengths the figures for timber represent ultimate stresses for loads sustained over periods of 40 or 50 years. In practice many types of loading have to be sustained for only a few minutes or even seconds, and for this type of loading timber has remarkable advantages. Tests carried out by the United States Forest Products Research Laboratory show that if we take the stresses quoted as a standard, a timber beam can sustain a load increase of nearly 30 per cent. for one month, over 50 per cent. for an hour, nearly double for 5 seconds and 2½ times as much for impact loading. In designing for wind pressure we have to consider maximum intensities which occur in gusts of only a few seconds' duration, while super-imposed floor loadings of nearly all classes except warehouses have a considerable proportion of their load applied over very limited periods. If we examined the order of merit of materials for short-term loading we would find timber very high up the list indeed, with particular advantage for the construction of roofs, towers, pylons, high single-storey shed buildings of the hangar type, and all floors carrying a large proportion of intermittent loading.

As it is, a comparative analysis shows that timber has a very high order of efficiency, much higher than would be supposed if judged solely by the attention paid to it in modern structural engineering. On the other hand, the analysis provides us with a striking confirmation of the correct uses to which the craftsman has put timber, with one notable exception ; if we examine a typical nineteenth-century roof truss or trussed girder, we find that the members are not only far too big, but that short compression members are made of timber, while the tension members are of steel. In contradiction our comparative analysis tells us that timber is the correct tension material and steel more efficient in pure compression. If we look for the reason for this apparent anomaly, we find that it is briefly, knots and joints ; knots which may completely ruin the strength of a tension member, and joints which can only be made by cutting away a substantial part of the cross section.

If these inherent disadvantages could be overcome science would have placed in the hands of architects and engineers a structural material of outstanding value even by comparison with the most up-to-date products of industrial ingenuity, and science is in a fair way to do it. The solution of this particular problem is to be found in stress-grading and modern adhesives ; stress grading which gives us quality control of timber, and adhesives which make lamination possible and provide us with highly efficient joints.

STRESS GRADING

The value of stress grading arises out of the relationship existing between the strength of a timber and its visible defects. If we take a large number of standard test pieces and sort out one batch in which the largest knots occurring in a specified length occupying say 15 per cent. of the width of the piece, and another batch in which the knots occupying say 30 per cent. of the width, we would find the average strength of the first batch significantly higher than the second. This percentage or knot ratio when considered in relation to other types of defect—shakes, checks, spiral grain and so on, provides a reliable and simple criterion by which to gauge the structural properties of the material. It is essentially a matter of statistics and probably one of the most important single contributions that mathematics can make to modern timber mechanics. Valuable work on these lines has been carried out by the Forest Products Research Laboratory at Princes Risborough, and the first British Standard on Grading Rules for Structural Timber was issued in 1941, but the subject is still new and there is still much to be done to make stress grading really effective.

The adoption of a rational stress grading system puts a quantitative value to qualitative judgment, and thereby makes the use of refined design methods an economical alternative to the empirical approach of the craftsman.

LAMINATION

If out of 100 test pieces we had taken one at random to build into some structure, this piece might conceivably have been the poorest specimen of them all ; if so we should be relying on our factor of safety to see us through, for our working stresses have been fixed with the full knowledge of just this possibility. Suppose, however, that instead of taking one piece we had taken two and glued them together. This second piece could not possibly be the lowest, it must necessarily be somewhat stronger, so that the combined strength of both members must be more than twice the strength of the poorest specimen to which our working stresses are related. To carry the picture a stage further let us now suppose that we glue the whole of our 100 test pieces together side by side. The poorest specimen was assessed at 3,000 lbs. per square inch, the best at 8,000 lbs. per square inch ; if our structure is such that the poorest specimen cannot fail without involving the failure of the best, the strength of the composite member will be the average strength of all its parts. Now if we assume that the average strength is say 6,000 lbs. per square inch, we see that by gluing them together we have brought about more than a slight increase in permissible stress, we have doubled it if we based our working stress on the 3,000-lbs. specimen. This, together with the elimination of framing joints constitutes the outstanding advantage of laminated structures. Working stresses are necessarily based on the strength of single units ; when two or more are joined together we justify an increased stress. Statistical analysis tells us what increases we can make ; we find that for two members we can increase the stress by about 33 per cent., for three 50 per cent., and so on, all pointing the way to more economical timber structures than we have yet known.

Lamination gives us plywood and makes possible the construction of large span beams and arches which, being in a single large cross section, involve no intricate framing, lend themselves more readily to architectural treatment and have far better fire resistance than the equivalent truss composed of smaller pieces. Although in one composite piece, they can be built up from material too small to be otherwise useful and can utilize poor quality materials in the lightly stressed parts. Beams can be cambered to avoid the undesirable appearance resulting from obvious sagging and all members can be tapered in depth for more graceful appearance and to save material where constant depth contributes but little to strength and stiffness.

ADHESION AND ADHESIVES

In 1721, Isaac Newton observed that there were " agents in nature able to make the particles of bodies stick together by very strong attractions " and he concluded it was " the business of experimental philosophy to find them out." Two hundred years went by, however, before experimental philosophy made any comprehensive study of the subject, and we still await the complete theory of the nature and laws of adhesion which will secure universal acceptance.

The general conclusion is that adhesion between two solid bodies may be of two kinds : specific adhesion produced by molecular forces of the same kind as hold together the molecules of a solid body, and mechanical adhesion obtained by the keying of the solidified adhesive into the crevices of the materials joined. Mechanical adhesion needs little explanation ; the interpenetration of adhesives with wood fibres is readily understood, but its relative importance or even desirability is not established beyond all doubt.

For one of the most interesting explanations of specific adhesion we are indebted to Dr. de Bruyne of Aero Research Ltd. He distinguishes between the primary chemical bonds which tie molecules together like links in a chain, and the secondary bonds which hold these chains to each other. These secondary bonds are of electrical origin and are described as " polar " or " non-polar," according to their characteristics. It is these secondary forces which are of importance to the designer. Failure of materials occur through their disruption, and it is their power of attracting or holding molecules of other materials which makes specific adhesion possible.

Polar forces are usually much stronger than non-polar, with the result that their molecules will not mix, the forces of attraction between the polar molecules being strong enough to squeeze the non-polar out. This happens when we try to mix polar water with non-polar oil. Conversely, birds of a feather flock together, and, according to de Bruyne, any polar material which can be applied to wood in a liquid state and then solidified will make an effective glue, wood itself being held together by forces of a polar nature. On this basis, we would expect water to make an excellent glue for wood, as indeed it does ; joints displaying apparent shear strengths of the order of 1,000 lbs. per square inch having been obtained by simply freezing two pieces of wood together.

The shear strength of a glued joint cannot be regarded in the same light as say, the shear strength of a rivet, as the strength of the glue may not itself be the governing factor. If the glue were weaker than the timber, the strength of the glue film would be of major importance but with modern adhesives this is not generally

the case, these adhesives usually having a shear strength much greater than the shear strength of wood. In these circumstances we find that the strength of the joint is governed by the thickness and physical properties of the materials joined as well as by the shape of the joint.

Gelatine glues of good quality could always be produced which were stronger than the wood they joined, so it has not been necessary for modern research to find a stronger glue so much as a stable glue ; a glue which could easily be applied and which would have a greater resistance to the effects of humidity and the normal processes of decay.

Gluing does for timber what welding does for steel ; it enables joints to be made without cutting any material out of the members joined and makes it possible for the designer to take advantage of all the economies associated with monolithic construction. A glue which will not lose its strength when wet, which is not subject to the ravages of micro-organisms, which will not crack or craze through its own internal stresses, which will maintain its efficiency over a wide range of temperatures and have a permanence comparable with that of wood itself, will revolutionize timber construction and give almost unlimited scope and freedom of architectural expression.

Synthetic and casein plastics have produced adhesives which have many of these desirable qualities but experience has yet to confirm that any one product combines them all. Casein, the product of skimmed milk, was widely used before the war. It is cheap and easy to apply, and in dry situations it has a long working life. It loses strength when wet, however, and under certain conditions of temperature and humidity it is subject to the group of micro-organisms.

The synthetic resins now commonly used are plastics made available through the interaction of either phenol or urea with formaldehyde. Both the phenol and urea formaldehyde adhesives can be highly water-resistant, they can stand high temperatures without loss of strength and are not subject to bacterial attack. They require stricter control in application than casein and on the whole are more liable to crazing. Tests carried out by the United States Forest Products Research Laboratory indicate that phenol formaldehyde adhesives have retained a high percentage of their strength after four years' exposure under the most exacting conditions ; conditions which could never occur in actual practice and which must be regarded as equivalent to a very long working life. In America a lot of attention has also been paid to glues manufactured from blood albumen. These also have been tested and while they appear to be much superior to casein, they do not appear to have retained their strength when wet to the same extent as phenol formaldehyde. In other respects they compare quite favourably, but they do not seem to have been used to any great extent in this country.

One of the most significant developments in plastic adhesives is known as the Redux process, particulars of which have recently been released by permission of the Ministry of Aircraft Production. It is claimed for the process that through the use of a synthetic resin it enables light alloys and steel to be cemented together or to wood, giving joints stronger than comparable riveted joints. It is mildly thermo-plastic and loses strength at temperatures of about 212° Fahrenheit which is regained on subsequent cooling. It is stated that this loss of strength does not render the process unsuitable for aircraft work. Such a process seems to bring us within measurable distance of the composite structure in which wood, metals and plastics can play their proper parts welded together with joints of 100 per cent. efficiency.

MECHANICAL JOINTS

The United States Forest Products Research Laboratory has devoted considerable attention to the strength of mechanical joints made with nails, screws, bolts and surface dowels, by which we get the maximum effective bearing surface combined with the minimum depletion of the cross section. In this country we have had little opportunity of building large timber structures during the war, but, judging by the progress made in America the surface dowel type connector is likely to prove one of the most important developments in timber engineering.

In the design of any type of mechanical joint it is necessary to give the same consideration to the spacing of the connectors as is customary in designing a riveted connection in steelwork. The rules are necessarily more complicated as they have to deal not only with the distances between the connectors and the ends and sides of the members and distances between each other, but must also take into account the species of timber, direction of grain, moisture content and type of connector used.

BUILT-UP CONSTRUCTION

The combined use of lamination, adhesives and metal connectors in a single structure is a recent American development, indicating the current trend in timber engineering. A noteworthy example is the heavy girder with laminated flanges and solid stiffener, covered with plywood webs. The construction is somewhat unusual in that the laminations are held together with toothed metal connectors instead of glue. The resin-bonded plywood webs are nailed to the flanges and stiffeners, with cement coated nails and the whole girder is carried on posts by timber connectors.

The use of plywood for the construction of beams and girders is a very economical but comparatively new development, and one which holds great promise particularly in the field of prefabrication. It must not be overlooked, however, that the building up of hollow timber beams or girders of joist section requires greater refinement in design method than is necessary for solid rectangular sections. Unlike steel, timber has different ultimate strengths in compression and tension and it behaves in a different way in bending. Owing to its well-defined grain, timber distributes its bending stresses in a different way from steel and the built-up timber beam or girder emphasizes in the highest degree the different behaviour of the two materials. The difficulty of determining the actual stress distribution which really occurs arises from the fact that we have no direct means of measuring stress in a beam. We can measure things like weight and distances and we can measure strain and deflections, but stress always remains a matter of calculation. Of these calculated stresses the Modulus of Rupture is probably the most used in design. The Modulus of Rupture is the calculated bending stress at which a tested beam fails and this calculation is made on the assumption that timber bends in the same way as steel. It does not correspond with any of the fundamental properties of wood and is a purely hypothetical value. In the circumstances it is not surprising if this calculation sometimes gives puzzling results ; for instance, if two rectangular beams, one shallow and one deep, of the same characteristics and quality are tested under identical conditions, the shallow beam exhibits a higher Modulus of Rupture than the deep one. This is due to the fact that the assumptions behind the ordinary beam formula do not fit the type of stress distribution which occurs in timber.

In our comparative analysis of specific strengths a stress of 2,280 lbs. per square inch was used for compression. As this is much lower than the tension stress, the ordinary assumptions of design should lead us to use it for bending, for evidently the beam ought to fail on the compression side when this stress is reached. So far from this being the case, we find we can work to a hypothetical Modulus of Rupture which is about 65 per cent. greater.

An interesting explanation comes from Newlin and Trayer, at the United States Forest Products Research Laboratory. They argue that the slender, hollow tapering cells comprising the great mass of wood tissue act in compression somewhat like small slender columns. When a beam is loaded, the tiny columns on the outermost compression side are restrained against buckling by their neighbours below. When they receive their maximum load they deflect slightly and allow these neighbours to take up some of the strain. These fibres in turn rely on their lower neighbours, and when fully loaded pass on some of the burden and by this means a stress approximating to the maximum is redistributed down into the body of the beam.

If such a section is fully stressed over the whole area as might occur in a short column all the fibres will receive an equal load and there will be no lightly stressed fibres to help the over-worked brethren and consequently the strut fails at a lower stress than the beam.

If our beam is made hollow like a box a similar condition applies; there are now no fibres in the middle to help the highly stressed area on the outside and again we find that the box girder fails at a lower stress than the solid beam.

This does not mean that the solid beam is more economical, but that in designing box beams or beams of joist section we have to take this phenomenon into account. This could be done by using a correct theory of flexure, but unfortunately, the correct theory which agrees entirely with observed results has not yet been developed. In the circumstances our only alternative is to employ the ordinary beam theory and modify the results by the use of factors determined experimentally.

CONCLUSION

Turning to the aspects we have examined, we find first of all that timber has a very high comparative efficiency in terms of the strength-weight ratio. Except under shear, we find that timber compares very favourably indeed with other materials and is pre-eminent in the range of structures which are large in relation to the loads they sustain or which are subjected to temporary or intermittent loading. We have sounded a warning note on the exclusive use of the strength-weight ratio and pointed out that it is not the only criterion but should be regarded as a step towards the ultimate criterion of cost.

The developments we have considered as being significant to the trend of modern design are :—

1. The application of statistical methods to the stress-grading of timber.
2. The utilization of statistical results to provide high working stresses for laminated forms of construction.
3. The development of stable and water resisting adhesives for the purposes of lamination and to provide highly efficient joints.
4. The use of mechanical timber connectors as an alternative to adhesives.
5. The use of plywood in built-up structural components with particular reference to their application to prefabricated methods of construction, and finally
6. The development of scientific research into the anisotropic behaviour of wood, the characteristic behaviour of a material with a well-defined grain.

Scientific research is seen as the key to all these developments and may well bring about a renaissance of timber as a material for scientific construction.

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RIBA

New Members

As Fellows (4).—Davies, David Owen Harris (Birmingham), Hutton, George Roy, F.S.I. (Oxford), Symcox, Edgar John (Ipswich), McArdle, Francis, B.SC. (Belfast).

As Associates (17). — Cadwallader, John Douglas (Sutton Coldfield), Davey, William George Harvey (London), Gatoff, Henry, DIP.ARCH. (King's College (University of Durham), Newcastle-upon-Tyne) (Newcastle-upon-Tyne), Hand, Kevin P., B.ARCH. (University College, Dublin) (Dublin), Harper, William Stanley (London), McCormick, William Henry Dunlevy, DIP.ARCH. (Lpl.) (University of Liverpool) (Londonderry), McMahon, Colm John, B.ARCH. (N.U.I.) (University College, Dublin) (Dublin), Taylor, Mrs. Sheila Douglas (University of Liverpool) (Liverpool), Thomas, Llewellyn (The Polytechnic, Regent Street, London) (London), Tierney, Liam Patrick (University College, Dublin) (Newry, Co. Down). (*Overseas*).—Efroiken, Morris, DIP.ARCH. (Capetown) (Capetown), Lyth, John Burdsall (University College, Auckland, New Zealand) (Wellington, New Zealand), MacGoun, Robert George Maxwell, B.ARCH. (University College, Auckland, New Zealand) (Wellington, New Zealand), Mathew, Hugh Pawley, B.ARCH. (Rand) (Johannesburg), Mee, Harold Henry Massey (Maroubra, N.S.W., Australia), Price, Herbert Ernest Meredith (Umtali, S. Rhodesia), Tavener, Felix William (Killara, New South Wales, Australia).

As Licentiates (14).—Bell, Douglas (Northallerton), Camish, Cyril (London), Campbell, John Wilfred (Malta), Champkins, Thomas Gordon (Ewell, Surrey), Ford, James Fulton (Edinburgh), Giddens, Joseph Jonathan (London), Hardwick, William George (Chesterfield), Lowe, Bernard Sidney (Wootton Wawen, nr. Birmingham), Mason, James Francis (London), Morris, John Charles (London), Moss, Cyril Edwin (Salisbury), Richards, Charles Arthur (Brentwood, Essex), Townsend, Geoffrey Paulson (Twickenham, Middlesex), Venables, William Gwyn Scale (Cardiff).

ANNOUNCEMENT

Mr. W. H. Ansell, PP.R.I.B.A. and Mr. Arthur Bailey, A.R.I.B.A., formerly of 12, Gray's Inn Square, W.C., have moved to 5, Verulam Buildings, Gray's Inn, W.C.1. Telephone: Chancery 8169.

THE BUILDINGS ILLUSTRATED

CANTEEN IN THE NORTH (pages 191-194). Architects: Richard Sheppard and Jane Shufflebotham. Assistant: Hilton Wright. The general contractors were Purdie Lumsden & Co., Ltd., who were also responsible for the reinforced concrete work. Principal subcontractors were as follows: Accordo Blinds Ltd., blinds ; Adamsez Ltd., lavatory fittings; kitchen sinks, kitchen drainers ; Carter & Co. (London) Ltd., tiling ; Commercial Marble & Tile Co., Ltd., terrazzo ; Crittall Manufacturing Co., Ltd., windows, door trims, gas proof doors and external door trims ; Newcastle-on-Tyne and Gateshead Gas Co., gas installation ; General Electric Co., Ltd., lighting fittings ; Granwood Flooring Co., Ltd., flooring ; J. W. Gray & Son, Ltd., lightning conductor ; Gyproc Products Ltd., suspended ceiling ; Hammond & Champness, Ltd., service lifts ; Hardy & Stewart, Ltd., rolling shutters ; J. T. Leake & Co., Ltd., heating, steam and hot water installation, drainage, plumbing and cold water pipes, railings and ventilation equipment ; Lenscrete Ltd., Lenscrete panels and glass bricks ; The Lightfoot Refrigeration Co., Ltd., refrigerating plant and cold chamber ; Ragusa Asphalt Paving Co., Ltd., tanking and roofing ; N. F. Ramsey & Co. and Adrian Stokes Ltd., door furniture ; Truscon Floors, precast floors and roof ; Twisteel Reinforcement Ltd., reinforcement ; Venesta Ltd., internal flush doors ; Watson-Norie Ltd., electrical installation. The suppliers of kitchen equipemnt were Ash's Manufacturing Co., Ltd. ; Richard Crittall & Co., Ltd. ; and Rowe Bros. & Co., Ltd.

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ARCHITECTURAL DRAUGHTSMAN required at once, exempt, good draughtsman capable of preparing working drawings from sketches, surveys of existing buildings, etc. State age, experience and salary required, with name of last employer. J. S. Thomson, F.R.I.B.A., 68, Wimbledon Hill Road, S.W.19. [Architect and Consultant]. 270

JUNIOR ARCHITECTURAL ASSISTANT required for West Norfolk. Apply stating experience, age and salary required, to Box 271. Permanent position with good prospects. [Architect and Surveyor].

Architectural Appointments Wanted

Architectural Assistants and Students seeking positions in Architects' offices will be printed in "The Architects' Journal" free of charge until further notice.

KEEN AND ENTHUSIASTIC A.R.I.B.A. 17 years' experience, requires spare time work at own home. London area. Box 244.

ARCHITECTURAL PERSPECTIVE ARTIST desiring prepare works for Exhibition, free of charge, seeks Contact Architects view collaboration. Box 245.

BUILDING SURVEYOR, CLERK OF WORKS, REGISTERED ARCHITECT desires position, carried out extensive Contracts during 30 years public and private experience, practical and theoretical, also Estate Management, General Property Repairs and Maintenance; in Midlands, London and North of England; not liable for military service; rendered War Service during 1914-18. Box 248.

REGISTERED ARCHITECT, Dip. Arch. (Austrian nationality), requires position with architect in London. Interested in post-war planning and housing. Salary by arrangement. Box 249.

ARCHITECT - ENGINEER, qualified, American citizen, desires new appointment, varied experience. Box 257.

ARCHITECTURAL ASSISTANT, qualified, exempt, seeks position; wide experience of all kinds of work, including setel and R.C. framed buildings. Knowledge of quantities and surveying. Salary by arrangement. Box 258.

ARCHITECT experienced in carrying through works complete, requires position with prospects. Box 259.

ENTERPRISING AND CAPABLE ARCHITECT, B.A.(Hon.), A.R.I.B.A., wide experience, requires responsible and interesting appointment. Box 263.

YOUTH, aged 16 years, General Schools Certificate, taking evening course in Architecture, desires post in Architect's office, London area. Six months' office experience. Box 264.

QUALIFIED ASSISTANT, B.A. (Arch.), A.R.I.B.A., seeks position. Experienced in all types of work, including design and supervision of industrial and other buildings for war purposes. Salary by arrangement. Box 265.

STUDENT (24); exempt R.I.B.A. Intermediate; four years' training in fully-recognized school; knowledge of all branches of architecture; desires position in London area. Available in a month—or later. Excellent testimonials available. Box 267.

COST INVESTIGATOR AND MEASURING SURVEYOR, would like situation in Lancashire district. 18 years' experience with contractor and two years' experience with Quantity Surveyors. Box 268.

ARCHITECT, A.R.I.B.A., A.M.T.P.I., would be glad to undertake preparation of drawings in own office in Birmingham district. 15 years' experience in varied high-class work. Box 269.

Classified Advertisements continued on page xl.

ARCHITECT (registered), L.R.I.B.A. (quantity-surveyor), age 38, desires responsible position (near Birmingham), experienced, Licensed Premises, Hospitals, Factories, Housing Estates, Hotels, Land and Building Surveys, working drawings, details, specifications, bills of quantities, supervision of works and final accounts. Salary £450—£500 p.a. Box 272.

Other Appointments Vacant

Four lines or under, 4s.; each additional line, 1s.

ASSISTANT EDITOR wanted for Architectural Paper. Write, with full particulars of qualifications, salary required, &c., to Box 51.

ASSISTANT SECRETARY, preferably with some technical knowledge of the Woodworking Trade. Reply by letter only, stating age, experience and salary required to The Secretary, The English Joinery Manufacturers' Association (Incorporated), Sackville House, 40, Piccadilly, W.1. 563

RESEARCH ASSISTANT required to work on housing and prefabrication. Editing ability necessary. Full applications Box 566.

GROUP OF SURVEYORS, all members of the Chartered Surveyors Institution, would like to hear from junior Surveyors who may be interested in a new progressive firm with exceptional opportunities for post-war advancement. No appointments are contemplated immediately so that men in the services can apply with the knowledge that such applications will receive a favourable consideration. Box 565.

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Four lines or under, 2s. 6d.; each additional line, 6d.

ADVERTISER of proven ability and with valuable existing contacts with Architects, Government Departments and the building industry generally, would like to hear from progressive and well-established company requiring the services of a keen and responsible sales executive. Box 205.

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SUBSTANTIAL AND ENTERPRISING WOODWORKING FIRM, London area, is looking for SUGGESTIONS AND COLLABORATION from those who have specialized in the manufacture, sale or design of architectural or other specialized wood-work. Sports goods also considered. Preparatory work undertaken as soon as possible. Purchase of controlling interest in company complementary to the above considered. Replies should indicate the nature of the proposal, be marked "Principal" and will be treated as confidential. Box 564.

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ARCHITECT wishes to hear from established firm with practice in Kent—Maidstone, Medway, Ashford, Tonbridge—to discuss association or partnership. Box 551.

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