

THE ARCHITECTS' JOURNAL



standard contents

every issue does not necessarily contain all these contents, but they are the regular features which continually recur.

DIARY

NEWS

from AN ARCHITECT'S
Commonplace Book

ASTRAGAL

PLANNING NOTES

LETTERS

CURRENT BUILDINGS

INFORMATION

CENTRE

Physical Planning Lighting
Structure Heating & Ventilation
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No. 2525] [Vol. 97
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★ The war has both multiplied the number of Official Departments and encouraged Societies and Committees of all kinds to become more vocal. The result is a growing output of official and group propaganda. A glossary of abbreviations is now provided below, together with the full address and telephone number of the organizations concerned. In all cases where the town is not mentioned the word LONDON is implicit in the address.

AA	Architectural Association. 34/6, Bedford Square, W.C.1.	Museum 0974.
ABCA	Army Bureau of Current Affairs. Curzon House, Curzon Street, W.1.	
ABT	Association of Building Technicians. 113, High Holborn, W.C.1.	Mayfair 9400 (Extension 461). Holborn 1024-5.
APRR	Association for Planning and Regional Reconstruction. 32, Gordon Square, W.C.1.	Euston 2158-9. Welbeck 9738.
ARCUK	Architects' Registration Council. 68, Portland Place, W.1.	
ASB	Architectural Science Board of the Royal Institute of British Architects, 66, Portland Place, W.1.	Welbeck 6927.
BC	Building Centre. 23, Maddox Street, W.1.	Mayfair 2128.
BCGA	British Commercial Gas Assn. 1, Grosvenor Place, S.W.1.	Sloane 4554.
BEDA	British Electrical Development Association. 2, Savoy Hill, W.C.2.	Temple Bar 9434.
BIAE	British Institute of Adult Education. 29, Tavistock Square, W.C.1.	Euston 5385.
BINC	Building Industries National Council. 110, Bickenhall Mansions, W.1.	Welbeck 3335.
BOE	Board of Education. Belgrave Square, S.W.1.	Sloane 4522.
BOT	Board of Trade. Millbank, S.W.1.	Whitehall 5140.
BRS	Building Research Station. Bucknalls Lane, Watford.	Garston 2246.
BSA	British Steelwork Association. 11, Tothill Street, S.W.1.	Whitehall 5073.
BSI	British Standards Institution. 28, Victoria Street, S.W.1.	Abbey 3333.
CEMA	Council for the Encouragement of Music and the Arts. 9, Belgrave Square, S.W. 1.	Sloane 0421.
CPRE	Council for the Preservation of Rural England. 4, Hobart Place, S.W.1.	Sloane 4280.
CSI	Chartered Surveyors' Institution. 12, Great George Street, S.W.1.	Whitehall 5322.
DIA	Design and Industries Association. Central Institute of Art and Design, National Gallery, W.C.2.	Whitehall 7618.
DOT	Department of Overseas Trade. Dolphin Square, S.W.1.	Victoria 4477.
EJMA	English Joinery Manufacturers Association (Incorporated), Goring Hotel, Grosvenor Gardens, S.W.1.	Victoria 9787-88.
FMB	Federation of Master Builders. 23, Compton Terrace, Upper Street, N.1.	Canonbury 2041.
GG	Georgian Group. 55, Great Ormond Street, W.C.1.	Holborn 2664.
HC	Housing Centre. 13, Suffolk Street, Pall Mall, S.W.1.	Whitehall 2881.
LAAS	Incorporated Association of Architects and Surveyors. 75, Eaton Place, S.W.1.	Sloane 3158.
ICE	Institution of Civil Engineers. Great George Street, S.W.1.	Whitehall 4577.
IEE	Institution of Electrical Engineers, Savoy Place, Victoria Embankment, W.C.2.	Temple Bar 7676.
IHVE	Institution of Heating and Ventilating Engineers. 21, Tothill Street, S.W. 1.	Whitehall 9609.
IRA	Institute of Registered Architects. 47, Victoria Street, S.W.1.	Abbey 6172.
ISE	Institution of Structural Engineers. 11, Upper Belgrave Street, S.W.1.	Sloane 7128-29.
ISPH	Committee for the Industrial and Scientific Provision of Housing. 3, Albemarle Street, W.1.	Regent 4782-3.
LIDC	Lead Industries Development Council. Rex House, King William Street, E.C.4.	Mansion House 2855.
LMBA	London Master Builders' Association. 47, Bedford Square, W.C.1.	Museum 3767.
MARS	Modern Architectural Research. 8, Clarges Street, W.1.	Grosvenor 2652.
MOH	Ministry of Health. Whitehall, S.W.1.	Whitehall 4300.
MOI	Ministry of Information. Malet Street, W.C.1.	Euston 4321.
MOLNS	Ministry of Labour and National Service. St. James' Square, S.W.1.	Whitehall 6200.
MOS	Ministry of Supply. Shell Mex House, Victoria Embankment, W.C.2.	Gerrard 6933.
MOT	Ministry of Transport. Berkeley Square House, Berkeley Square, W.1.	Abbey 7711.
MOTCP	Ministry of Town and Country Planning. 32-33, St. James's Square, S.W.1.	
MOW	Ministry of Works. Lambeth Bridge House, S.E.1.	Reliance 7611.
NBR	National Buildings Record. 66, Portland Place, W.1.	Welbeck 1881.
NFBTE	National Federation of Building Trades Employers. 82, New Cavendish Street, W.1.	Oxford 48809.
NFBTO	National Federation of Building Trades Operatives. 9, Rugby Chambers, Rugby Street, W.C.1.	Langham 4041.
NT	National Trust for Places of Historic Interest or Natural Beauty. 7, Buckingham Palace Gardens, S.W.1.	Holborn 2770.
PWB	Post War Building, Directorate of. Ministry of Works, Lambeth Bridge House S.E.1.	Sloane 5808.
RC	Reconstruction Committee RIBA. 66, Portland Place, W.1.	Reliance 7611.
RCRA	Reinforced Concrete Association. 91, Petty France, S.W.1.	Welbeck 6927.
RS	Royal Society. Burlington House, Piccadilly, W.1.	Whitehall 9936.
RSA	Royal Society of Arts. 6, John Adam Street, W.C.2.	Regent 3335.
SPAB	Society for the Protection of Ancient Buildings. 55, Great Ormond Street, W.C.1.	Temple Bar 8274.
TCPA	Town and Country Planning Association. 13, Suffolk Street, S.W.1.	Holborn 2646.
TDA	Timber Development Association. 75, Cannon Street, E.C.4.	Whitehall 2881.
TPI	Town Planning Institute. 11, Arundel Street, Strand, W.C.2.	City 6147.



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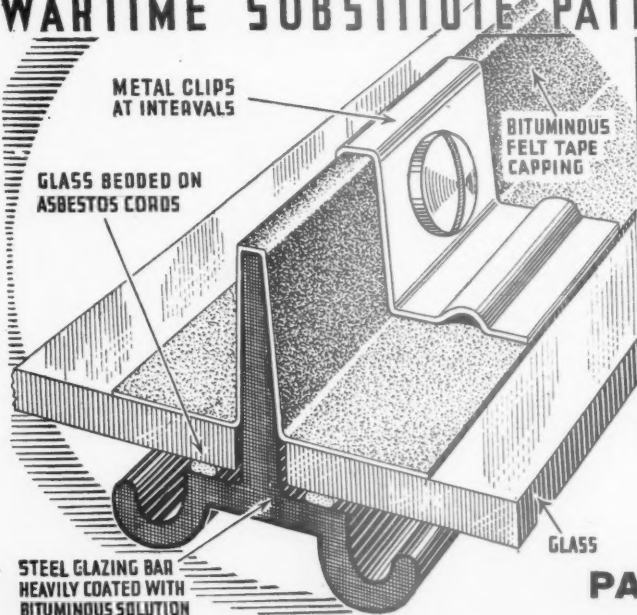
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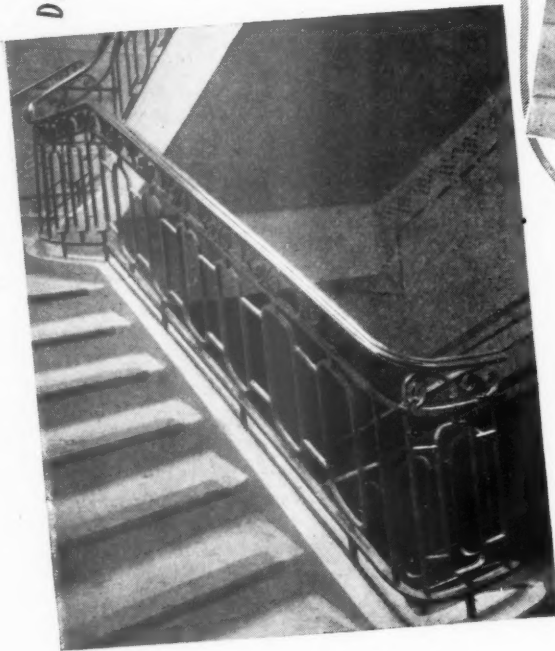
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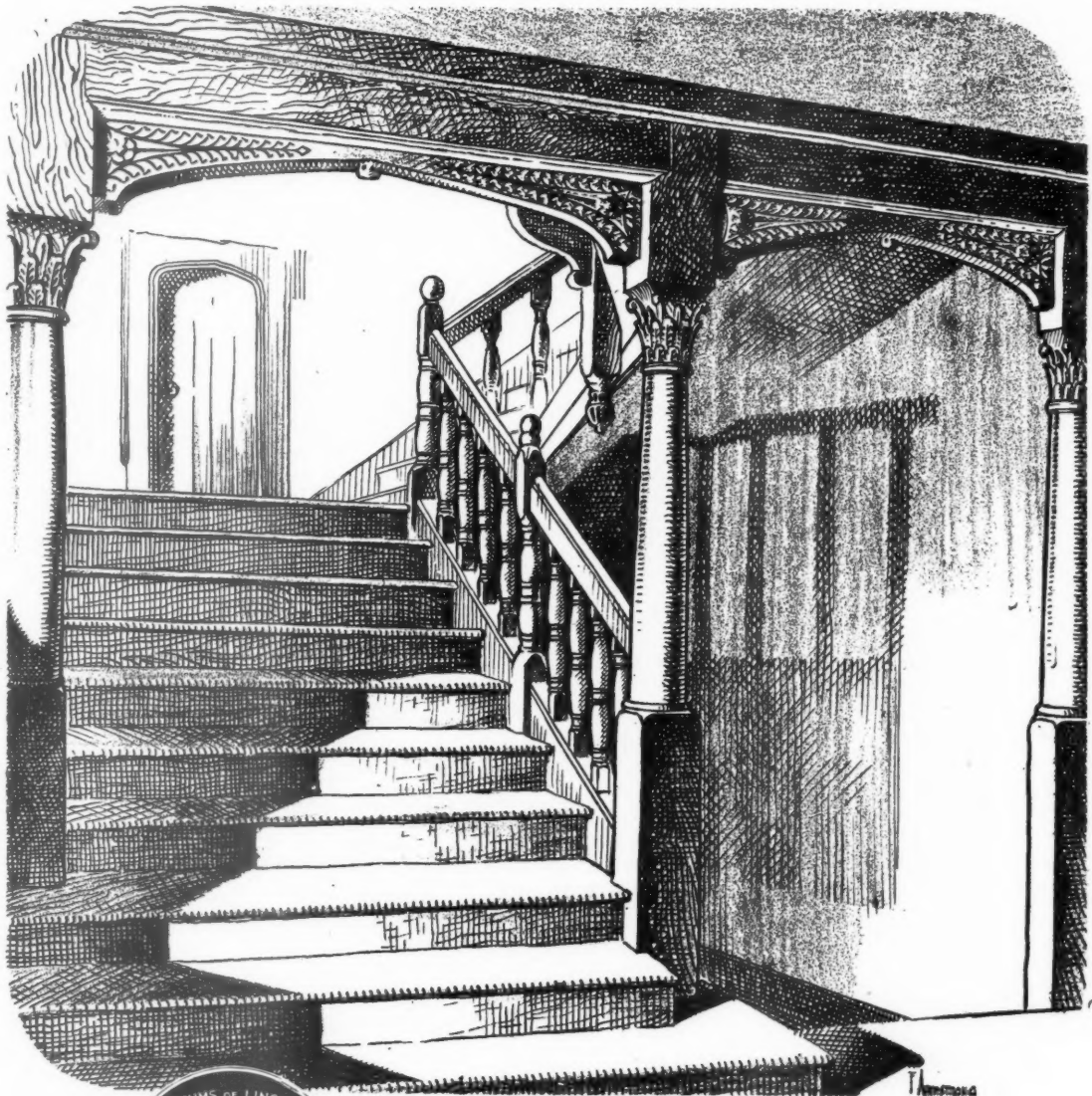
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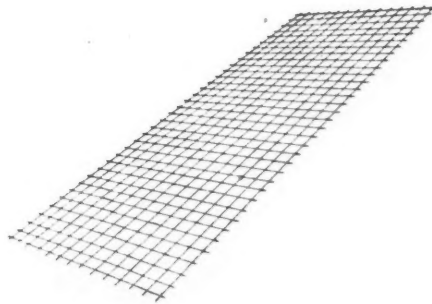
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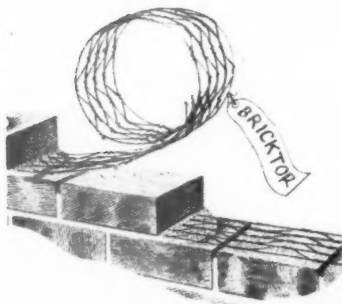
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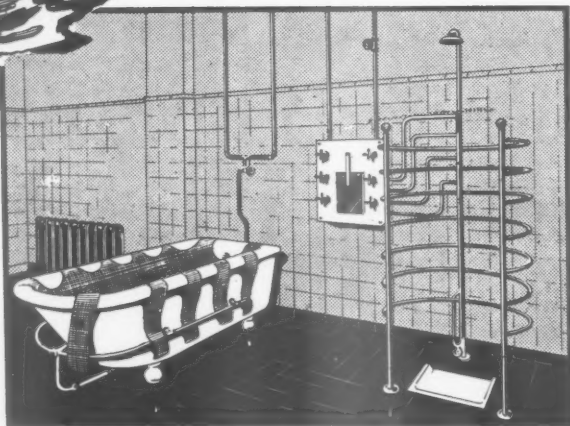
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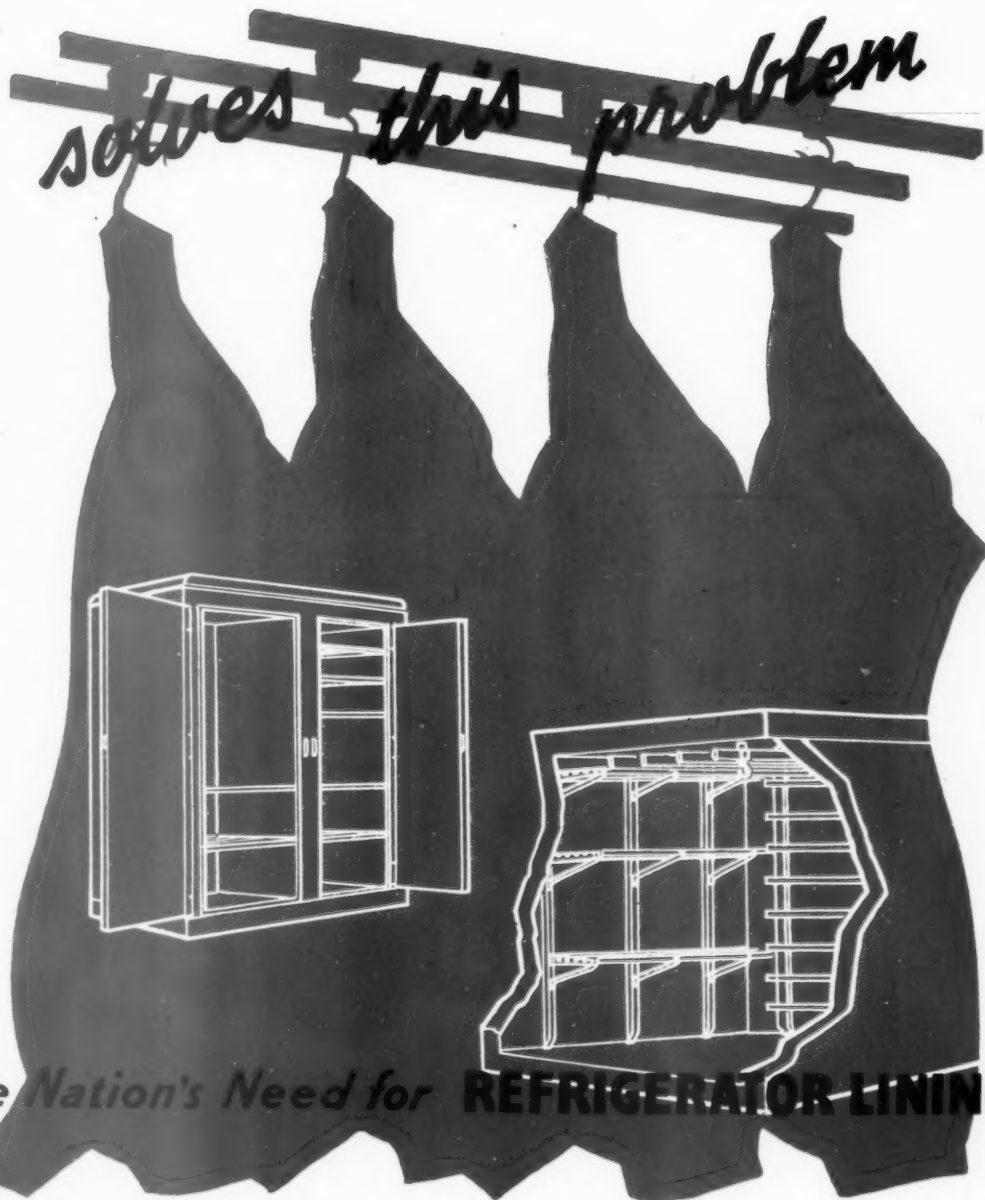
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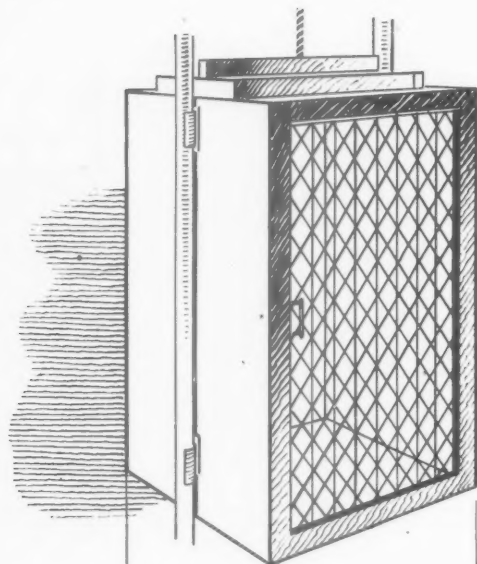


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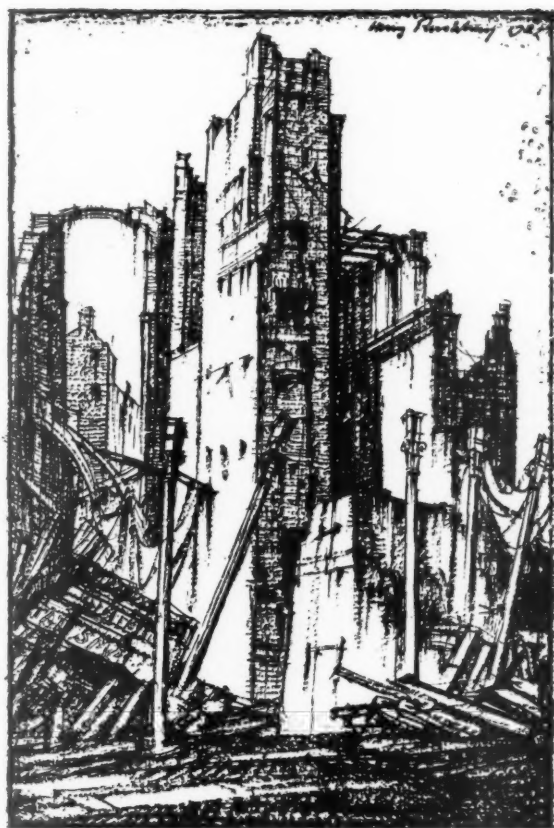
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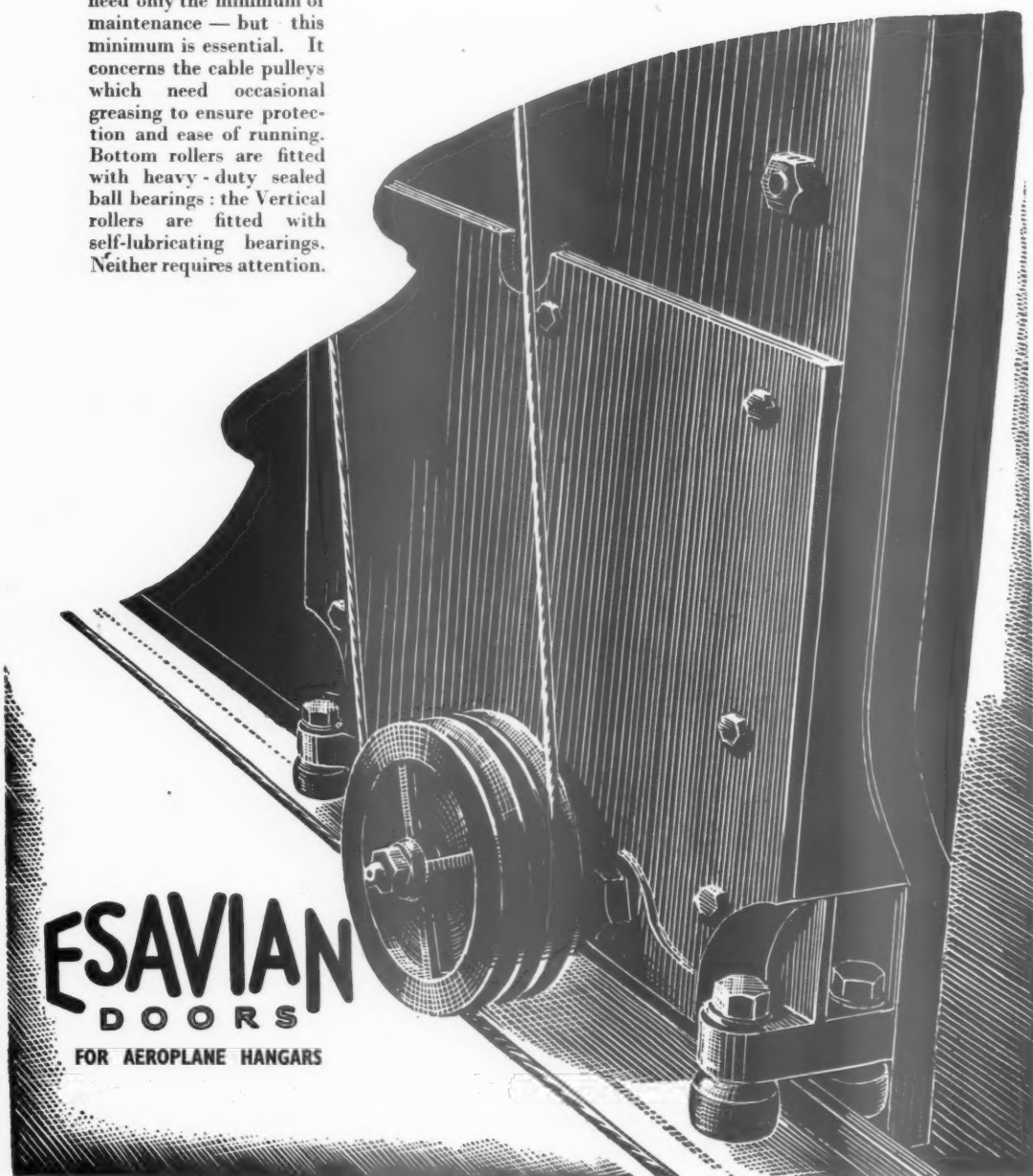
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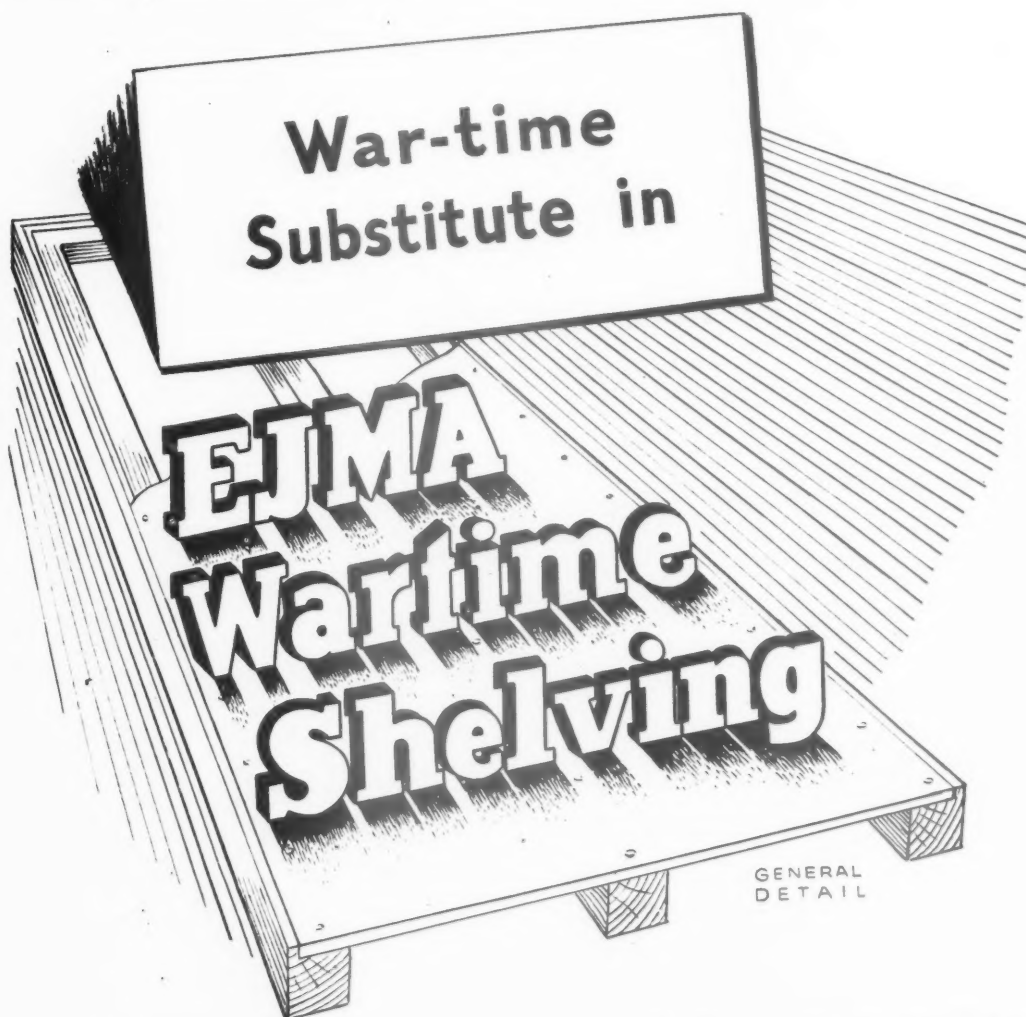
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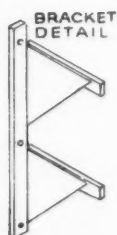
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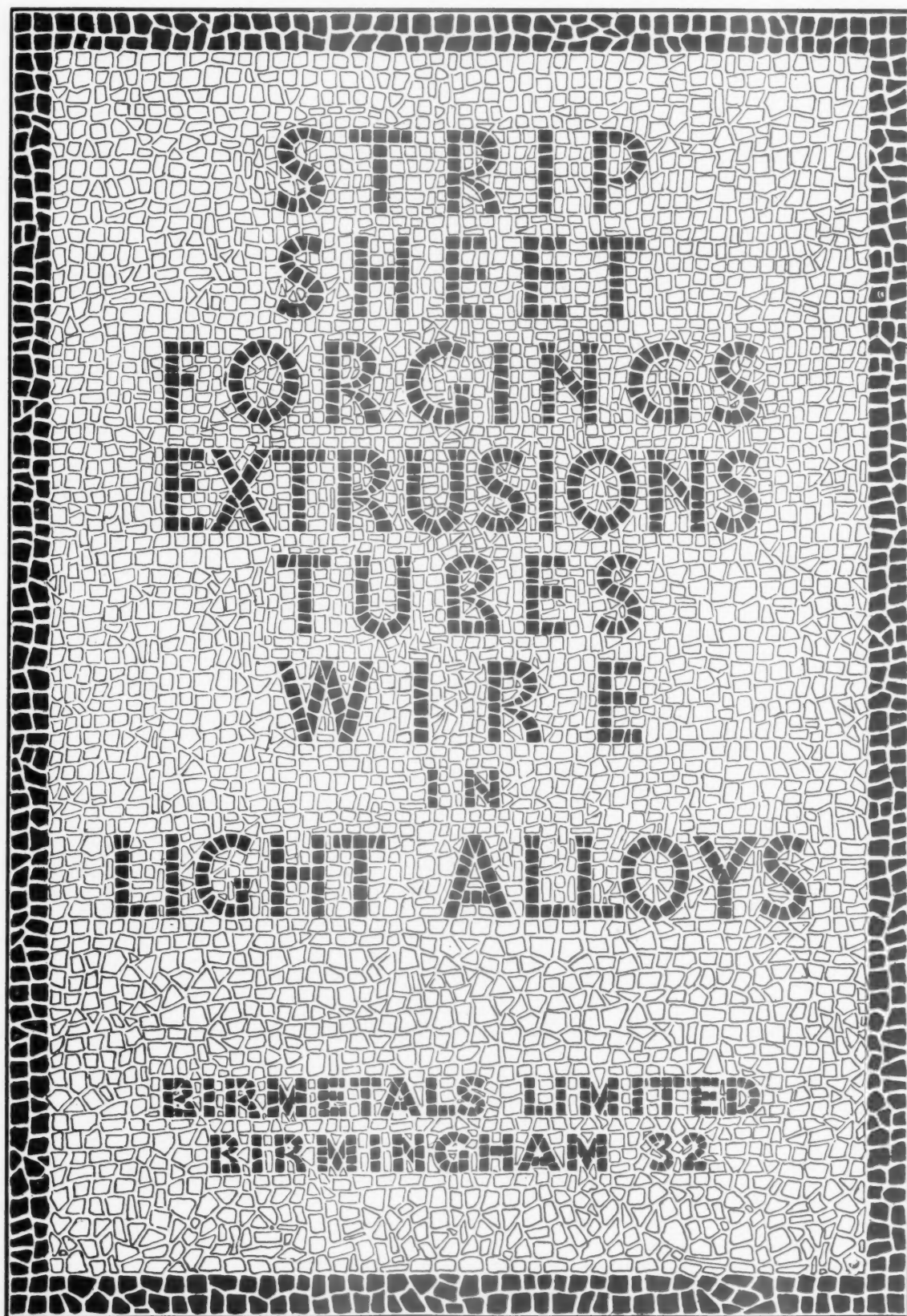
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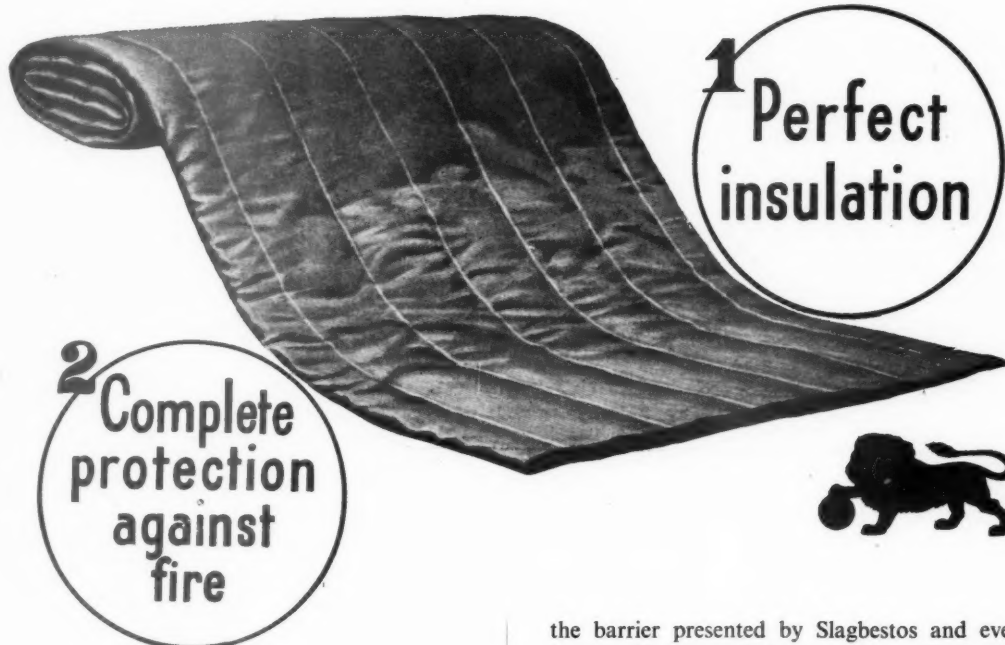


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In common with every other periodical this JOURNAL is rationed to a small part of its peacetime needs of paper. Thus a balance has to be struck between circulation and number of pages. We regret that unless a reader is a subscriber we cannot guarantee that he will get a copy of the JOURNAL. Newsagents now cannot supply the JOURNAL except to a "firm order." Subscription rates: by post in the U.K. and Canada, £1. 3s. 10d. per annum; abroad, £1. 8s. 6d. Special combined rate for ARCHITECTS' JOURNAL and ARCHITECTURAL REVIEW in the U.K. and Canada, £2. 6s.; abroad, £2. 10s. Single copies, 6d.; post free, 8d. Special numbers are included in subscription; single copies, 1s.; post free, 1s. 3d. Back numbers more than 12 months old (when available), double price. Volumes can be bound complete with index, in cloth cases, for 12s. 6d. each; carriage 1s. extra. Goods advertised in the JOURNAL, and made of raw materials now in short supply, are not necessarily available for export.

NEWS

THURSDAY, JUNE 17, 1943
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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.

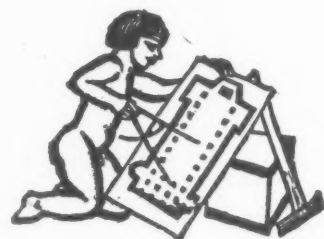
★ means spare a second for this it will probably be worth it.

★★ 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.

Former Director-General of Roads in the Transport Ministry, SIR HENRY MAYBURY, HAS LEFT £72,372. He died intestate: letters of administration have been granted to his son Harry P. Maybury, of Prestbury, Cheshire, and his daughter Mrs. Lizzie S. Killick, Bayworth Manor, Abingdon.

Mr. Henry Strauss, Parliamentary Secretary to MOTCP, addressing the Chelsea Society in London said that Bedford Square and QUEEN ANNE'S GATE OUGHT TO BE PRESERVED beyond any shadow of doubt in any future London rebuilding plans. He thought that never again will any central planning authority allow another square to be treated as St. James's Square has been treated in our lifetime. He said that the Temple should be rebuilt, but St. Paul's must not be hemmed in again with buildings. One of the biggest requirements of good planning is the segregation of through traffic from the places where people live and play.



DIARY FOR JUNE-JULY

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

ABERYSTWYTH. *Town and Country Planning Association Conference.* 11 a.m. to 5 p.m. JUNE 19

BLACKWOOD, MON. *Your Inheritance Exhibition.* (Sponsor, HC.) JUNE 17 to JULY 1

BRADFORD. *Town and Country Planning Association Conference.* 11 a.m. to 5 p.m. JUNE 26

CHRISTCHURCH. *Living In Cities Exhibition.* (Sponsor, BIAE.) JUNE 28—JULY 5

EPSOM. *Your Inheritance Exhibition.* At the School of Art. (Sponsor, HC.) JUNE 17 to 30

GATESHEAD. *Englishman Builds Exhibition.* At Shipley Museum and Art Gallery. (Sponsor, BIAE) JUNE 21 to JULY 4

GIBRALTAR. *Living in Cities Exhibition.* JUNE

LEICESTER. *Homes to Live In Exhibition.* At the Museum and Art Gallery. (Sponsor, BIAE). Brains Trust. JUNE 19, 1 p.m. JUNE 17 to 27

LONDON. *Royal Academy's Summer Exhibition.* In Burlington House, Piccadilly. 9.30 a.m. until 7 p.m. Weekdays; 2 p.m. until 6 p.m. Sundays. Admission one shilling. JUNE 17 to AUGUST 7

Exhibition of the work of the London Regional Reconstruction Committee. At the National Gallery. The LRRC is a Committee appointed by the Council of the RIBA, with 12 members from the Institute and the AA respectively. It has been at work for nearly two years on the problems of reconstruction and post-war planning for the London Region. The latter for the purposes of the Committee's work has been defined as C.D. Region No. 5, the area of which is about 850 sq. miles, with a population of about 8,500,000. The exhibition consists of proposals for a Regional Plan illustrated by plans and a plan-model to a scale of 6 in. to 1 mile. Many other drawings and diagrams are exhibited to illustrate particular problems of the Region, such as transport, and to demonstrate the principles upon which the Committee has based its proposals. A Historical Section is included in the exhibition. (See A.J., June 10). The Second Interim Report of the Committee, contains illustrations and form a comprehensive survey of the work of the Committee and of the exhibition. JUNE 17 to JULY 10

Rebuilding Britain Exhibition. At Royal Exchange. Open at 1.45 p.m. Monday to Friday; 10 a.m. to 12 noon Saturdays.

Verner O. Rees. *Twentieth Century London.* At the Greater London—Towards a Master Plan Exhibition, National Gallery. Chairman: Henry Braddock. (Sponsor, LRRC.) 5 p.m. JUNE 21

The March Towards Freedom from Want Exhibition. At HC, 13, Suffolk Street, S.W.1. Exhibition by the Civil Service Clerical Association to illustrate The Beveridge Plan. JUNE 21 to JULY 3

Members of the Birmingham and District Branch of IHVE. Submission of technical data on *Vertical Temperature Gradients in Factory Buildings Heated by Unit Heaters.* At 21, Tothill Street, S.W.1. (Sponsor IHVE). 6 p.m. JUNE 22

Mrs. H. Hichens. *Industry in the Country.* At 13, Suffolk Street, S.W.1. (Sponsor, HC). 12.45 p.m. JUNE 22

H. V. Lanchester. *Life in Reconstructed London.* At the Greater London—Towards a Master Plan Exhibition, National Gallery. Chairman: Frederick R. Hiorns. (Sponsor, LRRC). 5 p.m. JUNE 23

Professor Ernest Barker. *Social Background of Town Planning.* At 1, Grosvenor Place, S.W.1. 1.15 p.m. (Sponsor, TCPA). JUNE 24

Frederick R. Hiorns. *Factors in Urban Planning.* At the Greater London—Towards a Master Plan Exhibition, National Gallery. Chairman: H. V. Ashley. (Sponsor, LRRC). 5 p.m. JUNE 28

Michael Waterhouse, Hon. Secretary, RIBA. *The Activities of the RIBA during the War, and the Place of the Architect in the Post-War World.* At the RIBA, 6 p.m. Sponsor, RIBA. JUNE 29

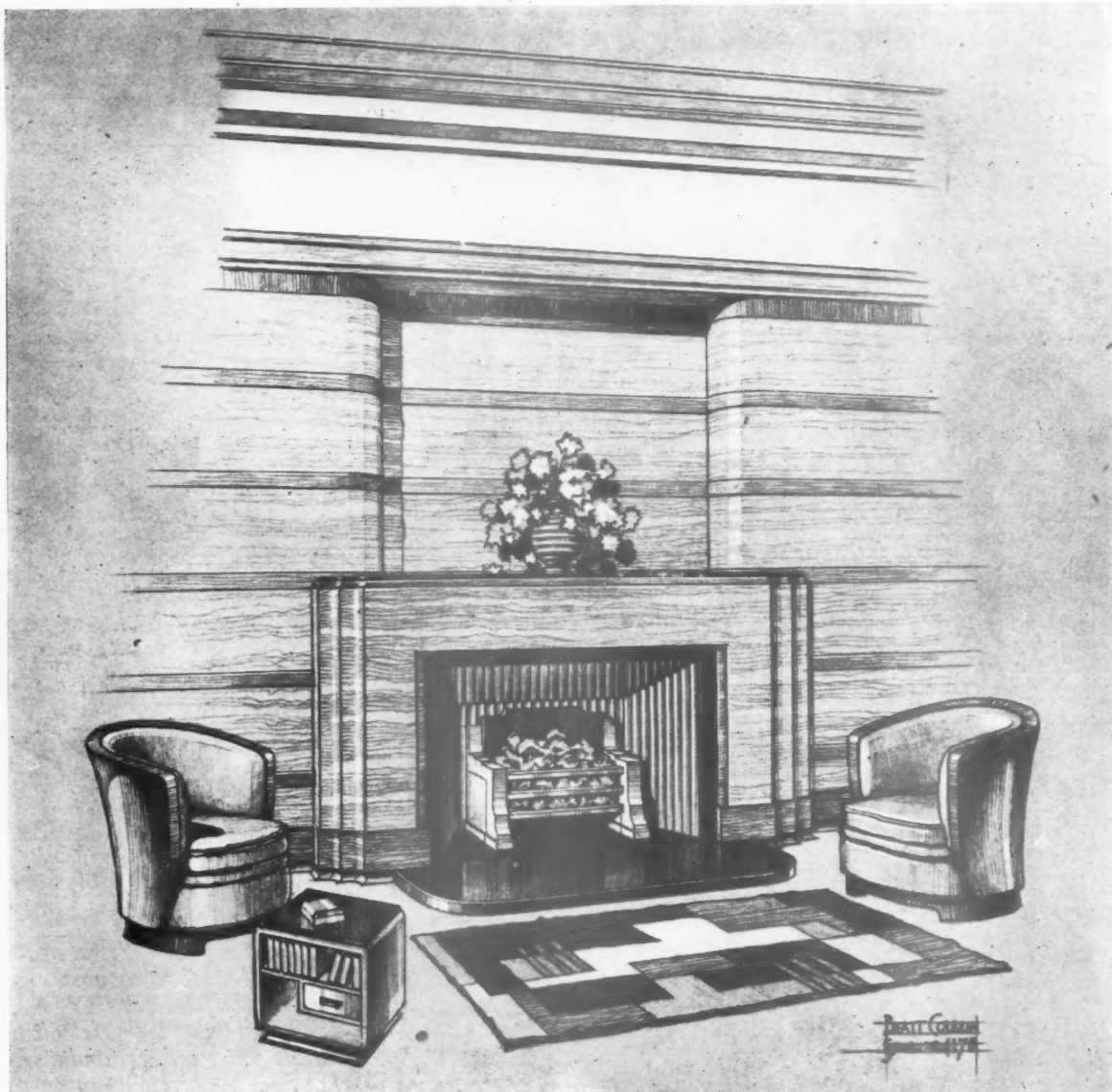
L. C. White, General Secretary, Civil Service Clerical Association. At 13, Suffolk Street, S.W.1. *Social Security and Democracy.* (Sponsor, HC.) 12.45 p.m. JUNE 29

Stanley Hamp. *The South Side: London's Opportunity.* At the Greater London—Towards a Master Plan Exhibition, National Gallery. Chairman: Arthur W. Kenyon. (Sponsor, LRRC). 5 p.m. JUNE 30

MARKET DRAYTON. *Living In Cities Exhibition.* (Sponsor, BIAE.) JUNE 26 to JULY 10

RUGBY. *Your Inheritance Exhibition.* At the School of Art. (Sponsor, HC.) JUNE 25 to JULY 2

WREXHAM. *TCPA Conference.* At the Guildhall. (Sponsor, TCPA.) 11 a.m. to 5 p.m. JULY 17



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THE NEW NOMADISM. [*From Housing Production ; the First Report of the Committee for the Industrial and Scientific Provision of Housing.*] There is a strong tendency in Western Civilisation for individuals and families to become rooted to a locality. This became in time almost a social virtue, although it is arguable that this attitude was fostered owing to its economic advantages to the more important members of the feudal hierarchy. In any case, it has become among the older generation a deeply rooted instinct and therefore prejudicial to the idea of limitation of life (of houses). It is probable, however, that this rooting instinct received a rude shock during the last war. Millions were then uprooted and tasted the pleasures and excitements of changing environment and still more millions will go through the same experience in this war. Many of our war-time camps and factory hostels, hospitals and so forth are of a style and character which will create new requirements of space and æsthetics in the minds of those inhabiting them and, again, this movement without personal responsibility and without possessions is bound considerably to revalue the attitude towards permanence. Thus it becomes clear that at the end of the war, we shall be faced with two classes of population : those who wish to stay put and those who are willing, if not eager, to be without those roots which they feel will inhibit change and development.

Clydeside shipyard workers are threatening a "TOKEN STRIKE" TO PROTEST AGAINST LOCAL HOUSING conditions, Mr. Kirkwood said in the House of Commons.

He was speaking in a debate on Scottish health and housing, in which Scottish members of all parties demand emergency measures to increase housing accommodation. Cmdr. Galbraith said it will take 32 years at the pre-war rate of building to build the 100,000 houses required, and it will then be found that an additional 165,000 will be needed because of dilapidations. Mr. Tom Johnston, Secretary for Scotland, who opened the debate, said he sympathized with the anxiety felt, but the war has retarded provision of new houses. Mr. Westwood, Under-Secretary for Scotland, replying to the debate, said that the Government are planning to build 50,000 houses a year for 10 years after the war.

Lord Hirst, chairman of the General Electric Co., who BEGAN WITH A SMALL SHOP in London where he sold electrical fittings, has left £498,650 (net £391,883), on which death duties were £152,853. In his will two-fifths of the residue of his estate is left to each of his daughters, and one-fifth on trust for his granddaughter, Pamela Collyer. Bequests include £1,000 to the RAF Benevolent Fund.

Mr. Ernest Brown, Minister of Health, stated in the House of Commons that the Government has in contemplation a ten-year programme of house construction, which will include about THREE HUNDRED THOUSAND COTTAGES FOR AGRICULTURAL WORKERS, to cover all needs including the replacement of unfit property and other needs. In reply to other questions concerning agricultural cottages, the Minister stated that

by May 28 sites had been selected and approved for 2,734 houses, and plans approved for 1,624. Tenders for substantial numbers are expected soon. There is a mass of detailed work to be done to get to the point where tenders can be approved, and the selection of sites in 382 rural districts has meant a considerable amount of hard, detailed work. In view of the importance of the price of houses, acceptance of tenders requires his approval. A number of tenders have now been received from districts throughout the country and he hopes shortly to be in a position to announce the decision of the Government in regard to them.

Miss F. Horsbrugh, Parliamentary Secretary to MOH, stated in the House of Commons that in Monmouthshire and IN WALES THE AGRICULTURAL WORKERS' HOUSES TO BE BUILT TOTAL three hundred and twenty-eight.

Miss Horsbrugh stated that the arrangement whereby the houses are to be built was made in conjunction with MOA through its Central War Executive Committee.

Addressing the Engineering Industrial Association, Mr. Ralph Assheton, Financial Secretary to the Treasury, said that unless we are very careful the STATE MAY TAKE TOO MUCH UPON ITSELF, and give the impression that it is able to plan much more than is possible.

There will, he said, be the great risk that some of these State plans will throttle enterprise and stop business men from making plans for their own businesses. We wanted to build a world where all could become owners of property.

Plans for a big expansion of the schools meals service announced by Mr. R. A. Butler, President of BOE, include the provision of complete, FULLY EQUIPPED KITCHENS FREE OF CHARGE to local education authorities.

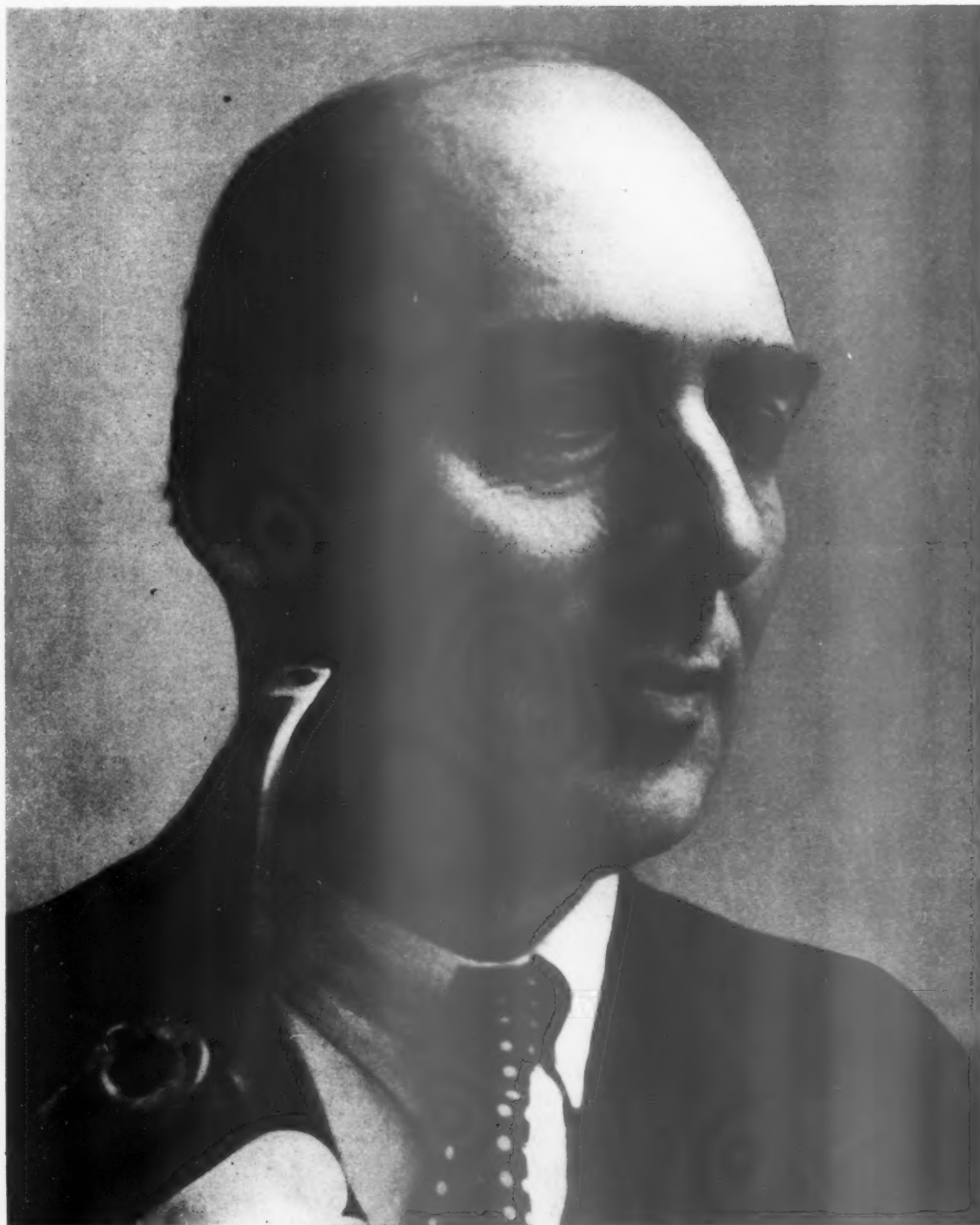
Arrangements, he said, are being made for MOW to undertake building work including the adaptation of school buildings and the provision of sculleries and small kitchens where needed. All capital expenditure to which authorities are committed after May 1 will be met in full by the Government, and all canteen equipment provided free of charge.

We regret to record the DEATH OF WILLIAM WALCOT, F.R.I.B.A., R.E., architect, painter and etcher.

Born in Russia in 1874, the great-grandson of John Walcot, of Worcester, solicitor, he was educated in Paris and at the Imperial Academy of Art, St. Petersburg. His first exhibition in London was in 1908. Among his publications were *Architectural Water Colours and Etchings of William Walcot*, and *Etchings of Frank Brangwyn and William Walcot*. He was a director of, and very closely connected with, the Architectural Press, Ltd. His recreations were archaeological research and travel.

A resolution carried unanimously by the Council of LMBA CALLS ON THE GOVERNMENT to make known at the earliest possible date its decisions on the Scott, Uthwatt, and Barlow Reports.

OWING TO THE HEAVILY INCREASED COSTS CAUSED BY THE WAR THE PUBLISHERS OF THE JOURNAL HAVE BEEN FORCED TO RAISE ITS PRICE TO NINEPENCE AS FROM THE ISSUE OF JULY 1. AT THE SAME TIME THE ANNUAL SUBSCRIPTION RATE WILL BE INCREASED TO £1/15/-



Executive Officer of the ISPH

Trained as a shipbuilding and aircraft engineer, Mr. Raymond Perry was engineer and armament officer in the RAF until 1929. From then on he was a student and practitioner of industrial economics and administration, and until 1941 he knew nothing about architecture or building. But he then decided to rebuild his own farm himself. The technical and other difficulties which he experienced, combined with excessive cost and delay, lacerated hands and crushed toes, stimulated his interest in the use of the machine in, as he expresses it, "the enclosure of space for human consumption." There followed correspondence with the JOURNAL and a thesis on the research and in-

dustrial organization necessary for producing factory-made houses. From this the *Committee for the Industrial and Scientific Provision of Housing*, whose first report has just been published, was born. With Mr. Perry on the ISPH Committee are the Chairman, Mr. Harry Weston, former Chairman of Coventry's Housing Committee, and a number of architects, engineers and others, including Ove Arup, Denis Clarke Hall, R. A. Duncan, D. E. E. Gibson, G. L. Greaves, Max Lock, C. A. Minoprio, Howard Robertson, and H. J. Spiwak. The first report of the Committee forms the subject of this week's leading article, and extracts from it appear on pages 402 to 404.

★
Last week, at a meeting of T CPA, the Earl of Lytton, President of the Association, PRESENTED THE HOWARD MEMORIAL MEDAL TO PROFESSOR PATRICK ABERCROMBIE, M.A., F.R.I.B.A., for his distinguished services to planning.

In his speech in honour of Professor Abercrombie, the Minister of Town and Country Planning, Mr. W. S. Morrison, said: It is no extravagance to say that Professor Abercrombie is the foremost exponent of the art and science of town and country planning in this country to-day. As a practising planner he has probably put forward more proposals for the planning and betterment of our land than any other Englishman living. A monumental and still-growing series of plans and reports bears his name and is a remarkable testimony to his energy and labours, no less than to his imaginative power and skill. To-day many new plans are being made in preparation for peace; and in this work Professor Abercrombie is playing a leading part. His name is associated with the reconstruction plans of several of our towns (Plymouth, Hull and Dublin), but above all, we think of him in connection with the planning of London and the Greater London region. That he should, now, at this stage of his career, have shouldered this most onerous of tasks, bespeaks in a remarkable manner the vitality, imagination and belief in the powers of good example which have characterized all his work. I believe that when the plan for the County of London is published, we shall find that its imaginative scale and the fundamental nature of its proposals will make a landmark in planning history. "For me it is a great personal pleasure to pay tribute to Professor Abercrombie on your behalf as well as on my own."

Mr. W. H. Forsdike, chairman of the National Joint Council for the Building Industry, has been elected TO REPRESENT NFBTE ON THE MOW ADVISORY COUNCIL in place of the late Mr. G. H. Parker, C.B.E.

The Federation's other representatives on the Council are the President, Mr. Leslie Wallis, and the Director, Sir Jonah Walker-Smith. Mr. Forsdike is a past president of the Yorkshire Federation of Building Trades Employers, and has been on the Council of the National Federation for the past fifteen years. He was President of the Institute of Builders from 1937-1940.

The West Yorkshire Society of Architects has awarded BEDFORD SCHOLARSHIPS FOR MEASURING BUILDINGS to the following student members:

A. Brunton, R. T. Clough, H. H. Craft, A. G. East, B. W. Grocock, S. Heaton, R. C. Marshall, J. L. Midgley, F. A. Nuttall, and D. B. Roy. The scholarships are awarded from funds provided under the terms of a bequest from the late Mrs. Ellen Brown Bedford. Successful candidates are required to measure buildings in the West Riding and to prepare careful drawings as records. With one exception all the candidates are students in the Leeds School of Architecture, Leeds College of Art, but their homes are in many parts of the Riding.

MAKE HOMES BY MACHINE

BY far the biggest and most urgent job in post-war reconstruction will be the provision of new homes. We shall have not only to make good the time lag and the destruction caused by the war, but we shall have to tear down and rebuild those millions of hovels built over the past century in which the major part of the British people still live to-day. The Government itself has agreed that no fewer than four million houses will have to be built as soon as possible, and this is obviously a very conservative estimate.

It is clear that the building industry as now constituted and the traditional manner in which the Government apparently intends to reconstitute it after the war cannot possibly alone supply enough properly equipped houses at the speed which will be needed. Building will have to be tackled in an entirely new way if the people of this country are to have adequate shelter and those amenities which can so easily be provided with proper organisation and the full use of modern technical resources. There is one solution only to the problem of post-war housing. It can be expressed in three words—Use the Machine.

Only to a very limited extent has the machine been applied to housing. Sweden has for many years produced prefabricated timber houses, and during this war many thousands of temporary homes have been built for war workers in the USA of large, mass-produced, precision-built parts, but in this country so-called prefabrication in building has been applied only for the use of soldiers, motor-cars and chickens. It is strange that whereas the machine with its tremendous advantages has been fully used to produce most of the other appurtenances of living, houses themselves retain forms of construction and character belonging to a defunct age of handicrafts. Prejudice is to blame for this probably far more than vested interests, for the Cotswold cottage fetish dies hard.

Once again private initiative, and not the Government, takes the lead in showing us in a very practical way how to begin to apply the solution to the housing problem. In November 1941 an organisation was formed, called the Committee for the Industrial and Scientific Provision of Housing, to "enquire into the nature of a body to investigate and promote the use of alternative methods of building with particular reference to the introduction of mechanised production methods." The committee, whose work is voluntary, is mainly composed of a group of well-known architects and engineers.

As the result of the investigation by the committee of some hundreds of different systems and items of the mechanised production of houses, a number of inter-related problems emerged. The committee has analysed these problems and canvassed them in relevant industrial and professional circles. The resultant findings are contained in a report* just issued

*Housing Production or the Application of Quantity Production Technique to Building; Its Social, Commercial and Technical Possibilities and Requirements; being the First Report of the Committee for the Industrial and Scientific Provision of Housing (3, Albemarle Street, London, W.1. Price 5/-). Extracts from this Report appear on pages 402 to 404.

by the committee which is obviously the outcome of a great deal of research and hard thought. The report deals with the problems arising from the factory-production of houses such as those of technique, industrial organisation, marketing, costing, æsthetics and society, labour relations and legislation. The committee's conclusion is that "in view of the shortage of houses and the depletion of the number of building operatives available immediate steps must be taken to initiate the use of mechanised production methods."

The ISPH proposes the establishment of a Housing Production Council whose objects *inter alia* will be to promote the use of contemporary production methods in the provision of housing, to promote research, to investigate modular planning or dimensional co-ordination, and to be a reference organisation for the exchange of information and opinion on new methods and materials in building between those Governmental, professional, trading and sociological bodies concerned. A public relations campaign on a large scale will also form an important part of the work of the Housing Production Council to convince not only the public but also various bodies connected with building and industry of the practicability and desirability of factory-produced houses. A number of interests in the traditional building industry, including the trade unions, may, for instance, raise strong opposition to the aims of the Council. It will be necessary to convince them that the interests of building trades operatives can be reconciled with the social benefits which factory production can bring to the community, and that for many years to come there will be ample full-time occupation for every available skilled man in the building industry. Moreover, if, as the committee suggests with some reason, factory-produced houses should be designed to have a definitely limited life, thus becoming consumer goods rather than capital goods, the traditional building industry will be able to concentrate on the many permanent types of structure which will be needed. The ISPH report is an important document, not only because of its thorough and practical analysis and proposals but because of its implications. The Machine has come to stay and the more fully and gladly we accept it the better. Until man accepts and adjusts himself to his new technological environment, he can but expect a repetition of his present sufferings. The ISPH report shows how to apply the machine to the provision of one of the three essentials of human life. Mechanisation can now fully provide these essentials for all and can thus create the foundation for a new, living and universal culture, for as Gropius wrote in his *New Architecture and the Bauhaus*, "Were mechanisation an end in itself, it would be an unmitigated calamity, robbing life of half its fullness and variety by stunting men and women into sub-human, robot-like automatons. But in the last resort mechanisation can have only one object: to abolish the individual's physical toil of providing himself with the necessities of existence in order that hand and brain may be set free for some higher order of activity."



The Architects' Journal

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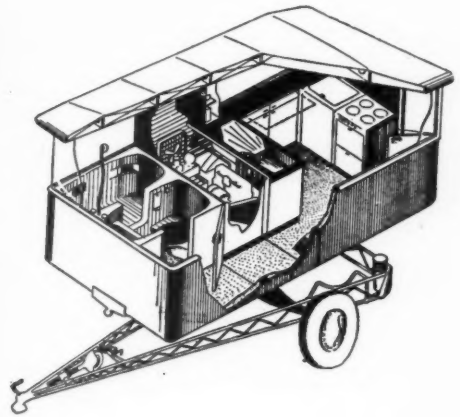
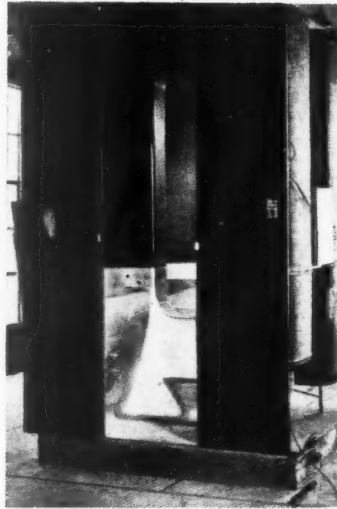
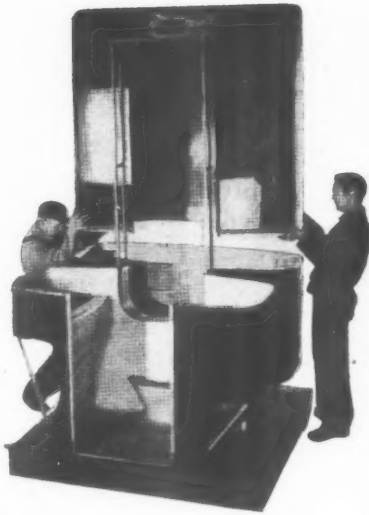
N O T E S & T O P I C S

THE VICIOUS SPIRAL

Impressive as the Report of the Committee for the Industrial and Scientific Provision of Housing is, it is surprising to discover what might be thought by some to be an implied contradiction in its arguments on a point of economics. Whereas the report states "the application of mechanised production methods must be in terms of man hours, machine hours and materials rather than in pounds, shillings and pence," it also claims that, if savings "can be diverted into gradual absorption by the provision of houses, the tendency to inflation, already palpable, will be considerably decreased." A simple mind, uninitiated into the mysteries of finance, would hold that, if money were made to act purely as an accurate measure of real wealth, it could not possibly either inflate, deflate, reflate or disappear in the spectacular manner it does. The following recent personal experience, however, will show how real and terrible a thing inflation can be.

★

I went to a shop to buy one egg. The grocer said he could not supply one as his whole stock of eggs had inflated overnight, and he pointed sadly to a sticky mass of what appeared to be smashed ostrich eggs. But worse was to follow. On returning home I found my house in ruins. Apparently a bomb had fallen, but a warden informed me that the house had inflated suddenly and without warning. The walls had expanded outwards and



Left and centre: An all-metal, four-piece prefabricated bathroom, designed by Buckminster Fuller and built experimentally by the Phelps-Dodge Research Laboratory in 1937. The unit contains a bath-tub, basin and water closet. The entrance is through a sliding door set in a facing panel of plastic-surfaced plywood. The rest of the shell is left unfinished on the outside and would be enclosed by ordinary partitions. Each of the four parts is small enough to be moved through an ordinary door. Right: Fuller's proposal for a portable mechanical core, incorporating the bathroom in a trailer-like unit including kitchen and heat-light-power unit. See Astragal's note below.

the floors had collapsed. The staircase still stood, but it had assumed a spiral form and was soaring viciously towards the cosmos.

★

Is sufficient concern in official and building circles being shown over this serious question of inflation? Another name should surely be added to the list of MOW's Post-war Study Committees—the Committee for the Prevention of Inflation in Building. Or should this matter be considered by another, more puissant, Government Department?

THE MECHANICAL CORE

It was disappointing not to find in the ISPH Committee's report any illustrations of examples of prefabrication—a term, by the way, which the committee deprecates as being an inaccurate description of quantity production of housing but one which by now is bound to stay. The report would have been more stimulating with illustrations. The committee, however, is at present reserving all the data it has acquired of existing systems in a special technical report which is available only to subscribers. The American architectural papers have shown us more pictures of prefabricated houses and equipment than any other publications. The *Forum*, for instance, has published over

eighty-five illustrated articles on prefabrication since 1932 and is now running a special series on the subject.

★

The illustrations at the top of the page have been culled from the January number of the *Forum* and they are of interest in showing an experimental form of mechanical core, including a bathroom unit, which were designed by Buckminster Fuller for the Phelps-Dodge Research Laboratory in 1937.

★

A house, Fuller says, has two jobs to fulfil—to house people, and to house utilities. The traditional house offers no special provision for utilities. We have added plumbing, heating and other equipment to a form of structure designed before such utilities were in use—a principle that has come to be described in language borrowed from the motor car industry as a separation of motor and chassis. Fuller has proposed that all the equipment for a house be prefabricated, installed in a trailer and wheeled to a structure after it is completed. Here in the complete prefabricated mechanical core, obviously lies the most scope for quantity production in post-war building.

★

As the ISPH Report points out, quantity production should tend,

by reducing costs, to increase the spaciousness of houses. Many examples of prefabrication, however, give the impression that it necessarily implies restricted space, made habitable by slick planning. Fuller's bathroom, for instance, would surely turn a mild form of claustrophobia into raving lunacy. And how can the gyrations of Muller's Five Minute System be performed in that cramped space without cracking the knuckles? How can the morning hymn, reverberating powerfully from those close and resonant walls, be chanted without blasting the ear drums?

TOWARDS A NEW BRITAIN

I was glad to see displayed on nearly every bookstall I passed last week a pile of copies of the little book, *Towards a New Britain*,* for it is first class propaganda for right planning and building. Though it fulfils the function of acting as a handbook to the RIBA *Rebuilding Britain* Exhibition—a function which was sadly neglected when the exhibition opened at the National Gallery—the book does not depend on the exhibition for intelligibility, being complete in itself. The book says all the right things in an admirably direct and simple style.

ASTRAGAL

**Towards a New Britain*, published for the RIBA by the Architectural Press; price 1s. 6d.



LETTERS

Malcolm Mactaggart

A. Calveley Cotton

George Fejer

(Technical Consultant, Uni-Seco Structures)

Judex

R. Cecil Smart

How to Ruin the Case for Planning

SIR,—In support of the directive powers (presumably) necessary for peace time planning, Mr. R. V. Boughton refers (in your issue for June 3) to his own personal background as a company director.

Does Mr. Boughton imply that the company in question is run on lines of economic democracy—i.e., are the company's directees also its shareholders and, as such, responsible for having, in the first place, directed Mr. Boughton to direct them?

Perhaps Mr. Boughton will be kind enough to carry his argument a step further.

MALCOLM MACTAGGART.

Berkhamstead.

Riding Out the Lull

SIR,—I must protest against your leader "Riding out the Lull." If architects are too apathetic to provide the Government with the necessary machinery for post-war building, I consider it is both childish and unpleasant to grumble because the Government takes the only course open to it and fills the new planning ministries with civil servants, who are a known and well-tried machinery.

The exhortation to Ride out the Lull reveals a nature almost too naive to be true. Surely the writer does not imagine that the public will approach a disunited and disorganized profession and beg it to replan Britain. In this country, only the insistent demands of a majority, backed by sound business machinery, ever gets anything done.

Our first duty is to win the war, and to see that the profession is organized to give the country good architecture after the war.

Apart from these two duties, all other projects such as lectures, exhibitions, societies with funny initials, etc., are just putting theoretical carts before a non-existent horse.

I suggest the order of the day should be, get cracking.

Bath.

A. CALVELEY COTTON

Ply-Plastics

SIR,—Ever since my article appeared on Plastics on October 29, 1942, there has been a considerable discussion on the question whether laminated products should be termed Plastics, or not. Mr. Stoneham maintains that laminated veneer products belong to the plastics family. Another of your correspondents, however—see answer 1112, April 8, 1943—regards laminated materials as non-plastic. Mr. Kennedy—April 29—stresses the importance of ply-plastics as materials of great architectural value.

My own view is that the argument arises from the ambiguity of the word Plastics, and that the difference between straight plastics, that is resins plus fillers, and laminated products is often only one of degree rather than that of kind. I agree with Mr. Kennedy on the architectural importance of resin bonded wood structures, but I do not share his views on the traditional and unscientific outlook of architects and building technicians. I would like to point out that we have certainly passed the initial stage of experimenting with such materials and steady development has now been pursued for years to manufacturer bonded wood structures for building purposes. Approximately 3,000 prefabricated buildings have been erected in this country (the purposes and locations of which cannot be disclosed), the structural members of which are made of resin bonded wood. I enclose the photographs of various buildings erected by using prefabricated Seco units throughout. The beams and columns seen in the pictures are lightweight hollow structures, with box-like sections. These are designed in a manner that the amount of wood used is surprisingly small, making full use of the principles of stressed skin construction. This was only possible by using thermo-hardening plastics in the fabrication.

These structural elements are neither plastics nor wood, but a combination of both. The resulting shape and design of the units is very different from the characteristic sections of steel, concrete or solid wood members.

I feel sure that most architects realise that the significance of the resin wood combination,

laminated plastics, etc., goes further than helping to eke out the timber and steel shortage. The intelligent combination of synthetic resins and wood products presents a new architectural medium which has considerable post-war possibilities.

GEORGE FEJER

London.

Architects' Salaries

SIR,—I wish to raise my voice in "flaming protest" against the inadequate salaries still being offered by public authorities. Perhaps they think we can live like the birds, on the crumbs which fall from the rich man's table. Only recently a Northern Burgh advertised in the national press for a town planner at the ridiculous salary of £250 per annum. It was not reported, however, if anyone appeared at that price, but it is the parsimonious outlook against which I wish to protest.

The Association of Building Technicians have all the data and information necessary to make a statement on the position. It is about time they did so. This is a matter of such vital importance that any masterly inactivity can no longer be tolerated. No town planner or qualified architect should be paid less than £1,000 a year. The labourer is worthy of his hire. We cannot expect to carry out any future policy of reconstruction on the cheap. This cheeseparing must cease.

Aberdeen.

JUDEX.

Subterranean Fires

SIR,—In the report of the Auditor-General on the 1941 Civil Appropriation Accounts, reference is directed to heavy financial loss due to lack of care in the selection of a site for the erection of a factory engaged on the national account.

In this present instance an expenditure of £656,000 was incurred to remedy structural defects resulting from subterranean fires at a newly-completed factory involving an outlay of over £1,000,000 on buildings and plant.* The foregoing figures do not represent the full expenditure that may be ultimately involved in assuring the stability of the premises due to subsidence from the fires.

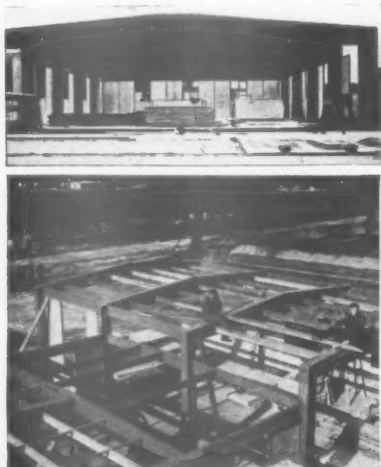
The site consisted of made-up ground composed of combustible material not properly consolidated.

In the first place it is hardly necessary to emphasize that if professional assistance had been sought from consultants with experience in such matters, this loss might have been avoided.

The writer has had to deal with many such problems due to the hazards of subterranean fires involving undertakings of comparable magnitude in mining districts, and in a review of the matter published a few months ago† directed attention to the major factors involved for the avoidance of such risks. Dangers due to the installation of plants involving processes responsible for the initiation of subterranean fires can be guarded against and are preventable. Naturally one cannot expect mechanical or civil engineers to be fully conversant with such hazards but to any mining engineer having a knowledge of manufacturing operations in many industries, an important factor in the selection of sites for new factory premises would naturally be concerned with the combustible nature of the material upon which the buildings were to be erected. It is obvious therefore that apart from the method of construction of factory floors to meet the character of the plant installed thereon and other conditions *in situ*, one must consider the working processes involved and their effect on the underlying strata upon which the buildings are constructed.

Birmingham

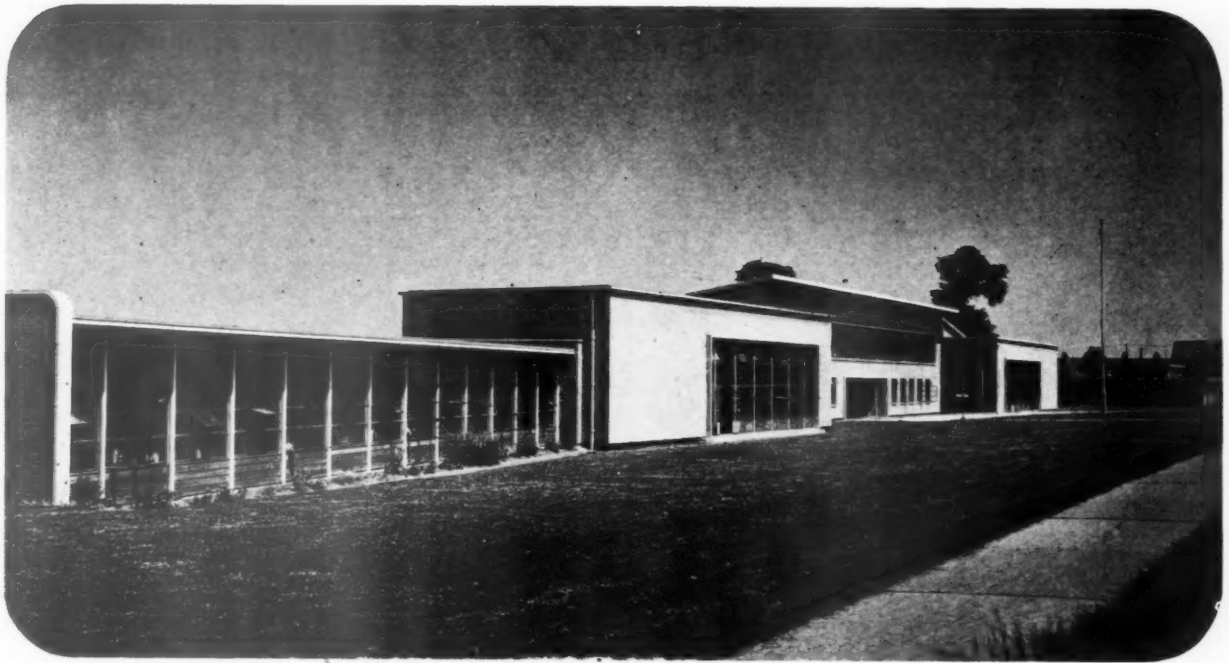
R. CECIL SMART



Prefabricated ply-plastic construction. See letter by George Fejer.

* A.J., May 6, page 295.

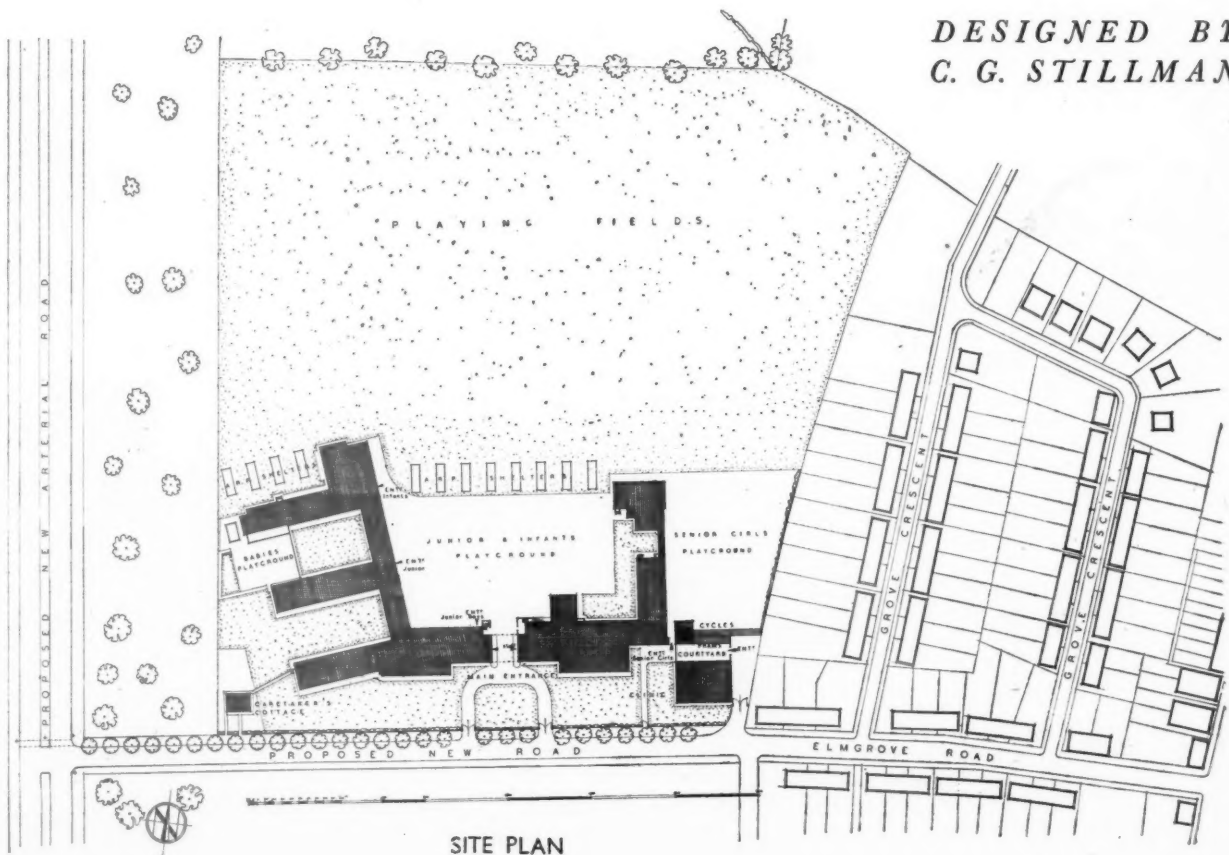
† "Industrial Fire Hazards." *Fire Protection and A.R.P. Review*. February, 1943.



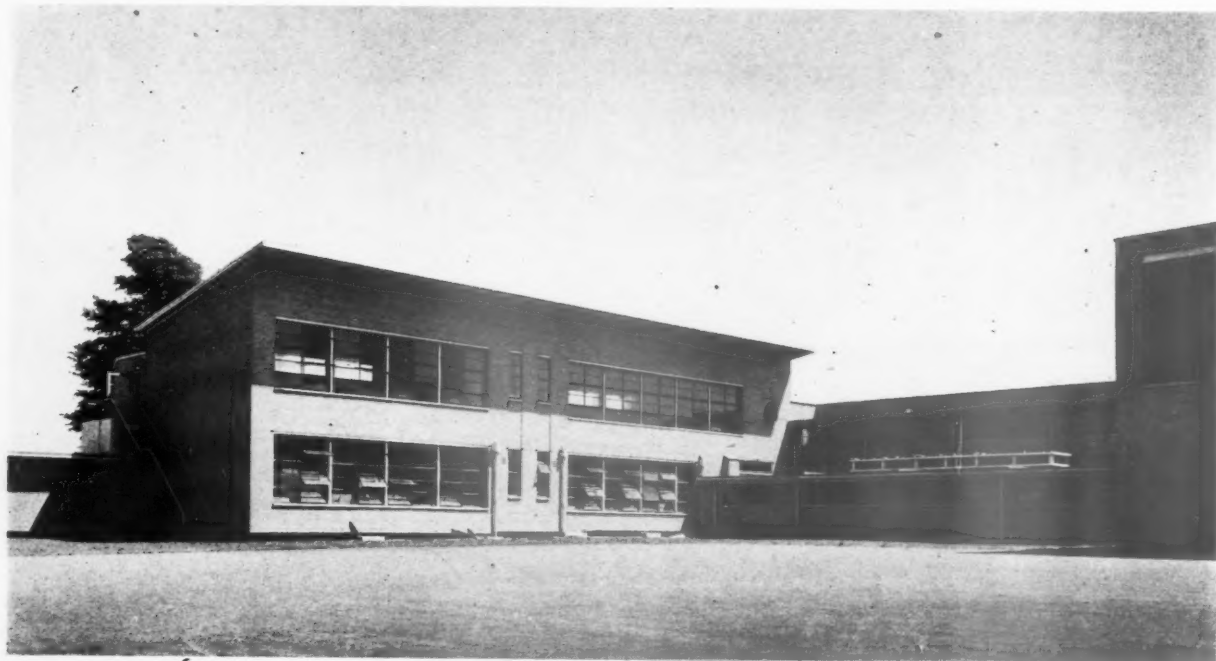
SCHOOL

AT LITTLEHAMPTON

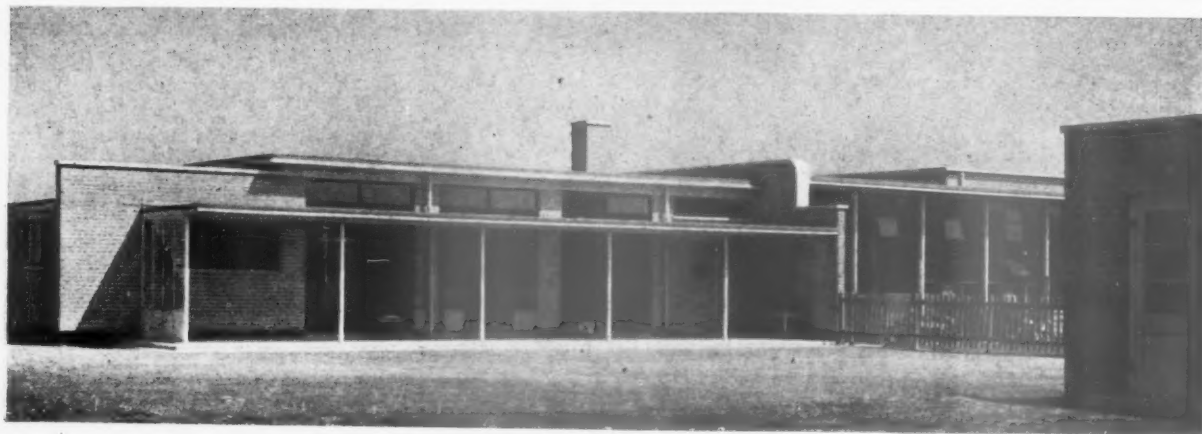
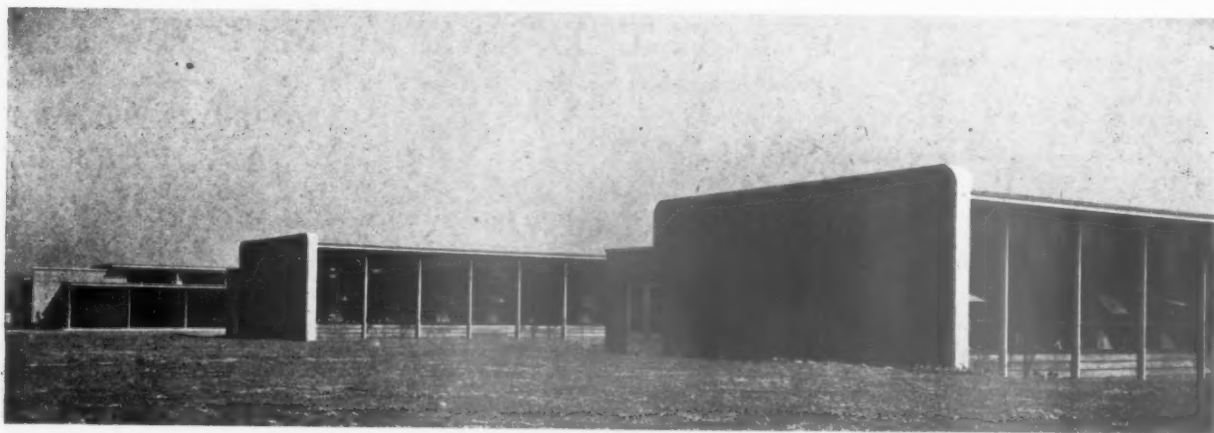
DESIGNED BY
C. G. STILLMAN



SITE PLAN



Above, the domestic subjects rooms (left) and girls' cloaks. Below, classrooms and babies' room (left); bottom, veranda to babies' room.



SCHOOL AT LITTLEHAMPTON, SUSSEX



Above, looking along the principal front, showing main entrance through administrative block, to the left of which are the junior assembly hall and classrooms. Walls are faced with buff coloured cement bricks, classroom wings are light steel framed construction.

D E S I G N E D B Y C . G . S T I L L M A N

projecting roof and proper control of the ventilation is obtained by vertically pivoted windows and hoppers. These classrooms have been designed to give the most successful acoustic properties to the rooms, the ceiling being lined with fibre-board. Natural ventilation is obtained by the particular form of overhang used in the corridor and permanent ventilating holes left in such a position as to form a baffle for any draught. The gymnasium has been kept apart from the school to isolate the noise due to physical training.

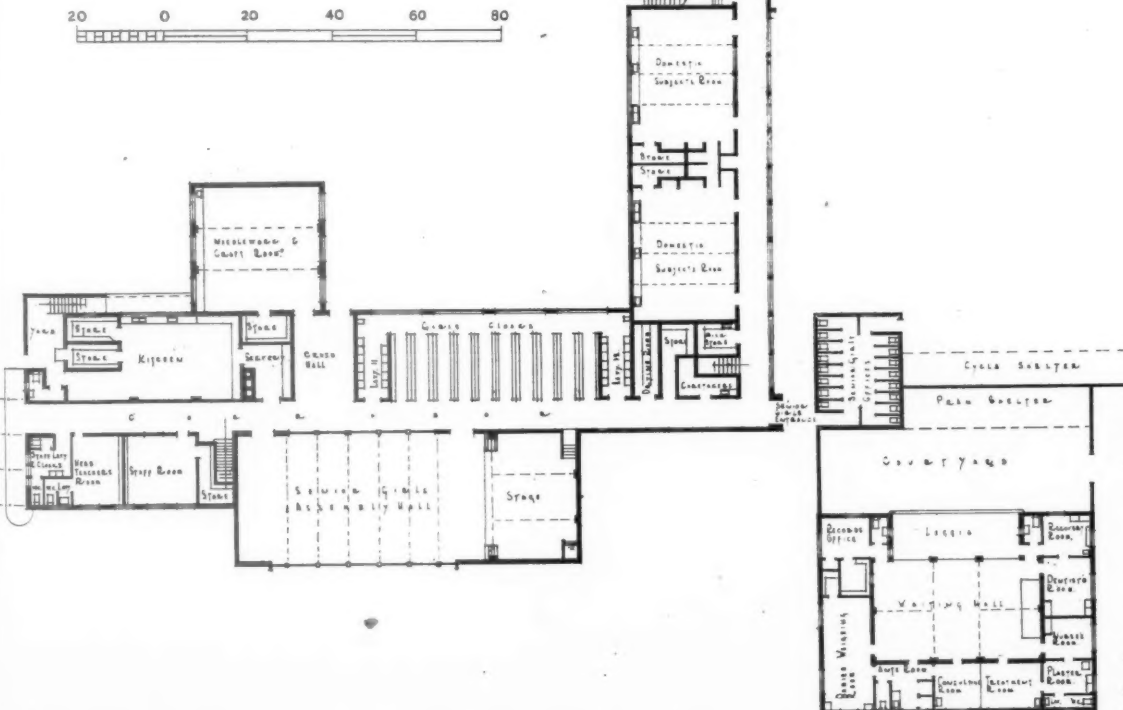
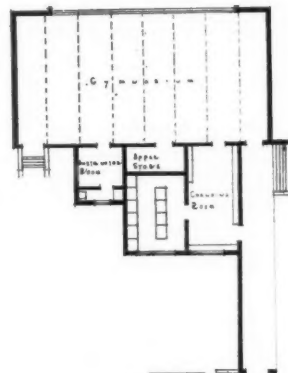
CONSTRUCTION—Walls are faced externally with buff coloured cement bricks. The main construction generally is brick, but the three classroom wings are light steel framed, and the assembly halls are steel framed with 11 in. cavity walls. The first floor roofs are covered with corrugated sheeting; other roofs are asphalted. The floors to all corridors, cloakrooms, lavatories, etc., are laid with granolithic paving, and those to the classrooms, staff room and halls are of columbian pine stained and wax polished. Partitions between corridor and classrooms are glazed; with a dado of asbestos panels in the lower portion. The partitions between the classrooms are made up with light steel sections bolted together, and being wood-filled provide a fixing for the various

wall fittings which are easily fixed and removed. The corridor roofs are V-jointed boarding on light steel tubular rafters. The light steel trusses are left exposed in the classrooms.

ELEVATIONAL TREATMENT—The classroom window frames are painted deep grey, and the walls below cill level are faced with western red cedar weather boarding, provision being made for flower borders along their entire length. Concrete architraves and surrounds are painted cream, the external doors green.



Above, a corridor to a classroom. Natural ventilation is obtained by the particular form of overhang and by permanent ventilating holes in such a position as to form a baffle for any draughts. Facing page, domestic science rooms block.



DESIGNED BY C. G. STILLMAN



Left: corridor on first floor; centre, gymnasium; bottom, looking from the roof of the girls' cloaks, along the domestic subjects rooms towards the isolated gymnasium.



INTERNAL FINISH—In the corridors the weatherboarding beneath the window is left showing. Lavatory and cloakroom walls are fairface, with cream distemper and dado in light stone paint, and black stain on doors with frames painted green. The walls of the assembly halls are fairfaced, painted cream with 3 ft. grey dado, and the V-jointed fibre board on the ceiling distempered cream. The walls of the classroom are cream distempered with grey dado, and the doors are stained black. The frames, windows and radiators form part of a different colour scheme in each classroom. Staff room walls are distempered cream, doors stained black. The clinic has a high gloss paint to walls and ceilings for cleanliness, doors painted green and skirtings cream. The floors are Granwood finish, except for the waiting hall which has quarry tiles.

The general contractors were R. Cook & Sons, Ltd. For sub-contractors see page xxvii.

SCHOOL AT LITTLEHAMPTON, SUSSEX

The function of this feature is to record 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. The **Information Centre** attempts to supply an index and a digest of scientific data, the lack of which has for too long been a handicap both to the technician and the planner. 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.

toward an improved counterpart of the old farmhouse kitchen. The actual food-preparation unit is small, but is accompanied by plenty of space. This flexible "kitchen work centre," as it is called, is adaptable to many needs. In a small house it can serve as kitchen and dining-room; in a medium-sized house, kitchen and breakfast room; in both, as a play-room for children while their mother is cooking. And in a large house it can be used as kitchen and servants' dining-room.

SANITATION and Plumbing

1163 Noisy Ball-Valves

NOISY BALL-VALVES. *The Editor (Plumbing Trade Journal, May, 1943).* Reasons for noisy ball-valves. Various methods of silencing described.

It has been suggested that trouble from noisy ball-valves is more prevalent with hot-pressed ball valves than with those of cast brass. Noise in water apparatus is often caused by water at high pressure passing through a very slight annular orifice. The possibility of this being the cause of noisy ball-valves is discussed. The types of silencer, one Swedish and two English, are described. The time factor as well as the degree of hissing or screaming is important and devices have been produced to reduce the time to a minimum. These devices have not been in great demand, as price is often considered more important than noiselessness. A number of methods for eliminating the trouble is dealt with and a possible reason for the suggested inferiority of hot-pressed ball-valves is put forward together with a suggestion to the makers for obviating the trouble.

Physical PLANNING

1162 The Modern House

HOUSES FOR HUMAN BEINGS. (*Fortune Magazine, USA, April, 1943*). Article on design of the modern house. Plea to give people better-engineered houses, letting style take care of itself.

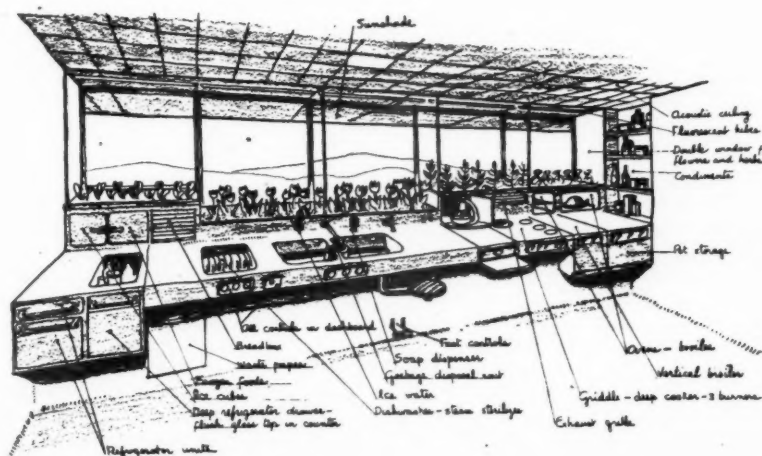
Bathroom.—The shower would automatically deliver water of the right temperature. The tap in the lavatory would open by knee or toe pressure against a convenient lever or pedal; hot water would run instantly. The towel rack would be formed of hot-water pipes, to keep towels warm and dry. Electric heaters and sun lamps would be built into the walls or ceiling. The shower would be enclosed in transparent plastic and would not steam up the room. The floor would be warm enough to walk on barefoot. The bathtub would preheat itself automatically. The washbasin would be big enough to bathe the baby in; like a kitchen sink it would be flush with a counter containing drawers and storage space. Soap would never turn to jelly because built-in soap dishes would drain properly. Space in the medicine cabinet would be sufficient to store the medicine for an army. And the mirror could be pulled close to a man's face and would be equipped with adequate light.

Kitchen.—The drawing suggests many of the features that such a unit might embody: light-flooded work counters with windows (not cabinets) above them, vertical broilers (to broil steaks on both sides simultaneously), pedals controlling the tap water, mechanical dishwasher sterilizers, built-in pressure cookers. These should not be thought of as extras tossed in like the dashboard gadgets on a *de luxe* auto. Each one saves a definite amount of time and labour, and the total is an impressive part of a lifetime.

The refrigerator, that triumph of American mass production for the home, could stand a lot of redesigning. It might consist of sets of drawers, in which food would be easy to reach and out of which cold air would not flow.

The stove, too, can be broken up into smaller units. The oven and horizontal broiler can be located above the burners, just as they were in the gas stoves of twenty-five years ago, before style-obsessed industrial designers "modernized" them. Supplementary burners can be spotted in several different places. With greater use of electricity for heat and with increased difficulty in obtaining servants, the stove as we know it might disappear. A kitchen recently designed by William Hamby has no stove at all: each utensil can be plugged into an outlet and acts as its own stove.

Despite the greater efficiency of the new kitchen, designers anticipate a bigger kitchen. The trend is away from the old ideal of a Pullman kitchen, with its almost cruelly efficient use of space,



Drawing showing the suggested equipment for a modern kitchen. From *Fortune (USA, April, 1943)*. See *Information Centre*, item No. 1162, above.

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

1164 Daywork Claims

Q Can you advise us on several points concerning building work done in the South-West on a daywork basis by our contractors?

These minor building works are carried out under an annual civil building licence which does not seem to bear any priority or to be covered by any of the recent Orders, such as Uniformity, Essential Work Order, etc.

We are at present paying the contractors on weekly daywork sheets, 15 per cent. profit on materials and 20 per cent. on labour. The contractors are now claiming recompense for travelling facilities, travelling vouchers every eight weeks for transferred labour, and 1s. 6d. per head per week to cover the Holidays with Pay scheme.

I shall be glad to know your opinion of the fairness of these claims and the recommended manner of dealing with them.

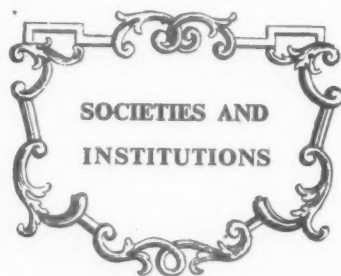
A The contractor must pay his men according to the regulations in force. If the Uniformity Agreement has not been applied he must grant travelling allowances in accordance with the local working rules, i.e. those of the South Western Counties Regional Joint Committee for the Building Industry, copies of which can be obtained from the (Employers) Secretary, 22, Richmond Hill, Clifton, Bristol, 8; if the Uniformity Agreement has been applied he must make travelling allowances in accordance with that agreement, copies of which can be obtained from the Uniformity Joint Board, 82, New Cavendish Street, London, W.1. The contractor must also pay for the Holidays with Pay scheme, his payments being 1s. 6d. per week per man.

Whether or not the contractor receives direct reimbursements for any or all of the items must depend upon his contract or agreement with the employer. As a general rule 15 per cent. on materials and 20 per cent. on labour were considered to be fair percentages for dayworks before the Holidays with Pay scheme was introduced and when it could be assumed that local labour was available, and we should expect to see the extra costs due to Holidays

with Pay and imported labour allowed. At the same time there is nothing to prevent you coming to an agreement to the contrary or getting contractors to tender for a prime cost contract.

As regards dealing with claims, we are not sure what your particular difficulties are. Items you might check are:

1. That the men stated on the claim are actually working on the site.
2. That the districts from which the men were drawn entitle the men to travelling allowances.
3. That the men were sent by or transferred with the approval of the Ministry of Labour, i.e. that they are not imported merely for the contractor's convenience.
4. That the payments claimed are in accordance with the particular regulations in force.
5. That the payments claimed were actually paid to the men.



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.

ISPH

First Report

The First Report of the Committee for the Industrial and Scientific Provision of Housing, *Housing Production, or The Application of Quantity Production Technique to Building: Its Social, Commercial and Technical Possibilities and Requirements*, has been released to the Press and forms the subject of this week's leading article. The following are significant extracts from the 96 pages of the report.

TERMS OF REFERENCE.

Technical development indicates the possibility of the manufacture of parts of houses by modern production methods with subsequent erection on site by assembly line methods such as are employed in other industries.

Such house production suitably allied to the traditional industry, utilizing the scientific and economic advantages of contemporary methods to the maximum, can only result from planned research and industrial co-ordination.

Production so planned may well involve many industries not now connected or only distantly connected with the building industry. Co-ordination of these can, by spreading productive activity into many fields, accelerate the national housing programme and the post-war re-absorption of labour and industrial resources.

There is no organization either for the planning of research or the co-ordination of industrial efforts on those lines.

The Committee therefore proposes to enquire into:

- (a) THE TERMS OF REFERENCE AND CONSTITUTION OF SUCH AN ORGANIZATION.
- (b) THE STEPS TO BE TAKEN TO CREATE IT.

THE SCOPE OF THE ENQUIRY AND A SUMMARY OF FINDINGS.

Some 650 systems or items have been collected and some 350 subjected to analysis in order that a fair assessment could be made of the practice and potentiality of the use of mechanised production methods. A further purpose of this analysis was the collection of data upon which to examine the wider or non-technical problems. A detailed and purely technical report of this enquiry is available to subscribers.

Thus the present report is based upon:

- (1) Technical investigation.
- (2) Discussions upon our terms of reference with over 500 industrialists, builders and contractors, financial authorities, economists and sociologists, architects and surveyors, officers and members of trade and professional bodies, architectural and trade journalists, and housing experts.

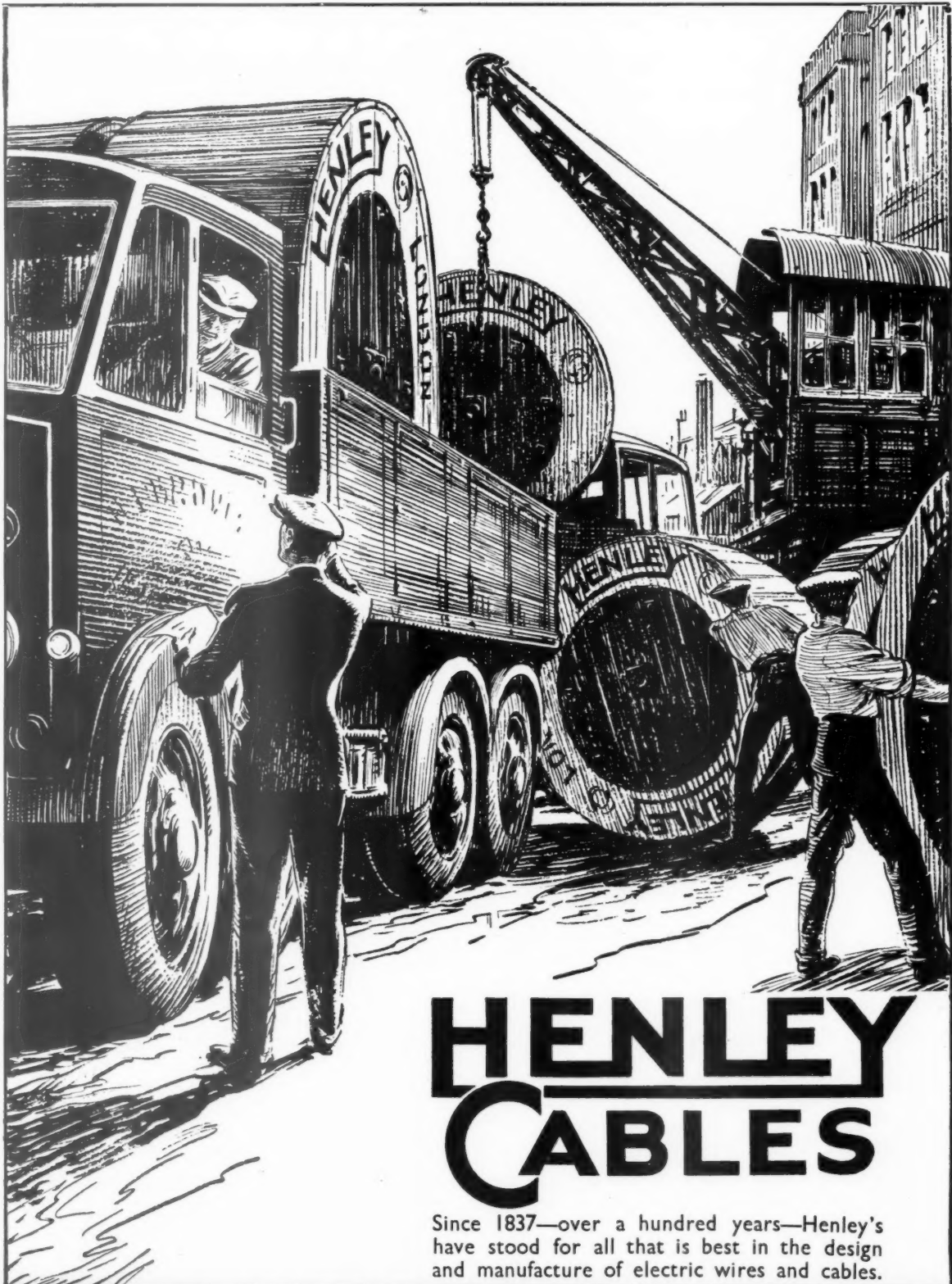
Findings: (1) There is a case for the considerable extension of the factory or mechanised production of parts of houses and a corresponding development of assembly methods.

(2) Further technical research is needed and, above all, co-ordination of research now in progress.

(3) It is essential that the non-technical problems involved be acknowledged and investigated. In many other fields, in both peace and war, there have been lamentable gaps between scientific or technical knowledge,



Mr. Harry Weston, Chairman of the Committee for the Industrial and Scientific Provision of Housing. He is also Managing Director of Modern Machine Tools, and was until recently Chairman of the Coventry Housing Committee.



HENLEY CABLES

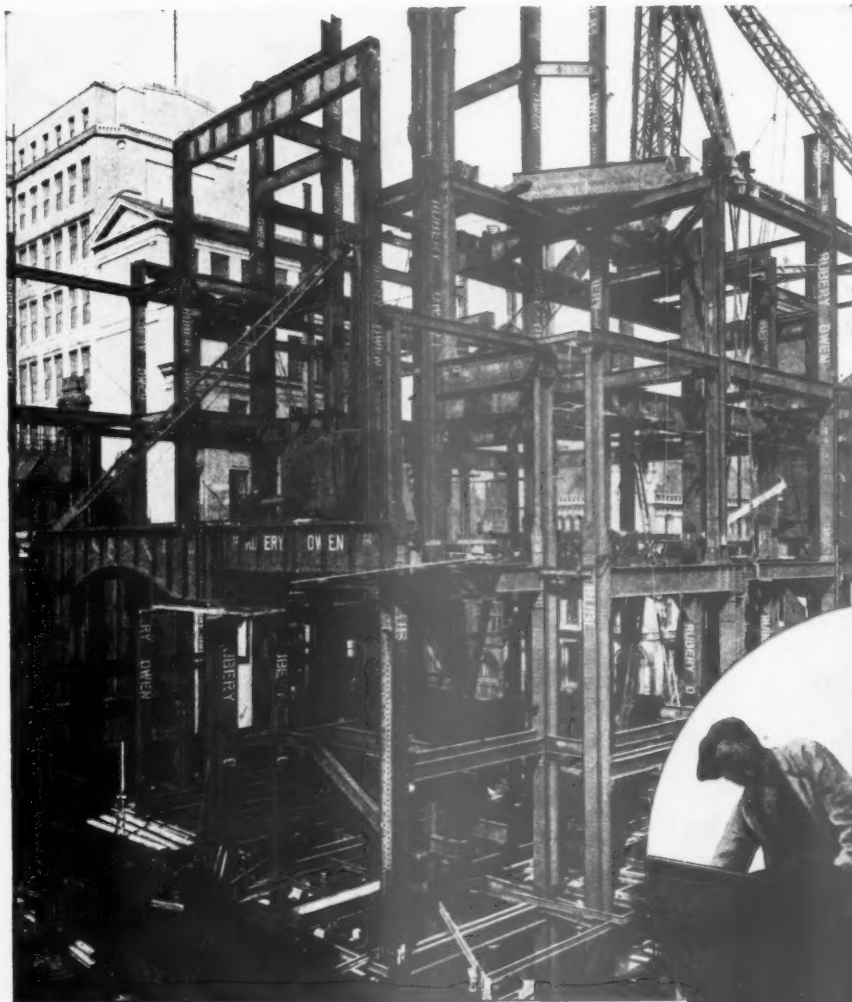
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Governmental function and industrial activity. These gaps have led to delay and confusion in the face of crisis. In view of the inevitability of the introduction of much new and mechanised technique into the provision of shelter—

(4) We propose the creation of a Housing Production Council to bridge those gaps and so expedite the rehousing of the people and assist in the re-establishment of industry.

GUIDING PRINCIPLES.

The machine has given us a standard of material comfort and well-being which few could have dreamed of a hundred, or even fifty, years ago. Why is it then that when we turn to the background of all these generous gifts, the framework in which they are set and in which the people live, move and have their being—in a word, the house—we find that it is the sole exception to the general rule of utilitarian progress and to the high standard of design common to the smallest articles in daily use? Surely the answer lies largely in the fact that there has been only a limited and totally unorganized application of the machine to this primary necessity of making homes.

The post-war replanning of Britain, on which such high hopes are rightly placed, must, to be successful, be conceived as a whole. Rapid provision of houses is surely the core of the plan, for without them it would be impossible to determine the location of industries, the placing of roads and the hundred other details that planning implies. Desultory house-building, stretching over a period of years, would not merely defer national planning, it could destroy it in essence.

Analogies drawn from other industries suggest that mere size in a factory-produced article has nothing like the same bearing upon total cost as in articles largely produced by traditional methods. Thus it is reasonable to suggest that machine-built houses can be larger as well as better equipped.

The provision of proper equipment should in future be considered as part of house building, and not as a separate operation . . . thus simplifying assembly and reducing costs.

There is a right and proper fear that the application of factory production in the provision of houses may lead to monotony and standardization of appearance, as well as of interior arrangement and decoration. The danger undeniably exists. Commercial exploitation of new techniques without authoritative information might indeed bring about a repetition of what has happened in the traditional building industry over the past twenty years.

Our researches have proved to us that at least as great a variety of designs can be available as in traditional building. The machine-produced house must, and will, evolve its own aesthetic. We realize that designs and planning must be first considerations and our hope is that the designer of houses—the architect—shall not, as has been largely the case in the past twenty years, be excluded from the important field of small-house building, but that he shall from the very beginning make the contribution that he is equipped to make to the mechanically produced house.

It has been said that mechanised production destroys craftsmanship. This is not true, for experience in other trades has shown that under the right guidance the machine may develop new forms of craftsmanship. We may, furthermore, expect that when mechanised production has reduced the structural cost of the building, the increased purchasing power available will give impetus to the development of craftsmanship in the furnishing and decoration of the houses of the future.

THE TECHNICAL PROBLEM.

In spite of some degree of utilization of machinery the traditional building methods are mainly based on craftsmanship and consist in the putting together by hand, with some form of cement, of building parts and pieces delivered to the site with a varying amount of

cutting and other site preparation. This method of piecemeal work sets by its very nature a certain limit to rationalization. It also creates problems in the economic use of labour, the shifting of men from one particular job to another, laying them off as soon as the particular job is finished, or when the weather is inclement, paying them by the hour, and consequently higher job rates than they would receive with all-the-year-round employment.

Although the transfer from the old methods of hand construction to the new methods may take the form of gradual changes, it must be recognized that once a certain phase of factory production is reached the new methods of manufacture will in all probability influence the basic approach to design, construction, organization, and the economic and financial aspect of building generally.

SYSTEMS OF CONSTRUCTION.

Our enquiry into the history of alternative methods of construction has been made under four headings: steel, concrete, timber and composite and miscellaneous.

INDUSTRIAL ORGANIZATION.

In the application of the machine to building the potential field covered embraces three main sections:

(1) Improvements in methods of manufacture of parts utilised in conventional building methods and the use of the machine for site preparation and site operations.

(2) A conjoint effort between the conventional industry in the provision of an outside skin and an altogether new industrial field of the provision of the inside structure and equipment of a house.

(3) The factory creation of parts of a nature and materials at present unknown or not applied, that such a complete house may be assembled on site without cutting or preparation by something approaching assembly-line technique.

In the first case there are many customs and organizations within the traditional building industry joining the producer, i.e. the builder, with the producers and distributors of materials and with the professions concerned with design and organization. Here, the problem of the application of the machine to building is comparatively simple, since it involves only the introduction of the production engineer at various points by specific sections of the trade to consider specific problems.

In the second case, organizational means have to be found whereby the production and distribution of new types of parts may be facilitated either through existing builders' merchants' organizations or through new organizations set up for the purpose or a combination of these methods. It will further be necessary either to establish an alliance between the erectors of the internal parts of the house and the builders of the traditional external skin or to disseminate the technical knowledge whereby the traditional builder can utilize the new methods, parts or materials. Close co-ordination between these two separate industries must be established.

In the sense mentioned above there is no industrial organization or form of industrial unit either tangible or intangible, concerned either with the production or the assembly of the factory-made parts of the interior.

In the third case, we are faced, in fact, with a completely new industry whose points of contact with the traditional industry are practically limited to site preparation, and possibly even here to a minor degree only.

The scale of operations necessary for the socially economic utilization of quantity production methods in building is enormous. It is, in fact, so great as to suggest, as in the case of the motor-car and aircraft industries, the concentration of plants not upon one type of house but upon one or several parts of one particular system of the factory production of houses. Only thus can maximum economy be reached. Nevertheless, this high degree of specialization introduces an

organizational difficulty since it increases the number of firms and perhaps the number of industries engaged in the manufacture of any one system of factory house-building. As has been found necessary in other industries, methods will have to be evolved whereby the work of these firms can be co-ordinated both technically and in terms of production schedules, and, possibly, financially as well.

It may be argued that rather than link a number of small firms or departments of large firms in the conjoint production of parts of houses to form a complete house under one or other system of construction, it would be desirable that all the parts of any one type of house should be constructed by one firm under one factory roof.

It thus becomes essential to find means of linking comparatively small productive units or departments of large firms. For this and many other reasons this linking is the pith of the problem of industrial organization.

PUBLIC RELATIONS.

There is a great deal of work to be done in convincing the various parties concerned of the practicability and desirability of factory-produced houses. This calls for a public relations campaign on a large scale. Ignorance concerning mechanised methods of production in some quarters and prejudice against them in others tends to impede the application of mechanised production methods to building. It follows that an essential part of the work of the Council is the dissemination of authoritative information in the proper quarters. The field to be covered embraces architects, the building industry, labour, new industries, official and academic circles and the general public.

Workers as represented in their Trade Unions and other organizations present a delicate problem, since their hardly won protection and livelihoods may appear to them likely to be harmed by the introduction of such unskilled labour as might be used in factory production. For a long time to come it would appear that there will be ample full-time work for every available skilled man in the building industry. It would also appear that the introduction of mechanised production would iron out the seasonal fluctuations of employment in the trade. When, however, in the distant future, the building problem has been largely overcome, some difficulties can already be discerned as likely to affect the welfare of the trade unions. Economic possibilities of continuous rebuilding arising from definitely limited life should be investigated and publicised.

New building technique will involve the entry into building of industries which hitherto have never been connected with the trade. In the interests of post-war reconstruction these interests must be kept fully informed of the possibilities offered them and of the most beneficial methods by which they can co-operate for the national welfare.

An important part of the Committee's public relations work must deal with the supply of accurate information to Members of Parliament, Government officials, economists, sociologists and those in public life concerned with post-war reconstruction.

There is a feeling that factory-produced houses necessarily mean temporary houses, and that temporary houses and factory-produced houses are necessarily flimsy, shoddy and unsuitable. Practical steps must be taken to dissolve these ideas which, to a certain extent, are still rooted in the army hut and its hasty adaptations after the last war. It is probable that nothing but practical demonstration will deal with this particular set of prejudices.

LIMITATION OF LIFE.

In architectural and town-planning circles there have long been proposals for the limitation of life of houses. The permanence of buildings in the past has tended to create slums and socially undesirable changes of function in buildings. Our technical investigations suggest that, whilst it is possible to construct

factory-produced houses having as high a durability as that of the best contemporary standards of traditional building, it is equally possible to construct them to have a life predetermined within comparatively fine limits, without at any time showing deterioration in safety, appearance or function. In other words, a factory-produced house might become consumer goods rather than capital goods.

Such proposals are of an extremely far-reaching nature both in law and in economics and they are also important in their bearing upon the work of the traditional building industry, since the result of the emergence of a type of structure having definitely foreseeable life might be to allow the traditional building industry to concentrate on types of structure where permanence or greater length of life is desirable.

THE COSTING PROBLEM.

The rehousing of Britain is obviously a matter of such primary social importance that it is an operation which must come under a large if not complete measure of State control. This brings it within the field where it must be considered primarily as a charge upon the total national productive capacity and only secondarily as a commercial activity. Further, it seems certain that for a considerable period at any rate, purely monetary values will not be able to be considered as static, even within wide limits. These two considerations appear to indicate that the costing investigations upon the subject of the application of mechanised production methods must be in terms of man hours, machine hours and materials rather than in pounds, shillings and pence.

LABOUR RELATIONS.

The factory production of houses would considerably affect the operatives now engaged or to be engaged in the building industry in the post-war years. It follows that means must be found to reconcile the interests of the building trades operatives with the social benefits which factory production should bring to the community in the form of the rapid provision of high quality housing at low cost.

At the present time there is no census of building requirements either as a whole or as divided between housing on the one hand and public works and the erection of large blocks of flats or offices and public buildings and contracting work generally. It is, however, highly probable that even the latter section would provide full employment for a considerable period for the traditional industry, depleted as it inevitably will have been by the end of the war. On top of this there will undoubtedly be a very considerable demand for houses of conventional construction, and this demand will assuredly continue for as far ahead as can reasonably be seen. Accurate knowledge of requirements and the production potentialities of both new and traditional methods is of vital importance.

The introduction of mechanised building processes will raise many problems for architects. The foremost of these is probably the question of architectural employment in erection of machine-built houses. It is beyond doubt one of the primary concerns of the Council that methods of factory production will so develop as to demand architectural supervision in the assembly and grouping of parts. Architectural training may have to be extended to embrace the newly evolved techniques, and the Council should be able to perform a most valuable function in the dissemination of the information necessary.

THE HOUSING PRODUCTION COUNCIL.

Having posed these problems which must be solved in order that the introduction of the machine into the provision of shelter may be socially, economically and aesthetically satisfying, we are now in a position to consider the constitution and functions of a body to correlate the study of them and to take such steps as may seem necessary to promote the

implementation of the solutions it may find.

Constitution: Following the practice of trade unions, trade associations, trade research bodies, professional institutions and the like, the Council will be a company limited by guarantee and not having a share capital or operating for profit.

Objectives: (a) To promote the development and use of new production methods and scientific knowledge in the provision of housing.

(b) To carry out, or promote or encourage or co-ordinate the carrying out by others, of research in connection with such methods or knowledge generally, and in particular in connection with:

- i. the aesthetic, social and economic implications of the development of such methods or knowledge;
- ii. the means whereby proper aesthetic, social and economic direction may be given to such development;
- iii. the housing requirements of the public, either in this country or abroad, in relation to the possibilities opened up by such methods or knowledge;
- iv. the establishment of a British export trade in parts of factory-produced houses, or other materials, made available by such methods or knowledge;
- v. modular planning or dimensional co-ordination;
- vi. the need for the establishment of bodies for the practical implementation of proposals suggested by any such research, or by information acquired by the Council, and the constitution, nature or functions of, such bodies.

(c) To establish or promote or assist in the establishment or promotion of such bodies (not being bodies trading for distributable profit) as may appear to the Council to be necessary or desirable for the purpose of carrying on or assisting in carrying on any activities which the Council may consider conducive to the attainment of its objects.

(d) To propagate knowledge of, and interest in, new production methods in the provision of housing generally; and, in particular, by holding, or promoting the holding of, exhibitions, lectures or meetings and establishing, or assisting in the establishment of, reference organizations or organizations for the exchange of information, libraries, lectureships, scholarships, prizes or certificates.

(e) To promote co-operation between the building industry and the architectural, professional and operative personnel associated therewith on the one hand, and those trades or industries which are, or may become, involved in the development or use of new methods or materials in building and the architectural, professional and operative personnel associated with such trades or industries on the other hand.

(f) To co-operate with any associations or bodies in this country or abroad having objects similar to all or some of the objects of the Council.

Composition: The Council will comprise:

- (1) An advisory panel.
- (2) A policy or management committee.
- (3) A body of subscriber members.

PWB

Study Committees

The following is the fifth extract from the booklet issued by the Directorate of Post-war Building of MOW, containing reviews of ten of the *First Draft Reports* of its twenty-three Study Committees. See leading article for April 22, and these columns for April 22, 29, and May 6, 20 and 27.

GROUP B. STRUCTURE

9. STEEL STRUCTURES COMMITTEE. First Draft Report, January, 1943.

Introduction. Sections A—K.

8 pp. divided thus:

Introduction.

Membership of Committee and terms of reference.

Three members of the Committee were appointed to form a Sub-Committee, together with three members of the Reinforced Concrete Structures Committee, to consider the question of "loads and stresses" in connection with intensity of loading on floors and permissible stress intensities in steel members.

Section A. Intensity of loading on floors.

RECOMMENDED that loads permissible under L.C.C. Bye-laws be accepted with the following exceptions: (1) for public floors, dance halls, etc., the D.S.I.R. and B.S.S. 449 (1937) figures be accepted; (2) that a footnote be added to paragraph dealing with minimum total allowance for internal partitions, warning designers that rate of 20 lb. per sq. ft. of floor area is not always adequate; (3) that partitions which are now treated as dead load should in future be treated as superimposed load rather than dead load; (4) that, with regard to wind loads, Para. 4 of *Report on Steelwork for Buildings, Part 1. Loads and Stresses*, published by the Institution of Structural Engineers, be accepted with the exception of Paragraph (c), where L.C.C. Bye-laws be retained for wind loads on sloping roofs.

Section B. Application of methods of design based on true stresses in beams and columns instead of approximate methods now in general use.

RECOMMENDED that insufficient experience has been obtained to justify deviation from recommendations of the revised Code of Practice, prepared by the Joint Committee of Civil and Structural Engineers based upon the accurate methods of stress analysis given in final report of the Steel Structures Committee, 1936.

Desirable, however, that further experience be obtained, and therefore that buildings designed or sponsored by Government departments be based upon the more exact design methods developed in the Report of the Steel Structures Research Committee, 1936, relating to the load-carrying capacity of the structure rather than limiting working stresses, and that design and calculation be published as a basis for drafting improved empirical methods, which may prove more economical.

Section C. Permissible stress intensities in steel members (stresses in compression flanges of beams partially restrained and in cantilevers).

RECOMMENDED (1) that working stresses in B.S.S. No. 449 (1932) for mild steel and for high tensile steel be retained, but increased stresses recommended as a war emergency revision be retained for industrial and single-storey buildings only, except the revision to Clause 18. For the purposes of this clause, an industrial building shall be regarded as one which is included in classes 5 and 6 of Clause 4 of L.C.C. Bye-laws, and heavier buildings for similar purposes. (2) that Clause 18 *Stresses due to wind forces* of B.S.S. 449 (1937) be adopted, but the words "in no case shall the maximum stress exceed 10-2/3 tons per sq. in. for mild steel or 16 tons per sq. in. for high tensile steel" be added; (3) that, for high tensile steel complying with B.S.S. No. 548 (1934) a corresponding increase in general may be permitted on industrial and single-storey buildings, but details require further consideration.

RECOMMENDED that for reinforced concrete, no war emergency increases apply, or may apply, and stresses should never exceed 25,000 lb. per sq. in., or half the guaranteed yield point, whichever is less. B.S.S. No. 15 (1936) for mild steel be adhered to unless revised to require a minimum yield point, in which case the stresses in mild steel might be reconsidered.



THERE ARE SOME who hold the view that "for the duration" only the winning of the war is of importance, that any consideration not solely concerned with the achievement of victory is irrelevant and worthless.

THERE ARE OTHERS who believe that, without detriment to the war effort, it is possible and desirable for individuals to plan and prepare intelligently in order that the immediate post-war condition shall not be one of chaos and inefficiency.

In defence of this latter view it may be pointed out that because we were not prepared for war we spent three ineffectual years and sustained grave military defeats. We shall be equally guilty of neglect, apathy and lack of foresight if we fail to recognise **NOW** the importance of preparing for peace.

It is unquestionable that the Building Industry will at the end of the war be faced with a task of unprecedented enormity and difficulty, and we of Building Industries Services hold the view that the measure of social welfare and content in the immediate post-war years will depend to a very great extent upon the measure of competence, confidence and expedience with which the Building Industry is able to tackle the great task of re-housing and reconstruction.

Trade Associations, Contractors and Manufacturers in the Building Industry are not unconscious of the great responsibility that will be theirs; they realise, most of them, that they cannot be ready to carry out their share of the work with efficiency and expediency unless they have been able to plan and prepare in advance; they realise, too, that the greater share of the work will of necessity go to those Companies which have found it possible during the war to engage in research and planning for post-war preparedness.



Gen. Smuts says :

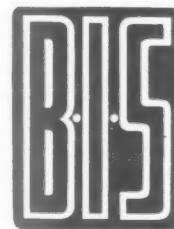
"Health, housing, education, decent social amenities, provision against avoidable insecurities—all these simple goods and much more can be provided for all, and thus a common higher level of life be achieved for all. . . . With honesty and sincerity on our part it is possible to make basic reforms both for national and international life which will give mankind a new chance of survival and of progress. Let this programme, by no means too ambitious, be our task, and let us now already, even in the midst of war, begin to prepare for it."



Dr. Cyril Garbett, Archbishop of York, says :

"If at the end of the war men find neither houses nor sufficient work, there will be a dangerous feeling of anger, discontent and disappointment throughout the country. If you have a strong, comprehensive planning and housing scheme, you are also dealing with the problem of unemployment."

BUILDING INDUSTRIES SERVICES is a group of independent, qualified technicians widely experienced in objective research. It was established some years before the war and has been associated with many notable technical advancements. Important building Trade Associations and leading Manufacturers have enlisted their collaboration and have profited thereby.



The work of **BUILDING INDUSTRIES SERVICES** is to-day mainly concerned with planning for post-war preparedness . . . the collection and collation of technical data and the examination of that data in relation to the kind of circumstances and conditions that are likely to prevail in the immediate post-war building activities.

Trade Associations and Manufacturers are much preoccupied now with the fulfilment of war contracts and are unable to give adequate consideration to the kind of post-war requirements that they will be called upon to fulfil.

BUILDING INDUSTRIES SERVICES is competent and qualified to bridge this gap on your behalf . . . they are doing it for others, can they be of service to you?

May we suggest that you, entirely without obligation, discuss this all-important matter with one of our Directors. He will be able to tell you what B.I.S. have done in the past, what they are doing to-day and, subsequent to a preliminary interview, would be glad to prepare a report outlining the procedure and method that would be adopted in the application of B.I.S. services to your own particular problem.

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Section D. Character of casing of steel members and effect on strength and dead weight of structure.

RECOMMENDED that for beams, encasements should comply with clause 13 of B.S.S. No. 449. Also that additional stresses for concrete encasement in the war emergency revision of this specification be worked to in case of industrial or single-storey buildings.

In view of result of tests on strength of gravel concrete under conditions of high temperature, it is—

RECOMMENDED that no increased stresses for encased stanchions be permitted at present. Further tests are necessary and a future programme has been arranged with B.R.S. Types of encasement suitable for testing are enumerated.

Section E. Standardisation of construction with a view to reducing number of types of rolled steel section in common use.

Committee is of opinion that merits of broad flange beams should be considered. Their use might, in many cases, be economical. Apart from this, the Committee decided against variations in existing number of sections.

Section F. Recommendations concerning extended use of welding, in view of great development of welding in war period.

RECOMMENDED (1) that subject to rules for safeguarding quality of welding, its use be encouraged in all suitable cases; (2) that utmost use be made of welding in shops or on ground, but that site welding supersede bolt connections only where economy of material or labour is affected; (3) that where site connections are welded, due allowance be made for added rigidity at joints; (4) that in case of multi-storey construction, consideration be given to degree of strength required in bolted connections, which secure structure until site welding is effected; (5) that typical details of various types of joint and connection be prepared, together with tables of safe loads on various types of connection; (6) that en-

couragement be given to new types of design made possible by special characteristics of welding.

Section G. Recommendations regarding design of cleats and connections with view to eliminating unnecessary work and materials.

RECOMMENDED (1) that girder cleats to stanchions should accord with recommendations of Code of Practice published by the Institutions of Civil and Structural Engineers; (2) that no splay cuts or similar refinements be called for on cleats or connections, unless necessary for stress connection or for equalising stress distribution.

Section H. Pressures on concrete foundations and types of support which reduce steel in column base to a minimum.

Considered that pressures given in B.S.S. 449 are reasonable, and will often make bloom bases more economical than riveted bases. Bloom bases should be calculated on basis given in B.S.S. 449.

Section I. Suggestions for elimination of customs in steel construction which may provide unnecessarily liberal margins of strength and are not dictated by requirements of rational design.

Suggestions enumerated.
RECOMMENDED that standard symbols of the Institution of Structural Engineers be adopted for use in design of structural steelwork.

Section J. Use of cold strip rolled light structural shapes for small span trusses, purlins and subsidiary frames.

Considered that considerable economy would be achieved by proper use of cold steel strip rolled light structural shapes, provided there are safeguards against corrosion and fire risks.

RECOMMENDED that this matter be dealt with now by an authoritative committee, in order that results be available without delay.

Section K. Additional comments.

Other aspects affecting economy in time and money are: (1) supply of full information when contract is placed; (2) avoidance of revisions

after commencement of fabrications; (3) early checking and return of detail drawings with comments; (4) adequate survey before building is designed; (5) time schedule, covering client, professional advisers and contractors, to correlate all sections of work from date of letting of contract to completion.

RECOMMENDED that standard basic form of specification covering these suggestions be prepared.

BUILDINGS ILLUSTRATED

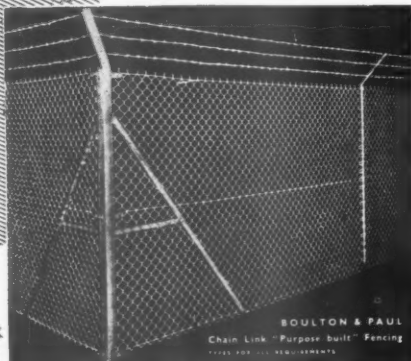
ELEMENTARY COUNCIL SCHOOLS AND CLINIC, LITTLEHAMPTON (pages 395-400). C. G. Stillman, F.R.I.B.A., Architect. General Contractor, R. Cook & Sons, Ltd. Clerk of Works, J. Pears. Sub-contractors: G. Asserati, asphalt; Haywards, Ltd., concrete lanterns, etc., cast concrete roof; Johnson's Reinforced Concrete Engineering Co., Ltd., reinforced concrete; Dunbrik, Ltd., bricks; Blokcrete Co., Ltd., artificial stone; Matt. T. Shaw & Co., Ltd., and Light Steel Sectional Constructions, Ltd., structural steel; John Stones, Ltd., partitions and folding partition; Granwood Flooring Co., Ltd., patent flooring; G. N. Haden & Sons, Ltd., central heating and boilers; Brighton, Hove and Worthing Gas Co., gas fixtures and gas-fitting; Cosh & Hammond, electric wiring, electric light fixtures and electric heating; Bunce & Co., door furniture; James Couper & Sons, Ltd., casements and window furniture; John Stone, Ltd., folding partition; W. Dibbens & Sons and Haywards, Ltd., iron staircases; Hill Aldam & Co., Ltd., sliding doors; Accordo Blinds, Ltd., sunblinds; Granite (Great Britain), Ltd., glazed tiling; North of England School Furnishing Co., Ltd. and Wilson & Garden, Ltd., school fittings; J. Parkes, Ltd. and General Contractor, cloakroom fittings; Parker, Winder and Achurch, Ltd., cycle racks.

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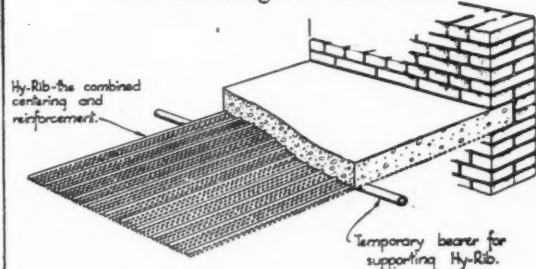


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2nd layer 60-lb. Ruberoid Compound	30 lbs.
3rd layer 60-lb. Ruberoid Underlay	30 lbs.
4th layer 60-lb. Ruberoid Compound	30 lbs.
Finishing layer 1-ply Ruberoid Standard Roofing	24 lbs.
32. 1st layer 60-lb. Ruberoid Underlay	30 lbs.
2nd layer 60-lb. Ruberoid Compound	30 lbs.
3rd layer 60-lb. Ruberoid Underlay	30 lbs.
4th layer 60-lb. Ruberoid Compound	30 lbs.
Finishing layer Ruberoid Slab	65 lbs.
33. 1st layer Astos Asbestos Felt	35 lbs.
2nd layer Ruberoid Compound	30 lbs.
3rd layer Astos Asbestos Felt	35 lbs.
4th layer Ruberoid Compound	30 lbs.
Finishing layer Ruberoid Slab	65 lbs.
34. 1st layer Astos Asbestos Felt	35 lbs.
2nd layer Ruberoid Compound	30 lbs.
3rd layer Astos Asbestos Felt	35 lbs.
4th layer Ruberoid Compound	30 lbs.
Finishing layer Ruberoid Slab	65 lbs.

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Concrete. Terra-cotta Slab, or old asphalt roof, etc. Surface should be graded to suitable falls to give adequate drainage. In forming new concrete roofs, use tapered guide laths to obtain correct falls. A fall of 1 in. in 10 ft. is suitable. We advise more if possible to ensure rapid drainage.

FLASHINGS & GUTTERS.
Ruberoid.

DETAIL DRAWING.
See page 14.

TYPES OF ROOFS TO WHICH SPECIFICATIONS J. APPLY.
All types, flat, pitched or curved concrete asphalt roofs, etc.
Minimum fall recommended for Flat Roofs in 10 ft.

NOTE: On all pitched or curved and asphalt roofs, the first layer is bedded in Ruberoid Compound.

SPECIFICATION — For suitable form of specification, see page

TO WHICH SPECIFICATIONS J. APPLY.
All types, flat, pitched or curved concrete asphalt roofs, etc.
Minimum fall recommended for Flat Roofs in 10 ft.

NOTE: To avoid dry rot, ventilation should be provided in the roof structure. For suitable form of specification, see page 14.

ROOF BOARDS
UNDERLAY
COMPOUND
UNDERLAY
COMPOUND
FINISHING LAYER OF RUBEROID

CONCRETE ROOF

COMPONENTS

Page Ten

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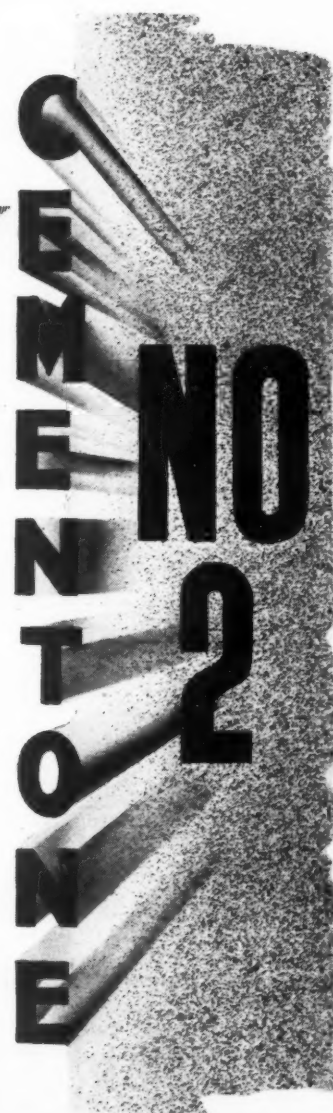
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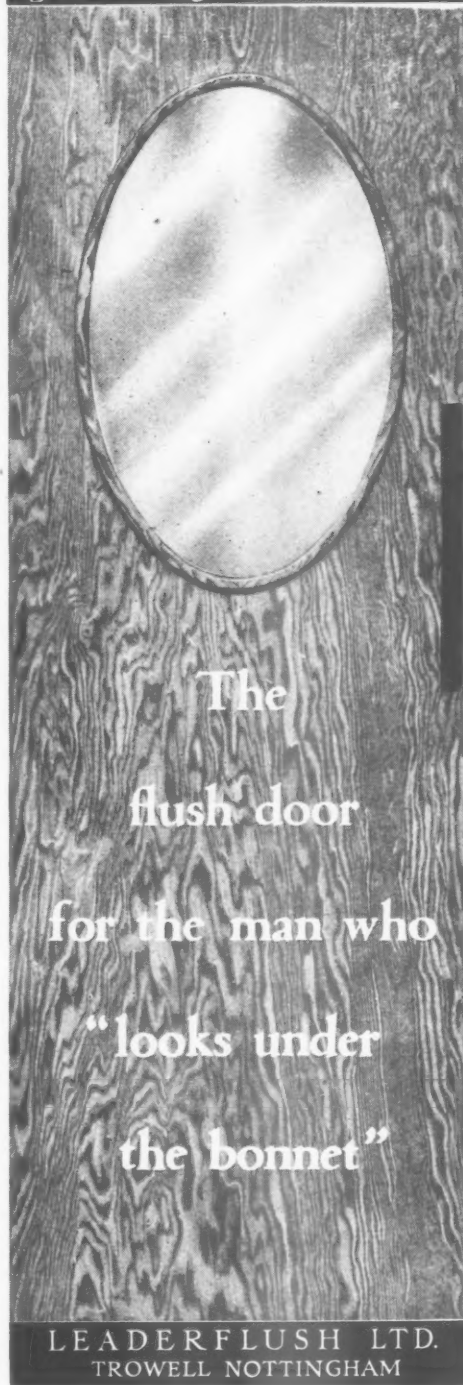
In other words, the answer is in the negative. It's hard, even for a horse, to be taken out of a well-earned retirement just because we've a war on. But he's helping to keep a tank going "somewhere." So let's put the best face we can on it and admit that a little inconvenience is inevitable these days for most people. Those who have trouble in getting M.K. products should know that the war effort is absorbing the entire facilities of our factory. When the piping days of peace are here again, production of fine quality switches, switch plugs and electrical accessories will be resumed.



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Other forms of vegetation burgeoned (as Mr. Ruskin might have said) in a rich pattern on the walls. And in the evening, when twilight crept stealthily among all this foliage, the sense of living in a sub-tropical jungle must have become almost startlingly real.

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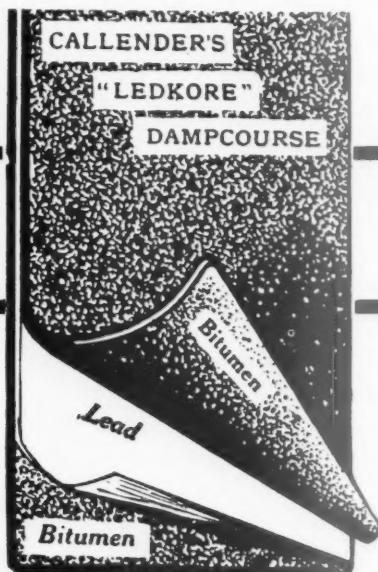
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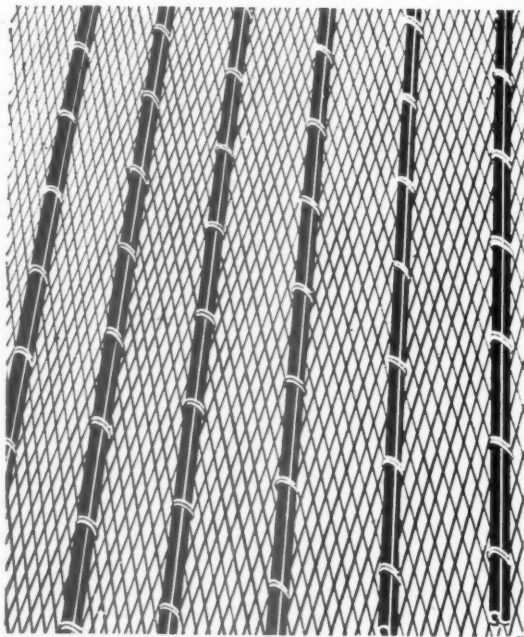
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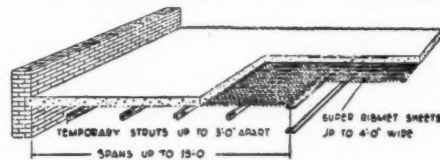
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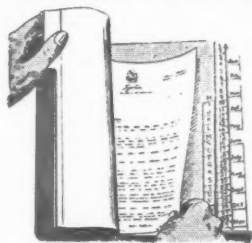
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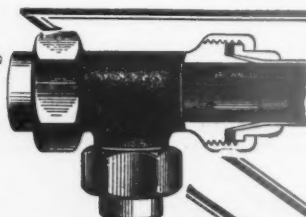
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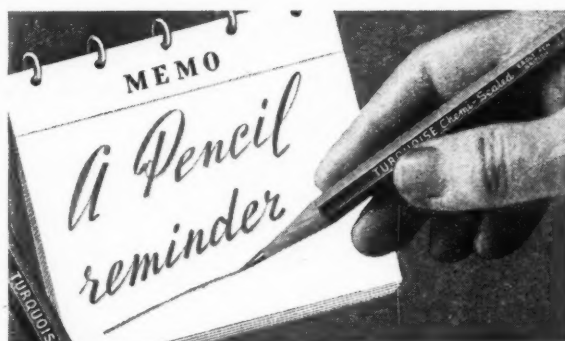
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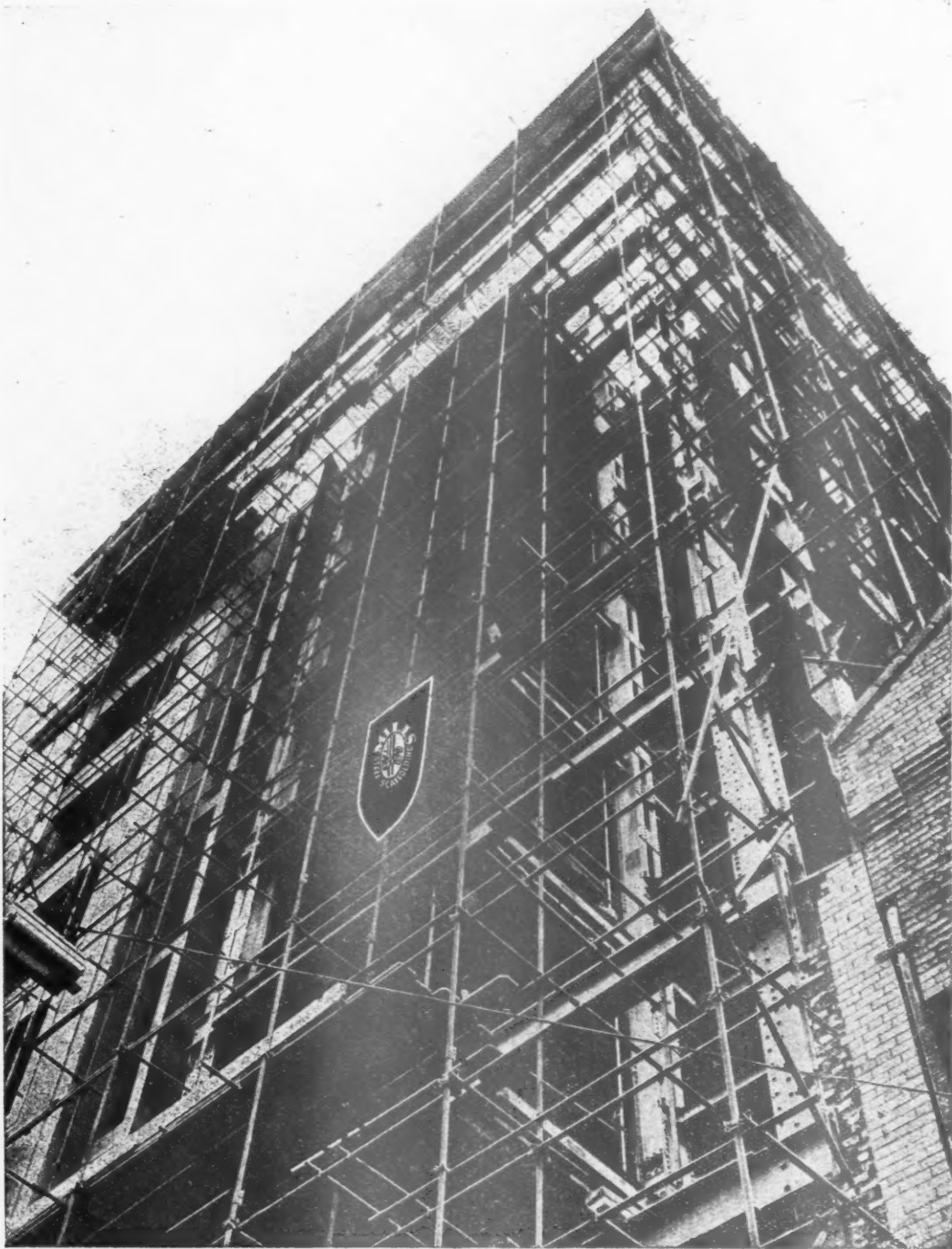


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