The technical and practical perfection of this example of a modern brewery fermenting room could, by no possibility, have been evolved without close and willing collaboration between three people, The Brewer, The Architect and the Refrigerating Engineer, each an expert in his own subject but each realising his limitations and his dependence on the other two.

The innumerable applications of

REFRIGERATION

in Department Stores, Retail Shops, Factories, Office Buildings, Hospitals, Laboratories, Schools, Restaurants, Cafés, Theatres, Cinemas, Hotels, Dairies, Breweries, &c., often present Architects with unfamiliar problems of a highly technical nature, which are best solved by obtaining the expert assistance and co-operation of

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Alphabetical Index to Advertisers

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

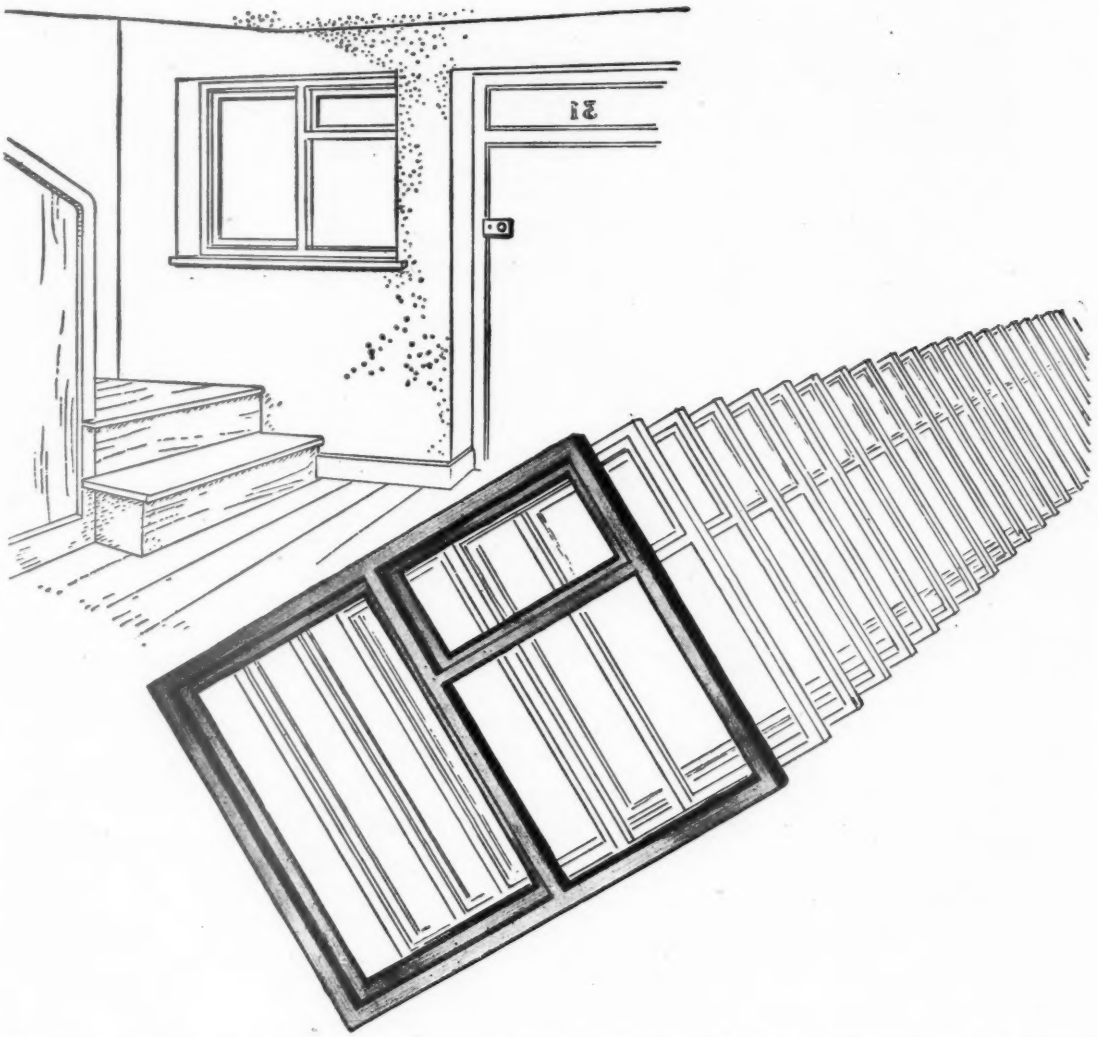
THE designers and builders of motor cars are seriously considering plastic materials and their possible application to the peace-time car.

These materials have undergone great changes and rapid development due to the perfecting of aircraft and other machines of war. How far this work of the research chemist and the engineer will influence the design and construction of tomorrow's car cannot yet be foreseen. Plastics have long played a part in the mass production of internal fitments for cars—such as instrument panels, handles, knobs and lighting fittings. Bigger things may lie ahead. Tinted or opaque "Perspex" for sunshine roofs, clear "Perspex" for back lights and side windows, extruded sections of "Welvic" polyvinyl chloride compositions for window fillets, are a few of the many possible applications. I.C.I. make many types of plastic material and will be pleased to supply particulars of them on request.

ICI

IMPERIAL CHEMICAL INDUSTRIES LIMITED, LONDON, S.W.1

P.144



Medium sized two-light EJMA wood casements give good lighting up the staircase, especially if the head be placed fairly high, and good spread of light into dark corners of the entrance hall.

Austins have adopted the new EJMA range of post-war wooden windows because they are good-looking, good quality and have been designed for fast production.

AUSTINS
OF EAST HAM

LONDON, E.6 **[LIMITED]** **GRAngewood 3444**

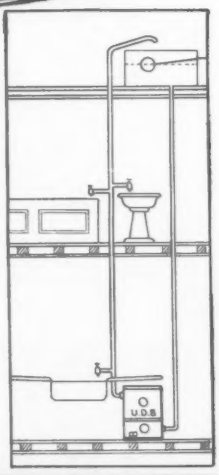
Stonesham & Kirk

The Architect's interest in a house begins with the planning of the first blue-print. The Housewife's begins when the removal contractor's van draws up at the front gate.

Sadia, thinking ahead, have produced an Electric Water Heater to satisfy the requirements both of the Architect whose calculations are in terms of pipe work, flues, ventilation, and constructional costs, and of the Housewife who thinks in terms of efficiency, economy and convenience.

The SADIA TYPE U.D.B. (UNDER DRAINING BOARD) provides a complete hot water installation while occupying the smallest possible space. As efficient as it is compact, as cheap to run as it is easy to fit, the Sadia U.D.B. ensures a constant hot water supply in bathroom and kitchen and wherever else it may be required. Used in conjunction with solid fuel hot water installation, it is Sadia's contribution to the home of the future.

Further particulars on request.



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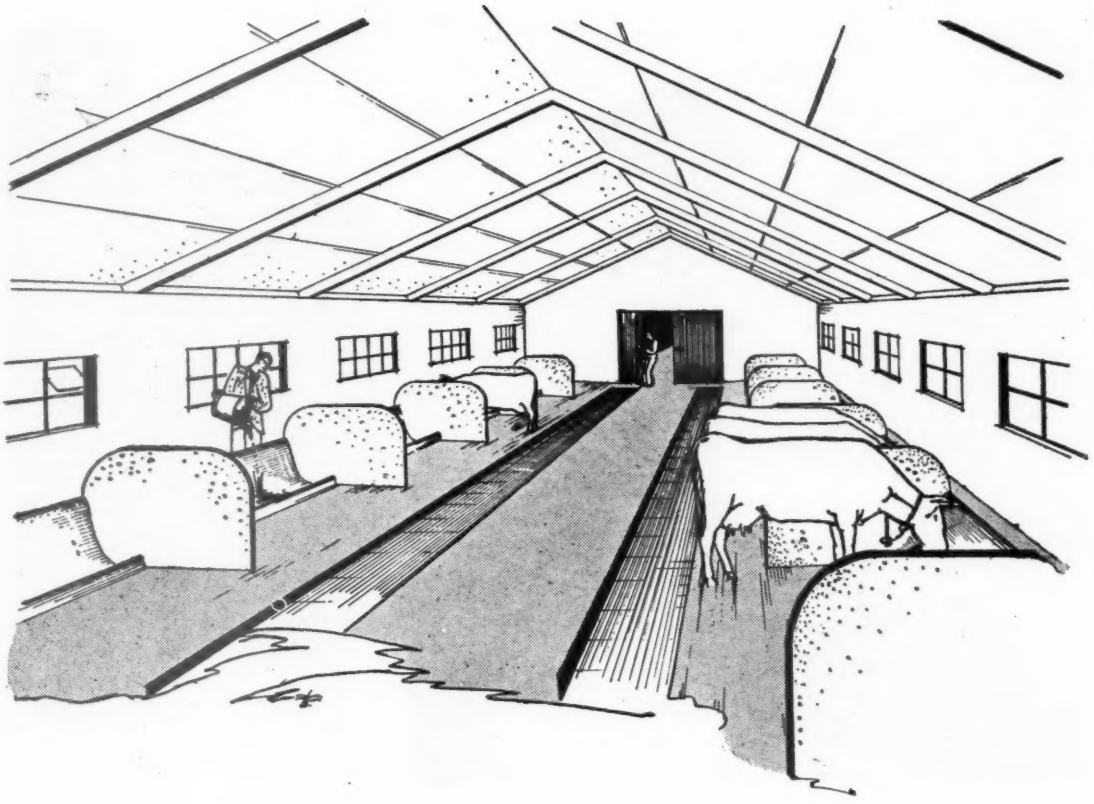
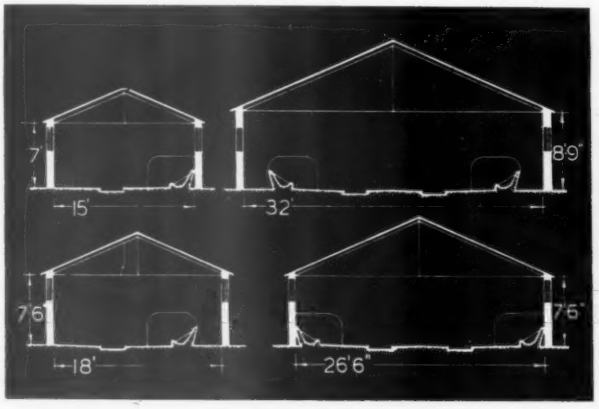


MARLEY agricultural buildings have many uses. Designed primarily as cow sheds, these buildings can be adapted for use as drying sheds, for storage, as canteens, etc. Blueprints giving full details of the construction and method of erection will gladly be sent on request.



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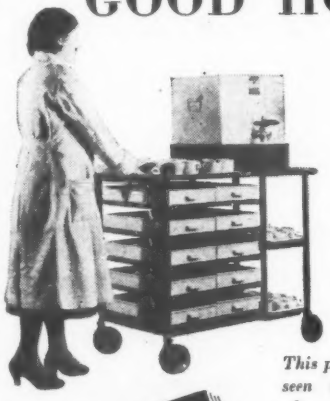
Photograph by courtesy of Good Housekeeping School of Canteen Cookery

GOOD HOUSEKEEPING WAR TIME MEAL CENTRE

View of Servery from Main Restaurant



This picture can be seen in hundreds of war factories.

WE ARE NATURALLY PROUD of the fact that the people who have done so much to raise the standard of peacetime domestic appliances should ask us to design and install their wartime Meal Centre which caters for 300 lunches every day beside training hundreds of students to become efficient members of the vast army of cooks, counter servers and supervisors so urgently required for Priority Industrial Canteens.

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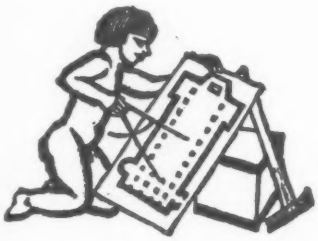
In common with every other periodical this JOURNAL *is rationed to a small part of its peacetime needs of paper. For this reason it is virtually impossible for Newsagents to accept new orders for the* JOURNAL *for the time being, and the Publishers are also now unable to enter new subscriptions. Intending subscribers should, however, send in their names either to their Newsagent or direct to the Publishers to be recorded on the "waiting list" when they would be advised as soon as a vacancy occurs. The annual post free subscription rate is £1 15s. 0d.. Single copies, 9d., postage 2d. Special numbers, price 1s. 6d. are included in the annual subscription. Back numbers more than 12 months old (when available), double price. Volumes can be bound complete with index, in cloth cases, for 15s. each; carriage extra. Goods advertised in the* JOURNAL, *and made of raw materials now in short supply, are not necessarily available for export.*



DIARY FOR JUNE JULY AND AUGUST

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

BISHOP'S STORTFORD. *When We Build Again.* Exhibition and film. At the Training College Hall. (Sponsor, TCPA in collaboration with Messrs. Cadbury Bros.). JULY 1-8

BRIGHOUSE. *Rebuilding Britain Exhibition.* At the Gas Showrooms. Guide lecturer, Miss Ivor Jones. (Sponsor, BIAE). JUNE 29 to JULY 8

CHELMSFORD. *The English Town: Its Continuity and Development.* Exhibition, and *When We Build Again.* Film. (Sponsor, TCPA.) SEPT. 1-9

GRANTHAM. *The English Town: Its Continuity and Development.* Exhibition. At the Guildhall. (Sponsor, TCPA.) JULY 12-26

KETTERING. *The Englishman Builds Exhibition.* At the Museum and Art Gallery. Guide lecturer, Miss M. McLeish. (Sponsor, BIAE). JUNE 29 to JULY 8

LEEDS. *When We Build Again* and *Homes of To-morrow.* Exhibition and film. (Sponsor, TCPA.) JUNE 29-JULY 22

LLANDYBIE, SOUTH WALES. *When We Build Again.* Exhibition and film. At the National Welsh Eisteddfodd. (Sponsor, TCPA in collaboration with Messrs. Cadbury Bros.) AUG. 7-11

LONDON. *RA Exhibition.* Weekdays 9.30 a.m. to 7 p.m. Sundays 2 to 6 p.m. Admission: One Shilling. JUNE 29-AUG. 7

National Buildings Record Exhibition. At the National Gallery. Photographs of buildings of architectural interest throughout the country taken during the past three years for record purposes. Most parts of England, from Northumberland to Cornwall, are represented and the subjects range from the Central Tower of Durham Cathedral to Georgian wallpaper in a house at Falmouth. (Sponsor, National Buildings Record.) 10 a.m. to 12.30 p.m., 2.15 p.m. to 6 p.m. JUNE 29-JULY 15

Breughel Reproductions Exhibition. At the Geffrye Museum, Kingsland Road, E.2. A collection of reproductions of paintings by Pieter Breughel. (Arranged by CEMA.) Open daily, except Sundays and Mondays, from 11 a.m. to 8 p.m. (10 a.m. to 7 p.m. on Saturdays). JUNE 29-JULY 8

Ernö Goldfinger. *Housing, Towns and Roads.* At 13, Suffolk Street, S.W.1. (Sponsor, HC.) Lunch 12.45, Talk 1.15 p.m. The lunch will introduce the touring exhibition *Traffic,* which Ernö Goldfinger and Ursula Blackwell have made for the Army Bureau of Current Affairs. JULY 4

Miss Judith Ledeboer. *Post-War Housing.* At 2, Savoy Hill, Strand, W.C.2. (Sponsor, TCPA). 1.15 p.m. JULY 6

R. L. Reiss. *The Future of the Country Town.* At 2, Savoy Hill, Strand, W.C.2. Chairman: G. N. C. Swift. (Sponsor, TCPA.) 1.15 p.m. JULY 6

Sir Albert Howard. *Fresh Food and Town Planning.* At 2, Savoy Hill, Strand, W.C.2. Chairman, Lord Portsmouth. (Sponsor, TCPA.) 1.15 p.m. JULY 20

Reconditioning England Exhibition, 1944. At St. Martin's School of Art, 109, Charing Cross Road, W.C.2 JULY 24—AUGUST 7

F. J. Osborn. *Preservation and Progress.* At a meeting to be held by TCPA in conjunction with *Reconditioning England* Exhibition at St. Martin's School of Art, Charing Cross Road, W.C.2. Chairman, Lord Harmsworth. 3 p.m. JULY 25

London Master Builders' Association half-yearly meeting. At the Connaught Rooms. Mr. H. C. Harland, President of the Association, will preside. Mr. Henry Willink, M.P., Minister of Health, is to be the guest of honour. JULY 27

Federation of Master Builders. Luncheon meeting preceding Fourteenth Quarterly Meeting. At the Connaught Rooms, Great Queen, Street, W.C.2. Guest of Honour, Lord Portal, Minister of Works. 12.45 for 1 p.m. JULY 27

NEW MALDEN, SURREY. *The English Town: Its Continuity and Development.* Exhibition. At the Public Library. (Sponsor, TCPA.) AUG. 19-26

PEMBREY. *When We Build Again.* Exhibition and Film. (Sponsor, TCPA in collaboration with Messrs. Cadbury Bros.) AUG. 5-15

STOCKPORT. *When We Build Again.* Exhibition. (Sponsor, TCPA in collaboration with Cadbury Bros.) AUG. 19-26

SUDBURY, SUFFOLK. *The English Town: Its Continuity and Development.* Exhibition. (Sponsor, TCPA.) SEPT. 21-30

TAUNTON. *The Englishman Builds Exhibition.* At the School of Art. Guide lecturer, G. Mayer-Marton. (Sponsor, BIAE). JUNE 29 to JULY 1

NEWS

THURSDAY, JUNE 29, 1944
No. 2579. VOL. 99

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

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

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

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

By its acceptance of plans for important alterations in St. Nicholas Street and Netherkirkgate, Aberdeen Town Council has placed A DISTINCT HANDICAP on the ultimate replanning of the centre of the city. Expressing this opinion, Mr. G. R. Mackenzie, President of the Aberdeen Society of Architects, said: The crossing of Union Street is one of the major problems to be considered. The decision of the Town Council simply means that the plans now adopted for this integral part will dictate the design for the general lay-out instead of the general design dictating the shape and construction of each individual part. That is contrary to all the principles of good town planning. Mr. Mackenzie agreed that this might have been an excellent plan fifty years ago. In fact, he recalled that his father prepared a similar plan in the '90's for a proprietor in the Netherkirkgate. After the war, bus traffic will have to be co-ordinated with railway traffic. In addition, there will also be the heavy traffic. It is axiomatic in town planning that heavy traffic be diverted from shopping centres, and it is obvious that Union Street will continue to be the shopping centre. My society, he said, is gratified that a factual plan for Aberdeen is being prepared. It advocated this three years ago and also suggested then that a model of the centre of the city should be prepared before major decisions were taken. We architects are conscious that the replanning of the centre of the city is a difficult enough problem without having what is to be done at a crucial point laid down beforehand.

from AN ARCHITECT'S *Commonplace Book*

ARCHITECTURE EMERGES FROM THE MELTING POT. [*From* Fine Building, *by Maxwell Fry* (*Faber & Faber*)]. Architecture when led by men of imagination will always be in advance of its time because the normally expressed wishes of clients will be interpreted, not in accordance with established fact and convention, but in the light of the full range of their imagination and experience. Where clients see themselves as individuals or isolated bodies in need of buildings which they can only imagine by reference to existing buildings, the architect, sympathising with their individual needs, yet sees their relationship with those of society as a whole, and translates them by reference to his reservoir of knowledge and feeling. These individual wishes, often so poorly and impractically expressed, emerge from the mental process defined and enriched. It is doubtful whether at any other period in the world's history, the social conditions and the materials and tools from which architecture derives its justification and its means of expression, have changed with such rapidity. If the structural developments which have led to our present technical skill were to continue at the same pace into this century, at a pace, that is, exceeding our capacity as artists to assimilate them, then our hopes of establishing a workable architecture would be slight. But that is not the case. The main lines of development are now foreshadowed and refinements of pure technique are a simpler matter to deal with.

A card index scheme for architects is proposed by the RIBA to assist DEMOBILISATION AND POST-WAR EMPLOYMENT.

The Card Index (applicable to architects normally domiciled in the United Kingdom) will be available to all Registered architects in addition to members, students and probationers of the RIBA, members of the Allied Societies and of the Architectural Association. The primary object of the index is to provide the information required to ensure that those demobilised from the Forces, or released from other forms of National Service, are given every opportunity of obtaining suitable employment where such is available. Registered Architects who are not members or students or probationers of the bodies mentioned, but who wish to avail themselves of this scheme, should make application to the RIBA for a copy of the necessary Questionnaire to be sent to them. They should complete the Questionnaire and return it as soon as possible to the RIBA so that the particulars may be included in the Card Index.

During the quarter ended March 31, the following MINISTRY OF HEALTH LOANS were sanctioned to local authorities in England and Wales.

Housing, £352,921 ; Municipal Services, (including clinics, sanatoria and mental hospitals), £400,750 ; Swimming Pools, playing fields, recreation grounds, open spaces, etc., £182,634 ; Water Supply, £86,298 ; Disposal of Waste Products (sewerage and sewage disposal and refuse destruction), £178,211 ; Education Services (including libraries and museums), £56,253 ; Air Raid Precautions, £56,935 ; Roads and Bridges (including private street works), £2,620 ; Other Services (including loans to defray contributions, etc., under War Damage Act, 1941-43), £180,690. Total £1,497,312.

Mr. James Barr has been elected PRESIDENT OF THE CHARTERED SURVEYORS' INSTITUTE.

Mr. James Barr, who succeeds Mr. W. C. Farnsworth, was born in 1884 and educated at Glasgow Academy. He was apprenticed to his father, the late Mr. James Barr, F.S.I., in 1900, and became his partner nine years later. His firm, Messrs. James Barr & Son, of Glasgow, practise as Quantity and Land Surveyors and Valuers. Mr. Barr acts as professional adviser to the British Iron and Steel Federation and numerous industrial concerns. He is a Deputy Commissioner for Scotland under the War Damage Act ; a member of the Panel of Arbiters for Scotland under the Acquisition of Land (Assessment of Compensation) Act, 1919, and of the Panel of Commissioners for the holding of local inquiries under the Housing (Scotland) Act, 1935. He was a member of the Uthwatt Committee ; of the Scottish Building Costs (Housing) Committee, of which he was chairman ; and of the Building Committee of the Empire Exhibition, Glasgow, of which also he was chairman. He is at present chairman of the committee now inquiring into the proposed Forth-Clyde Canal. He is a past chairman of the Scottish Branch of the Institution and served on the Council of the Institution from 1935 to 1938, and again from 1940 to the present time. He is the first surveyor practising in Scotland to have been elected as President of the Institution since 1923, when the late Sir James Davidson, of Edinburgh, was elected to that office.

The War Executive Committee of the RIBA Council has approved in principle a scheme for TEMPORARY POST-WAR OFFICE ACCOMMODATION for architects.

The scheme submitted to the RIBA by Lieut.-Col. V. H. Seymer, A.R.I.B.A., is intended to

At a lunch-time meeting of the Town and Country Planning Association held in the industrial demonstration room at the Lighting Service Bureau (see page xxx). *Left to right, V. W. Dale, Assistant Director and Secretary of the British Electrical Development Association ; W. J. Jones, Director of the Electric Lamp Manufacturers' Association, who occupied the chair ; E. E. Hoadley, Consulting and Resident Engineer and Manager of the Maidstone Corporation Electric Supply, who delivered a paper on* Electricity After the War ; *C. G. Seeley, member of Council, Electric Lamp Manufacturers' Association ; and F. J. Osborn, Secretary, Town and Country Planning Association.*

Pure Form in the Sixteenth Century

That architecture relying for its effect on simple, unadorned, three-dimensional form is not the prerogative of the twentieth century, nor without romantic precedent, is illustrated by this dramatic picture of Hvezda Castle, near Prague. It was built in 1555 for Archduke Ferdinand, son of the Bohemian King Ferdinand. The famous Battle of the White Mountain of 1620, when the Bohemian army was defeated by the forces of the Catholic coalition, took place round the castle. Methods of fighting and building may change ; geometry remains immutable.

provide temporary office accommodation for architects demobilised from H.M. Forces or released from other forms of National Service. The RIBA states : It is recognised that many architects returning to private practice will have lost their former offices owing to enemy action or for other reasons, and will lack equipment which in the immediate post-war period it will be difficult to replace. Other members of the profession may, however, be in a position to offer temporary hospitality in such cases, thus enabling those whose practice has been suspended to resume work as quickly as possible and to make more permanent arrangements at a later stage. The duration of such hospitality would, of course, be a matter for private arrangement. The War Executive Committee commend this scheme to the attention of practising members, who are invited to advise the Acting Secretary of their willingness to assist in the manner suggested and to indicate the number of architects to whom it would be possible to offer temporary accommodation.

The British Cast Iron Research Association is to open a BUILDING USES DEPARTMENT at ALVECHURCH, BIRMINGHAM.

A new department of the British Cast Iron Research Association is to be opened at Alvechurch, Birmingham, on July 1. It has been formed in order to furnish an authoritative and completely impartial information service for users, particularly architects, quantity surveyors and builders. It will be known as the Building Uses Department, and Mr. Derek Bridgwater, F.R.I.B.A., has been appointed consulting architect. The British Cast Iron Research Association was incorporated as one of the Government-aided research associations in British industry and is a voluntary association of manufacturers of castings for all purposes and thus unites all ironfounders, whether making grey or white cast iron or malleable cast iron. It has hitherto operated through three main departments, a research department for acquiring new knowledge, a development department for carrying out large-scale work needed to apply discoveries and to aid the industry in applying them, and an intelligence department which covers all the functions inseparable from dissemination, library, information bureau, translations, bibliographies, abstracts and the like for both manufacturers and users. It exists for the technical advancement of the industry and for the creation, application and dissemination of material which will assist makers to improve the quality, uniformity and economy of iron castings. It is concerned not only with the range of alloys known as the cast irons, and their treatment, but also with moulding materials, melting practice and the processes involved. The Association recently acquired a country house at Alvechurch, twelve miles south of Birmingham, with fifteen acres of land for post-war extension.

★

The Government's Plans for rebuilding the blitzed areas and the CONTROL OF THE USE OF LAND in all parts of the Country were issued on Friday last.

The plans fall into two parts: the Town and Country Bill, presented by Mr. W. S. Morrison, which widens, strengthens, simplifies and expedites the powers of local authorities for the compulsory purchase of land; and a White Paper foreshadowing further legislation at a later date to deal with the long-term problem of the use of land and the payment of compensation to owners deprived of the right to develop. The Bill lays it down that local authorities will normally meet the cost of land acquisition by raising loans. The financial memorandum accompanying the Bill estimates on a preliminary basis that the cost for war damaged areas will be about £575,000,000. The Exchequer will make grants towards this cost. To start with, the grants will be equal to the loan charges of the first two years, and this is estimated to cost something under £50,000,000. During the following eight years, or 13 if necessary, the Government will continue financial assistance if it is satisfied that damage has made it impossible to bring the area into use for any substantial purpose. For this purpose the Government will assess both the loan charges and the revenue the land is yielding to the local authority. Later there will be a five-yearly review on the same basis and repayments to the Exchequer may be required. Local authorities may dispose of the land they acquire to allow private enterprise to use it for building or other purposes, or they may retain it themselves. Both courses will require the assent of the Minister of Town and Country Planning, and this will be given only in most exceptional cases to outright sales or leases exceeding 99 years. Under this scheme, as far as possible people who were living or carrying on businesses in the area are to be given an opportunity of obtaining accommodation in the redeveloped area. In the White Paper the proposals reject the plan of the Uthwatt Committee to vest all development rights in the State. The White Paper argues that landowners should be left with some incentive to develop their land.

Dundee town council is sending a deputation to the Department of Health TO PRESS FOR WOODEN FLOORS in Scotland's new houses.

The deputation will ask this question: If, as has been reported, the 500,000 temporary houses to be built in Britain are to have wooden floors, is there any reason why timber should not be released for permanent houses built in wartime? Says Councillor W. Black: It does not seem logical that temporary houses should have wooden floors and permanent houses concrete floors.

Malham Tarn, the SECOND LARGEST EXPANSE OF INLAND WATER in Yorkshire, is to be sold.

Malham Tarn is included in the estate of the same name which is to come up at auction. The estate lies in the West Riding and runs to about 870 acres, with sporting rights over 9,786 acres of moorland. Charles Kingsley wrote that Malham Tarn, a sheet of water covering 153 acres, possessed the best fishing in the whole earth.

SCIENCE AND LIVING

THE two recent lectures arranged by the Architectural Science Board of the RIBA maintained the high standard and sound philosophy of their predecessors. They showed how the scientific collection of house-building knowledge and its application fit within the framework of the social function of science. The first, *Social Survey Technique* by Mr. Dennis Chapman, dealt with the collection of information relating to our needs. It suggested that our present methods of planning and executing housing are of a rough and rudely empiric character, based for the most part on out-of-date conceptions with the more glaring errors of the past eliminated or, in the case of private enterprise housing, on the assumption that what will sell is what is required, but never on a real investigation of people's needs. The important point brought out in the lecture was the growing necessity of applying the scientific method in the field of sociology to guide and help the modern architect, who in his turn employs the accumulating evidence of scientific investigation and research.

The latter subject formed the theme of Mr. Anthony Chitty's lecture on *Science and Housing**, which surveyed the regions where the scientific method can to-day be properly applied and suggested further subjects in which rational and scientific thought is urgently needed, including legislation, finance and the consideration of long and short term housing policy.

The significance of both these lectures was perhaps less in their factual statements, which were interesting enough in themselves, than in their implication—the implication that an extremely high standard is now possible in one of the three major essentials of human life, namely shelter, if the scientific approach is taken, from the early discovery of true needs to the final construction. This is itself part of the wider implication that the physical means already exist to bring about a new age of universal peace and plenty, having a more vital, more satisfying and less chaotic cultural pattern than exists at present. As Mr. Chitty said, "The part of science is largely an indirect one, the unseen background to creative and imaginative thought . . . On the material plane we seek always economy. The chief virtue of economy is, of course, as a means to an end, to set us free to address ourselves to the more important values and activities of life, art, study, recreation, expression and social practice." What are the particular needs of to-day, he asks. "They are," he replies, "first, our desire to avoid unnecessary menial labour; second, and linked with this, greater space for the better use of the leisure thus gained; third, our more conscientious and efficient care of children, and with it the sense of the importance of play as a factor in life from childhood onwards; fourth, our increasing need for privacy, quietness, and ease, in the racket of an industrial world."

Technical development has been blamed too often for present

* Reported on pages 492-494.

social and cultural maladjustments, when it is clearly its application and our slow adaptation to its powers that are at fault. To be able to put to proper use the scientific knowledge now available, to be able to generate a new culture in which science not only provides for our future well-being, but, by providing fully for that, provides also for our moral well-being, a new will is needed, and therefore an imagined picture of the future to stimulate that will. As yet the picture is blurred, but already the form on the canvas grows more definite. These two lectures at the RIBA are encouraging symptoms, among many others, of that fact. Refrigerators for All will not alone fill the canvas. Unless men in general, and architects in particular, can make clear in their mind's eye the whole picture of the future that in their hearts they want, science of itself cannot save us, nor can building become once again an art and an essential element in a way of living that is serene and whole. Already architects are beginning to take a wider and healthier view of their function in society. That view must become wider still in order that they may imagine life in the future vividly and as a whole in which they will play their particular and intrinsic part. As Paracelsus has it, "Resolute imagination can accomplish all things."

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

NOTES & TOPICS

BURT BOYS TO BIRMINGHAM

The members of the Burt Committee, final arbiters on matters of house-design and construction, were recently levered out from under the conference table and sent off to Birmingham to inspect the experiments being carried out in that area. It was a larger mission which set out than that which recently exhibited in London the tools they brought back from the USA, and it was accompanied, I understand, by an impressive retinue of officials, experts and technicians whose task it was, presumably, to throw a protective screen round the committee when it approached the danger areas where, behind every tubular frame, every asbestos slab, and every concrete post, lurked the industrialist, the tycoon, the slick presentation boys, and the deceptively disarming architect-salesmen.

★

However, no screen was necessary. The committee members were as high-spirited and as aggressive as an OTC platoon off on a field day. No lavatory paper was of course unrolled from carriage windows, no blank cartridges were fired, and reports of the general singing of Mareseytotes and doeseytotes and littlelamseytivie are not substantiated. But the committee was clearly on the offensive from the starting point when a challenge to a fight over a reserved seat was unhesitatingly thrown down, to the moment at the end when, in an unsuccessful attempt to prove brittleness, an asbestos-sheeted experimental house was subjected to a barrage of ill-aimed stones from the members' own hands.

★

Altogether, according to our Birmingham spies, it was a highly instructive and valuable visit, and not without its lighter moments. There was the moment, for instance, when a famous City Architect with an obstinate preference for personal experiment sat down on a w.c. and snapped it off at the root, drenching the distinguished bystanders (already somewhat awash from a huge lunch). This caused nervous laughter and silent grinding of teeth among the executives concerned, and laughably disproved William Blake's famous dictum that "cisterns contain, and fountains overflow."

★

There was also the puzzling encounter with a friendly deaf mute outside the Mutual Life Building, where a group of architects reverently admiring Lethaby's detail were informed (in writing) that pigeons with more amusing habits could be seen elsewhere. (Some lip-reading confusion possibly with Pugin, from whose St. Chad's the same band of students had just emerged?). Some undertook a desperate foray to Dudley where it was confirmed that the Zoo buildings were still as romantically placed as the castle above them, but not ruinous.

POETS' CORNER

SOCIAL LADDER

I aint no woman of no workin classes,
And when I conquers I don't need ter stoop,
I've gorn up one, me lad, and dont forget it,
I'm a lidy of a Lower Income Group.

It's a miracle it is, and no mistake,
When I was just plain poor I used ter droop,
But now theyve chinged me name I quite enjoys it,
I'm a lidy of a Lower Income Group.

When rent day come with nuffink in me pocket
I used ter think that I was in the soup,
But that was yesterday before they told me
I was a lidy of a Lower Income Group.

And now I never care when me cupboard shelves is bare
And all me sixteen children ave the croupe,
For in love and war and words, blimey, everything is fair
For the lidy of the Lower Income Group.

Edward Lewis.

DISCOVERING CONSUMERS' NEEDS

Denys Thompson's recent book, *Voice of Civilization*, is perhaps the most scathing criticism of extravagant advertising ever published. Yet even it allows that "some advertising . . . brings the producer into closer contact with the

real needs of the consumer." May not this have a special significance for the industrial designer? May not design benefit if the producer-consumer gap is breached? We have been told often enough that one reason for the instinctive good design of the pre-Industrial Revolution days was the personal contact between craftsman and customer. Can modern advertising restore this lost touch in a world of mass production and complex distribution?

★

Some attempt is being made to use advertising for such a purpose. A notable instance is the current series of newspaper advertisements by the Hoover people, which have a footnote inviting users to submit suggestions for improvements which they consider should be incorporated in post-war Hoover products.

★

Just before the war, the Frigidaire company in America used the services of their advertising agents to obtain guidance on the design of an electric cooker, which they were then planning. The advertising agents produced a questionnaire in pictorial form showing various alternative features that could be embodied in the design of the cooker. Over 7,000 housewives studied the pictures and had only to place a mark against those features which they chose and another mark to show whether those features were embodied in any cooker they already used. Thus it was possible to tell how far the views expressed were based on experience.

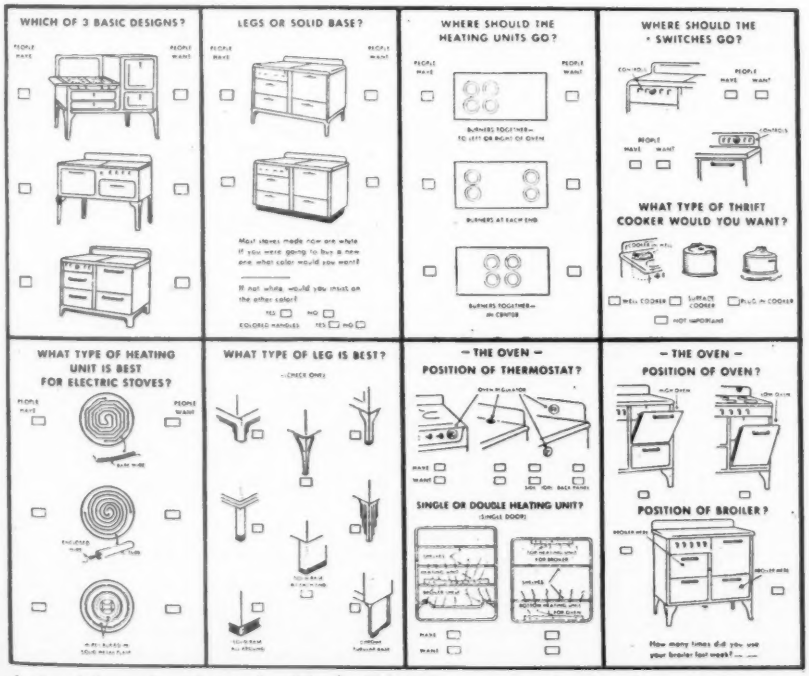
★

Investigation on such lines as this enables the manufacturer and the designer of household equipment to find out what potential customers really want, instead of what *they think* they want. That the method was successful in the case of Frigidaire is indicated by a report that, when the cooker designed to embody the housewives' suggestions was placed on the market, it set up "an enviable sales record . . . in a remarkably short period of time."

BEACHCOMBER'S CORNER

"The suggestion that there should be roads and shopping districts underground is obviously the first step towards a new world in which nobody will emerge from under the earth except to board an aircraft. The surface of the earth will be used, not for growing food but for landing grounds. The food will be made in cavern-laboratories. People will go about in hygienic nightshirts, being educated from cradle to grave."—(Beachcomber in the *Daily Express*.)

ASTRAGAL



A pictorial questionnaire produced by the Frigidaire company, showing alternative features in an electric cooker, which was submitted to 7,000 housewives. See Astragal's note above.

LETTERS

Fellow
H. W. Rosenthal
C. G. Fowlie, F.S.I.
John Watt, L.R.I.B.A.
Prometheus
T. Herdman Rae, F.S.I.
L. Fraser Mills, L.R.I.B.A.
Leslie C. Wood
James Lees-Milne

The Churchill House

SIR,—In view of the storm of criticism being levelled at the so-called Churchill House, is it not unfortunate that Parliamentary Reports are able to record that, in reply to a question in the House of Commons as to the authorship of the design, the Parliamentary Secretary, Ministry of Works, stated that "the President of the Royal Institute of British Architects . . . complimented my Minister on the design"?

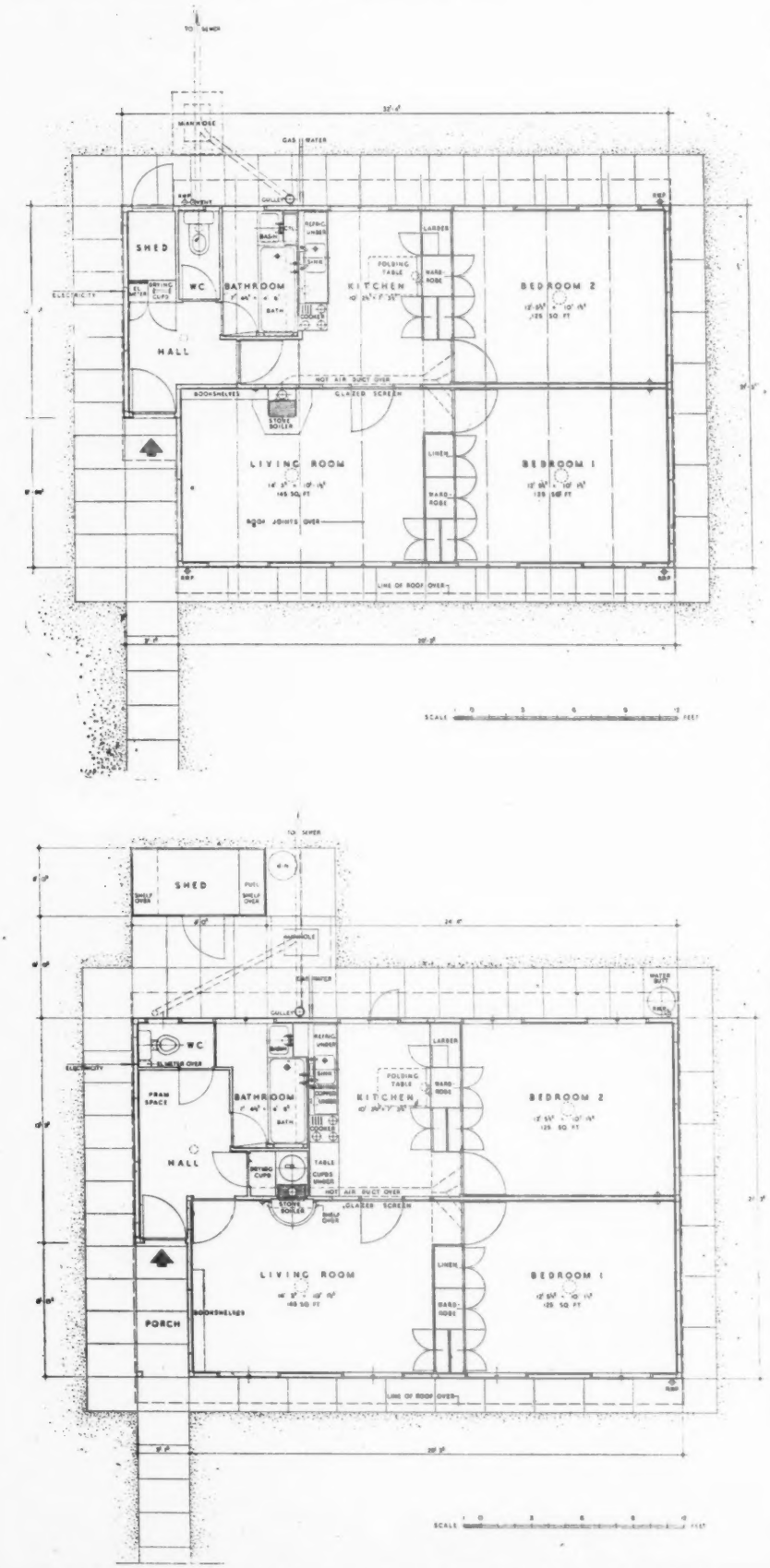
Is it not germane to the matter to ask whether the President was voicing his own personal opinion or was speaking *ex cathedra*?

FELLOW.

SIR,—While endorsing many of the criticisms of the Churchill house published in the JOURNAL, I think the frequently recurring objection to steel finishes in the kitchen on account of possible condensation is unjustified.

Condensation occurs on surfaces where the temperature is below that of the dew point of moisture laden air. It is our usual experience that metal surfaces appear cold and are therefore prone to condensation. This is due to the high thermal capacity of metals and the subsequent long periods required for their warming up.

In most traditional houses heated intermittently only through local coal fires metal surfaces may never be given a chance to become warmed up. The position, however, becomes entirely different in a house heated permanently and evenly as in these emergency houses. Here the metals will probably be warmed up to room temperature particularly as the sheets are thin. The heat loss should be small, provided the roof insulation is sufficient.



The Churchill House, designed by the Ministry of Works. Top, the original plan and below, the revised plan issued later.

Condensation therefore would be avoided. The raising of the surface temperature of the sheet metal might be further assisted by passing an air current over it. An out-let from the hot air duct under the ceiling into the kitchen would serve this purpose admirably and thus reduce even further any liability to condensation.

Taking these possibilities into account, the metal surfaces in the kitchen might become a definite asset. Where there is no absorption no odorous fumes will be absorbed and retained, and no food smells will linger longer than desirable. A window opened for five minutes will carry away any traces of these smells. The ease with which the steel finishes can be cleaned is also a very considerable advantage.

Leicester. H. W. ROSENTHAL.

SIR,—The prominence you have given to criticisms of the MOW steel houses should go a long way in remedying faults in design, and if ever they start to come off the conveyor belt and the worth-while modifications are incorporated, they should be up to a high standard. I think the Government is to be congratulated on obtaining so much expert free advice.

Before the war I was concerned with some bungalows planned on the lines suggested by Mr. O'Rorke and Mr. Enderby. These bungalows were freehold, detached standing on plots 40 ft. by 200 ft., brick built, with tiled or slated roofs, gas, water and electric light connected, while drainage was to a septic tank. They sold for under £400 including all expenses or were let at 15s. per week, including rates and repairs. These bungalows were built by a small country builder and did not form part of a big scheme.

Properly organised I see no reason why the building industry should not be able to cope with the housing shortage quite as well as the pressed steel people. Prefabrication (as it is called) will make immense strides as soon as we can give our undivided attention to the matter and a choice of materials again made available which will allow of individuality.

Haverford West. C. G. FOWLIE.

SIR,—The plan can be improved, leaving the shell as before, by adding a partition and door to the kitchen and a vestibule door.

Entrance Hall: One door makes a draughty house, suggest vestibule door by extending porch 2 ft.

Bedrooms: Bedrooms entering off a living room, or kitchen, should be avoided at all costs, it is bad planning and inconvenient for the occupants.

Suggest forming passage with direct access to bedrooms, omit hall and kitchen door. Move kitchen cupboards 2 ft. 6 in. into bedroom No. 2, form partition to kitchen with door. Move cupboards 1 ft. 0 in. into living room, thus making —

Living room 13 ft. 3 in. by 10 ft. 1½ in.
Bedroom No. 1, 13 ft. 5½ in. by 10 ft. 1½ in.
Bedroom No. 2 10 ft. 1½ in. by 10 ft.
Kitchen 9 ft. 9 in. by 7 ft. 4½ in.

The foregoing alterations could be carried out at very little extra cost and also make the house more habitable.

Another suggestion would be 8 ft. headroom in place of 7 ft., making it a house and not a garden shed.

Where is the wash tub, or wash tank?

I enclose herewith sketch showing the suggested alterations.

Edinburgh. JOHN WATT.

Ownership of Land

SIR,—The reason for the reluctance of architects to express their convictions, in response to Mr. Athoe's invitation, on the subject of the nationalization of land, is not far to seek. The ownership of land is perhaps the most powerful of all vested interests. The practising

architect is hardly in a position openly to profess his convictions while he depends for his existenee upon the favours of landowners. After all, most architects have a wife and family to keep.

Anyone of intelligence who applies himself impartially to the problems of town planning must inevitably arrive at the conclusion that no solution is completely satisfactory without the nationalization of all land. That the Uthwatt Committee realized this is clear from their report. They rejected it on one ground alone, and the nature of that ground is significant. They had no doubt that "land nationalization is not practicable as an immediate measure and *we reject it on that ground alone.*" The principal reason advanced for the alleged impracticability was that it "would arouse keen political controversy." A weaker or more fatuous reason could hardly be imagined. I should like to hear of a single instance where any reform since the birth of democracy did *not* arouse "keen political controversy." What has happened to us? Are we to reject all reforms because someone might differ from us? Must we, like the BBC, cease to mention, still less debate, any topic which threatens the established conventions of Little Muddlecombe?

Even so, the actual recommendations of the Uthwatt Committee have hardly succeeded in avoiding controversy, if indeed that was their aim. I sometimes suspect the Committee of playing the Antony and revealing the proper route by the very weakness of their camouflage.

The crux of the matter becomes clearer every day to those with eyes to see, and the sooner it is brought into the open the better it can be dealt with. There is a Power amongst us which is opposed to all planning. It is the Power which shelved the findings of the Barlow Commission and the Scott and Uthwatt Committees. It undermined the Beveridge Plan. It is the same Power which removed Sir John Reith when he threatened to take his job seriously. It is the Power of Money.

In Town Planning it is not a question of "immediate practicability" or "political controversy," or "administrative machinery" which acts as a brake. It is a question of the Money Power. Money must be served. Man is becoming enslaved by this new tyranny. Fresh bonds are being welded every day as his debts accumulate in the account books of the Money Power.

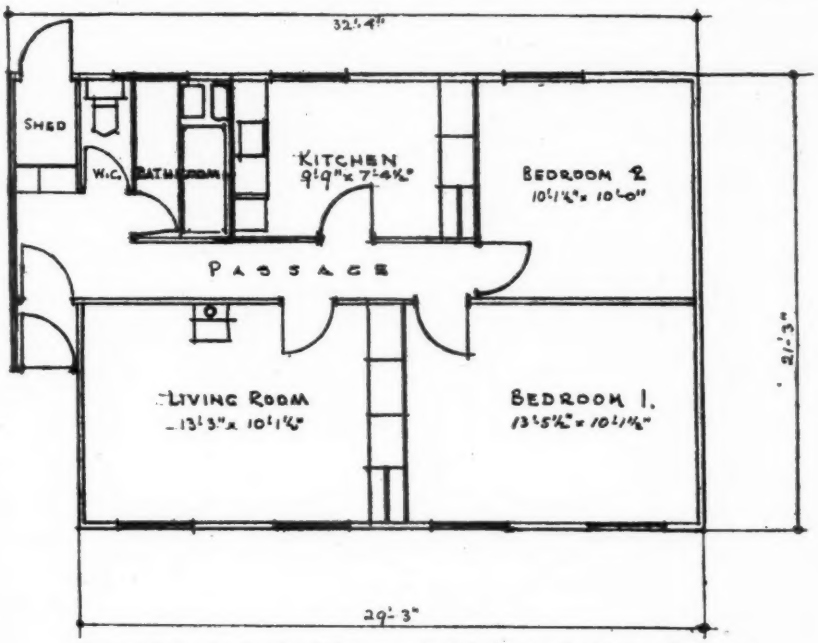
If the State wishes to build some cottages it may not use the material and labour at hand. It must borrow the money from the usurers, and the taxpayer must pay tribute on a loan which exists solely in the account books. Likewise, the State must pay forfeit for the use of its own land by way of ground rent. It would be as logical for the Air Lines to pay ransom for the use of the air through which their aircraft must pass. Does not the freehold extend upwards as well as downwards? In brief, privately owned land is stolen property, and no one cries out for compensation when stolen property is restored to its rightful owner.

Meanwhile the Power which opposes planning pursues its propaganda campaign with subtle ingenuity. The property owners parade their pathetic concern for the poor widow eking out from her meagre rents a pale and frugal existence. The Building Societies proclaim to their guests of honour their resolute refusal to be prevented from serving the public. The yapping press, obedient to its masters, upholds in yet heavier type the sanctity of private property, private enterprise and private freedom to be buried in a pauper's grave.

We are told, of course, that the benefit to the large landowners, the maintenance of dividends, and the interests of advertisers are just myths invented by the long-haired executive planners. Of course.

Make no mistake about it. To crush this "last enemy" is not going to be easy. It will need Voltarian courage and persistence. Our motto should be "Ecrasez L'Infâme."

PROMETHEUS.



Suggested plan for the Churchill House. By John Watt. See letter on facing page.

Thoughts of Architects

SIR,—I presume your selection from An Architect's Commonplace Book for your issue of June 1 is made with malice. I cannot otherwise find any justification for it. As an example of Blah and Bilge it is excellent, but do you think the majority of your readers will realise your motive in reprinting it? Sometimes, I think, wit defeats itself by its own modesty. Of course I agree that the final sentence of your selection shouts for laughter, and that he is the veriest dullard who sees it not, but I wonder . . .

While I laud your attempts to present varying angles of thought—that is as it should be—surely there are some deeper (or higher) Thoughts of Architects than this one. Your own notes on Sharawaggi for example.

Sunderland. T. HERDMAN RAE.

Let America Prefabricate

SIR,—The Report of the MOW Mission to the USA is a first-class document, revealing the hustle with which our American cousins always succeed in getting things done.

We in this country have done the spade work of our post-war building. Although the Government's policy is not yet in print, things are moving fast. The situation here is entirely different from that in America, and we should have been foolish to have gone any further with our post-war building even if this were practicable. The Prime Minister, therefore, is wise in refusing to do more until the present emergency becomes a thing of the past.

It is generally agreed that we are to have prefabricated houses by the thousand. Would it not be wise and indeed complimentary to our American friends to encourage them to set up agencies and factories in this country in which American firms could turn out prefabricated houses—houses to be bought outright at a price all our people could afford?

Our building costs are just double what they were, and will remain so when peace comes. To-day the four-roomed house or bungalow built since the last war is selling at £1,250 and more. The vast majority of people cannot afford this, and when they try are tempted to mortgage their wages or salaries to the building societies at 4½ per cent. With building materials more than double the 1939 figures, how can people realize their ambition to own a house of their own? Everyone cannot get the Churchill house.

It would be interesting to find a good four-roomed house or cottage designed and supervised by a qualified architect, built of brick to up-to-date standards at a price to suit the pockets of wage earners, and secured by easy and low interest payments.

Glasgow. L. FRASER MILLS.

Visual Planning

SIR,—Your Planning Series has at last come to the discussion of the architect's own particular job, and Messrs. Kallman and McCallum are to be congratulated on their article. It must, however, be realized that sensitive design of and in an environment, otherwise architectural good manners, has for long been the concern of conscientious architects, despite the fact that your illustrious contemporary appears only now to have found a word for it.

Their failure may be ascribed in some part to inadequate training, but this is beside the point: the real causes are more obvious and less remediable.

Some of these may be briefly stated:

1. The division of land into small freeholds, with the impossibility of design influence from one to the next.

2. The much divided and jealously guarded control of street layout and equipment, largely controlled by rating and other financial considerations.

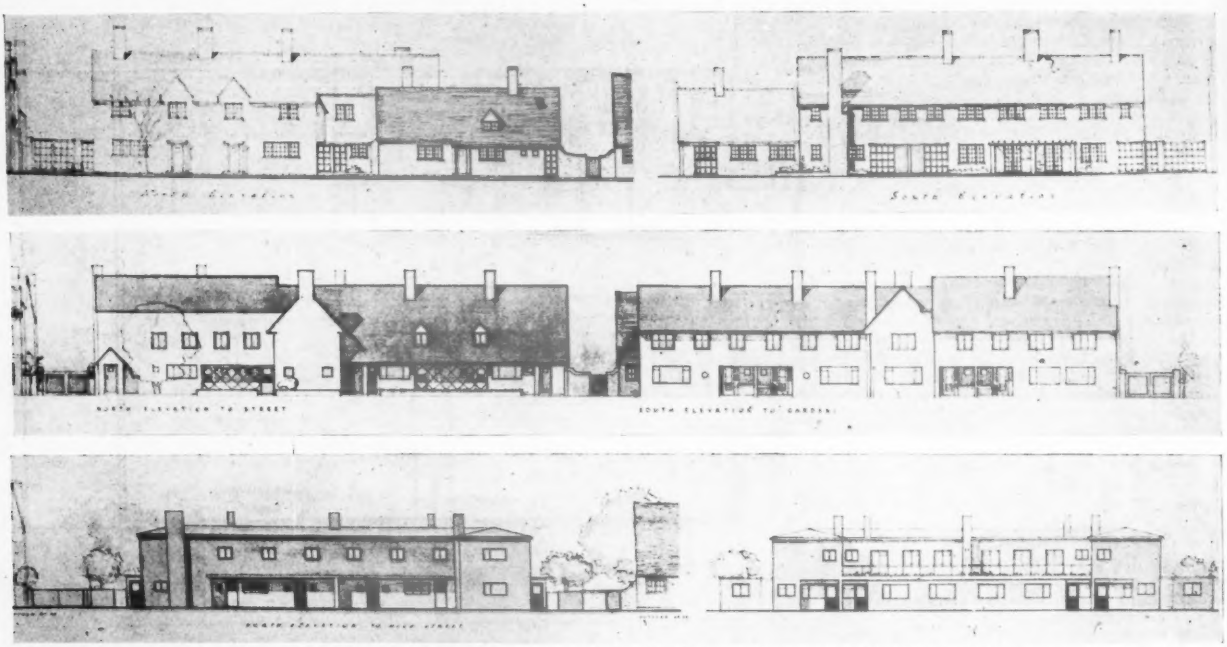
3. The deification of wheeled traffic. The presence of many moving vehicles inevitably upsets the architect's efforts at restfulness, intimacy of grouping or æsthetically telling approach.

4. The public need of good design has no corresponding public desire for it. Your contributors, with reason, want to base visual design on unity and coherence in society, but signs of these desirable conditions have yet to show themselves.

It would be interesting to know what suggestions Messrs. Kallman and McCallum can make for dealing with these four great difficulties. As I see it, the architect's chief hopes lie in the schemes which are now beginning for the education of the public, and in his own integrity. His responsibility is the more heavy, though not the less acceptable, for the certain knowledge that nine-tenths of his work will be ruined by mishandling of the surroundings, which he will be quite powerless to control.

LESLIE C. WOOD.

Messrs. Kallman and McCallum write: We believe that the second part of Mr. Wood's



Above are the elevations of three of the designs submitted by the same firm of architects, Messrs. T. Mellor, G. Grenfell Baines and J. A. Ashworth, in the West Wycombe Rural Cottages Competition, recently promoted by the National Trust. The top elevation belongs to the winning design, which was illustrated fully, together with designs placed second and third in the JOURNAL *for April 20. A week later Astragal criticised the promoters for awarding prizes for designs of a "bogus romanticism" when the conditions asked for "something more than replica work." This resulted in a letter from the winners which was published on May 18. Now Mr. Lees-Milne, of the National Trust, replies to Astragal's criticisms and in connection with this the three alternative elevations shown above have some point, being respectively of traditional, semi-traditional and contemporary character.*

fourth difficulty, the lack of unity and coherence in society, is the cause of the other difficulties, which are only symptoms of this lack. If visual planning were really no more than "architectural good manners" and "sensitive design," it could not hope to be instrumental in creating a satisfactory environment. The purpose of the article under discussion was to show that the design of environment demands a wider approach than the architectural, one that is closely linked to physical planning, of which it is the visual expression. If a common agreement is reached to plan both economically and physically for the general well-being of every individual, then many of the obstacles to a satisfactory environment, among them Mr. Wood's points 1-3, will be dealt with by legislation, zoning, etc. If, however, such agreement is not reached, unity will either be imposed or disorganization and the consequent disintegration of environment will continue. The authors agree with Mr. Wood when he states that the architects' chief hopes lie in the schemes which are now beginning for the education of the public, but they also believe that unless architects, from whose profession most visual planners will be drawn, define and demand the wider powers necessary to develop and operate the new technique, physical plans will be realized without them, and thus without due regard to visual design.

West Wycombe Cottages Competition

SIR,—In a recent issue, under Notes and Topics, you imply that the National Trust assessors, in adjudging the 257 designs submitted for the West Wycombe Village Competition, were sadly influenced by Ye Tea Shoppe taste of that archaic decade, the 1930's. It is not for me to express surprise at your reaction to the "bogus romanticism" of the winning design. That attribute is surely a matter of taste. But when you continue to impute to the winning design "sentimentalities associated with half-timber work on the by-pass," I feel bound to protest that no vestige of that outmoded style is anywhere apparent in the winning design. If you had seen the great bulk of the "modernistic" as well, it is true, as the "Tudor," "Jacobean" and "Georgian" designs which it was the assessors' painful task to adjudge, I think you might have been more disposed to sympathize with their choice than to condemn it.

I enclose a copy of the Assessors' very able and informative Report which they submitted to the General Purposes Committee of the National Trust.

JAMES LEES-MILNE,
Acting Secretary, The National Trust.
London

[*This letter appears to need no answer as the winners' three alternative designs, on this page, answer it for us.*—ED., *A.J.*]

Here are extracts from the report of the assessors (Messrs. Darcy Braddell, Edward Maufe and William Weir), referred to by Mr. Lees-Milne:

In making our award we have had to take into consideration a number of different factors, both practical and æsthetic, which are material to this problem, and balance their values very carefully. There is the character of the village, and the necessity of the new buildings making harmonious relations with it; this will apply not only to the expression of each proposed cottage but to the arrangement of the whole as an architectural composition taking a natural, unforced place in the village street. These are purely æsthetic problems. There are others of a practical nature which claim serious consideration; for example, the number of cottages which can profitably be built upon the site without overcrowding; the simplicity of their structure, which will bear directly upon its cost; the convenience of the internal planning of each so that it shall be suitable to the lives of the persons who are intended to live in it; the size of rooms, so that they shall be sufficiently generous without being extravagant; a sensible layout of the irregular site, so that the utmost is attained from it. We have had to balance all these factors in order to assess a correct value to each, since it is certain that no single design will outshine the others on all sides of a problem that has proved by no manner of means easy to solve.

We are happy in being able to assure you that, in our opinion, you have in No. 166 a design which has summed up all these salient points *as a whole* and made the best of them; therefore, we have placed it first.

This design provides four cottages without overcrowding—three cottages of two stories and one with ground floor only. The plans of all the cottages are economical and practical. There are no entirely north rooms as in so many of the designs, yet the housewife has the opportunity, during her work, of seeing, at a reasonable distance, what is going on in the village street.

Probably the best point in this design is the way it has been subtly influenced by the site itself, for both the shape of the plan and the shape of the structure are a masterly response to the special characteristics of the site. The general layout accords with the shape of the site, and, with regard to the composition of the building, we agree with the winner when he says in his report, "The contrasting heights of the buildings on the east and west sides of the site call for a group which forms a link." By setting the three two-storied cottages back from the road along about two-thirds of the east end of the site he has managed to preserve the view of the interesting west gable of the existing cottage abutting the site on the east, and has, in fact, used this as one side of a shallow courtyard. On the other side of the site he has planned a one-storey cottage, which cleverly echoes the scale of the existing cottage abutting the site on the west, thus providing the other arm of the courtyard. This seems to us to have solved in a most admirable and sensitive manner the extremely important question of obtaining a really satisfactory architectural composition to fit in with the existing adjacent buildings.

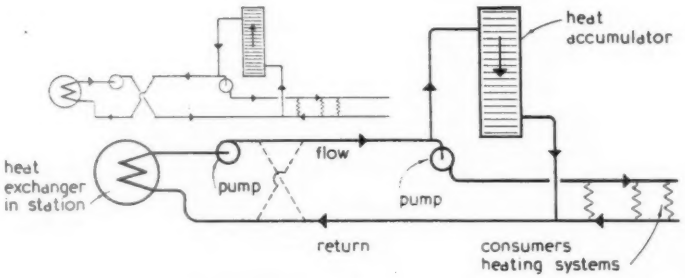
The design is expressed in a traditional manner. The plan of the internal accommodation is very good for the purpose of all essentials, though it is not faultless, and should be remedied in places.

We have been particularly sympathetic toward those designs which show the more modern tendencies, but unfortunately such designs have either proved themselves complete strangers to the village or have been planned in a way possibly suitable for the week-ender but not for working-class tenants as specifically mentioned in the Conditions.

• DOMESTIC WATER HEATING 6: DISTRICT HEATING (C)

HEAT STORAGE AND THE THERMO-ELECTRIC STATION :

Most efficient operation of a Thermo-Electric station occurs when the heat and electric loads are in balance ; i.e., when pass-out steam is just sufficient to supply heat demand. This can rarely occur in practice. Diagrams on this sheet show typical electric and heat load curves.



THERMAL STORAGE SYSTEM : Showing heat accumulator being charged and (small diagram) discharging into circuit.

HEAT ACCUMULATORS :

Heat storage is generally used with hot water as the medium. The heat accumulator is a huge cylindrical vessel insulated so as to have negligible thermal losses, and placed near the heat station or near the centre of load.

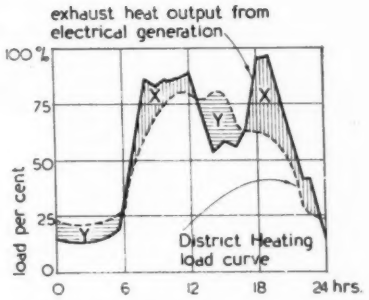
HEAT STORAGE AND THE "GRID" :

In this country, with electrical generating stations connected to the "Grid," surplus electrical energy can be transferred elsewhere ; high electrical loads can be met by energy taken from outside. A combined station, grid-connected, can be run mainly to meet heat load which can be smoothed out by heat storage.

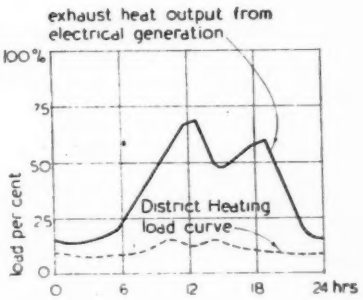
LOAD FACTOR :

The Annual Load Factor is the ratio:— Annual consumption: Consumers' maximum hourly demand × 8760 (8760=365 days × 24 hours per day). The load factor for heating is dependent on weather, kind of building, kind of heating system, and period of occupancy. The number of degree days possible from 30°F. to 60°F. for a heating season of 210 days is 6,300. In the London area an average season has about 3,750 degree days, i.e., a load factor of 3750 : 6300=0.6. Over 365 days this becomes 0.35.

Buildings are not commonly heated fully at night. Many are shut down at weekends. Daytime occupancy further reduces heat required. Hot water supply and process heat is continuous summer and winter, but is a small proportion of the whole, and is generally operating much below maximum peak. The combined effect is that average load factors are generally of the order of 0.15 to 0.25. The importance of this will be apparent when it is remembered that in the building-up of the tariff, the fixed costs are far greater than the running component. A given plant can supply a much greater annual number of therms if the demand is more nearly continuous than if the system is lightly loaded for long periods of the year. The consumer can improve load factor by adopting continuous heating instead of intermittent ; this means taking some heat at night-time so reducing the morning peak, but it need involve no sacrifice in economy. Heat storage on the consumers' premises has the same effect.



Winter : Areas X (winter curves)=an excess of pass-out steam. Areas Y= deficiency of pass-out steam. The excess means waste. The deficiency means steam direct from boilers. A heat storage accumulator applied to such a case would absorb the surplus heat X and discharge it during the periods Y, thus keeping the efficiency to a maximum. Heat storage gives a station greater capacity to meet peak loads, hence a greater load may be connected.



Summer : In summer, heat load is confined to hot water supply, etc. Pass-out steam is too great over the whole 24 hours. Steam for this light load is "bled" from one of the turbines, the remainder going to condenser. If the bled steam is supplied at a uniform rate the heat accumulator balances out the heat curve variations.

DIVERSITY FACTOR :

Another consideration affecting the size of plant for a given connected load is the Diversity Factor.

All buildings may not require full heat at the same time. Others, such as Theatres and Churches, may require heat at periods when other buildings are not occupied.

This has the effect of spreading the plant capacity over a bigger potential load, and so helps to reduce the tariff.

[TURN OVER

PARTICULARS OF SOME DISTRICT HEATING STATIONS:

	Type	Capacity	Buildings served
GREAT BRITAIN			
Manchester—1911	St.	30,000 lbs. St./hr.	Offices and warehouses.
Dundee, Logie—1920	St. and H.W.	16,000 lbs./hr.	250 houses.
Dundee, Hospital and Stirling Pks.—1922	H.W. (l.p.)	20,000 lbs./hr.	270 houses.
Staveley	H.W.S. only by waste heat	15 million B.Th.U./hr.	2,000 houses.
Treforest Estate—1938	St. superheated	100,000 lbs. St./hr.	Factories and Process.
U.S.A.			
Washington D.C.—1934	St.	640,000 lbs./hr.	Federal bldgs
New York (5 plants)—1910 onwards	St.	6,600,000 lbs./hr.	2,400 comm. bldgs. apart't. bldgs., etc.
Detroit—1903	St.	2,600,000 lbs./hr.	1,800 customers.
Chicago—1900	St.	1,000,000 lbs./hr.	Commercial bldgs.
GERMANY			
Hamburg—1921 onwards	H.W. (h.p.) accs. & com. el.	520 million B.Th.U./hr.	210 customers.
Berlin, Steglitz—1927	,,	120 million B.Th.U./hr.	4,000 flats, offices and shops.
Berlin, Charlottenburg	St. accs. & com. el.	320,000 lbs./hr.	—
Dresden—1927	,,	105 million B.Th.U./hr.	—
CZECHOSLOVAKIA			
Brno—1929	H.W. & St. com. el.	400 million B.Th.U./hr.	—
DENMARK			
Copenhagen	St. & H.W. com. el.	350 million B.Th.U./hr.	—
FRANCE			
Paris, Cité Jardins du Plessis Robinson—1935/7	H.W. Htg.	36 million B.Th.U./hr.	2,400 houses and flats.
Paris, Cité de la Muette Drancy—1937	H.W. Htg.	40 million B.Th.U./hr.	2,500 flats.
RUSSIA			
Moscow (4 stations)—1930/7	H.W., com. el.	500 million B.Th.U./hr.	Institutional and residential.
Leningrad—1924	,,	300 million B.Th.U./hr.	,,
Rostov-on-Don—1932/7	,,	150 million B.Th.U./hr.	Residential and industrial.
Kharkov—1934/7	,,	140 million B.Th.U./hr.	Residential, Public and Commercial.
Krasnozavodsky—1934	,,	130 million B.Th.U./hr.	Industrial.
Gorky—1934	,,	150 million B.Th.U./hr.	,,

District Heating Stations in operation or construction up to 1939 :—U.S.A. 170, Russia 156, Germany 35, Other Countries 50 approximately.

Htg., Heating ; St., Steam ; H.W., Hot Water ; H.W.S., Hot water supply ; l.p., low pressure ; h.p., high pressure ; accs., accumulators ; com. el., combined electric ; comm. bldgs., commercial buildings ; apart't. bldgs., apartment buildings.

EXAMPLES OF A TYPICAL THERMO ELECTRIC DISTRICT HEATING STATION: WATERSIDE, NEW YORK CITY. (CONSOLIDATED EDISON CO.).

The first part of the scheme, Waterside Station No. 1, was completed in 1937. It consisted of :—

two—back pressure turbo-alternator sets of 50,000 kw. each

four—water tube boilers of 500,000 lbs./hr. normal evaporation at a steam pressure of 1,475 lbs./sq. in. steam temperature 925°F.

The second part of the scheme, Waterside Station No. 2, was completed in 1941 and contained :—

two—back pressure turbo-alternator sets of 65,000 kw. each.

four—water tube boilers of 615,000 lbs./hr. evaporation at the same steam pressure and temperature as the above.

Exhaust steam is supplied at the rate of 1,000,000 lbs. per hour to the steam mains of the New York Steam Corporation. These mains are also supplied with steam from five direct heat stations.

The buildings served with heat from the New York steam mains comprise apartment buildings, office blocks, hotels, theatres, hospitals, shops, stores, and other commercial and civic buildings. Steam is supplied in each case through a reducing valve at pressures between 2 and 50 lbs. per sq. in. Condensate is taken through an economiser and a meter on its way to drain. Charges are made according to this meter reading.

This is the first example in recent years of the back pressure principle being used on an extensive scale in the U.S.A. where straight heat stations have heretofore been the rule. This new development may be the forerunner of other similar schemes taking advantage of modern high-pressure technique and utilising exhaust steam for district heat, whereby considerable thermal economies can be made.

The turbines exhaust at a back pressure of 200 lbs. per sq. in.

Part of the exhaust steam supplies the the old Waterside low-pressure generating plant.

The boilers are equipped with pulverised fuel burning plant, electrical grit precipitators, air preheaters, and the usual auxiliaries associated with modern high efficiency practice.

The condensate from the district heating system is mostly lost to drain, and the make-up is softened in zeolite softeners. The feed water, together with the condensate from the low-pressure station, passes through deaerators and stage heaters fed with steam bled from the turbines at intermediate pressures.

The electrical output of the station is a maximum of 230,000 kw.

Ascot Gas Water Heaters Ltd., North Circular Road, Neasden, N.W.10. Telephone : Willesden 5121 (14 lines).

Issued by Ascot Gas Water Heaters Ltd.

Compiled by Oscar Faber, O.B.E., D.C.L., D.Sc., M.Inst.C.E., M.I.Mech.E., Pres.I.H.V.E. and J. R. KELL, A.M.I.Mech.E., M.I.H.V.E.

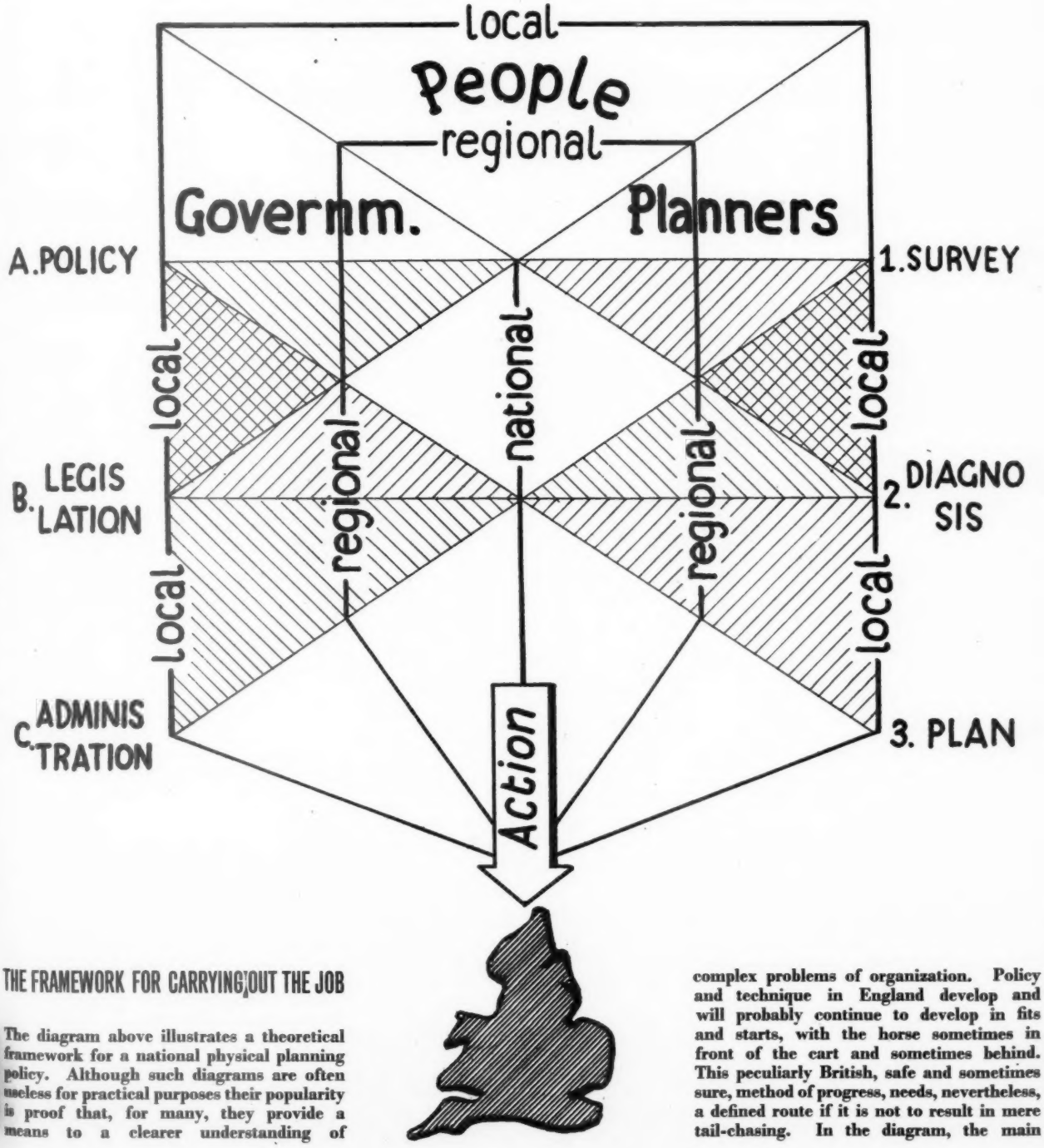
INFORMATION SHEET: DOMESTIC WATER HEATING 6

SIR JOHN BURNET TAIT AND LORNE ARCHITECTS ONE MONTAGUE PLACE BEDFORD SQUARE LONDON WC1

PHYSICAL PLANNING

AN OUTLINE FOR A POLICY

In the articles which have appeared in the Architects' Journal's physical planning supplement since September 2, 1943, twenty-four authors have considered the bogies and problems which beset the new technique of physical planning. From the large number of suggestions that have been made it is possible to form a clearer picture of the subject. This outline of a policy traces that picture by relating the points of common agreement found in reading the articles. It does not commit the authors in any way, for it is the result of but one reader's reaction to the series. It may, however, prove useful as a basis for further consideration of the very complex problem of formulating a national physical planning policy.



THE FRAMEWORK FOR CARRYING OUT THE JOB

The diagram above illustrates a theoretical framework for a national physical planning policy. Although such diagrams are often useless for practical purposes their popularity is proof that, for many, they provide a means to a clearer understanding of complex problems of organization. Policy and technique in England develop and will probably continue to develop in fits and starts, with the horse sometimes in front of the cart and sometimes behind. This peculiarly British, safe and sometimes sure, method of progress, needs, nevertheless, a defined route if it is not to result in mere tail-chasing. In the diagram, the main

stages of physical planning are shown in logical progression, the parallel and closely related work of Government and planners is shown, for convenience, under three main headings on each side. Policy, legislation and administration on the Government side; survey, diagnosis and plan on the planners'. Procedure should take place at national, regional and local levels; respect for the needs of every individual must be dominant all along the line. The outline below summarizes the most urgent problems under each of the six headings, giving serial number and date of the articles which have appeared in this series, where mention is first made to their subject-matter.

A. POLICY

A policy will be needed relating to:

ECONOMICS: Determination of needs—estimation of resources (labour, materials and industry)—population—production, distribution and consumption plan. **No. 7,** *6.9.43*; **No. 16,** *25.11.43*; **No. 23,** *27.1.44*; **No. 27,** *2.3.44*; **No. 28,** *9.3.44.*

FINANCE: Procedure for financing development. **No. 18,** *9.12.43*, p. *428* (*the local problem*).

ADMINISTRATION: Extent and distribution of legislative powers necessary to carry out development. **No. 12,** *21.10.43*; **No. 13,** *4.11.43.*

LAND USE: Allocation of land for development projects to ensure efficient utilization and rational human settlement. **No. 8,** *23.9.43*; **No. 9,** *30.9.43*; **No. 20,** *23.6.43*; **No. 21,** *30.12.43*; **No. 22,** *13.1.44*; **No. 24,** *3.2.44*; **No. 25,** *10.2.44*; **No. 26,** *17.2.44*; **No. 31,** *6.4.44.*

PUBLIC SERVICES: Coal—gas—electricity—water supply—drainage—transport. **No. 29,** *16.3.44*; **No. 30,** *23.3.44*; **No. 32,** *13.4.44*; **No. 33,** *24.4.44.*

EDUCATION: (*a*) Estimation of planners needed—number, types and training.
(*b* Adult education—exhibitions, lectures, films, literature, books and actual participation.
(*c*) Pre-adult education—the teaching of elementary planning principles and procedure in schools.
No. 14, *11.11.43*; **No. 15,** *18.11.43*; **No. 17,** *2.12.43.*

B. LEGISLATION

Legislation should cover:

(*a*) The location of new industries and the possible relocation of existing industries.
(*b*) Change of land use.
(*c*) The acquisition of land for planning purposes.
(*d*) Compensation and betterment under (*a*), (*b*) and (*c*).
(*e*) Priorities in materials and skill for development projects.
(*f*) Consultation between all persons whose interests are affected by development proposals.

C. ADMINISTRATION

Administration at the national, regional and local levels must be the responsibility of authorities vested with sufficient power to carry out the policy and administer the legislation for each level.

Matters for national administration are:

(*a*) Location of industry.
(*b*) Agriculture and rural development.
(*c*) Transport (trunk roads, main rail lines, major ports and harbours).
(*d*) Decentralization of population.
(*e*) Regrouping of population.
(*f*) Development of fuel and power resources.
(*g*) National parks and coastlines.

Matters for regional administration are:

(*a*) Distribution of industry and population.
(*b*) Transport and communications.
(*c*) Land use.
(*d*) Public utilities.
(*e*) Public services.
(*f*) Amenities.

The main functions of local authorities will be to:

(*a*) Apply principles laid down by central and regional authorities.
(*b*) Deal with all aspects of planning not covered by the policies, plans or decisions of the central and regional authorities.

1. SURVEY

The formula MAN—PLACE—WORK, which affords a key to social analysis, proves equally serviceable for planning at all levels. The sociologist, the geographer, the engineer and the economist must form part of the team supplying factual material to the planner. We need a uniform series of surveys at the national, regional and local levels. **No. 19,** *16.12.43.*

Surveys should cover (1) Geographic and Historic Pattern; (2) Population and Industry; (3) Physical and Administrative background; (4) Utilization of Land; (5) Communications and Transport; (6) Public Utility Services; (7) Housing; (8) Shopping and Retail Trade; (9) Social Services; (10) A detailed survey is also necessary of buildings and landmarks of historic, cultural or æsthetic significance. This survey will form an essential part of any visual proposals. **No. 35,** *1.6.44.*

2. DIAGNOSIS

The step following the collection of all information relating to physical planning at the national, regional and local levels must be that of diagnosis. The conclusions drawn from the surveys should be shown to the public by map and diagram; draft solutions in the form of master plans should be produced. The formulation of policy and legislation should proceed parallel with this practical planning work.
See **Civic Diagnosis of Hull,** *A.J., 29.7.43.*

3. PLAN

The translation of the draft plans into more detailed short and long-term stage plans and finally into immediate development plans depends upon the successful integration of the two elements—technique and policy. Only when the technical and administrative planners are working together, within the same terms of reference, will the results be in any way notable. The four factors of realization which must be clearly defined in each development plan are:—

1. Time schedules—chronological order of development.
2. Physical—new development, re-development of existing arrangements.
3. Legislative—administrative and financial measures.
4. Community organization and public opinion.

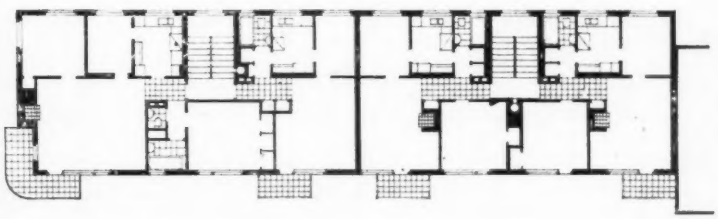
No. 34, *27.4.44.*

The success of any physical planning policy will be determined by our ability to agree on political and economic aims. This problem was considered in the Planning Bogies. No. 5, *2.9.43*; **No. 6,** *9.9.43*; **No. 7,** *16.9.43.*

FLATS

AT ABRAHAMSBERG, STOCKHOLM

DESIGNED BY CYRIL MARIUS

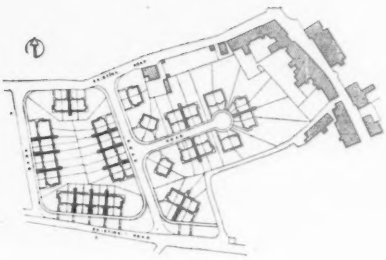


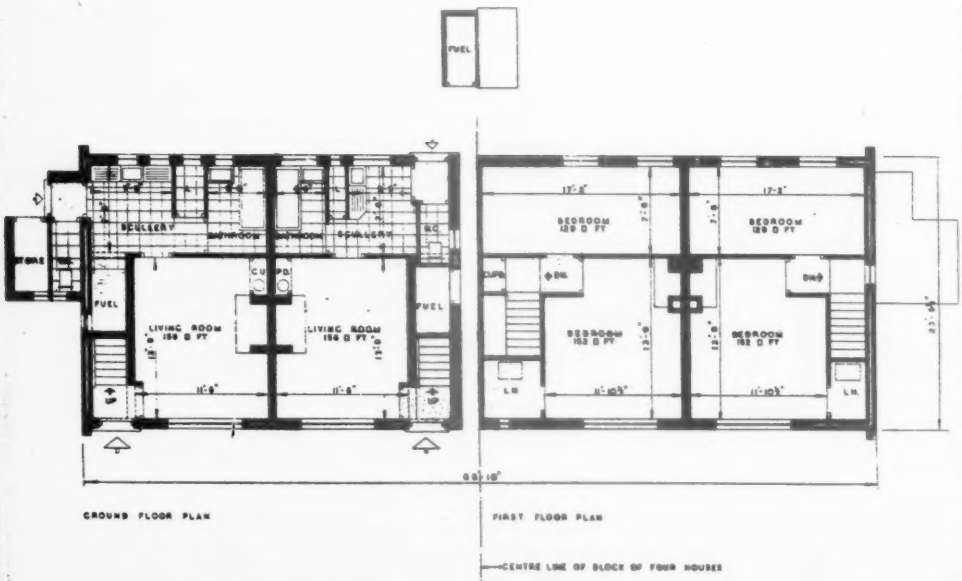
This block in the Abrahamsberg residential district of Stockholm, by Cyril Marius, is of brick and reinforced concrete construction, and has balconies, which are faced with painted corrugated sheeting. This corrugated motif is repeated on the garage doors at the end of the block, which contains three sizes of flat, varying from two to four rooms. The illustration on the left shows a well-fitted kitchen typical of the flats in the district. A hot-water heater goes on the wall above the end of the sink, where the connecting pipes can be seen. Window details of flats in the district by the same architect were illustrated in the Journal for May 4, page 330.

HOUSES

IN NORTH WEST ENGLAND

DESIGNED BY T. A. PAGE, SON AND BRADBURY



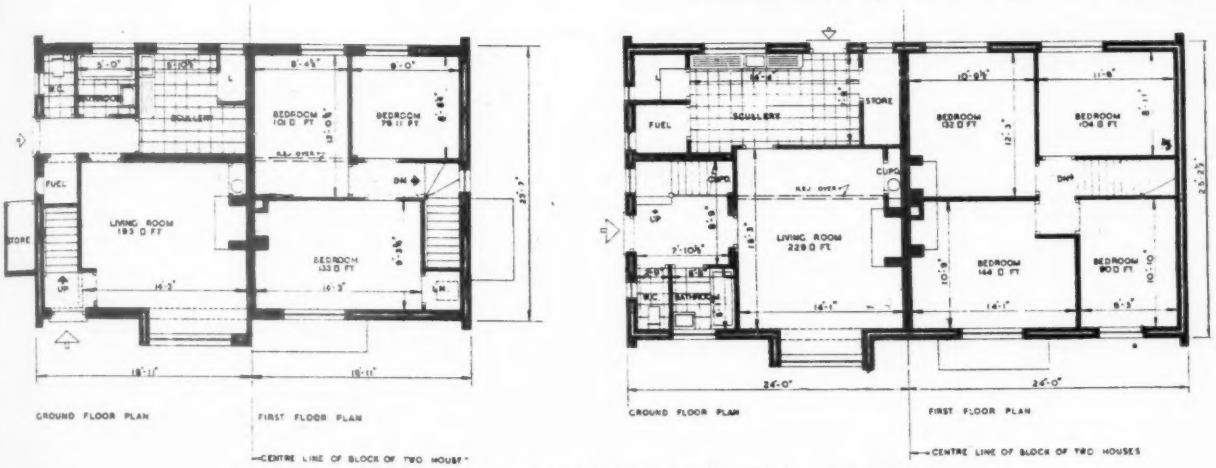


Two-bedroom house, ground and first floor plans.

GENERAL—Fifty-four houses for war workers. All the houses are of the non-parlour type. Twenty have two bedrooms, thirty have three bedrooms and four have four bedrooms. In planning the houses the chief aim of the architects was to cut out all waste space.

CONSTRUCTION—Walls, 11 in. cavity, cement rendered. Partitions, loadbearing, 9 in. and 4½ in. brick; non-loadbearing, 3 in. partition blocks. Ground floors, 6 in. screeding, 3 in. rough concrete, floors reinforced where built on made-up ground; first floors and roofs, pre-cast concrete units and screeding, spanning from wall to wall where possible, and from reinforced concrete beams to walls; staircases, timber.

DETAILS—Doors, external, wood; internal, wood with 4 in. wood architraves. Windows, wood; guttering and rainwater pipes, cast iron; lintols, part reinforced

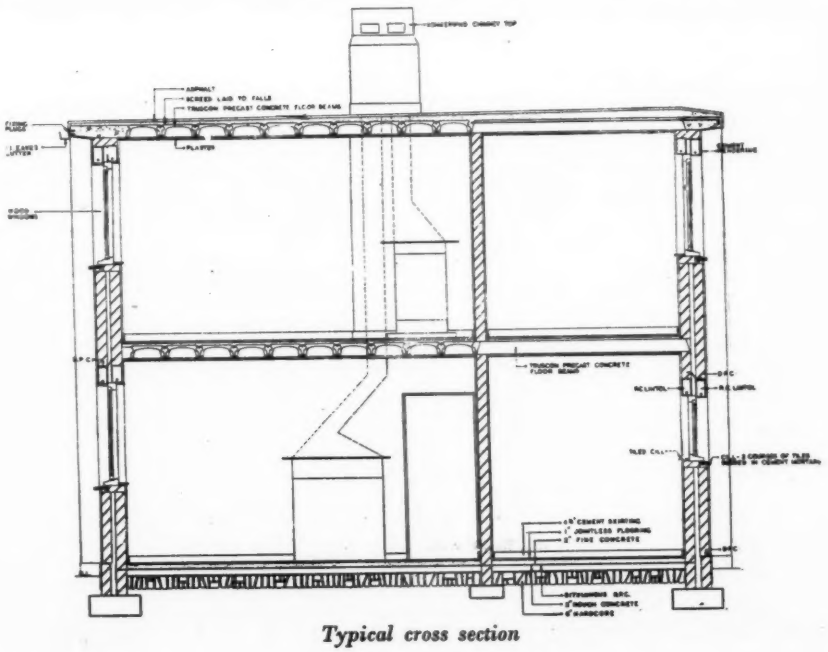


Ground and first floor plans of three-bedroom (left) and four-bedroom houses.

concrete, part concrete cast *in situ*. Window cills, external, two courses of quarry tiles; internal, one course of quarry tiles; chimney cappings, precast concrete to eliminate down draught; window and door surrounds, 2½ in. cement; eaves, reinforced concrete, with 9 in. overhang at front and back only; roofs to bay-windows and cycles, reinforced 6 in. concrete.

INTERNAL FINISH — Ground floors: living-rooms and lobbies, 1 in. jointless rubber flooring; scullery, coals, bathroom, w.c., and cupboards, grano finished with cement skirtings. Roofs, screeding, 3-ply patent felt built-up bitumen, with ½ in. bitumen lime stone finish as topping. Ceilings, plaster on Hy-rib and skimcoat plaster; walls, plaster; paths and steps, concrete.

For the names of the general and sub-contractors, see page xxx.



Typical cross section

INFORMATION CENTRE

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

STRUCTURE

1516 House Construction

HOUSE CONSTRUCTION, POST-WAR BUILDING STUDIES, NO. 1. *By an Interdepartmental Committee appointed by the Minister of Health, the Secretary of State for Scotland and the Minister of Works.* (*HMSO*, 1944, 2*s*.) (*Summary reprinted in* Architects' Journal, *April* 6, 1944, *pp.* 268-9). Suggested basic technical considerations of house construction, Alternative forms of construction used in the inter-war period. Notes on materials. Recommendations for use of no-fines concrete.

This is the first of a series of 22 reports under the title of Post-War Building Studies. The reports are being prepared by a series of committees appointed either by a Government department or convened by a professional institution, a research association or a trade federation. Their purpose is to investigate the major problems which are likely to affect peace-time building. The reports are not official publications in the sense that the Government as such is responsible for, or necessarily accepts, the views expressed, but their contents are authoritative since they contain the considered views of experts and others closely connected with the subject.

Report No. 1, on *House Construction*, was prepared by a committee under the chairmanship of Sir George M. Burt. The terms of reference of the committee were "to consider materials and methods of construction suitable for the building of houses and flats, having regard to efficiency, economy and speed of erection, and to make recommendations for post-war practice in the light of all relevant findings of the Study Committees co-ordinated by the Directorate of Post-War Building of the MOW."

The report is divided into three parts. By far the most important is Part I, which is an attempt to establish a "proper standard of habitability." It is the first systematic scientific approach to the problem of house construction, analysing the various requirements which a dwelling house has to fulfil. It is only on such basis that a fair comparison can be made between various materials and methods of construction. It is pointed out that the standards suggested are "tentative and may require revision in the light of experience." The problems have been examined generally in connection with one and two-storey buildings, though there is occasional reference to flats.

The basic technical considerations in house construction are:

(1) Strength and stability;
(2) Moisture penetration and condensation;
(3) Thermal insulation;
(4) Sound insulation;
(5) Fire hazard;
(6) Maintenance and durability;
(7) Vermin infestation.

(1) It is suggested that floors of houses of not more than two storeys should be designed for a superimposed load of 30 lb./sq. ft. or a load of 240 lb. uniformly distributed on any foot width of slab or floor-board, whichever gives the worst conditions. The same superimposed load of 30 lb./sq. ft. is suggested for flat roofs and roofs up to 10° pitch. This is a welcome and substantial reduction of the requirements of present bye-laws (e.g. the LCC Bye-Laws of 1938 specify a superimposed load of 50 lb./ft. for floors and flat roofs and roofs inclined at an angle up to 20°, and alternatively ¼ ton uniformly distributed per foot width of floor). The specification of a horizontal load for parapets and balustrades fills a gap in present regulations. (There is a discrepancy between clause 16 and clause 174, which specify 30 and 25 lb./ft. respectively.)

(2) Dampness in houses may be due to rain penetration through external walls, the rise of moisture through walls or ground floors, rain or snow penetration through roof, or to internal condensation. Each of these sources of dampness is examined.

The 9 in. solid brick wall is unacceptable as a standard of house construction, the trend has been towards the 11 in. cavity wall.

Condensation is the result of the deposition of moisture from the air inside the building. Adequate heating is an important counter against it. The best and most permanent method of preventing condensation is to reduce the thermal conductivity of the walls, floor and roof and to provide an internal lining of low thermal capacity.

(3) In the past not enough attention was paid to the importance of thermal insulation. From the economic point of view, the problem is one of balancing capital costs against running costs. Although it is not possible to lay down absolute standards of thermal insulation, as has been done in the case of strength and stability, maximum values for the heat transmittance of walls, floors and roofs (measured in B.Th.U.'s) can be suggested. These depend on the method of heating and are different for the living-room and the rest of the house. The advantage of double glazing or double windows—common practice on the Continent—is mentioned, but not sufficiently emphasised.

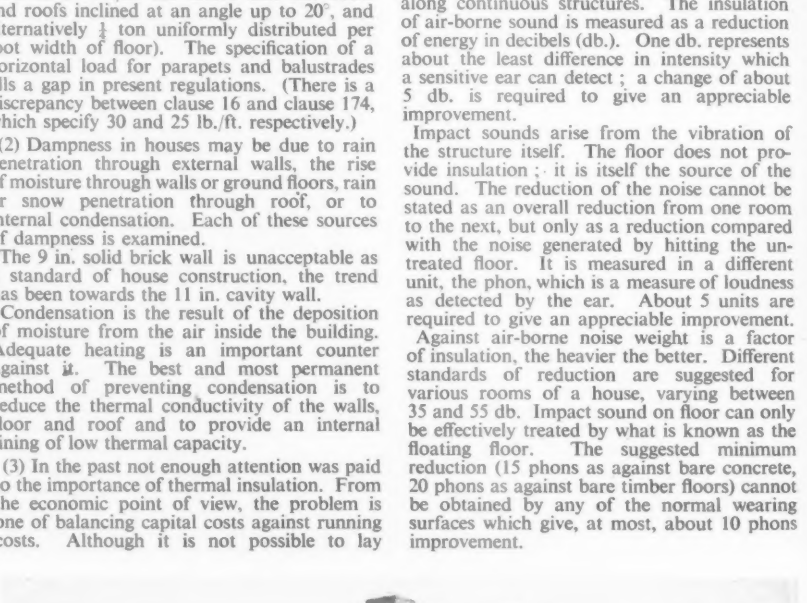
The 11 in. cavity brick wall is inadequate in thermal insulation, particularly for a living-room. It is suggested to apply insulation in the form of linings to the interior of the walls. As a general rule, it is preferable for the insulation (whether floor, walls or roof) to be on the inside surface.

The report proves that in most cases additional capital expenditure on insulation will be justified.

(4) Sound originates either as a disturbance in air, called air-borne sound, or a blow or impact applied directly to some part of the building, called impact sound. Air-borne sound is transmitted by free air paths (open windows, cracks, etc.), or across and along continuous structures. The insulation of air-borne sound is measured as a reduction of energy in decibels (db.). One db. represents about the least difference in intensity which a sensitive ear can detect; a change of about 5 db. is required to give an appreciable improvement.

Impact sounds arise from the vibration of the structure itself. The floor does not provide insulation; it is itself the source of the sound. The reduction of the noise cannot be stated as an overall reduction from one room to the next, but only as a reduction compared with the noise generated by hitting the untreated floor. It is measured in a different unit, the phon, which is a measure of loudness as detected by the ear. About 5 units are required to give an appreciable improvement.

Against air-borne noise weight is a factor of insulation, the heavier the better. Different standards of reduction are suggested for various rooms of a house, varying between 35 and 55 db. Impact sound on floor can only be effectively treated by what is known as the floating floor. The suggested minimum reduction (15 phons as against bare concrete, 20 phons as against bare timber floors) cannot be obtained by any of the normal wearing surfaces which give, at most, about 10 phons improvement.



Typical light steel frame construction for house building. From House Construction, Post-War Building Study No. 1, *issued by the Ministry of Works. See No.* 1516.

(5) Fire risk has to be considered as (*a*) the risk to the personal safety of the occupants, called the personal hazard; (*b*) the likelihood of the house catching fire from a neighbouring fire, called the exposure hazard; and (*c*) the possible effect of a fire on the house itself, called the structural hazard. From the point of view of the personal hazard, the possibility of escape is the main requirement, especially from the upper floor. Safety against exposure hazard can best be obtained by suitably spacing the houses and limiting the size of blocks. The usual 9 in. party wall in brick or concrete provides a much higher degree of safety than would be necessary. This applies also to the structural hazard. The normal timber floor with plaster ceiling is accepted as satisfactory although it has a fire resistance of less than half an hour, as defined in B.S.S. No. 476, i.e. it does not attain even the lowest degree of resistance specified. The resistance of pitched timber roofs is not dealt with in the report.

(6) Most of the deterioration which occurs in houses is associated with water penetration. The report considers the durability of the various parts of a house: A, Foundations and rafts; B, External walls; C, Renderings; D, Structural roofs; E, Pitched timber roofs; F, Chimneys; G, Floors; H, (*a*) External woodwork, (*b*) External metal work; I, Roof coverings; J, Gutters, flashings, fillets, etc.; K, Internal construction.

Capital costs and maintenance costs are factors which can be balanced in terms of annual expenditure. It is not necessarily true that materials requiring periodic protection are in total more expensive than those requiring no protection.

The report does not mention the protection of pipes against freezing, a common source of trouble in the traditional type of house. This requirement should also be included in future standards.

(7) The commonest and most serious form of the infestation of dwellings is that by the bed-bug. The report indicates the main causes of infestation and describes precautionary measures and methods of disinfestation.

In an Appendix the suggested standards are compared with the values achieved by normal brick construction. With the exception of the strength and fire resistance of the brick walls, the ordinary brick house with timber floors and pitched timber roof is far below the suggested standards particularly with regard to thermal and sound insulation.

In Part II, alternative forms of construction used in the inter-war period are surveyed. These are classified as concrete houses, framed or solid timber houses, steel-framed houses and metal-clad houses. 11 systems of concrete houses, 7 types of timber houses, 5 types of steel-framed houses and 5 types of metal (steel and cast iron) clad houses are considered.

Among the systems of concrete houses, emphasis is laid on the no-fines concrete house (see Inf. Centre No. 1299) by the inclusion of an Appendix with detailed recommendations for the use of no-fines concrete. In view of the particularly high efficiency of heat transmission for 8 in. walls of no-fines heavy weight aggregate (.43 to .46 as against a desirable standard of .15 to .20 B.Th.U.), it seems doubtful whether this emphasis is justified and whether it would not have been preferable to include recommendations for the use of foamed slag aggregate in cast in situ single-leaf walls. With foamed slag the required standard of thermal insulation can be achieved without additional lining and, at the same time, a nail holding wall is obtained.

In many systems, in which clinker aggregate was used in concrete external walls, troubles arose from the use of unsound clinker.

Timber houses are on the whole satisfactory with the exception of fire hazard. In the absence of prompt fire fighting the structure (with the exception of brick party walls) will be totally destroyed.

The experience with steel-framed houses has also been favourable in most cases. Maintenance and durability depends largely upon the resistance of corrosion. The steelwork was either encased in concrete or a thick coat of tar or bitumen was applied to the steelwork after erection. As far as is known, all three methods proved satisfactory.

The most serious disadvantage of thin metal sheets for external cladding is that they contribute little to the thermal insulation of the wall. This depends upon a lining in conjunction with an air space between the lining and the metal cladding. Corrosion is an important problem in the use of metal sheets. In Scotland a method of painting, known as paint harling, gave good results; in England corrosion was prevented by normal painting methods (see also Inf. Centre No. 1240).

None of the systems considered shows an outstanding advantage against brick walls, although many offer a useful alternative in the event of a shortage of bricks or bricklayers.

It is regrettable that Part II of the report is confined to the consideration of walls only. It creates the impression that no alternatives to the traditional timber floor and pitched timber roof will be required in post-war housing. According to the Appendix to Part I, the performance of timber floors and pitched timber roofs is very poor as compared with the standards suggested. During the war, many thousands of houses have been completed with reinforced concrete suspended floors and flat roofs in a great variety of systems, upon which the Cement and Concrete Association has issued a preliminary report (see Inf. Centre No. 1154). Some of these houses have been in use for four years and although this is a comparatively short period in the lifetime of a house, it would have been desirable to include some of the war-time housing schemes in the report, independently of the question of timber supply after the war.

Part III presents in a comparative form the main features of the materials available for different purposes. Traditional materials, such as timber or brickwork, are not discussed, the aim is to concentrate on alternative materials of construction which may be used to supplement them. The materials are grouped under the following headings:

Damp-proof Membranes for Concrete Ground Floors.
Floor Finishes for Concrete or Steel Floors.
Wall and Ceiling Linings.
Light-weight Concrete Aggregates and Light-weight Concretes.
External Renderings.
Painting Requirements of alternative Building Materials.

In general, the weakness of the report is that, although the deficiences of the traditional brickhouse are clearly realized, the new building materials are looked upon as mere substitutes. Under the terms of reference of the Committee one might have expected a more positive approach to the problem of achieving the suggested standards of house construction. Nevertheless, the report is a most valuable contribution to the housing problem. It contains a large number of suggestions and data which will be very helpful to all concerned with housing.

LIGHTING

1517 Tool Colouring

LIGHT FINISHES ON MACHINE TOOLS. *J. H. Nelson.* (*Light and Lighting, December*, 1943, p. 190.) Description of English experiment on machine tool colouring to improve vision conditions and cheerfulness in factories.

There have been a number of references in these columns to the use in America of colour for plant and equipment. The work is done with one or both of two objectives in view—improvement of vision conditions, and cheerfulness.

Very little has been written about such work in England. Perhaps very little has been done. The present report shows that at least one firm is making trials, and an installation is described. The machines are painted Portland Stone (B.S.S. No. 341, Colour No. 64), while the walls are Eau de Nil (Colour No. 16) below the dado, and Pale Cream above (Colour No. 52). Skirtings for walls and machines are dark green.

It is reported that an unusual sense of lightness is obtained even at relatively low levels of illumination, which suggests that it contributes to efficiency of vision.

1518 Nature of Colour

THE CONCEPT OF COLOUR. *Chapter II of the Colorimetry Report of a Committee of the Optical Society of America.* (*Journal of the Optical Society of America, October*, 1943, *p.* 544.) Elaborate discussion of nature of colour.

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.*

1519 Building Costs

Q *What was the approximate level of building costs in* 1939 *compared with* 1930, *expressed as a percentage?*

A With regard to comparative building costs, we suggest that you refer to the chart prepared by Mr. H. J. Venning, F.S.I., and published in *The Architect and Building News* of January 14, 1944.

Reference to the chart will show that although building costs were fairly stable during the early part of 1939, they rose very sharply after the outbreak of war, and that it would be unwise to refer to the *average* cost during the year 1939. Judging from the chart, the answer is as follows:

From the beginning of the year 1930 to the beginning of the year 1939: decrease in cost of rather less than 5 per cent.

From the end of the year 1930 to the end of the year 1939: an increase of about 15.5 per cent.

1520 Courses in Town Planning

Q *Some weeks ago I noticed particulars in the* JOURNAL *re correspondence courses for HM Forces in Town Planning. No address was given. What is the address?*

A We assume you are referring to the correspondence course on Town and Country Planning prepared by the School of Planning and Research for Regional Development, at the request of the War Office. Applicants should apply to their Education Officer for the necessary enrolment forms, or write to the school, who will give their names to the War Office and arrange for the forms to be sent to them.

Full particulars can be obtained from the school, the fee is 10s., and text books are free.

The address of the school is the School of Planning and Research for Regional Development, 32, Gordon Square, London, W.C.1.

SOCIETIES AND INSTITUTIONS

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

RIBA

ASB Lecture

June 13, at 66, Portland Place, W.1. Lecture arranged by the Architectural Science Board of the RIBA, on SCIENCE AND HOUSING, by Anthony M. Chitty, M.A., F.R.I.B.A.

A. M. Chitty: The application of science to housing is only one aspect of its general application to the wider reaches of building technology. We live at a vitally important point in time, the turning-point of the technician from an hereditary and oral and local tradition of handcraft towards a newly evolving tradition of machine craft. A change, so fundamental in character, when accomplished in so short a time, a mere hundred years, must of necessity be hard and painful. In the materials of consumption the change has been rapid and easy—it hurts little to throw away the flat-iron or the phonograph and replace them with more up-to-date conveniences. But with building, this process has been difficult and slow. The past history of the building industry is of a large number of parochial and distinct units relying for their skill upon hereditary and oral instruction passed on from father to son, from master to apprentice. This machinery has been disjointed by the development of transport and communication, but the small units remain, untrained and unprepared for the advent of the scientific method in building. The means by which to bridge this gap has not yet been devised.

Together with food and clothing, shelter is the greatest necessity of mankind on the material plane, and finds its expression in the house, which therefore occupies a central position in the whole of our economy. Since some 90 per cent. of the buildings in any urban community are dwellings, it is clear that a balanced and proficient knowledge of housing is essential to any attempt to plan our national life. "The socialized provision of houses in integrated neighbourhood units" is the economic foundation for the city of to-day.

Yet looking around us, the most casual glance shows the inadequacy of our arrangements. The vast benefits of science, invention and production methods have improved and cheapened the material objects of civilized life in almost every direction, but with the exception of a few pieces of specialized equipment, the house itself, the centre of the whole complex social system, has scarcely been touched by these influences. "Houses tend to outlast the habits and possibilities of those that live in them, and this is further emphasized by the almost universal tendency of allowing the poor to live in the discarded houses of the rich." To-day even the finest urban dwellings of past centuries are, on the whole, obsolete. Few of them even by the most drastic and expensive renovation and adaptation can meet the requirements of to-day. Such adaptation may provide a degree of shelter, but by no means the framework for living. The reason is simple: such dwellings were designed for a mode of living which is dead and gone; for a way of life more limited and confined than ours; for a different ritual and for other needs. What are the particular needs of to-day? They are: first, our desire to avoid unnecessary menial labour; second, and linked with this, greater space for the better use of the leisure thus gained; thirdly, our more conscientious and efficient care of children, and with it the sense of the importance of play as a basic factor in life from childhood onwards; fourth, our increasing need for privacy and quietness and physical ease in the racket of an industrial world. Such requirements demand a different type of dwelling and different social disposition. As Mumford says: "In many ways we have already crossed the threshold of a new age; but our housing remains behind, clinging to dreams that no longer satisfy, making a parade of sickly archaic tastes attempting to meet conditions that no longer exist, and failing to take advantage of conditions that do exist and promise far more by way of human reward. Even much of the new housing done by both public bodies and private building exhibits only a stuccoed modernity over an obsolete form."

And here I want to stress the significance and real danger of the change that has taken place. With the increasing possibilities of knowledge and experience to-day, we are at the same time menaced by the evil of over-specialization, the danger that outstanding minds may work in grooves with a celibacy of intellect which is divorced from contemplation of the complete facts. By this habit the directive force of reason is weakened and the leading intellects lack balance. The lesson that we may learn from this in the housing field is that no single spectacular advance in technology is of value unless integrated with other developments. To look for satisfactory housing in terms of planning or construction alone is not sufficient. Geographic, social, technical, personal, economic factors must all be considered on a single plane. From this it will be seen that there is no simple solution to this problem, the problem of the house, which is a highly complex adapatation to an exceedingly varied set of difficult requirements.

Since the provision of proper housing is, in the national sphere, largely an economic problem, we see at once the uselessness of applying the scientific method to the house without examining the finance of housing from the same point of view at the same time. For example, I for one believe that much greater space is required for proper living and family conditions than heretofore; but the provision of such extra space is futile if the occupant cannot afford to pay increased ren and must take in lodgers to do so. In just the same way, full and proper attention must be paid to the reform of our retrograde system of rating, and to such anomalies as the fact that the largest single factor in house rent is the cost of moneylending.

A word must be said here on the increasing cost of the house and the physical changes that have been responsible. The nature of the house has been changed very largely by the introduction of machinery. The mediæval house was a completely isolated unit standing in its own plot. To-day this physical isolation has been broken down, and every house is part of a larger unit linked to it by every kind of common service, roads and pavements, water, drains, power, telephone and so on. The dividing line between public costs and consumers' costs grows year by year more difficult to draw. Housing is clearly becoming a public utility similar to those other services for which we accept public responsibility. In 1935 one-fifth of the housing in Europe was publicly owned or administered, and doubtless this proportion will increase.

Such increases in public services have meant increasing cost, for the house that was once a mere shell has now become a complicated organism, whose equipment may be as much as 40 per cent. of the total cost to-day. Similarly, the cost of space within the shell is relatively cheaper than it was. A Ministry of Health Survey of housing costs in 1935 showed that a 14 per cent. increase in floor area increased the cost by only about 6 per cent. No doubt this tendency will increase.

CONSTRUCTION

After these general remarks we come to the main part of this talk, which is concerned with the application of the scientific method to house construction. This subject has been dealt with in the recently published Report of the Burt Committee, Part I, of which is something of a milestone in the history of housing, because it sets publicly for the first time the problem of the house in terms of numerical standards. Up till now legislation on building has tended to lay down materials and dimensions which has, of course, given rise to many anomalies. These were later overcome by relaxation and waivers from the more distressing absurdities, and by making wording more flexible. This naturally led to the human difficulties of local interpretation by a variety of persons of differing training and qualifications. Now, however, the proposal is to set standards of performance judged on a scientific basis, and within this new framework it will be possible to fit the wealth of new material and knowledge that increases year by year.

I take here some of the Burt Committee's performance categories and to these have added some further ones, so that we may see briefly what is proposed and what further steps might be taken in the near future.

STRENGTH AND STABILITY

The first and most obvious characteristic required in house construction is, of course, strength and stability. So important is this that already we have in existence a well-defined minimum standard under various bye-laws and local legislation. Closely supporting such legislation are the various British Standard Specifications covering objects, materials and methods.

One of Kipling's characters made the penetrating observation: "The British think weight's strength." This misconception dies hard; in fact, it is as yet very much alive. The massive monuments of Dartmoor, the prodigious bulk of Stonehenge, the vast fabric of Durham Cathedral, this is a tale of huge redundancies. It is not till the Age of Reason, the eighteenth century, that this blind empiric tradition gives way to slenderness and calculation, and architects begin to foresee the application of the scientific method to building construction.

The Burt Committee puts forward suggested minimum loadings, giving figures for dead loads and superimposed loads; strengths for parapets and balustrades; figures for wind on vertical surfaces with variations for sheltered or exposed location; loadings for flat and pitched roofs, including provision for the effects of suction; strengths for roof coverings.

Such provisions are elementary, but necessary. They take the design of structures a step further, and will, no doubt, in the course of time be adopted and become mandatory.

And what further developments can science

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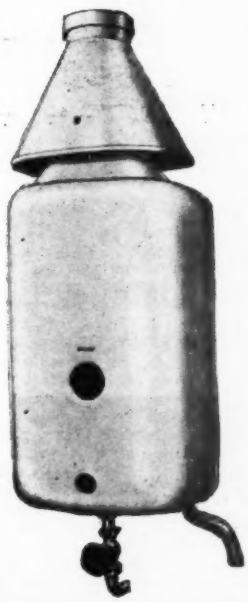

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bring about in this category of strength and stability? "The main principles of architecture are just beginning to feel the effect of the revolution introduced by new materials and new processes. It will soon be possible to break altogether with conventional architecture, with its tradition of putting stone on stone or brick on brick unchanged since the time of the Pharaohs, and move in the direction of rational fabrication. The physical functions of architecture are principally insulation and support, but these are perfectly separable factors. Thick walls and heavy girders are a most inconvenient way of providing both together." There is now room for considerable thought and investigation into weight/strength ratios of various materials, particularly in the new and vast fields of light metals.

We should not forget that aluminium is the most abundant metal on the earth's surface. The ten-mile crust of the earth is 8 per cent. aluminium against 5 per cent. iron. Magnesium is another important metal in this class to be explored, being of greater strength than aluminium for less weight. Closely allied to the use of light metals is the study of corrosion. With heavy steel structures hundreds of thousands of pounds are spent annually on preservation by painting, lacquering, galvanizing and other treatments but, in spite of this, it is estimated that the annual wastage by rusting is 20 per cent. of the annual output of iron. The problem of corrosion becomes more acute with light metals used structurally, since the margin of safety may be reduced thereby. Interest in this sphere may centre on surfacing technique such as anodizing and the Alclad method.

A closer study of the flexibility of materials is also overdue. We see around us to-day very many examples of defects due to the movements of building elements of dissimilar flexural capacity, and research into this subject might help us to classify such materials as a guide to safe combinations.

Calculation of the strength of welded structures is a further development in this category, and this is already assisted by the use of X-rays for internal inspection of welds under test. One of the most striking illustrations of the scientific method applied to structures is the use of polarized light, together with models of isotropic materials such as celluloid in analysing the internal stresses in structural members of irregular shape.

Further experiments will cover the strength of jointing materials (such as mortar in brick walls) and the properties of adhesives.

MOISTURE PENETRATION

The next category of shelter is the prevention of moisture penetration. As to degree, all that can be said is that prevention must be 100 per cent. How to achieve it is an interesting dilemma. In the history of English building to date, great reliance has been placed upon the principle of the lapped joint, and also upon acceptance of a certain degree of penetration through material deficiency offset by a second line of powerful defence. This principle is exemplified in the 11-in. cavity brick wall, and also in the patent glazing bar. It is also seen in roof tiles lying upon waterproof paper. Such methods may be effective as regards a penetration of moisture, but they are somewhat inefficient by scientific standards, and result in a redundancy of material and labour costs.

The other solution to this problem is to provide an impervious macintosh admitting no penetration at all. Cement renderings, metal and asbestos cement sheathings, faience facings, are attempts at solution by this means, but woe betide a failure of this means. The lecture on "Weathering," by Mr. Brady, dealt fully with this problem. Many of the proposals now being made for prefabricated structures attempt the impervious macintosh type of covering, and the success or failure of this approach turns largely on the design of and material for the jointing. The more impervious the cladding, the more vital the joint becomes. In considering such schemes, it is important to remember that the less efficient characteristics of masonry construction have been offset by very considerable safety factors, for example, the porosity of the outer skin of an 11-in. cavity wall of common bricks is balanced by the very great moisture barrier of the 2 in. airspace. The same can be said of the Scottish principle of strapping. When leaving older methods of construction behind, therefore, we should not forget these safeguards which have been evolved over centuries by men no less competent than ourselves.

The other factor in the category of moisture penetration concerns condensation. By the scientific study of first principles, the causes of condensation are now well known, and the cure lies in the proper heating and ventilating of buildings, the reduction of the thermal transmittance of the fabric, and the provision of internal linings of low thermal capacity. We may expect developments in the form and substance of the latter, and in the temperature control of wall, ceiling and floor surfaces.

THERMAL INSULATION

The next category is thermal insulation, and perhaps this is the most important single development of our time. It is also, I think, the subject with most significance for the future. Professor Bernal in his book, *The Social Function of Science*, says: "Given good insulating walls, the problem of heating houses entirely disappears. Indeed, even in winter, the heat generated by the inhabitants of the houses would require some method of cooling to get rid of it. To secure this degree of self-sufficiency, however, it would be necessary to devise a rational ventilation system which did not, as at present, take in air cold and send it out hot, but arranged for the outgoing hot air to warm the incoming cold air in winter time, and vice versa in summer." He adds that already reversible heat engines which would pump heat into a house in winter and out in summer have been run on one-third to one-fifth of the cost of direct heating methods.

Returning to insulation, the key to any such developments, we find the Burt Committee proposing maximum values of heat transmittance for walls, floors and roofs of houses. If such standards be adopted, there would be a considerable saving not only in tenants' fuel bills, but also in solid fuel itself, hitherto this country's greatest natural resource.

Now that science has enabled us to analyse the physical characteristics of building materials, we can preserve the efficiency of a slender and economic structure and use suitable insulators as coverings and fillings to reduce the transmittance as required. Released from the need for carrying loads, the wall panel can now be perfected as macintosh, insulator and interior finish, performing if expedient all three duties at once in sandwich form.

The importance of the Burt Committee's suggested transmittance figures is not the fact that the standards are somewhat higher than would be obtained with normal brick house construction. The importance is the suggested application of a scientific and numerical basis to such an important aspect of housing. From this point the way lies open to a variety of developments; the study and development of aerogels, a matter for scientists; the improvement of equipment to permit of fully controlled heat output (this is a study at present closely engaging the attention of manufacturers); the use of reflective surfaces and colours for insulation; the scientific study of comfort in the widest sense, including gland reactions and other physiological phenomena (this is a study for doctors and represents a considerable gap in our knowledge); the reduction of heat loss through windows and other glazed openings.

Lastly, the promising investigations at present being made into thermal capacity linings. For example, consider a country house with a dining-room lined, we will say, with wood panelling upon a masonry wall. Such a room may be heated up to a comfortable temperature in half an hour, whereas a similar room without the panelling may take two hours to reach the same temperature. When the room is only used for perhaps an hour at a time, the importance of such linings is obvious.

SOUND INSULATION

What can we say on the subject of sound insulation? Again we suffer to-day from the same defect as with heat losses. The increasing tenuity of modern construction has reduced the resistance to sound, both impact and airborne, and little has been done to counteract this difficulty. At the same time, the sources of noise to-day have multiplied greatly, and increased in volume. Scientific research in the future will doubtless enquire into the ill effects of noise upon health and efficiency, and thereafter we shall appreciate the full importance of this aspect of building.

VENTILATION

At present we are throwing away an appreciable proportion of consumable materials, and doing so in a way that destroys health and the amenities of town and countryside alike. As much corrosive sulphuric acid goes into the air with smoke in a year as is produced by the whole chemical industry in that period. Only an enforced use of smokeless fuel, pending a reorganization of domestic heating, can remedy this nuisance.

Ventilation is closely allied to heating, and we have already spoken of the possibilities of applying a reversible heat engine to the internal air condition. There is a field of research here into district ventilation and to district heating. Nothing could be more primitive than the present arrangement, by which the odour of cooking and in many cases the products of combustion also are allowed to fill the kitchen and often the house as well.

LIGHTING

As to daylight, we are learning that rules can be established governing the relationship between penetration of daylight into rooms, the height of buildings, the space between buildings, and the plan shape of buildings. The further study of this subject will have great impact on such aspects of town planning as density, coverage, height, siting, and skyline. Once again we see here the importance of control over the use of land. The improvement of habitable conditions in urban areas by such a study would be enormous, and from a technical point of view, there is no longer any excuse for empirical methods and their fortuitous results in the lighting efficiency of buildings.

As to artificial lighting, much the same applies, and the lectures we have heard here on this subject show clearly the broad field for applied science following closely on the indispensable and continuous pre-stages of laboratory study. The next moves in this field are perhaps: The grading of intensities for various domestic purposes, freedom from the single-light source, that carry-over from the candle on which Mr. Hartland Thomas was so interesting—this development has made strides during the war in the form of fluorescent tubes.

The uses of infra-red rays for the relief of pain and the promotion of circulation; of ultra-violet rays for reactions on the bloodstream and the supply of vitamin D. The study of luminescent paints for storing daylight. The use of photo-electric cells for a variety of domestic operations, such as controlled cooking, opening and shutting of doors, control of ventilation, and many other activities. There is also the field of street lighting and the application of light to stimulating plant growth in the garden and allotment.

Our friend the firefly emits a light that is 97 per cent. light and only 3 per cent. heat, and it is towards this high degree of efficiency that we are proceeding slowly by way of the hot and cold cathode discharge tube and light sources activated by fields of energy rather than by cable current.

Nor should we forget that where lighting, both natural and artificial, are concerned, our aim is always to conserve and to preserve the most valuable of human senses—eyesight.

FIRE HAZARD

The subject of fire hazard is an interesting one. It has always seemed to me that fire has been a particularly English enemy, and that through it we have learnt our lesson. English history is full of fires—most of the great towns and cathedrals have been consumed at one time or another, and many a number of times. The tale of burning culminated with the Fire of London and the Great Fire of Tooley Street (1861), and to such episodes as these we can attribute the unique provisions against fire that exist to-day. The architect who sets out to plan a cinema or theatre in London will find that, practically speaking, it is designed for him by the fire regulations. It is for this reason mainly that we do not have those disastrous fires which occur in the public buildings of other capitals. Our fire legislation, our administration, our equipment, our personnel, are outstanding, and already we are beginning to see in true perspective how much we owed to this fire-fighting tradition when, in this war, the City of London was again in flames.

The Burt Report sets out three classes of risk: personal, structural, and exposure and time resistance figures are suggested; two hours for party walls, half an hour for steel-work and so on. These figures are combined with detailed information on particular elements of construction. Such figures are, of course, based on careful observation of tests made over many years at the Fire Testing Station.

For the future one may hope for increased facilities here to examine more closely and build theory in connection with the prevention of flame-spread on surfaces, the isolation of units, the fireproofing of timber, plywood and textiles, and improved methods of quick extinction. Methods of dealing with burning aircraft during this war should add considerably to the sum of this knowledge.

DURABILITY AND MAINTENANCE

The last category to be dealt with in the construction field is Durability and Maintenance. This is left to the end because of its difficult complexity. Of all the aspects of building construction, it has been least considered, and its problems call out loud for the attention of scientific minds.

No study of durability can be made apart from consideration of first cost, maintenance cost, and intended length of life. The Good House is an equation of these factors. At once, we see that the present distinctions between "permanent" and "temporary" housing are loose to the point of being meaningless. The all-important question is "how temporary?" Experience shows that over-permanence of structure has been a contributory factor in the making of slums and blighted areas. The structure has outlived its social usefulness. On the other hand, excessive mobility is equally vicious—as is shown in the life of the bargee and the American war-time caravan slums. Where, then, shall the line be drawn?

It is interesting to note that at a recent meeting between PEP and the Modern Architectural Research Society, the following view was recorded: "It is not possible to provide dwellings that are at the same time satisfactory when erected, and *structurally* of short life." War-time industrial building supports this point of view. If this be true, as I believe, we must examine more closely the alternatives in view.

The life of buildings depends upon two factors: (*a*) social obsolescence, and (*b*) physical decay. The two are closely joined together and can hardly be discussed separately.

(*a*) *Social Obsolescence*: On the subject of social obsolescence, all that we need consider at this moment is: That it depends upon the rate of social and economic change which at the present time is increasing in momentum. Much of the working-class housing built prior to the last war is now socially obsolete. The period of social obsolescence is likely to remain short for many years to come, until such time as a comparatively stable society has evolved. The period may then perhaps increase its span. Housing built during the next decade or two may fall under this influence, and may have only a short social life. The question, therefore, arises: Do we really want permanent houses? Houses which will become obsolete in a shorter time than ever before?

(*b*) *Physical Decay*: Different parts of a house decay at different rates. There is a growing differentiation between these parts, the shell and the mechanical core. Should we bring the shell more into line with the replacement capabilities of the service core? Would a permanent skeleton with replacement parts attached thereto be a solution to enable social amenities to be maintained in spite of the tempo of change? Is it not a much greater degree of flexibility in planning and construction that is needed in order to preserve these living amenities?

It is clear that the long life of old dwellings without social obsolescence was due to the small importance of the mechanical core in those days. With the increasing importance of this element, replacement possibilities become much greater, and it may be possible to adopt for the major part of the house some really flexible system of replacement and renewal of all the elements, including shell and core, at a low annual charge. This system is already successfully adopted for many consumer goods, for instance, cars and the tyres for motor buses.

To line up with the replaceability of the core, the shell might consist of standardized and easily detachable high performance panels for the external and internal walls, which could be adapted with great ease, and would at the same time have a high salvage and renewal value. Again, do we not see that the designations permanent and temporary are not sufficiently close definitions for the purpose?

Finance: At this point the question of the finance of housing enters the picture. The present rigid financial system which dictates the period of life of the house will scarcely fit, for the categories of permanence are simply suitable amortization periods for the loan. This, again, is a sphere where science and the scientific method can play a part aside from the prejudice of modern practice. This is a matter for modern-minded economists. In this connection do not let us forget that housing is primarily an economic problem; we are clearly reminded of this when we remember that a reduction of 2 per cent. in the cost of money gives a far more decisive saving than any cheeseparing of size or prefabrication methods. When we speak of the economies to be made by improved constructional technique, we are apt to forget that these economies will have a minor effect upon rent. The predominating factors in an inclusive rent are rates and finance, which in some cases amount to two-thirds of the rent. My suggestion is that if economists investigate this problem with an open mind and properly advised at the same time on the construction possibilities we may find it possible to work out a flexible replacement scheme of the kind I have sketched, which results in lowered rents and is still in harmony with existing finance arrangements.

SERVICES

We have already noticed the growing importance of public services both in linking the house to the larger social unit, and in bringing about changes in the house itself. Under the heading of services there is still a vast amount of research and development to be done. The proper development of these services has lagged behind, chiefly because this is not a profitable field for speculation and investment.

Water: Water supply is the most important house service, and strangely enough, its development is more retarded than that of the other services. Water is still regarded as a commodity to be used sparingly, an absurd state of affairs in a country where the rainfall after allowing a 40 per cent. loss by evaporation, is still 15 times the greatest possible demand. It is estimated that the Romans used more than twice the quantity of water per head of the population than we do. A cheap and plentiful supply to every household is essential, and is at present only prevented by parochialism and distribution problems. It is important that a national utility of this kind be administered on the broadest basis, and present proposals on the subject scarcely touch the fringe of this problem.

In a community water should be sold and developed in much larger volume as one of the least expensive contributions to higher living standards. It is said that more than half the value of all waterworks in the country lies buried in the elaborate system of distribution pipes, valves, hydrants, meters and other accessories. It is also estimated that in communities of 100,000 and over, at least half of the investment in the average waterworks is justified by the fire protection it provides. It will be seen from this that the present cost of water (which is much the same as your bus rides to work or your daily papers) could and should be reduced considerably. In fact, I have no doubt that eventually both water and power, like sewage disposal, will become free of a quantitative charge, and subject merely to a general rate under public administration.

There is a field for research and improvement in this subject. I have no British figures for water losses, but in America before filtration was introduced, there was a 23 per cent. loss of carrying capacity in the first 20 years of use. Since filtration became widespread this loss has been greatly increased, and in some cases doubled. There are comparable losses in consumers' plumbing systems. Present technology, if we so wished, could materially reduce these appalling losses. Another field for investigation and reform is the purification and softening of water. We do not know accurately the damage done to health and life by varying conditions of water supply. It is possible that eventually all houses will be supplied with both hard and soft water supplies.

Sewage: In the disposal of waste material science will also play a larger part in the future, and the archaic dustbin system must be modified. Of still greater importance is the scientific reclaim of sewage for agricultural purposes.

Communications: In communications the most obvious next step is television. The use of what is called Intercomm is already of value in the more complicated communal activities in schools and offices, and has its application also in the domestic sphere. Presumably we shall see a great extension of this form of communication growing out of war-time experience with shortwave telephony.

Power: As to power and fuel, we have already spoken of the wasteful use of coal for burning in the open grate, with the consequent high loss of valuable by-products. Presumably there will be outstanding developments in the production of cheap power and in the separation of radiant from convective types of heating.

SCIENCE AND DESIGN

No consideration of science in housing would be complete without some reference to design. What part can science play here? Science has given us, and is giving, the physical key to reconstruction in all its phases: by design I mean the imaginative synthesis we can create from this material. Briefly there seem to be three tendencies in design to-day, and in each of these science will play an important, though at first unseen, part.

(1) First, on the material plane: we seek always economy. Economy of labour, economy of material, economy of time. The chief virtue of economy is, of course, as a means to an end: to set us free to address ourselves to the more important values and activities of life, art, study, recreation, expression and social practice. Let us hope that the increase in leisure hours will find us better equipped to use it than in the past.

(2) Second, on the meditative plane: the chaos that surrounds us, to which we open our eyes afresh each morning, that oppresses the soul

throughout the working day, that wakes us in our troubled sleep; this social tragedy is gradually teaching us the value and essential need for serenity in our surroundings, and for legibility in design. The part of science in this tendency is largely an indirect one, the unseen background to creative and imaginative thought.

(3) Third, on the social plane: we saw just now how the house, originally an independent unit in a community, has now become a cell whose efficiency is conditioned by and linked to the proper working of the community as a whole. In a larger sphere this is as Mumford has clearly shown, the whole meaning of machine technique, an emphasis on standards for the community, collective standards, not individual standards. The social and political implications of this new orientation are obvious, and the scientific method is useful here to gather the necessary information and to make use of it, as was seen clearly in the last lecture in this series, by Mr. Chapman.*

SCIENCE AND THE ARCHITECT

What is the architect's part in this great movement? In the past, as a profession, we have not played any significant role in housing affairs. The reasons for this are many, and we need not discuss them here. It is now clear, however, that housing is a national affair, concerning every one of us as members of a community. In this great problem, the setting right of past faults and neglect; and the introduction of new standards and improvements in the future, not one of us can be disinterested, and architects especially *must* play their part to the full.

As to science itself, many architects will share my personal consciousness of inadequate training and experience in scientific methods and knowledge. At every turn one is hampered by this. The problem of training the architect to take full advantage of the scientific method is beyond the scope of this talk, but I remember with pleasure and satisfaction attending (in 1932, I think it was) a so-called Refresher Course at the Building Research Station. In one short fortnight I learnt more about building than in six years at school. The whole of the knowledge gained was to me, at any rate, entirely new, and I have always admired the delicacy of the words Refresher Course. Is it too much to ask that, when circumstances permit, the Building Research Station should renew this valuable service and, perhaps, extend its scope as a full-scale education of architects, builders and laymen as well?

* To be published in a forthcoming issue of the A.J.

TCPA

E. E. Hoadley

May 25, at 2, Savoy Hill, W.C.2. Lunch-time meeting of the Town and Country Planning Association. Talk on ELECTRICITY SERVICE AFTER THE WAR, by E. E. Hoadley. Chairman: W. J. Jones.

E. E. Hoadley: In spite of various questions in Parliament and inspired articles in the press, there is not much wrong with the Electricity Supply Industry. It is ludicrous to suggest nationalization unless gas and coal are also nationalized. In any case the industry knows where improvements are needed. At its own expense 27 million pounds have been spent in standardizing frequencies to 50 cycles per second, so there is no reason why the necessary further 17½ million should not be spent in standardizing voltage to 230 volts throughout the country. The problem of apparatus manufacturing would then be solved. It would no longer be necessary, as one manufacturer put it, to make everything in penny numbers. People who quote the cheapness of American electricity and equipment probably do not realize that America has only one voltage. Such a standardization would do away with the anomaly of a household moving from one part of a big city to another and having to scrap all its fittings because of a different voltage.

There ought also to be a universal tariff. Present methods of calculation are so complicated that a chartered accountant and a lawyer are needed to work out the bill. The consumer should get the tariff in as simple a form as possible.

Expansion of the electricity supply in industry has been due to its ability to fulfil a public requirement. In the ten years between 1928 and 1938, 290 million pounds were spent in electricity. In that same period there was an increase of 7½ million consumers and 12 thousand million units. This is a considerable record, but it is still insufficient, probably because charges for electricity are still too high in many areas, particularly in rural districts.

Cheaper supply is good policy because obviously the more people who can afford to use it, the more will be sold.

BUILDINGS ILLUSTRATED

Housing Scheme in the North-West (pages 488-9). Architects: T. A. Page, Son & Bradbury, FF.R.I.B.A. Contractors, J. E. Gardner, Ltd.; Newman Brothers (Newcastle), Ltd., plasterers; Messrs. Rowell (1924), Ltd., plumbers; Messrs. Denton & Co., flooring,; Magnus Flooring & Asphalt Co., Ltd., asphalt roofing; British Paints, Ltd., paints.

CLASSIFIED ADVERTISEMENTS

Advertisements should be addressed to the Advt. Manager, "The Architects' Journal." War Address: 45 The Avenue, Cheam, Surrey, and should reach there by first post on Monday morning for inclusion in the following Thursday's paper.

Replies to Box Numbers should be addressed care of "The Architects' Journal." War Address: 45 The Avenue, Cheam, Surrey.

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Six lines or under, 8s.; each additional line, 1s.

The Incorporated Association of Architects and Surveyors maintains a register of qualified architects and surveyors (including assistants) requiring posts, and invites applications from public authorities and private practitioners having staff vacancies. Address: **75 Eaton Place, London, S.W.1. Tel.: Sloane 5615** 991

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Candidates for (1) and (2) must be Fellows or Associates of the Royal Institute of British Architects. The Degree or Diploma of a fully recognized School of Architecture will be a recommendation. Previous teaching experience is an essential requirement for (1).

Candidates for (3) should be Members or Associate Members of the Town Planning Institute.

Salaries in accordance with the Burnham Technical Scale for London (plus war-time bonus), subject to the usual 5 per cent. deduction for superannuation. Commencing salary according to qualifications and experience.

Further particulars and forms of application, which must be returned by 29th July, 1944, can be obtained by sending a stamped addressed foolscap envelope to the Director of Education, The Polytechnic, 309, Regent Street, W.1. 682

LONDON COUNTY COUNCIL

A whole-time Principal is required at BRIXTON SCHOOL OF BUILDING, Ferndale Road, S.W.4, as from September next. The Institute activities include a junior technical (building industry) school for boys, housed partly at the main institute, partly at the Clapham College Annexe and a section evacuated to Bracknell, Berkshire; a senior day technical school (building industry and related professions), day classes for builders' apprentices and evening courses for building crafts, building technology, architecture, and the professions and vocations related to building and civil engineering. The Principal should possess a good knowledge of the building industry and of the organization of education for this industry; it will be part of his duty to keep in close touch with the trade, professions and institutions which are served by this school. SALARY £960-£50-£1,200. Application form (T.1/40), obtainable from the Education Officer (T.1), County Hall, S.E.1 (stamped addressed envelope necessary) returnable together with all particulars and copies of three recent testimonials by 24th July, 1944. 684

SURREY COUNTY COUNCIL.

EDUCATION COMMITTEE.

SUTTON & CHEAM SCHOOL OF ART.

Required for September, 1944, qualified part-time instructor to be responsible for teaching draughtsmanship and building construction to a class of boys age 14-16 years. The teaching periods are Tuesday and Thursday mornings and afternoons, and possibly Saturday mornings. Salary, 8s. an hour, plus reasonable travelling expenses. Applications should be sent to the Principal, School of Art, Throwley Road, Sutton, Surrey. 674

THE POLYTECHNIC

REGENT STREET, LONDON, W.1.

Applications are invited from Chartered Architects for the post of Head of the School of Architecture, Surveying and Building. The person appointed will be expected to commence duty on 18th September, 1944.

Candidates should hold the Degree or Diploma of a School of Architecture which is fully recognized by the R.I.B.A. and have had teaching and administrative experience in a school recognized for the Intermediate or Final Examination.

Salary scale, £730 by £25 to £930 plus war-time bonus of £52 per annum, subject to the usual 5 per cent. deduction for superannuation. Commencing salary according to qualifications and experience.

Further particulars and forms of application, which must be returned by 8th July, can be obtained by sending a stamped addressed foolscap envelope to the Director of Education, The Polytechnic, 309, Regent Street, W.1. 685

Architectural Appointments Vacant

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Wherever possible prospective employers are urged to give in their advertisement full information about the duty and responsibilities involved, the location of the office, and the salary offered. The inclusion of the Advertiser's name in lieu of a box number is welcomed.

TWO JUNIOR ASSISTANTS required by Reading firm of chartered architects. Apply stating age, experience and salary required—must be exempt from military service. Box 676.

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Applicants should write quoting appropriate reference to the Ministry of Labour and National Service, Room 432, Alexandra House, Kingsway, London, W.C.2, for the necessary forms which should be returned completed on or before 10th July, 1944. 687

SENIOR ASSISTANT for office in Midlands. Must be capable quantity surveyor with knowledge of building costs. Good draughtsman and conversant with war damage work. Reply stating salary required to Box 686. [Architects and Surveyors.]

JUNIOR DRAUGHTSMAN wanted by Chartered Architects, West Country. Probationer or Student R.I.B.A. preferred. Apply Box 688.

Classified Advertisements continued on page xxxiii

Architectural Appointments Wanted

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

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ASSISTANT, seven years' experience domestic, commercial, industrial structures and prefabrication, is available immediately for professional firm, contractor, industrial concern or research organization. Salary about £6 6s. Box 305.

SURVEYOR, BUILDING SURVEYOR, INSPECTOR, Etc., with over 30 years' varied experience, qualifications (theoretical and practical), in all branches of the profession, and building trades, seeks responsible position in Birmingham, or surrounding five counties; with Local Authorities, or public bodies, etc.; experience in public offices; and includes war damage, dilapidations, etc.; exempt military service, over military age. Box 306.

MALE ARCHITECTURAL STUDENT, second year Liverpool school of Architecture, wants work of national importance in an architect's office, London preferred, during summer vacation after July 8th. Box 308.

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ARCHITECT AND SURVEYOR, L.R.I.B.A., A.I.A.S. (Quants.), Age 37, seeks contact with firm offering post-war prospects, preferably with view to partnership; 20 years varied experience; very excellent credentials. Box 309.

JUNIOR DRAUGHTSMAN (aged 17), 4 years' technical college (building) training; some experience; wants position in either architect's office or drawing office in London area. Box 311.

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DRAUGHTSMAN TRAINEE. 16 years. 2 years Civil Service. Seeks position in South Yorkshire. Good Tracer. References. Carnley, 41, The Crescent, Bolton-on-Dearne. 318

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