

THE ARCHITECTS' JOURNAL



standard contents

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

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★ A glossary of abbreviations of Government Departments and Societies and Committees of all kinds, together with their full address and telephone numbers. The glossary is published in two parts—A to Ie one week, Ig to Z the next. In all cases where the town is not mentioned the word LONDON is implicit in the address.

AA	Architectural Association, 34/6, Bedford Square, W.C.1.	Museum 0974
AAI	Association of Art Institutions. Secy.: W. Marlborough Whitehead, "Dyneley," Castle Hill Avenue, Berkhamstead, Herts.	
ABS	Architects' Benevolent Society, 66, Portland Place, W.1.	Langham 5721
ABT	Association of Building Technicians, 5, Ashley Place, S.W.1.	Victoria 0447-8
ACGB	Arts Council of Great Britain, 4, St. James' Square, S.W.1.	Whitehall 9737
ADA	Aluminium Development Association, 33, Grosvenor Street, W.1.	Mayfair 7501/8
APRR	Association for Planning and Regional Reconstruction, 34, Gordon Square, W.C.1.	Euston 2158-9
ArchSA	Architectural Students' Association, 34/36, Bedford Square, W.C.1	
ARCUK	Architects' Registration Council, 68, Portland Place, W.1.	Welbeck 9738
ASB	Architectural Science Board of the Royal Institute of British Architects, 66, Portland Place, W.1.	Langham 5721
AScW	Association of Scientific Workers, 15, Half Moon Street, Piccadilly, W.1.	Grosvenor 4761
BAE	Board of Architectural Education, 66, Portland Place, W.1.	Langham 5721
BATC	Building Apprenticeship and Training Council, Lambeth Bridge House, S.E.1.	Reliance 7611, Ext. 1706
BC	Building Centre, 9, Conduit Street, W.1.	Mayfair 8641/6
BCC	British Colour Council, 13, Portman Square, W.1.	Welbeck 4185
BCCF	British Cast Concrete Federation, 17, Amherst Road, Ealing, W.13.	Perivale 6869
BCIRA	British Cast Iron Research Association, Alvechurch, Birmingham.	Redditch 716
BDA	British Door Association, 10, The Boltons, S.W.10.	Flaxman 7766
BEDA	British Electrical Development Association, 2, Savoy Hill, W.C.2.	Temple Bar 9434
BIA	British Ironfounders' Association, 145, Vincent Street, Glasgow, C.2.	Glasgow Central 2891
BIAE	British Institute of Adult Education, 29, Tavistock Square, W.C.1.	Euston 5385
BID	Building Industries Distributors, 52, High Holborn, W.C.1.	Chancery 7772
BINC	Building Industries National Council, 11, Weymouth Street, W.1.	Langham 2785
BOT	Board of Trade, Millbank, S.W.1.	Whitehall 5140
BRS	Building Research Station, Bucknalls Lane, Watford.	Garston 2246
BSA	Building Societies Association, 14, Park Street, W.1.	Mayfair 0515
BSI	British Standards Institution, 28, Victoria Street, S.W.1.	Abbey 3333
BTE	Building Trades Exhibition, 4, Vernon Place, W.C.1.	Holborn 8146/7
CABAS	City and Borough Architects Society, C/o Johnson Blackett, F.R.I.B.A., Borough Architect, Town Hall, Newport, Mon.	Newport 3111
CAS	County Architects Society, C/o F. R. Steele, F.R.I.B.A., County Hall, Chichester.	Chichester 3001
CCA	Cement and Concrete Association, 52, Grosvenor Gardens, S.W.1.	Sloane 5255
CCP	Council for Codes of Practice, Lambeth Bridge House, S.E.1.	Reliance 7611
CDA	Copper Development Association, Kendals Hall, Radlett, Herts.	Radlett 5616
CIAM	Congrès Internationaux d'Architecture Moderne, Dolderal, 7, Zurich, Switzerland.	
COID	Council of Industrial Design, Tilbury House, Petty France, S.W.1.	Whitehall 6322
CPRE	Council for the Preservation of Rural England, 4, Hobart Place, S.W.	Sloane 4280
CUJC	Coal Utilization Joint Council, 13, Grosvenor Gardens, London, S.W.1.	Victoria 1534
CVE	Council for Visual Education, 13, Suffolk Street, Haymarket, S.W.1.	Reading 72255
DGW	Directorate General of Works, Ministry of Works, Lambeth Bridge House, S.E.1.	Reliance 7611
DIA	Design and Industries Association, 13, Suffolk Street, S.W.1.	Whitehall 0540
DOT	Department of Overseas Trade, 35, Old Queen Street, S.W.1.	Victoria 9040
EJMA	English Joinery Manufacturers' Association (Incorporated), Sackville House, 40, Piccadilly, W.1.	Regent 4448
EPNS	English Place-Name Society, 7, Selwyn Gardens, Cambridge.	
FAS	Faculty of Architects and Surveyors, 8, Buckingham Palace Gdns., S.W.1.	Sloane 2837
FASSC	Federation of Association of Specialists and Sub-Contractors, 5, Arundel Street, Strand.	Temple Bar 6633
FBI	Federation of British Industries, 21, Tothill Street, S.W.1.	Whitehall 6711
FC	Forestry Commission, 25, Savile Row, W.1.	
FCMI	Federation of Coated Macadam Industries, 37, Chester Square, S.W.1.	Sloane 1002
FDMA	The Flush Door Manufacturers Association Ltd. Trowell, Nottingham.	Ilkeston 623
FLD	Friends of the Lake District, Pennington House, nr. Ulverston, Lancs.	Ulverston 201
FMB	Federation of Master Builders, 26, Great Ormond Street, Holborn, W.C.1.	Chancery 7583
FOB 1951	Festival of Britain 1951, 2, Savoy Court, Strand, W.C.2.	Waterloo 1951
FPC	The Federation of Painting Contractors, St. Stephen's House, S.W.1.	Whitehall 3902
FRHB	Federation of Registered House Builders, 82, New Cavendish Street, W.1.	Langham 4041
FS (Eng.)	Faculty of Surveyors of England, Buckingham Palace Gdns., S.W.1.	Sloane 2837
GC	Gas Council, 1, Grosvenor Place, S.W.1.	Sloane 4554
GG	Georgian Group, 27, Grosvenor Place, S.W.1.	Sloane 2844
HC	Housing Centre, 13, Suffolk Street, Pall Mall, S.W.1.	Whitehall 2881
IAAS	Incorporated Association of Architects and Surveyors, 75, Eaton Place, S.W.1.	Sloane 5615
ICA	Institute of Contemporary Arts, 17-18, Dover Street, Piccadilly, W.1.	Grosvenor 6186
ICE	Institution of Civil Engineers, Great George Street, S.W.1.	Whitehall 4577
IEE	Institution of Electrical Engineers, Savoy Place, W.C.2.	Temple Bar 7676
IES	Illuminating Engineering Society, 32, Victoria Street, S.W.1.	Abbey 5215

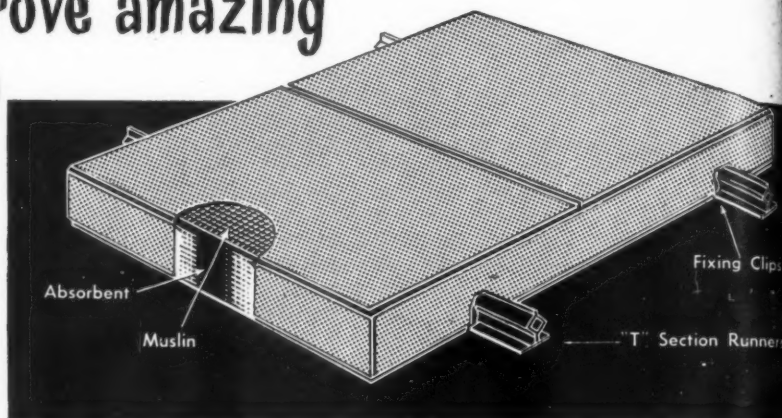
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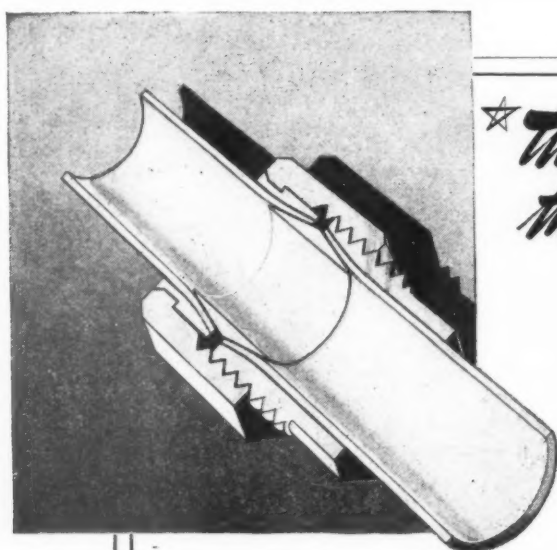
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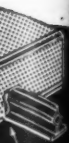
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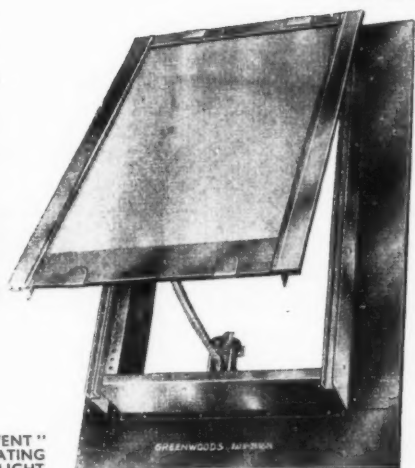
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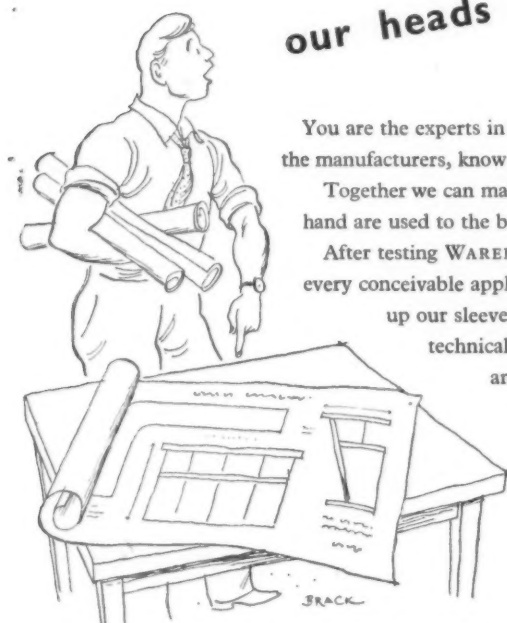
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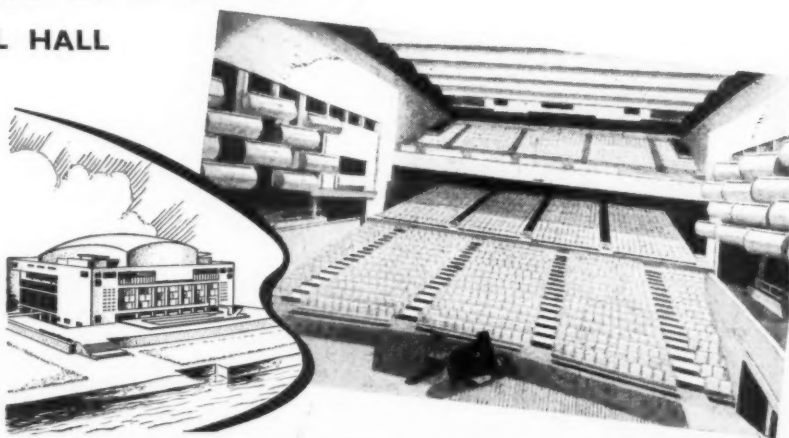
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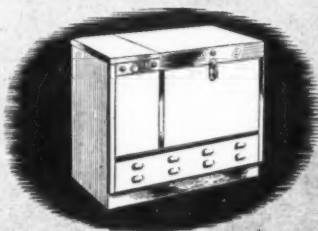
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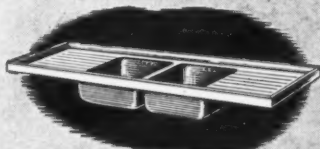
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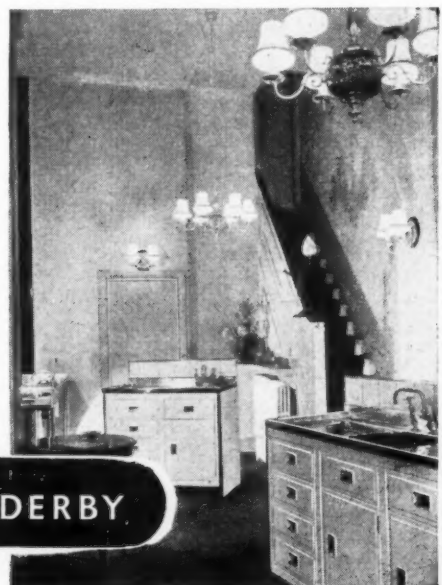
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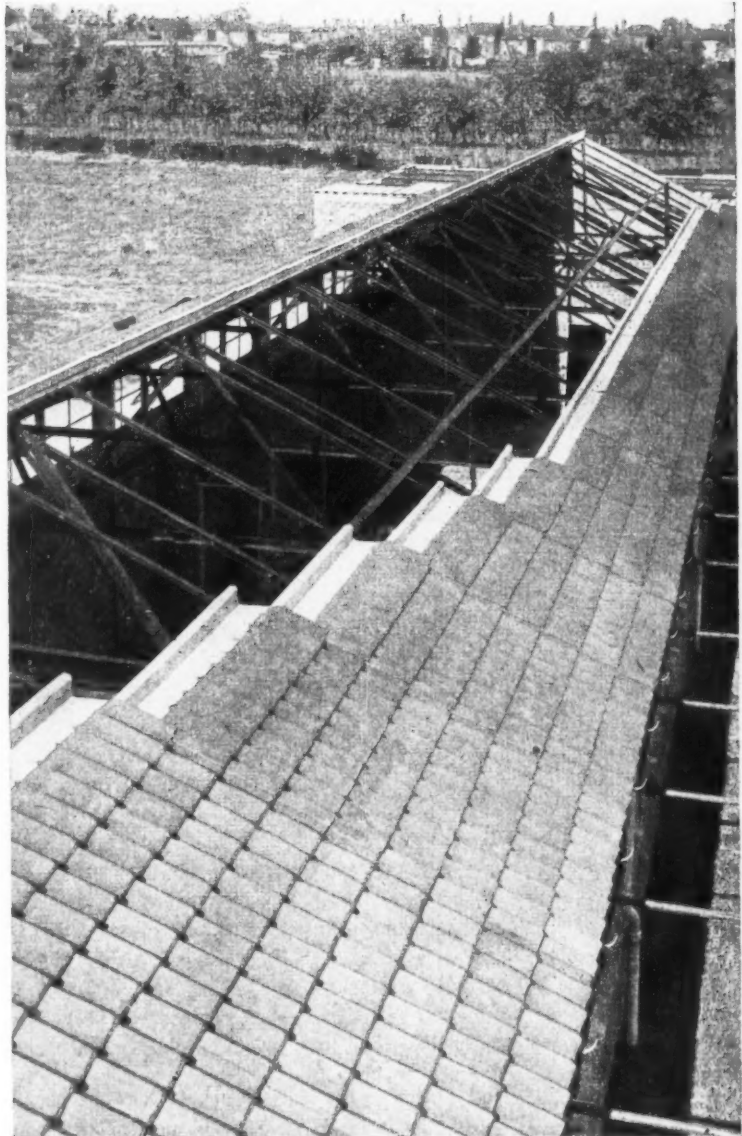
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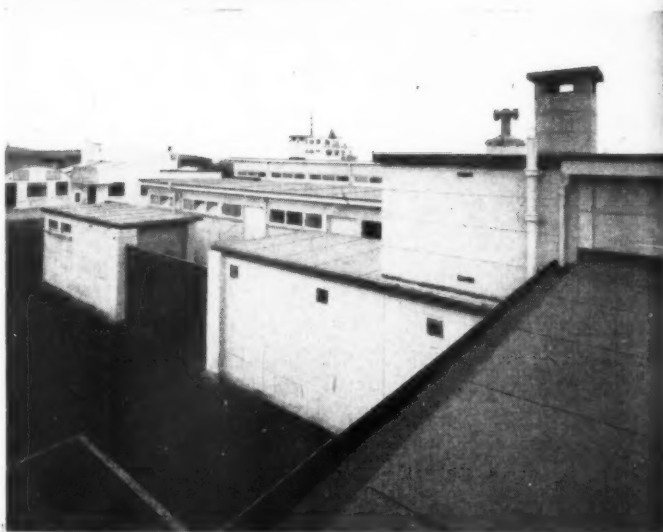
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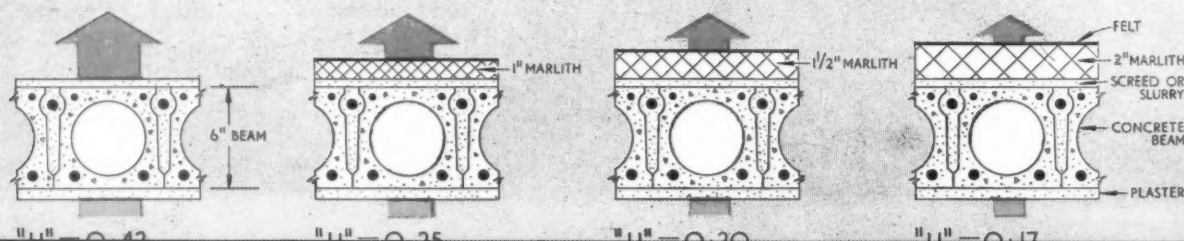
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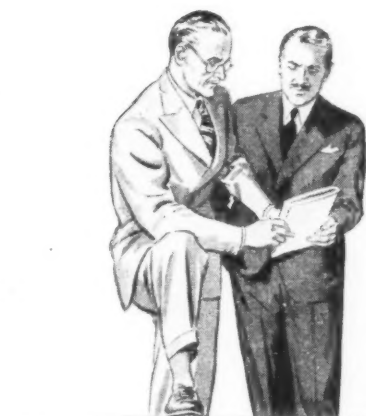
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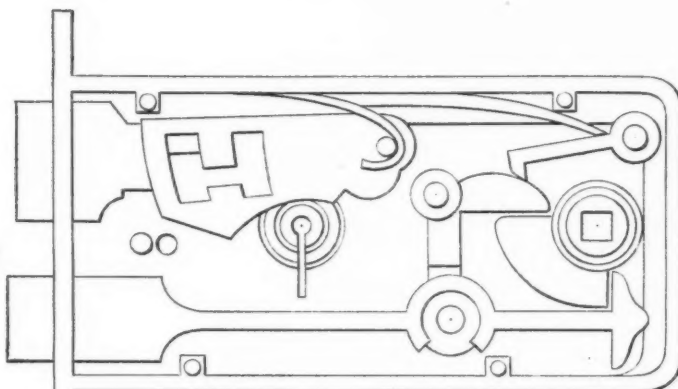
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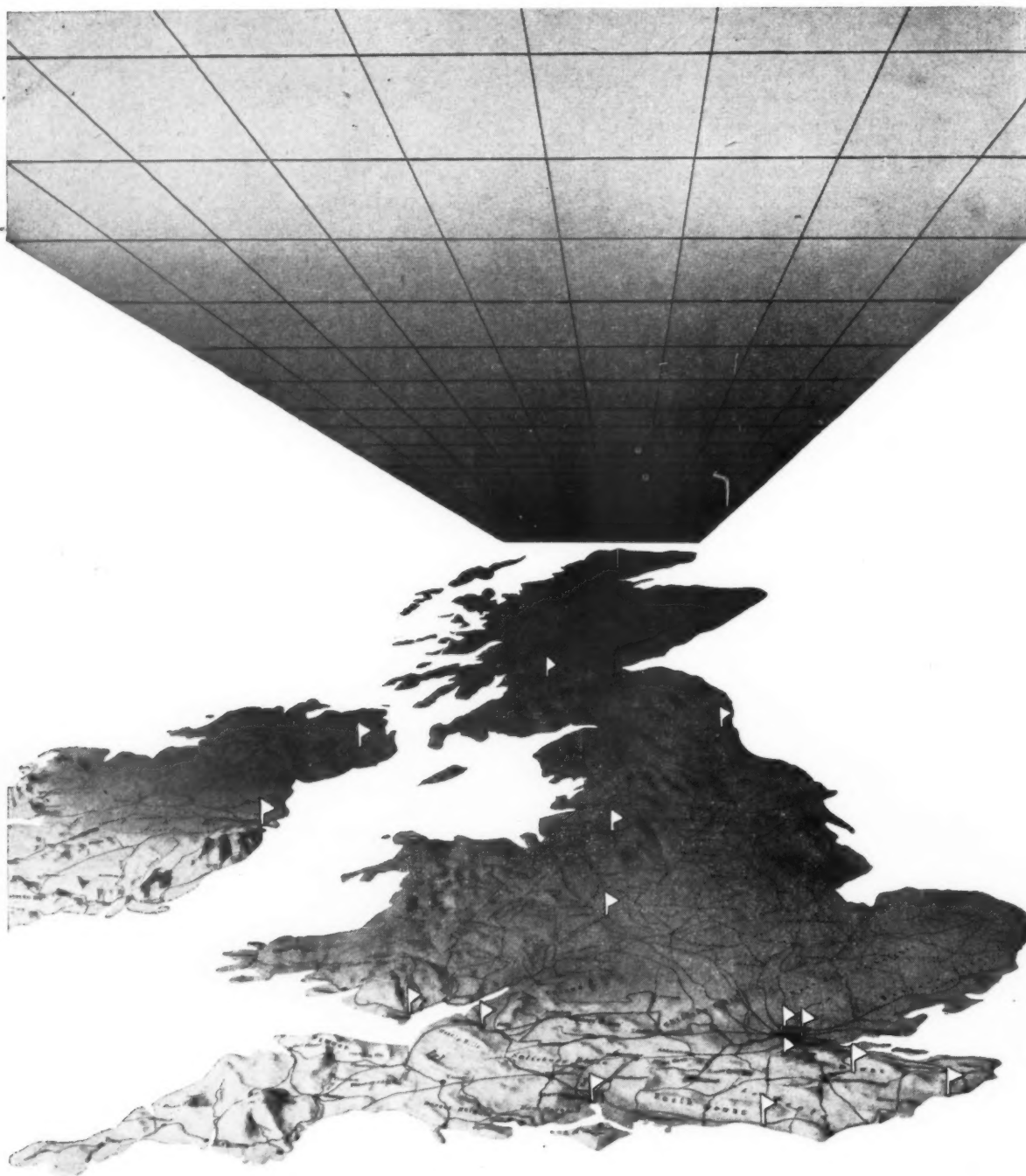
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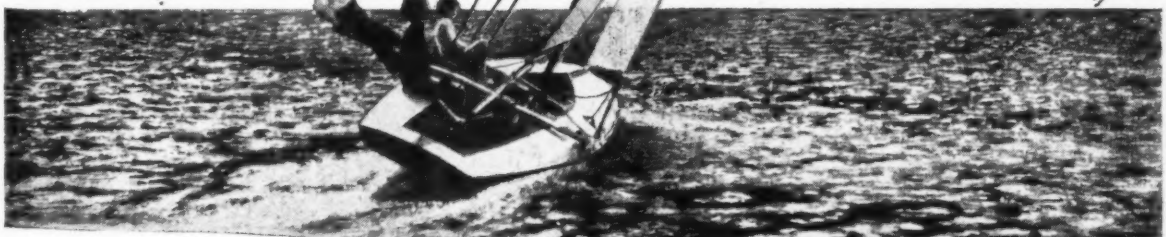
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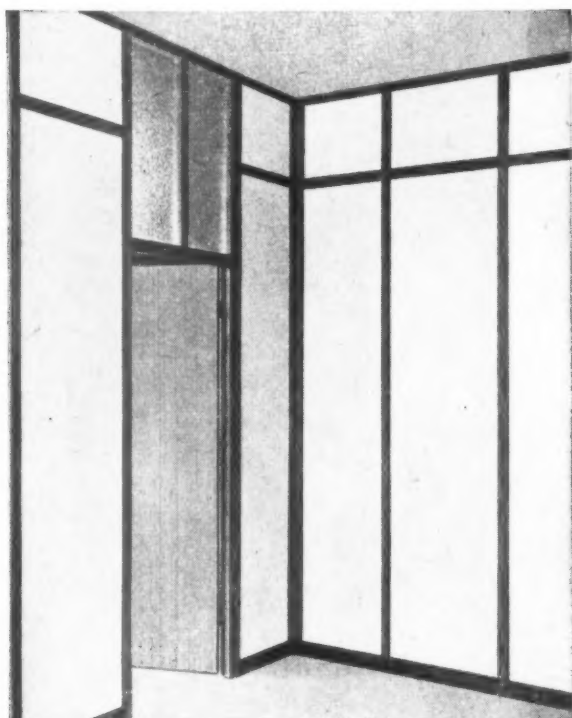
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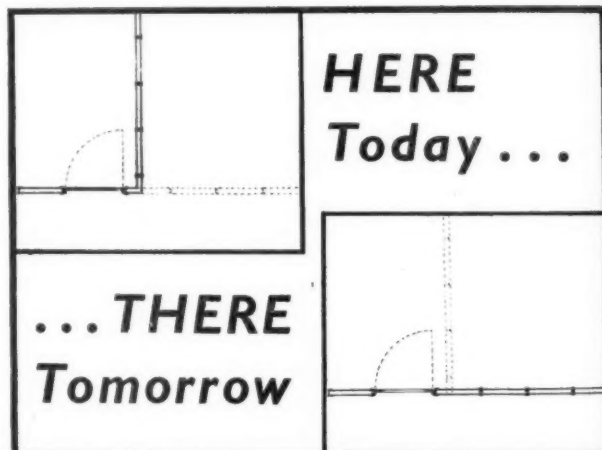
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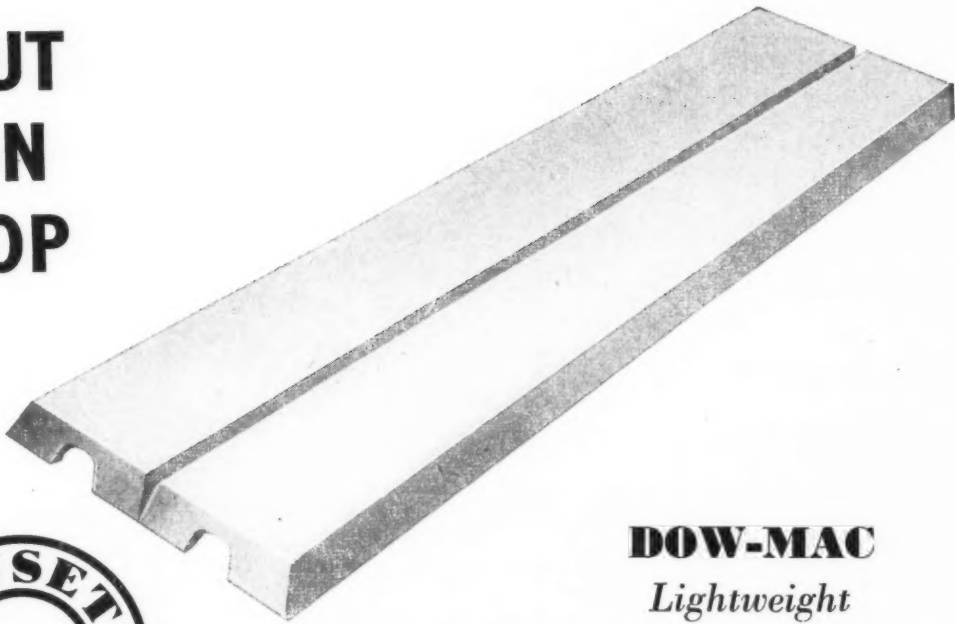
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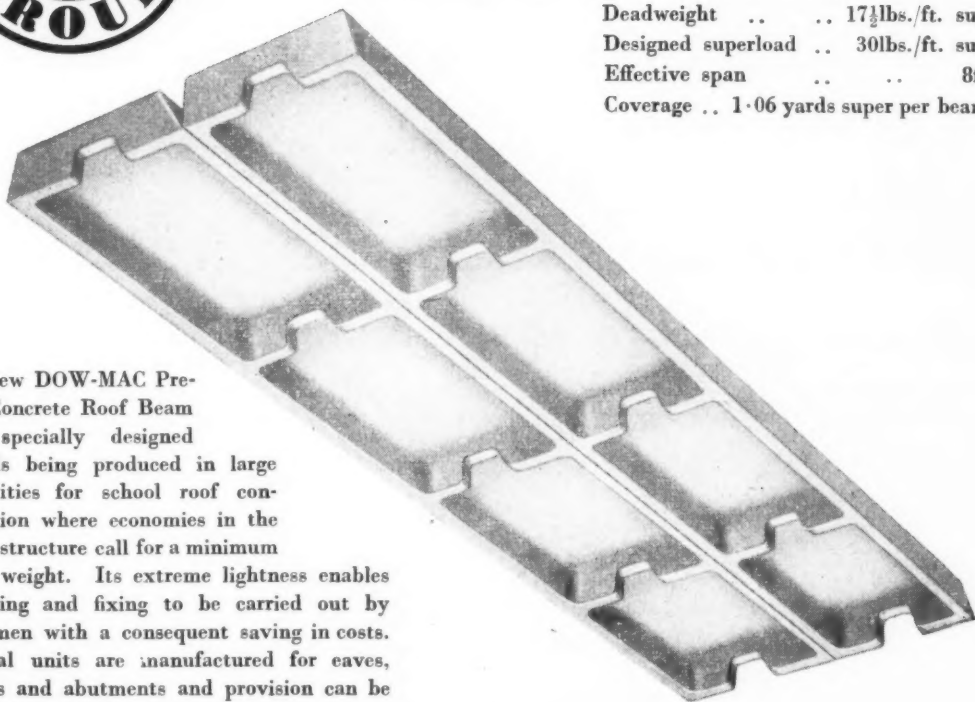
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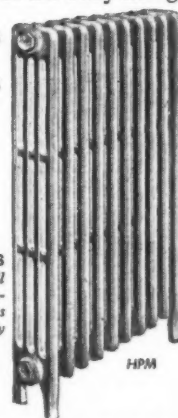
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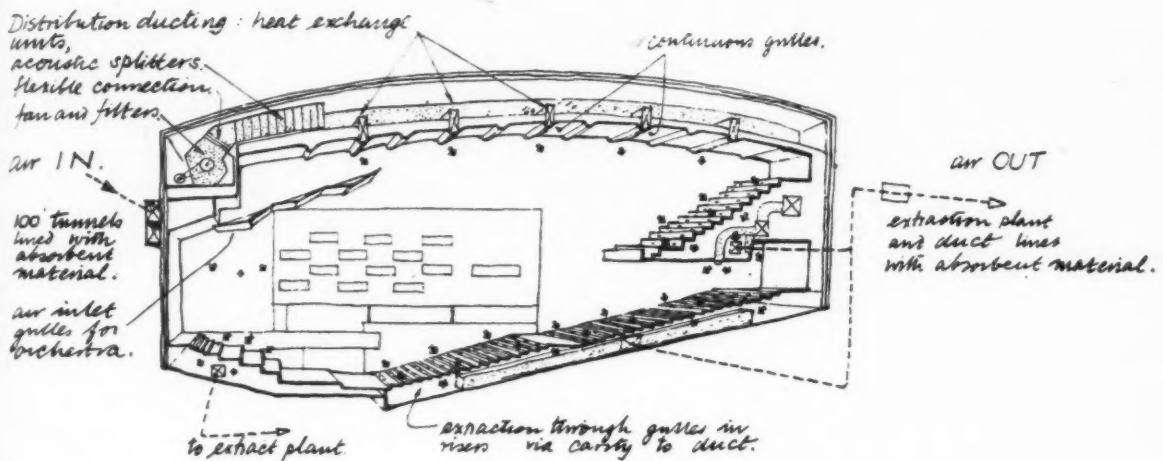
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SKETCH ILLUSTRATING METHOD OF AIR CONDITIONING AUDITORIUM

The heating and ventilation of the Royal Festival Hall

At the Royal Festival Hall designed by the Chief Architect to the London County Council, Robert H. Matthew, A.R.I.B.A., and the Deputy Architect, Dr. J. L. Martin, F.R.I.B.A., the heating, ventilating and hot water services were designed by the Heating Engineers of the Architects' Department, under the direction of R. Coe, M.I.H.V.E. The gas boiler plants and equipment were the responsibility of the Chief Engineer of the London County Council, J. Rawlinson, M.Sc., M.Inst.C.E., M.I.M.E.

The heating and ventilation for the Auditorium was a separate problem from that for the remainder of the building. There were, however, certain requirements common to each. One was that the systems should be flexible enough to run economically despite intermittent use: for example, the auditorium might be occupied by the public for about three hours only on any one day. Another was that nothing should be done which would interfere with the isolation of the auditorium, and the general insulation of the whole building from external

noises. This latter requirement precluded the use of natural ventilation in other parts of the building, since this would involve opening windows. Artificial ventilation was in any case necessary in the auditorium itself. The inevitable choice was, therefore, combined heating and ventilating plants to serve various parts of the building, since these could be made to respond rapidly to changing demands for heat. The decision was made to design a scheme for full air conditioning in the auditorium with no supplementary direct heating, and plenum ventilation

with supplementary heating in various other parts of the building.

Air Conditioning of the Auditorium

In the auditorium, air is introduced through grilles in the ceiling, and extracted through gratings in the risers of the steepings of the floor. The system is designed to operate downwards, because by this means the air can be introduced without causing draughts or disturbing dust, and because smoke and contaminated air is quickly removed without passing through the body of the auditorium.

Under L.C.C. regulations a minimum of 1,000 cubic ft. of outdoor air per person per hour must be supplied to the auditorium, whilst it is occupied by the public: further,

only 75 per cent. of the input may be extracted. Because of this a slight pressure is created, counteracting draughts at doorways leading into the auditorium. The plant is designed to provide 1,250 cubic ft. of conditioned air per person, per hour which will be warmed in winter. The apparatus has been designed to allow for full refrigeration to be added at a later date in order to provide cooling in summer. Until this is done it is hoped that half the cooling load will be obtained from cooled water from a demonstration "heat pump," which is being constructed near the site by the Ministry of Fuel and Power.

The rate of ventilation temperatures, and relative humidity, which will be maintained when the auditorium is occupied, are :

Winter

1,250 cubic ft. per person per hour, with no recirculation, at 65 to 67° Fahrenheit and 50 per cent. Relative Humidity. Two small auxiliary fan and heater sets are provided for recirculating the air in winter during those times when the auditorium is empty.

Summer (with full refrigeration)

1,875 cubic ft. per person per hour (including 625 cubic ft. recirculation) at 75° Fahrenheit and 50 per cent. Relative Humidity (with an outside temperature of 85° Fahrenheit).

There are two identical input plants to the auditorium, each serving one half of the hall. These are housed at roof space level with distributive ducting above the suspended fibrous plaster ceiling. The main elements of the scheme can be seen from the accompanying drawings. The heater batteries are fed by water at low pressure, heated from the main gas boilers.

Control of Heat Input

Minor variations in the amount of heat required in the auditorium caused by changes in the number of persons occupying the hall are recorded in the first place by thermostats in the extract ducts, where the condition of the air approximated closely to that in the Hall itself. Fine adjustments are made by these thermostats in controlling the amount of hot water which passes through the heater batteries. The humidifier is regulated by hygrostats placed in a similar position in the system. Other thermostats record the temperature of the water flow from the heating boilers, and these control the amount of heat needed to bring the water up to the required circulating temperature. If the temperature of the incoming air were constant these controls might be sufficient, but since this is not so changes in external air temperatures would be quickly noticed by the occupants. To overcome this it must be possible to adjust the heat output of the boilers rapidly. This is done by thermostats placed outside the building which reset the main thermostats on the boiler flow.

In order to maintain economically a system, such as has been described, which is required to respond to rapid changes in demands for heat, suitable boilers must be used. This was

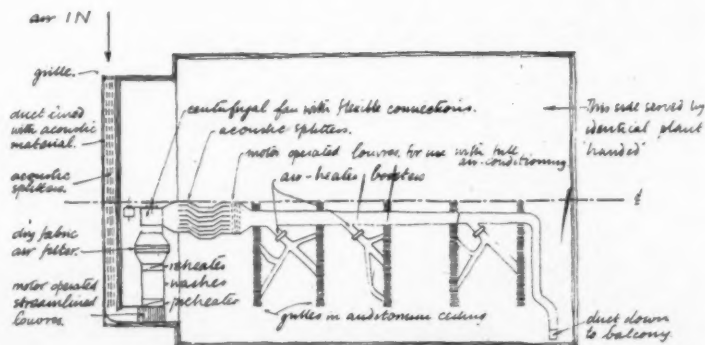


DIAGRAM SHOWING LAYOUT OF PLANT IN ROOF SPACE

one of the main reasons for choosing gas boilers. How those at the Festival Hall meet these requirements is described later.

Sound Insulation

One of the great difficulties in designing the building was to insulate the auditorium from external noise. It was particularly important that air borne sound entering by the air intake and extract ducts, and any noise made by the plant itself, should be absorbed before reaching the auditorium.

Air entering and leaving the building passes through concrete tunnels, each approximately 100 ft. long, which have walls and ceiling lined with acoustically absorbent materials. Vertical panels known as acoustic splitters, faced with similar material, are also provided in the tunnels so as to increase the area of sound absorption. Apart from noise brought in

from outside, the motors and fans, and the passage of air in the ducts were likely to be another source of disturbance. Specially silent electric motors were therefore chosen, and were fixed on spring type anti-vibration mountings and on bases insulated by glass silk blankets. Slow speed fans were installed, and the speed of air in the ducts will not exceed 1,000 ft. per minute. In spite of these precautions, the problem of eliminating all noise was thought so important, that a further set of acoustic splitters were built into the main distributing duct for about the first 25 ft. of its length, and the plant room housing the main heater batteries and fans was also lined with acoustic material.

Other parts of the Building

As was mentioned earlier, the heating of the remainder of the building surrounding the



A general view of the boiler house, showing the five gas-fired boilers which serve the heating system.

auditorium is independent of the auditorium heating. Separate plants are provided for the various other parts of the building so that there will be no wastage of heat elsewhere when, for instance, the foyers and restaurants only are in use. Even where the main method of heating is by the introduction of warmed air, supplementary heating is provided, sufficient to offset loss of heat through the fabric of the building. Convectors, radiators and floor panels are used for this purpose, and in the restaurant, where the window area is exceptionally large and there is particular danger of condensation, gilled tubes are incorporated in the transoms of the windows, and the ventilating plant is fitted with dew point control. Fresh air is introduced to the lavatories, which are all internal, and is mechanically extracted; duplicate sets of fans are provided in case of failure, and in order to comply with the Theatre Regulations. Another air conditioning plant will be installed to serve the small auditorium which is to be installed in the second phase of construction.

The Gas-Fired Boiler Installation

The whole of the heating for the building, and also that required for the supply of hot water, is provided by gas-fired boilers. Five vertical type Cochran "Sinuflo" boilers, each of 6½ mill. B.Th.U. capacity serve the heating system, and three similar but smaller boilers, each of 601,000 B.Th.U. are installed for the hot water supply. The estimated maximum total load of this plant is about 33 million B.Th.U., and, amongst gas-fired installations, it is one of the largest, and probably the most efficient in the country.

Since the Festival Hall has received so much careful attention throughout its design, the choice of fuel is worth commenting on.

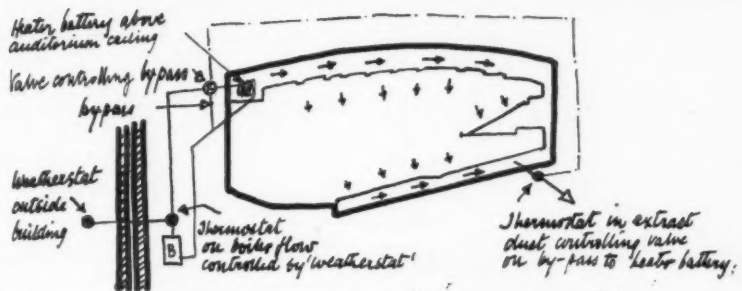
The cost of gas fuel may sometimes preclude the installation of gas-fired boilers, but in many buildings there are good reasons for considering them from the points of view of both heating engineer and architect, and also in the national interest. Furthermore, the cost of the fuel may not necessarily be an over-riding economic factor.

The gas and coke oven industries in the country account for over 20 per cent. of the total national coal utilisation, and a comparison of the efficiencies of a number of conversion processes is shown in the following table:—

Gas Works	75 per cent.
Electrical Generation ..	25 " "
Industrial Heating ..	50 " "
Domestic Heating ..	20 " "
Railways, steam engines	8 " "

The efficiency of the gas making processes is relatively high, and provided individual appliances using gas are as efficient as those using other fuels it would obviously contribute to the overall efficiency in the use of coal if gas were more widely used.

From the heating engineers point of view gas boilers in buildings such as the Festival Hall, where the demand for heat is not constant, are particularly satisfactory because with them it is possible to obtain quick automatic



SKETCH SHOWING METHOD OF THERMOSTATIC CONTROL

regulation of the flow temperature to suit the outside weather conditions, and because the boilers will continue to work at their maximum efficiency even when the load is much reduced. Furthermore, uniformity of quality of gas fuel, unlike that of solid fuel, is guaranteed, and the assumption that each cubic foot of gas will provide 500 B.Th.U.s or other specified calorific value can be relied upon. For large undertakings the Gas Board may be prepared to supply gas, under special contract, at a guarantee pressure.

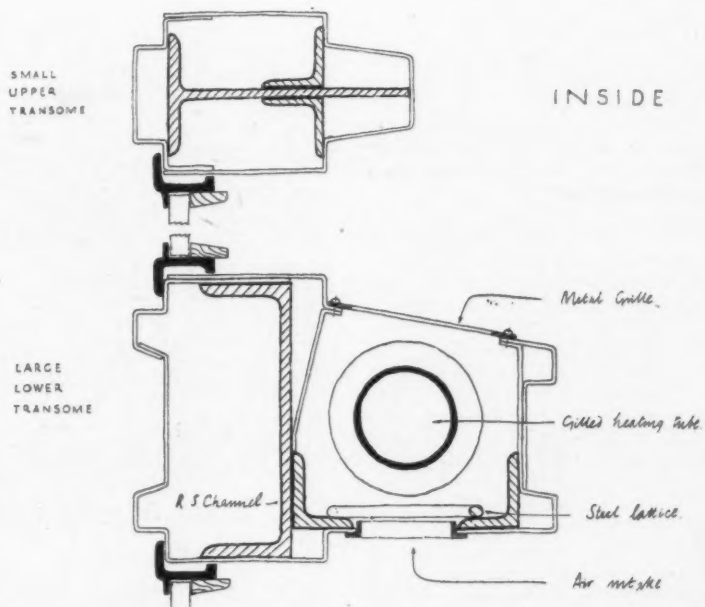
From the architect's point of view there are obvious advantages in using gas-firing. The storage problem is eliminated since no space need be allocated for storage of solid fuel under cover or for housing oil fuel tanks; the size of the boilerhouse is likely to be smaller than it would otherwise be; the operation of the boilers does not produce dirt, and the boilerhouse will remain clean and free from dust; tall chimney stacks need not be provided, since all that is required is a duct through which the waste gases may be discharged. These gases

are not injurious, and there is a complete absence of the smoke and dirt and pollution of the air associated with oil and solid fuel boilers.

Despite these advantages gas-fired boilers are often considered an extravagance merely because, on a heat unit basis, the cost of gas may be two or three times the cost of solid fuel. Yet, the extra cost of fuel may, in fact, be offset by a number of factors. The cost of the actual boilers is comparable with other types and there may well be savings in capital building costs. No stoking, handling of fuel, or ash removal is needed. Automatic controls minimise the attention required—the impressive range of boilers at the Festival Hall, together with all their complex controls, will be in the charge of only one man under the supervision of the Hall Engineer.

The layout of the boilerhouse is shown in the accompanying drawing.

One of the main boilers will be a spare one, and control of the whole set will be maintained



DETAILS OF LARGE WINDOWS ON RIVER FRONT SHOWING HEATING IN TRANSOMS

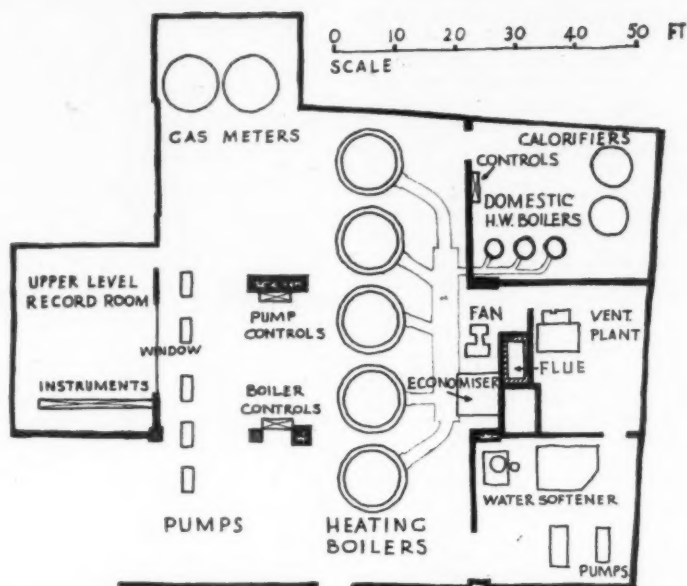
from two instrument boards in the boilerhouse. A comprehensive set of recording instruments is provided in a separate room. The five main boilers are each 9 ft. in diameter by 9 ft. 6 in. high, and each consist of a welded steel shell within which are 557 specially-shaped tubes. There is a gas jet below each tube, and these jets are mounted on four quadrants, each of which is on a swivel. Of the four operative boilers, two are so arranged that their four quadrants can be fired separately. Thus each of these two boilers can work at quarter, half, three-quarter or full capacity. Since the remaining two operative boilers can only be fully on or off, this allows sixteen possible stages before the full capacity of the four boilers is reached. On the top of each boiler there is a gas outlet chamber with individual flues, leading to a main duct, measuring 4 ft. 3 in. by 3 ft. 9 in., which in turn leads to the concrete chimney. This chimney is lined with molar bricks and rendered internally in high alumina cement mortar.

The automatic controls on the boilers include draught controllers at the outlet of each boiler and in the main flue, electrically-operated gas valves to keep the water at required temperatures, flame failure and electricity failure safety devices, C.O.₂ indicators, night shut-down controls and an outside climate controller to reset boiler flow temperatures to suit weather conditions.

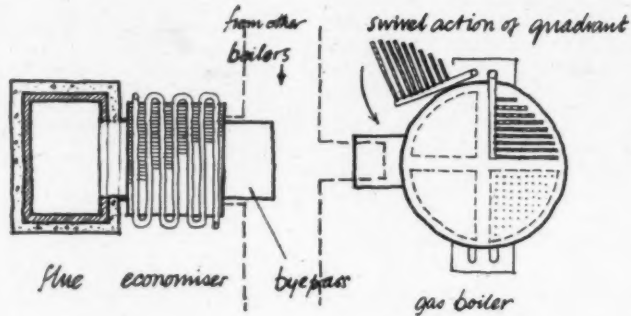
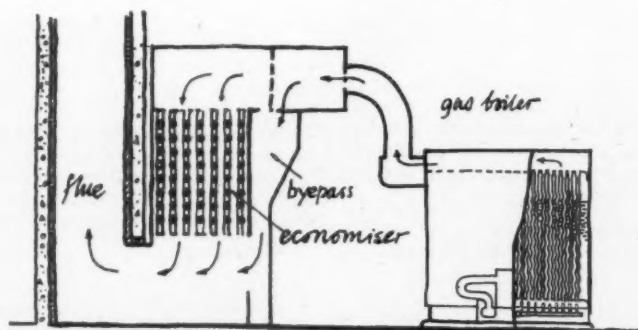
The efficiency of the boilers is high, but the large size of the installation justified the incorporation of a fuel economiser in order to extract some of the heat from the flue gases. This device consists essentially of a series of pipes placed in the main duct connecting the boilers to the chimney and so arranged that the hot gases passing over the pipes partially heat the water returning to the boilers. It works in much the same way as the coil in a calorifier and is expected to make a saving in fuel of 5 to 6 per cent. An efficiency of about 85 per cent. is estimated for the whole system. Economisers are normally used for large industrial boiler installations, but are not usually considered worthwhile unless the fuel consumption is more than 200 tons of solid fuel a year. So far as is known, they have not previously been used in combination with a town gas-fired installation.

The particular appliance used at the Festival Hall incorporates a special design of pipe with extended heating surface and straight gas passage. It has a total heating surface of 1,683 sq. ft., part or whole of which can be put into circuit according to the boiler load. An induced draught fan is incorporated in the plant to compensate for the draught resistance in the economiser, but both the economiser and the fan can be by-passed, and the boilers operated on natural draught when required.

Flue draught controls are provided at the outlet of each of the boilers, and also in the main flue, and the pull in the latter will be stabilised at approximately 0.03 inches (water gauge) irrespective of whether the economiser and its induced draught fan are used or not.



PLAN OF BOILER HOUSE



PLAN

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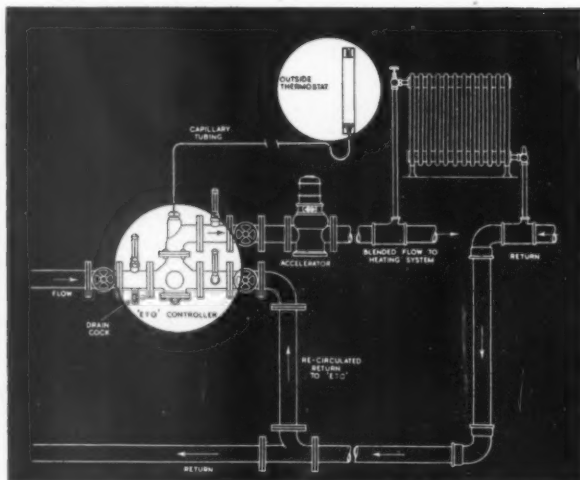


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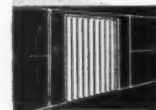


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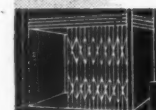
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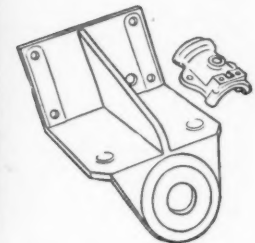
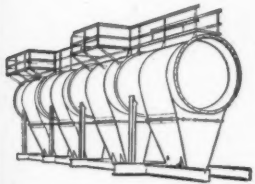
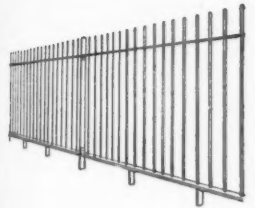
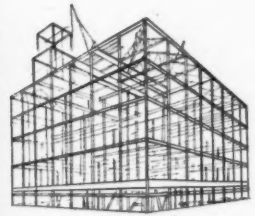
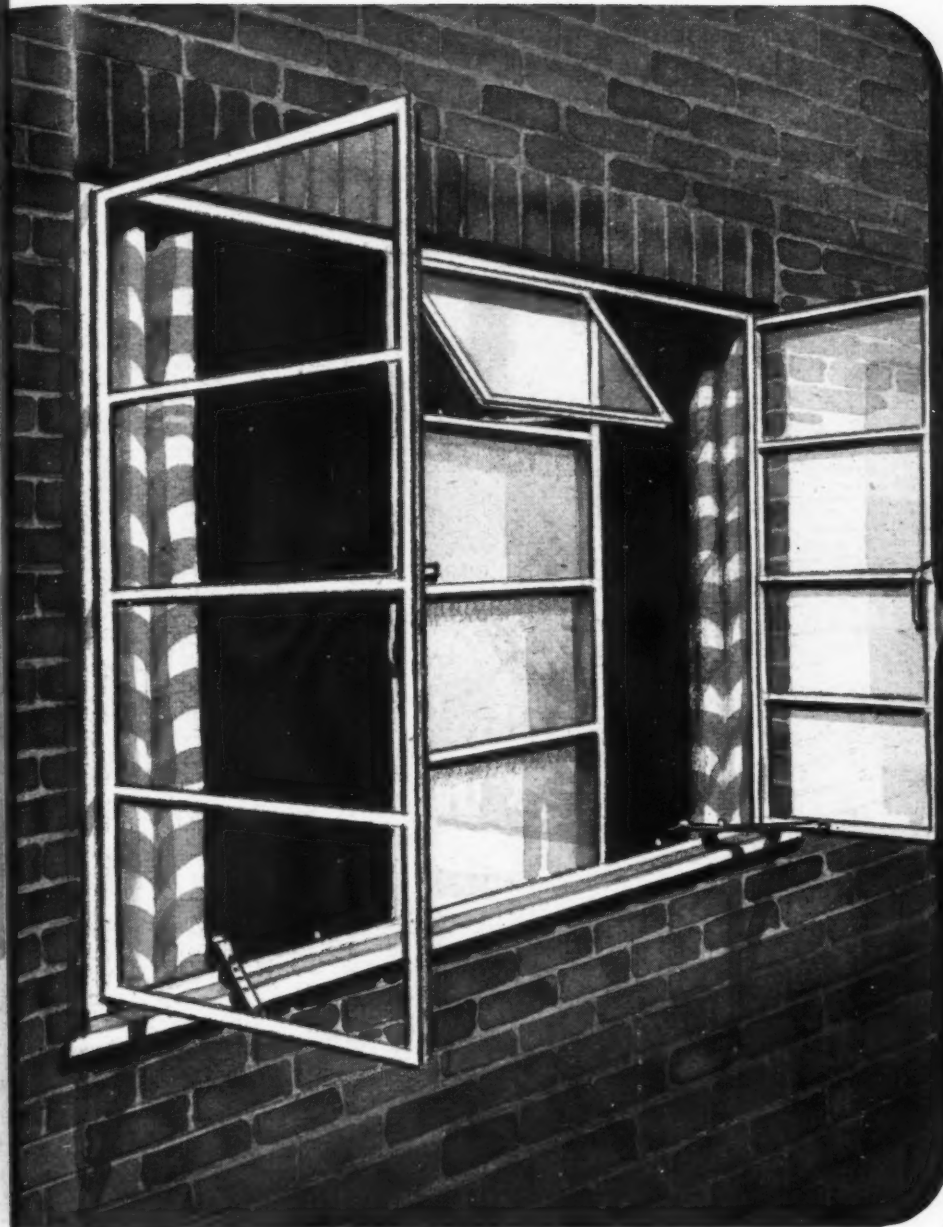


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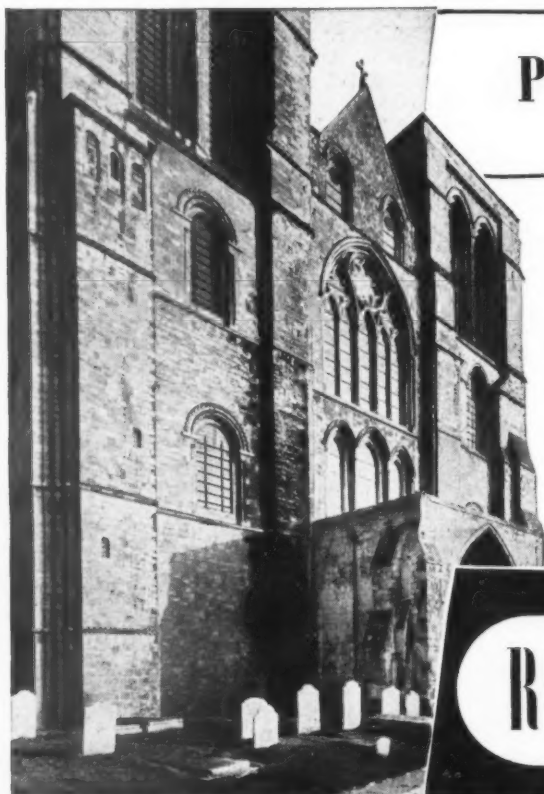
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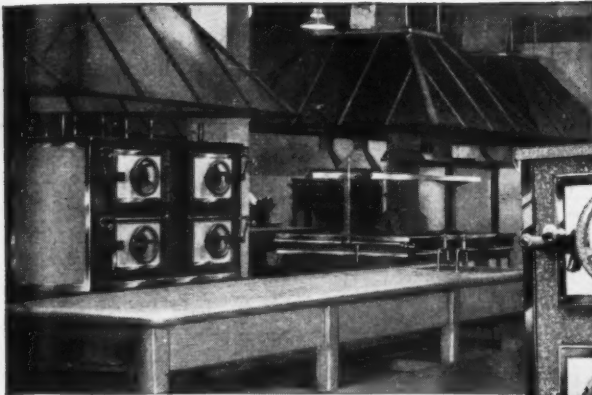
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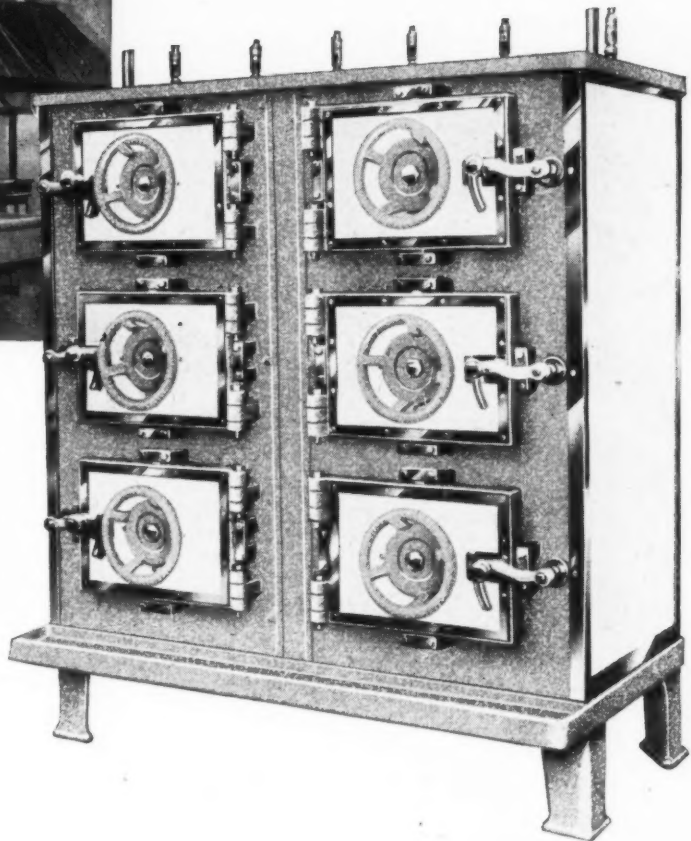


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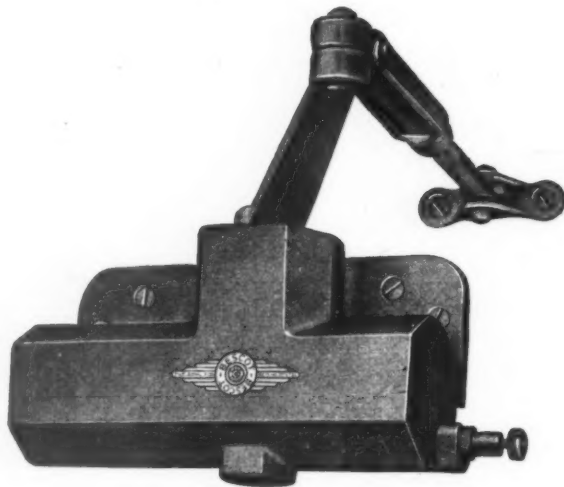
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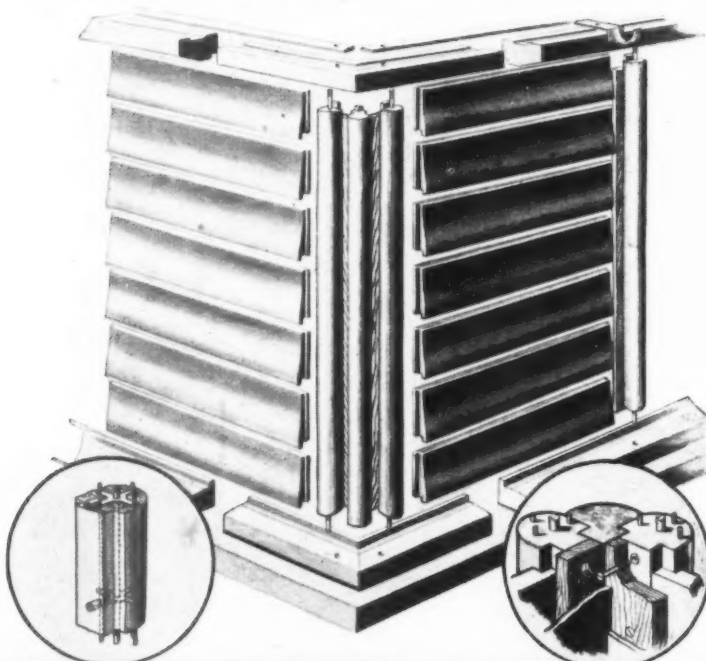
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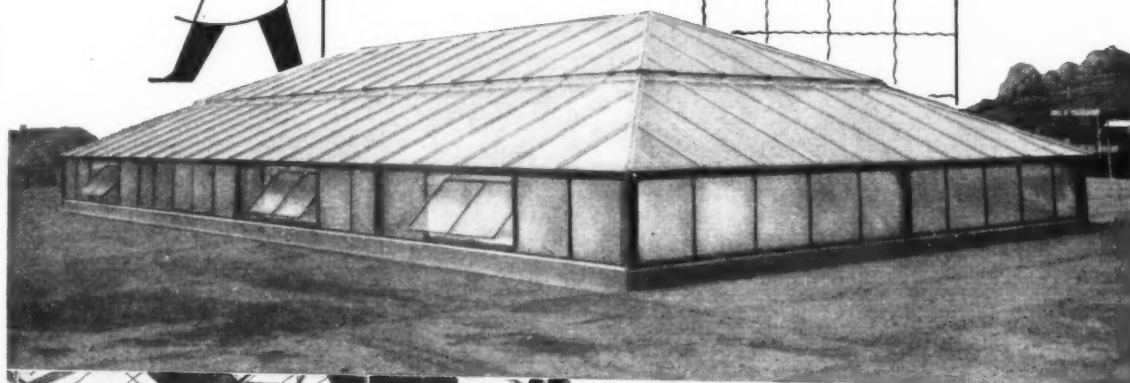
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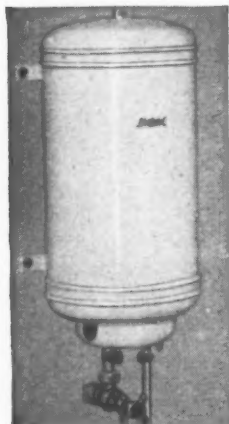
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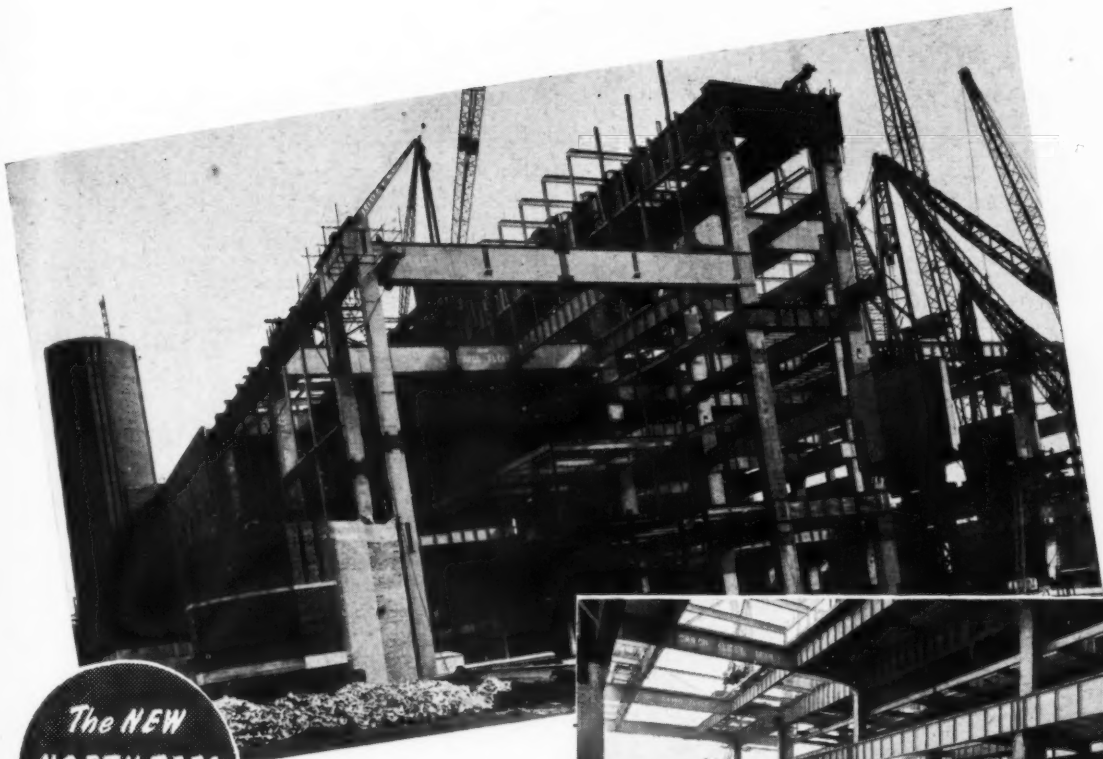
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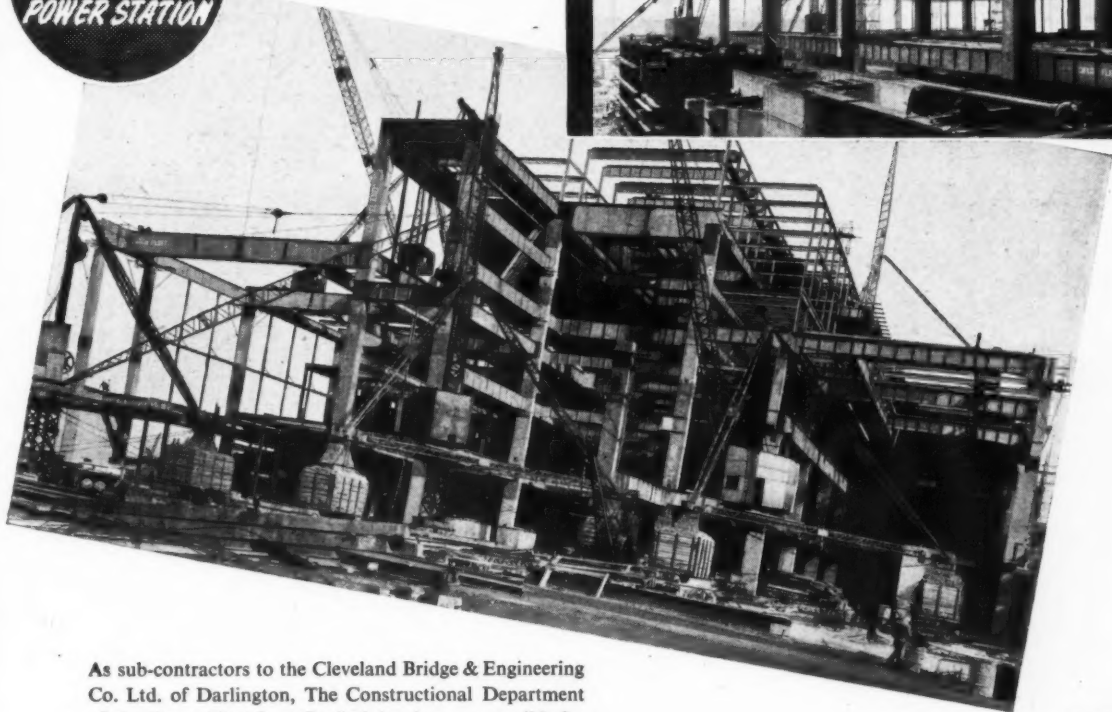
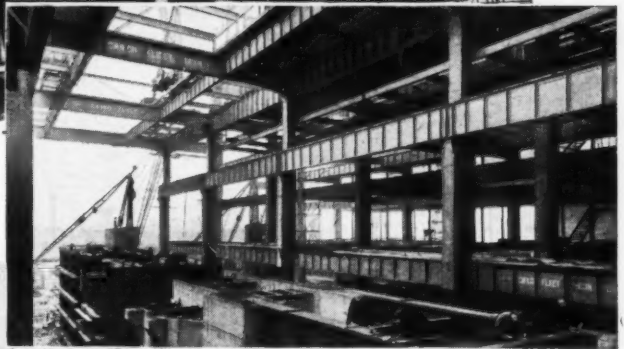
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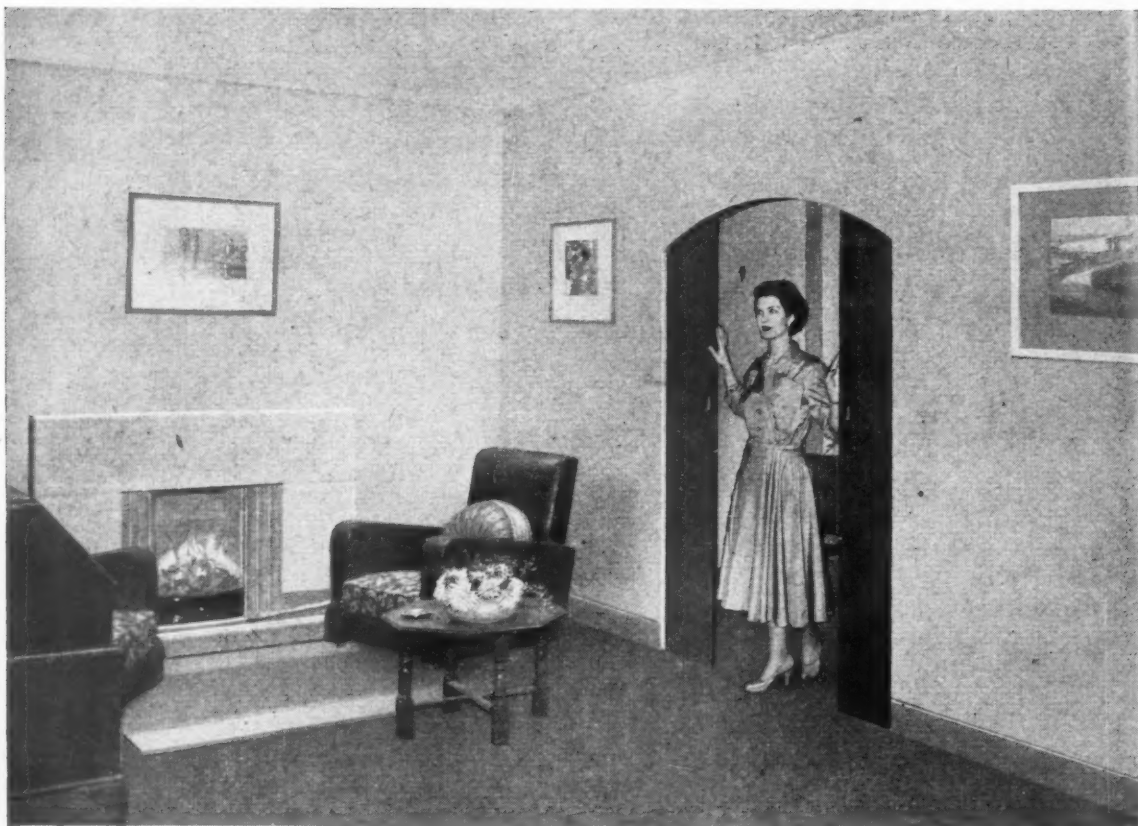
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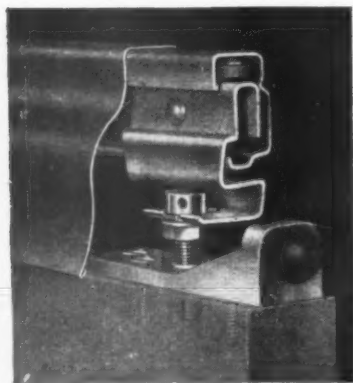
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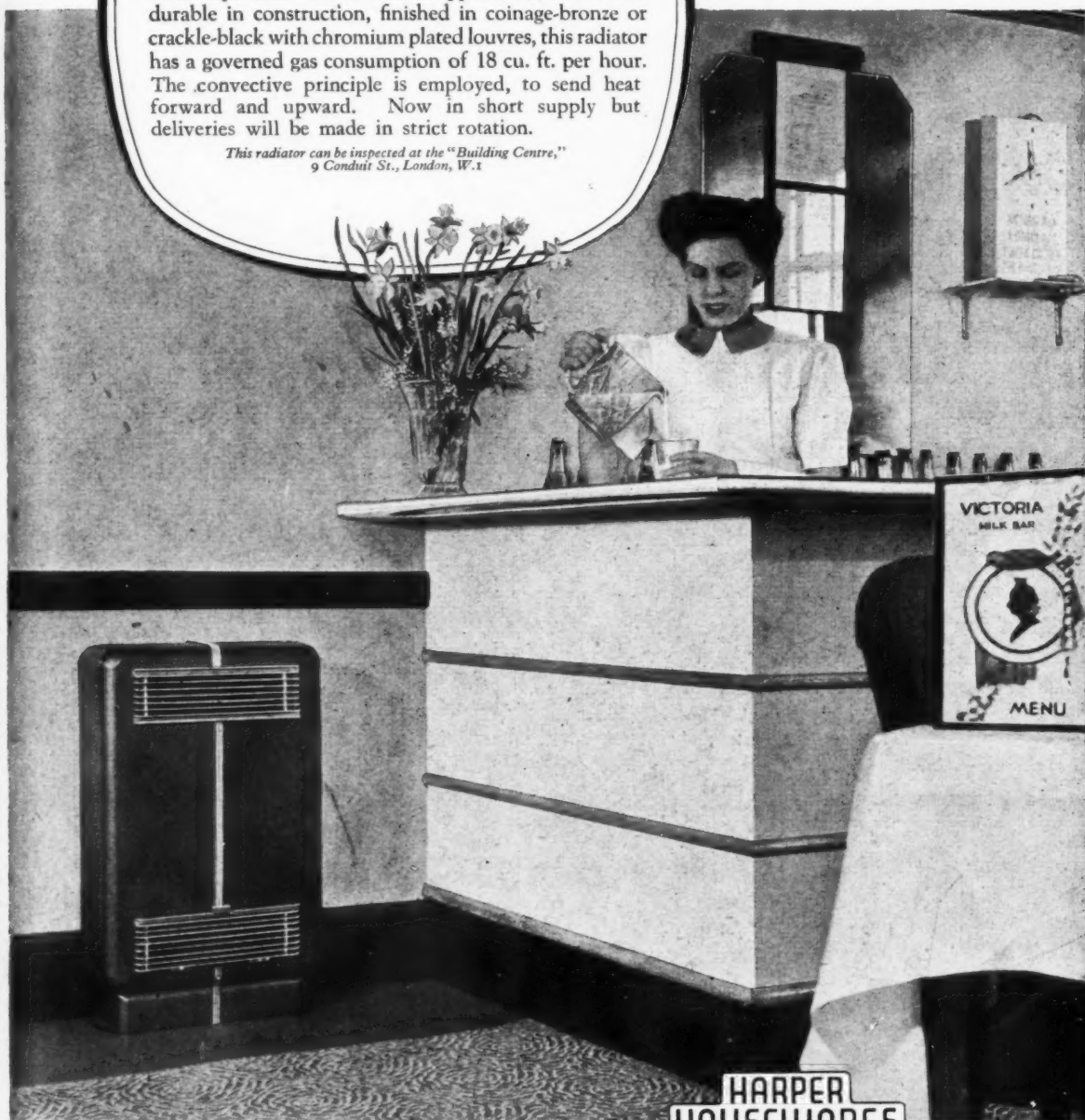
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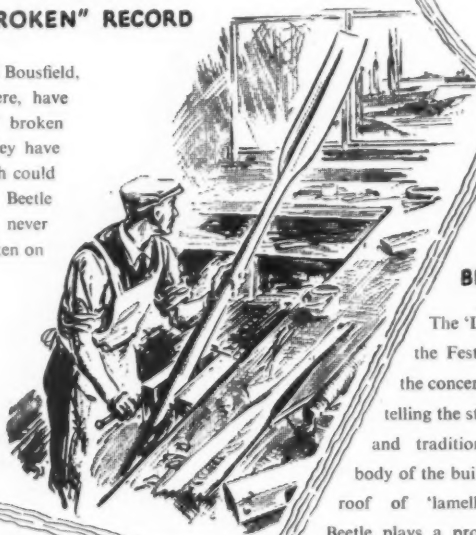
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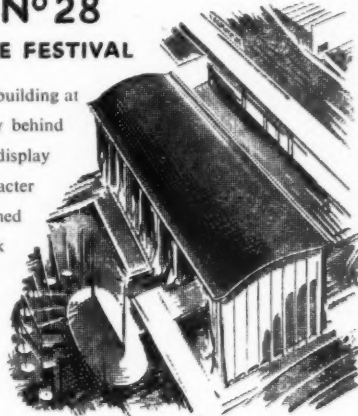


FACT N° 26 BEETLE STRIKES THE RIGHT NOTE

Beetle Cement W.2 and Hardener 3 are used in general piano construction work, particularly for pianos exported to tropical countries. Heat and humidity have never worried Beetle.

FACT N° 28 BEETLE AT THE FESTIVAL

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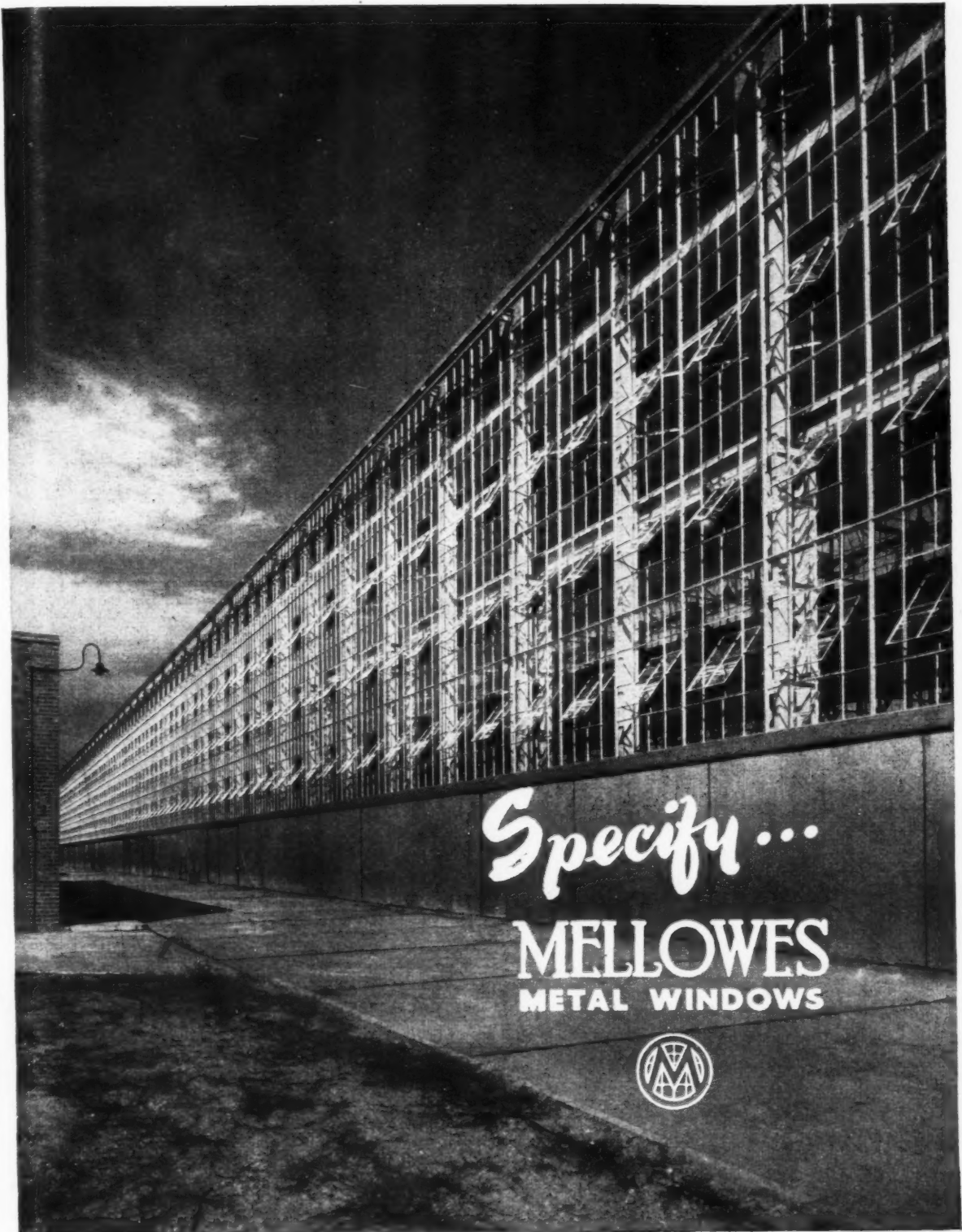


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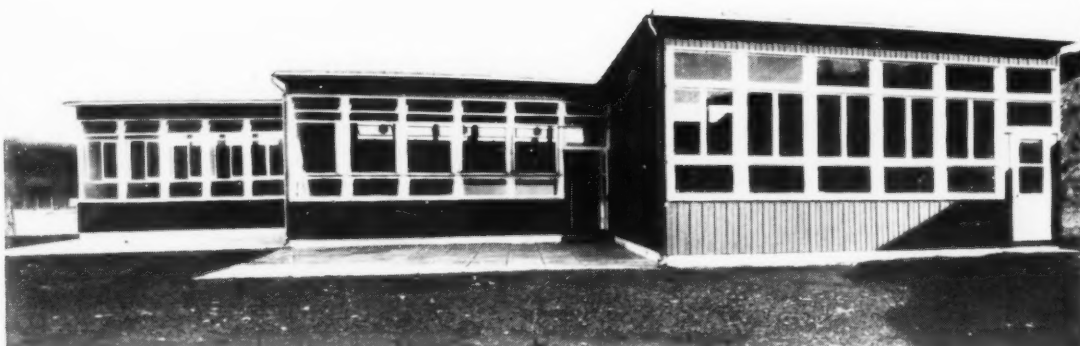
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THE ARCHITECTS' JOURNAL

No. 2935 31 MAY 1951 VOL 113

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CHELSEA ARTS

I have often complained in the past about the poor standard of design at the Chelsea Flower Show. The flowers themselves, of course, are wonderful; I refer to the coy rusticity of some of the show gardens, the thatched arbours and wrought iron gates that embellish them and the stands of garden statuary and ornaments.

They were all there again this year, but I can report one marked improvement, which I hope is the thin end of a wedge—it will have to be a very large wedge. The improvement is in what is traditionally called the Art Tent, where there is an exhibition of drawings and photographs of garden designs. For the first time these have been chosen by a selection committee

which included members of the Institute of Landscape Architects and the Council of Industrial Design. The difference is noticeable.

Is it too much to ask the Royal Horticultural Society to appoint a similar committee next year with power to ban the worst gnomes and birdbaths from the stands of the commercial exhibitors? In the long run it is surely in the exhibitors' interest that the show should acquire a reputation for good design as well as for good cultivation.

"PUT IT IN BRICKS AND MORTAR"

Not so very long ago houses were thought to be nice and safe as an investment for the patiently gathered nest egg. But nowadays, of course, there are any number of landlords who would be only too glad to pay large sums to be free of all their liabilities, and, although I have no love for landlords as a race, I must say I sympathize with them when they are faced with rents fixed twenty years ago and with repairs at 1951 prices. This is surely the way to produce slums as quickly as possible, and the 200,000 houses a year we are building now do really little more than keep pace with obsolescence, which is accelerated when landlords can't afford to do repairs.

The RICS has just produced a suggestion* which might well be a workable basis. They say that the difference between the rateable value and the gross value is the measure of the amount needed for maintenance, and that this should now be increased by 175 per cent. to meet current repair costs and charged as extra rent, e.g.,

* Rent Restriction and the Repair Problem. RICS. 2s.

rateable value £30, gross value £40, difference £10. 175 per cent. of £10 is £17 10s. 0d., which should be added to the rent, though only if the landlord keeps the house in a fit state of repair.

This seems to me a fairly reasonable method, but I can't see any Government making itself unpopular by allowing rents to go up, whatever the method suggested.

WREN DRAWINGS SOLD

Antiquarians are continually buoyed up by the hope of discovering some long-lost manuscript or remnant of the past, and it is but seldom that their anxious fumbings are rewarded. What excitement there must have been, therefore, for collectors—and particularly for architects and all who are addicts of architectural and aesthetic history—in the sale at Sotheby's last week. As some readers may know, the library of the Marquis of Bute has already provided the material for several sales, but on this occasion no less than 120 drawings by Wren were sold, together with further sets by Vanbrugh and Hawksmoor.

The story of the Wren drawings is a fascinating one. When, in 1749, Wren's son Christopher sold his father's belongings, these drawings went to the Duke of Argyll; the bulk of the others are to be found at All Souls and St. Paul's. The drawings sold the other day passed in 1761 to the then Earl of Bute and were known to have been in his possession in 1771 when a disastrous fire destroyed the contents of Luton House. The Wren Society and other authorities have always considered them to be lost. One can imagine the delight of John Summerson when he was asked to catalogue a



5.3.51.

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... of drawings for Sotheby's and found them to be these "lost" works.

It would be tedious to list the magnificent array of important works in this collection, which were sold in 21 lots. (The catalogue is, in any case, available to those interested.) But let me make reference to one or two.

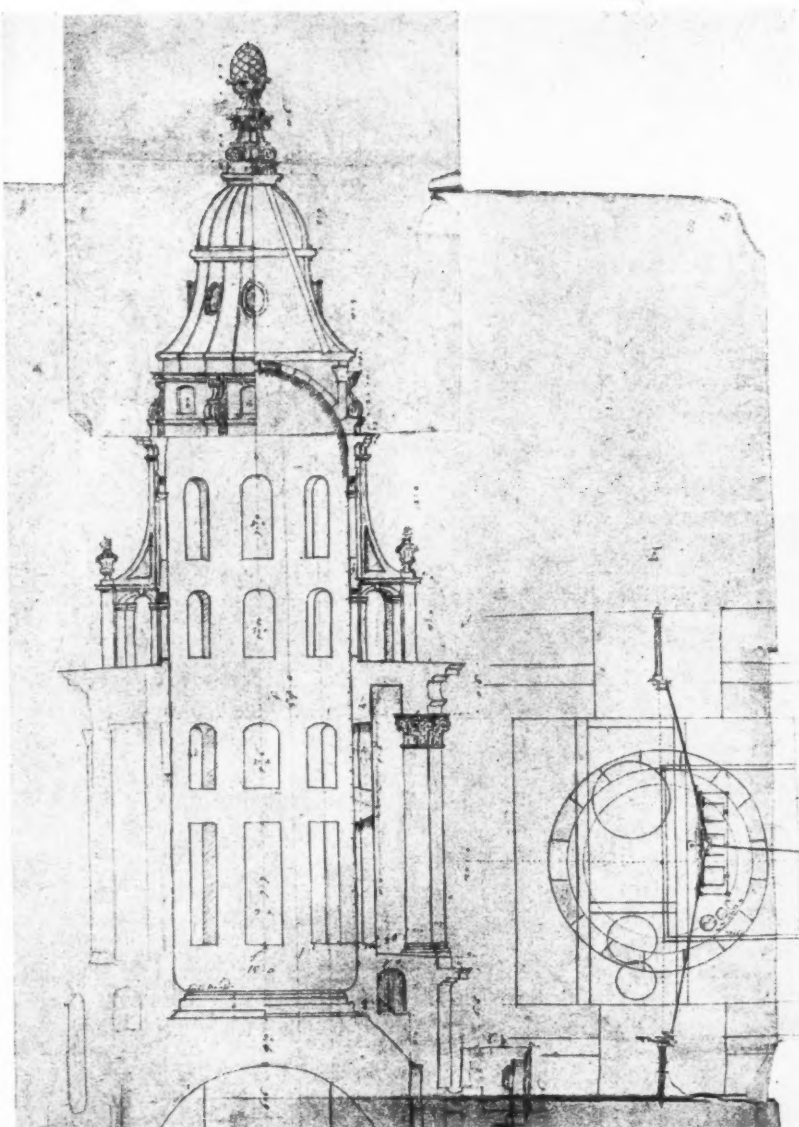
There were a number of early sketches for St. Paul's. Among them a working drawing showing a section of the west door (1705) with the top shown on a stuck-on drawing in Wren's hand, demonstrates, contrary to widespread belief, Wren's authorship.

Among many drawings of the City churches is one of St. Clement Danes, with the west front and Ionic portico as originally designed. This design was hitherto unknown. There are also drawings of a portico and cloister for St. Stephen's, Walbrook.

Some readers may recall a famous letter from Wren to Dr. Barrow referring to some large scale drawings for Trinity College Library and apologizing for his "pedantry" in sending them. The drawings referred to in this letter (quarter full-size) are in this collection. Interesting items are a plan of the Chapel Royal in Whitehall Palace and a drawing 16 ft. long, showing the river front of his design for Whitehall Palace following the fire of 1698. The great importance for the study of the development of English baroque in this design can be imagined. The Vanbrugh drawings included a series of drawings for Castle Howard, while those of Hawksmoor are very largely unidentified buildings.

MORE LIVE ARCHITECTURE

A colleague tells me of a very enterprising move on the part of the Harlow Development Corporation to procure the interest of the general public in what is going on in this new town. From now until September no less than four exhibitions are being held on the site. One consists of a neighbourhood unit, of about 650 dwellings, under



The drawings reproduced here were included in a collection of drawings by Wren which was sold at Sotheby's last week. Above: a section through the south-west tower of St. Paul's Cathedral—"a composite drawing on which many details seem to have been finalised, ink and pencil, in various hands, but the drawing of the lead capping and finial is certainly Wren's. Right; west elevation of what was probably an early design for St. Clement Danes.



construction. The visitor can wander freely over the site and inspect the completed houses. In another exhibition, completed houses and flats, including the 10-storey flat block designed by Frederick Gibberd (architect-planner for Harlow), are being used as "live" exhibitions of architecture and building equipment. Several new house types, with different



A Place to Confer

Belfast, with its colourful shop fronts, its trolley and tram wirescape, its clattering carts on cobbled roads, and its wide streets flanked by red-brick warehouses, is the headquarters of the RIBA Conference this week. The city has little of architectural merit, but is partly redeemed by a few Georgian houses, by the fact that many vistas are closed by the natural scenery of the

nearby hills and by some rich specimens of Victorian pub architecture (as above). The condition of contemporary building in Ulster is similar to that existing in pre-war England, though, as is pointed out in this week's article on the architect in Ulster, the Royal Society of Ulster Architects, which celebrates its Golden Jubilee this year, is playing an active part in a gradual improvement.

equipment and finishings, and new systems of construction, are included. Finally, two exhibitions are contained within Gibberd's block of flats: the roof is used as a viewing terrace, with maps and models showing viewpoints, in order to show the landscape of the New Town; and the top floor of the block has been arranged as an exhibition, with perspectives, working drawings and models, described the way the town has been designed, from the organization behind the Master Plan, through the various stages of planning, to the detailed design of industrial buildings.

*

I understand that illustrations from this four-in-one exhibition will be appearing in next week's issue. I trust that they will whet the appetite sufficiently to persuade the exhibition-weary (like myself) to make the hour-and-a-half journey to Harlow. Congratulations to the Development Corporation on their impressive list of architects doing work in the area; for having so much work on the ground after a rather late start, and for providing a rival attraction to Lansbury.

ASTRAGAL

DIARY

Exhibition of Drawings by Thomas Matthews Rooke (1842-1942). At 66, Portland Place, W.1. (Sponsor, RIBA.) Weekdays: 10 a.m. to 7 p.m. Saturdays: 10 a.m. to 5 p.m. **UNTIL JUNE 14**

Exhibition of Old Books, Maps, Prints, Engravings and Rare Documents. At 98, Gloucester Place, W.1. (Sponsor, Institute of Quantity Surveyors.) Daily (excepting Sundays and Bank Holidays): 2 p.m. to 5 p.m. **JUNE 2 TO SEPT. 29**

Harlow New Town Festival Exhibition. At Harlow. Monday to Friday: 10 a.m. to 4.30 p.m. Saturdays: by special arrangement. (Sponsor, Harlow Development Corporation.) **UNTIL SEPTEMBER**

FOB South Bank Exhibition. Daily 10.30 a.m. to 11.30 p.m. Sundays, 12.30 p.m. to 11 p.m. **UNTIL SEPT. 30**

Exhibition of Exhibitions. At Royal Society of Arts, John Adam Street, W.C.2. Mondays to Saturdays, 10 a.m. to 6 p.m. (Wednesdays, 10 a.m. to 8 p.m.) **UNTIL SEPT. 30**

FOB Exhibition of Architecture. At Lansbury, Poplar. Weekdays, 10.30 a.m. to 8 p.m. Sundays, 12.30 p.m. to 8 p.m. **UNTIL SEPT. 30**

1851 Centenary Exhibition. At Victoria and Albert Museum, South Kensington. Weekdays, 10 a.m. to 6 p.m. Sundays, 2.30 p.m. to 6 p.m. **UNTIL OCT. 11**

Technical Editor

DOMESTIC FLOOR CONSTRUCTION

THE recent rise in the price of timber warrants an inquiry into the likely trends for domestic floor construction.

A considerable amount of work in the development of alternatives to timber has been done recently. In particular, that by the Building Operation Research Unit of the BRS is significant. A survey has been made of the subject and the second part appears in this issue of the JOURNAL (the first part appeared in our issue of April 26).

At a time when prices are moving—mostly upwards—it is unwise to be too positive about future trends. The case as regards ground floors, however, seems to have been established. Taking all factors into consideration, the slab on solid filling, with one or other of the cheaper coverings which have been developed since the war, is technically a more satisfactory floor than the wooden floor. At today's price levels there should be no great difference in cost between the uncovered wooden floor and the concrete floor with a suitable covering for sites which have the normal amount of underbuilding. It is reasonable to suppose that if the present official ban on wooden ground floors were to be lifted the concrete floor, with modern type of covering, would hold its position as a superior article at no greater cost.

The case of the suspended floor is more difficult. The tendency in many countries is for reinforced concrete, in one of its many forms, to replace timber, largely by virtue of the superiority of performance of the reinforced concrete. In the United Kingdom the reinforced concrete suspended floor, with a suitable covering, is still more expensive than the suspended wooden floor, even at today's prices for timber. But it must be remembered that if, as is the case with the uncovered timber floor, a finishing has to be added by the tenants, there is an additional item, the cost of which, though difficult to compute, is certainly not trifling. This is true both for ground and for suspended floors. This, taking the broadest view, places the concrete floor, either ground or suspended, in a more favourable light than the comparisons in the body of the article show.

There is scope for the development of light reinforced concrete floors for domestic use. The application of this type of floor has become very common in many European countries. In particular, the exploitation of light prestressed concrete joists offers notable possibilities for savings in overall weight, quantity of steel required and, ultimately, for an appreciable reduction in cost. If development proceeds on the same scale as in several European countries it should be possible to choose freely between timber and other forms of construction. But this is for the future. In the meantime, such developments, should be fostered since they will assist in relieving a world shortage of timber, which can only be alleviated if and when supplies from Eastern Europe become available on a much larger scale than at present.



RIBA

Exhibition of Drawings

A small display of drawings by Thomas Matthews Rooke (1842-1942) is on view at the RIBA, 66, Portland Place, W.1 until Thursday, June 14 (weekdays, 10 a.m. to 7 p.m.; Saturdays, 10 a.m. to 5 p.m.).

After studying at South Kensington—now the Royal College of Art—where he became Gold and Silver Medallist, Mr. Rooke worked at the Royal Academy Schools. In 1874 a picture of his was among the first to be bought by the Chantrey Bequest. From 1878 onwards he did a considerable amount of work for Ruskin, both at home and abroad, making records of old buildings in their unrestored state.

The drawings exhibited at the RIBA were made in France, England, Italy, Switzerland and Tunis and cover a period from the eighteen-sixties to the nineteen-thirties when Mr. Rooke was over ninety. Some of the drawings have been purchased recently for the Ruskin Gallery which is being created at Brantwood.

Reception for Overseas Architects

The Council of the RIBA which welcomed many visitors from the British Commonwealth and the USA at the informal reception given last autumn, has decided to hold another informal reception this year on the same lines. The reception will be held at the RIBA on Tuesday, October 9, and, as last year, proceedings will be entirely informal. The Institute knows the addresses of a number of visitors from overseas, but there are certainly a great many more whose addresses in England are not known. If any architect who knows the names and addresses of any architects or students from the British Commonwealth or the USA visiting England the Secretary of the RIBA will be glad to have details so that invitations may be sent to these visitors. It would be of further assistance if any correspondence on this subject were marked on the envelope "Overseas Reception."

"Homes for Aged" Report

An abridged report of the speeches and discussion which took place at the discussion meeting on the housing needs of old people, held recently at the RIBA, is now available, price 6d. per copy, and can be obtained on application to the secretary, RIBA, 66, Portland Place, W.1. A small exhibition consisting of 30 panels (each panel 2 ft. 6 in.

wide by 3 ft. 4 in. high) on the theme of housing the old is available for free loan to associations or committees. Application should be made as soon as possible to the RIBA, as the itinerary of the exhibition is now being planned.

AA

President Appointed

Anthony M. Chitty has been appointed President of The Architectural Association for its 105th Session commencing on June 1.

MOLGP

Housing Medals Awarded

Owing to lack of space in the special issues of the JOURNAL of the last few weeks the list of 1951 awards of housing medals and diplomas offered by the Minister of Local Government and Planning, Hugh Dalton, for the best designed local authority urban and rural housing estates, in England and Wales, has not been published in these pages. The awards are as follows: *Northern*, Hexham: UDC; Garth Cottages, James Walter Hanson, Jnr., Newcastle-on-Tyne. *South West-morland RDC*: Milnthorpe, Edgar Middleton and Thomas Maldwyn Jones, 1, Queen Street, Lancaster. *East and West Riding*: Bridlington BC; West Hill Estate, Clifford Ewart Culpin, London. *Tadcaster RDC*: High fields, Aberford, Anthony John Steel, Hull. *North Midland*: Lincoln CBC: Hartsholme Estate, Patrick Francis Burridge, Lincoln. *Eastern*: Hemel Hempstead Development Corporation; Adeyfield Neighbourhood Unit, Herbert Kellett Ablett. *Epping RDC*: Parkfields, Roydon, Robert Oswald Foster, Buckhurst Hill. *London*. *Esher UDC*: The Grove, George Blair Imrie, Bristol 1. *Stoke Newington MBC*: Amwell Court, James Frederick Howes and Frank Leonard Jackman, London. *Southern*. *Winchester CC*: Stanmore Estate, Harold and Peter Sawyer, Winchester—in association with Mort and Howard. *Amersham RDC*: Shepcote Dell, Holmer Green, John Francis Watkins, High Wycombe. *South Western*. *Council of the Isles of Scilly*: Porth Cressa, Ailwyn Geoffrey Bazeley, Penzance, Axminster RDC: The Orchard Kilminster, Frederick Sidney Kett, Axminster. *Midland*. *Kingsway Housing Association*: Burton House Estate, Stafford, Ernest Bower Norris, Stafford. *Stratford RDC*: Ullenhall, Francis Walter Bagnall Yorke, Edgbaston. *North-Western*. *Lytham St. Annes War Memorial Housing Association*: Memorial Scheme, Church Road, Lytham St. Annes, Tom Mellor, Lytham St. Annes. *South-Eastern*. *Cuckfield UDC*: Box's Nursery, Lindfield, John Leopold Denman, Brighton. *Guildford RDC*: Seale Village, John William Wilton, Surveyor to Guildford RDC (responsible for contract), in association with A. J. Horsfield (responsible for design). *Medal to each*. *Wales*. *Newport CBC*: Gaer-Stelvio Neighbourhood Unit, Johnson Blackett, Borough Architect. *Newton & Llandiloies RDC*: Llandinam, John Brian Cooper, Birmingham.

Housing Progress in March

The MOLGP announces that the number of permanent houses completed in Great Britain during March was 16,757 compared with 13,984 in February and 13,150 in January. The total number of houses completed under the post-war programme is now 1,022,555 (865,409 permanent and 157,146 temporary).

DRY ROT

Information Bureau Opened

Rentokil Ltd., manufacturers of wood preservatives, has opened a Woodworm and Dry Rot Information Bureau at 23, Bedford Square, London, W.C.1. The bureau, which will be open to architects and the general public from 9 a.m. to 5.30 p.m. daily, contains a permanent exhibition of dry rot and other timber "diseases." Among the exhibits is a colony of live death-watch beetles, and various species of timber are on show, both in their normal condition and as they appear after having been attacked by fungus or beetles. Inquiries on all aspects of timber "diseases" and their prevention and cure will be welcomed by the sponsors.



Pembroke Wicks

Architects—Turned—Builders Should Not Be Registered

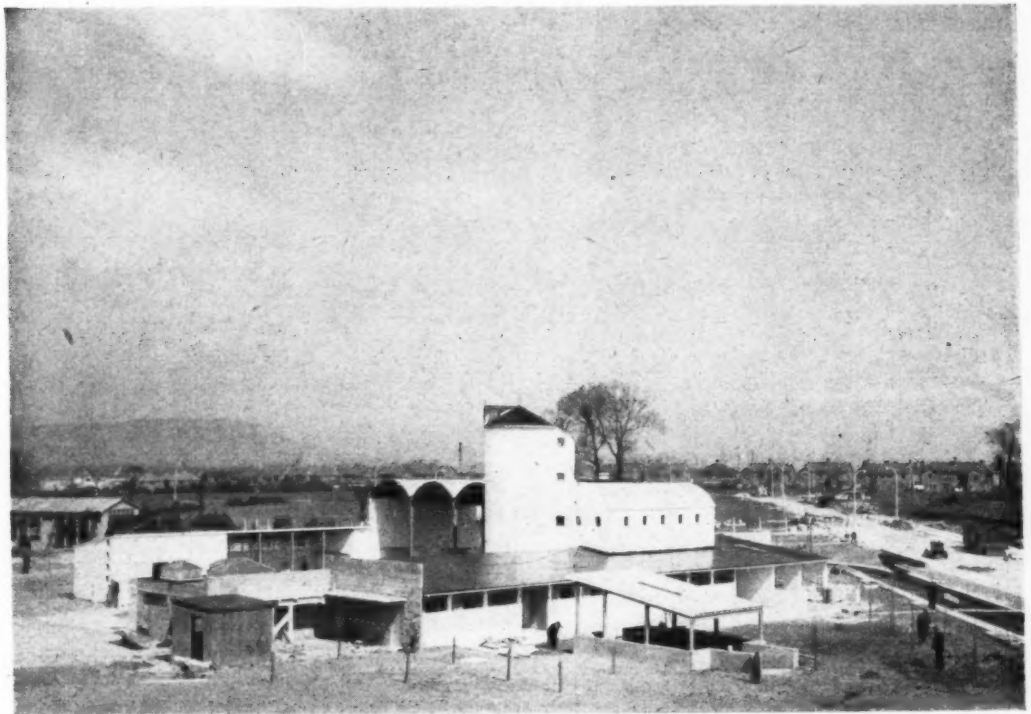
SIR,—I am instructed by my Council to draw attention to the position of architects who, having ceased to practise their profession, are carrying on business as builders or as manufacturers or dealers in building materials or directors of companies engaged in such undertakings. Strictly and technically such persons are not infringing the Code of Conduct, Principle VII of which reads as follows:—"An architect must not, while practising his profession, carry on or engage in any operation of trade or business inconsistent or out of keeping with the fitting and proper discharge of his professional duties."

It is, however, considered most undesirable that an architect, although not in practice, should remain on the Register if he intends to embark in any such business as referred to above, and the Council fully endorse the following extract from a report of their Discipline Committee in a recent case:—

"The Committee consider it necessary to state that it is desirable that any architect who intends to embark in business as a builder or builder's merchant should not be content merely to refrain from practising as an architect but in order to avoid misunderstanding should resign from the Register—relying on his right under paragraph 26(4) of the Regulations of the Council to be readmitted at any time should he wish to cease his commercial activities and to return to practice as an architect. To carry on any such business as referred to above while still on the Register, must inevitably place an architect in an equivocal position and make him liable to adverse criticism."

PEMBROKE WICKS,
Registrar, ARCUK.

London.



The people of Northern Ireland will have their first experience of large scale exhibition technique when they visit the Ulster Farm and Factory exhibition at Castlereagh, which is to be opened by the King and Queen on June 1. Above is the Farm under construction.

LIFE AND WORK TODAY FOR

THE ARCHITECT IN ULSTER

This year's RIBA conference is being held in Belfast where the Royal Society of Ulster Architects is celebrating its Golden Jubilee. Visitors to the city will find that the state of architecture there is similar to that existing in Britain before the war. Indeed it has been said that the architecture exhibition in the centre of the city and the Farm and Factory exhibition at Castlereagh will give the Ulsterman his first sight of post-war developments in architecture. Many aspects of architecture in Ulster are described in the following article. The writers are Robert McKinstry, a Liverpool graduate, now working for a firm of private architects, and Albert Neill, who is working at the MOH and for six years has been secretary to the Royal Society of Ulster Architects.

THE life of the architect in Belfast resembles that of the middle-class business man. Nearly all architects have been to local schools, and only a few belong to the Anglo-Ulster section of the community which sends its sons to English public schools. As there is no school of architecture in Ulster, the only one in Ireland being at the government-controlled National University, in Dublin, where a knowledge of the Irish language is compulsory, students must either serve an articulated apprenticeship with a recognized architect and take all their examinations externally, or else cross over to England and take a full-time, five-year course at one of the schools of architecture. As Liverpool and Belfast are not far apart there has always been close contact between Liverpool's school of architecture and the architects of Belfast, and at no time has Liverpool been without students from Ulster. Roughly twenty out of the two hundred architects in Northern Ireland are school-trained and more than half of them are graduates of Liverpool. It is probably true to say that in any provincial centre of Ulster the architect

is more part of the community than his counterpart in London. In Belfast, where "community life" really exists, the architect is never really out of touch with his clients.

Most of the architects' offices are in the centre of the city, and in the evening the architect goes to his home in the suburbs of Malone, Castlereagh, Knock, Jordanstown or Glengormley. Not many architects care to live *la vie bohème* and only a few are seriously interested in the arts of painting and sculpture—or even the theatre. The average Ulster architect is more interested in sport. And perhaps there is one feature about him which distinguishes him from a business man or a civil servant; that is his dress, which, in many cases, tends towards the tweedy and the country life style. In general, students are more flamboyant, though their taste is more subdued than that of their English equivalents. Hardly ever does one find bright shirts and corduroy jackets among the qualified men. Women architects? There is only one (qualified) at work in Ulster at present. But there are a few women students.



The architect for the Ulster Farm and Factory Exhibition is Henry Lynch-Robinson seen (above) talking to the Clerk of Works for the Farm. The covered way shown here leads from the farmhouse to the other farm buildings. Left: finishing touches being given to roof. The Farm cost £10,000 to erect and the machinery installed cost as much again. The traditional Ulster farmhouse (far left) which has been specially built on the exhibition site being sprayed with a coat of a solution which gives it the appearance of age.

There is no definite prejudice against women assistants in offices but girls leaving school do not seem inclined to turn towards architecture as a career. Ulster men still like their women to be in the home. (And no man is ever seen in the street carrying a string shopping bag or wheeling a pram!)

THE CLIENT CALLS THE TUNE

When we come to examine the architecture produced in Ulster since the war it may be useful to divide the work into three categories, each with a specific type of client. Firstly, there is the government; secondly, the local authorities; and, thirdly, the private individual or the private company. This last category is undoubtedly the most interesting to the visitor from across the water because in the housing situation (and it is with housing that architects in Ulster, like their British counterparts, have been primarily concerned) a situation exists which, in its freedom and scale,

can be compared to that existing in England in 1939. There are virtually no restrictions on private building, and about one-third of the 30,000 houses built (or being built) between 1944 and 1951 are in the hands of private individuals or companies (like the Merville Garden Village at Whitehouse). Naturally there are the usual restrictions laid down as regards the areas of subsidy houses, and no house may be more than 2,000 sq. ft. in area. But planning controls are not as tight as those in England and, above all, there is no development charge. Housing estates can be built by private enterprise and a block licensing system enables a contractor to build as many as twenty houses at a time for selling or letting at a limited price. It is therefore not surprising that the landscape of suburbs, and even of the countryside, has been changed by the building of a remarkable variety of private houses during the past few years, and that the development of new housing estates is heralded by a large contractor's notice advertising subsidy villas for



Left, Mr. Robinson and John Ulver, exhibition manager of the Farm and Factory Exhibition, in the latter's office. Belfast has no exhibition halls and the factory exhibits are most appropriately housed in a factory; one of many built by the Northern Ireland Government with the intention of renting to English firms. Although the factory was not designed for the exhibition, the large uninterrupted floor areas serve the needs of the exhibition admirably. The grounds of the factory have been used to accommodate the Farm and other features.

Henry Lynch-Robinson is interested in theatre decor. Above he is seen backstage at the Grand Opera House, Belfast, with Tyrone Guthrie, for whose production of "The Sham Prince," he designed the scenery. This play, presented by the Northern Ireland Festival Company, will be playing at the Opera House on June 1 and 2. Right, Mr. Robinson in his office.



sale. The preservation of the words "villa residence" expresses the real flavour of the speculator's paradise. An architect must please his client and, from the architect's point of view, the client's taste is definitely "Ideal Home." This can be interpreted in an astonishing number of styles from bijou-Tudor, with its fine collection of Elizabethan chimneys, numerous roofs and gables, through a Voyseyesque type of Old English cottage-de-luxe, with curiously lopsided gables, small leaded lights, Westmorland slates, rough plaster and all, to a horizontal brick Georgian. The latter will probably have green, double-rolled, Roman pan-tiles on the roof; walls peppered with bulls-eye service-windows; reinforced concrete slab canopies, and thin, tubular metal supports (just to show that someone had an eye for modern detailing). The client calls the tune with a vengeance. Indeed there are still many people in Ulster who feel that an architect is a luxury, all very well on some big planning scheme, but definitely in the way when it comes

to "architecting" a private house. A number of builders are happy to encourage this belief and they claim to give the public just what they want. However, amid all this architectural whimsy (which Osbert Lancaster might enjoy chronicling) there are some clients who are willing to give the architect a chance, and the houses of such young architects as Henry Lynch-Robinson and Houston and Beaumont are making history. And one must not overlook the quiet and more obviously domestic qualities of the best work of middle-generation architects, such as Granville Smyth, T. T. Houston & Co. and Smith and Dorman.

Much of the housing work done in Ulster over the past seven years has been the work of public government bodies. The work of architects for "public" clients is more in line with similar work in England, though there were few large-scale housing estates in Ulster before the war and most of the houses built between 1919 and 1939 were in small groups or were isolated examples of private enterprise

work. When Ulster came to tackle the post-war housing problem and when the Ministry of Health and Local Government was formed in 1944, no one had had any experience of siting or of the new standards for housing; in fact, Northern Ireland was in practically the same position that England was in at the end of the first World War. Therefore, to facilitate and supplement housing the Minister of Health set up the Housing Trust as a public authority and appointed five members, under the Chairmanship of Sir Lucius O'Brien. The Trust started practically from scratch, as regards land purchase or site development, and was to be responsible for one-quarter of the total housing target, the rest being left in the hands of local authorities. However, soon after the Trust started work in 1945 there was a shortage of building materials and skilled labour. To combat this, several types of non-traditional methods of construction were introduced—no-fines concrete, Easiform and Orlit—and about half the number of houses built by the Trust in Ulster is of these types. In England extra subsidies were paid for the construction of most non-traditional houses approved before the end of 1947, as they were more expensive to build than the traditional brick houses. But there is no marked differ-

ence in the costs of traditional and non-traditional houses in Northern Ireland and no extra subsidy has been given for the building of the new types.

The traditional low rents in Ulster provided the Trust with a big problem. In rural districts the rent is usually 2s. per week and in Belfast and urban districts it is 5s. Therefore, standards had to be reduced to a level lower than those in England and the strictest economy was necessary. It seemed almost impossible for the rent to be kept below the maximum of 14s. per week for a four-apartment house (exclusive of rates) but the low rent has been maintained throughout the rise in building costs by the reduction of 900 sq. ft. four-apartment houses to 800 sq. ft. (mostly built in terraces). A further saving in cost was effected by the introduction of cottage type flats, consisting of four dwellings (two upstairs and two downstairs) inside what looks like two semi-detached houses. At present, two-storey flats with a common stair are being considered. It is possible that many of the economical methods worked out by the Trust will have to be employed in England if the present economic difficulties continue.

Most of the Trust estates contain a wide variety of dwellings, ranging from one-, two- and three-bedroom flats, to

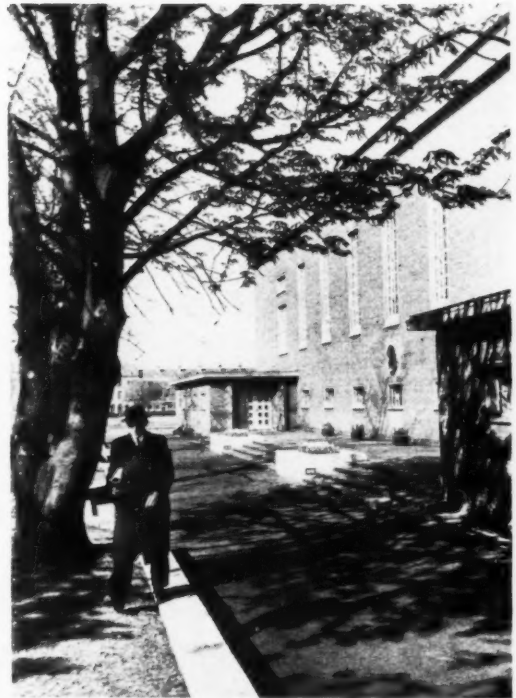


four-bedroom houses. And old people's houses are provided at a rent of 6s. 6d. at Finaghy. In fact, the intention of the Trust to provide houses where they were most needed has been fulfilled.

The architecture of the Housing Trust schemes must be described, for there is no doubt that the standard of work done, whether by private architects working for the Trust or by the Trust's own architectural staff, has been very high and it is obvious, especially in rural areas, that the Trust house designers have been fully conscious of the simple, rural, whitewashed-farmhouse tradition. Most of the rural housing schemes are in white roughcast; hipped gables are rarely introduced and full use is made of the beautiful sites, seldom flat and nearly always fortunate in the number of existing trees. The traditional terrace house has been successfully adopted by the Trust in such estates as that at Finaghy, by Gibson & Taylor, and that at Gregagh, by T. F. O. Ripplingham, Chief Architect, Ministry of Finance. This Gregagh scheme for 942 houses (700 of which have already been completed) will include a school, two churches, a club and a shopping centre; it is one of the few schemes to depart from the traditional pitched roofs, with the exception of some of the Orlit



R. H. Gibson, president of the Royal Society of Ulster Architects for the Festival year. The Saint Jude's Church Hall, in Belfast, won him the RIBA Ulster Architecture Bronze Medal for the four years ending 1937.



Left, the Council of the Royal Society of Ulster Architects meets once a month at its headquarters. Round the table, clockwise from the right are W. H. D. McCormick, N. B. Mitchell, Val Smyth, J. M. Aitken (chief architect to the MOH), J. R. Young, T. McCordle, R. H. Gibson (president), A. Neill (hon. secretary), Miss D. E. Macdonald (secretary), J. V. T. Scott, E. D. Taylor, A. F. Lucy and J. D. McCutchen. Messrs. Mitchell and McCutchen are provincial members. Below right, the entrance to the Royal Society of Ulster Architects' rooms at 7, College Square North, is one of the finest Georgian doorways in Belfast. The only large assembly hall built in Belfast in the last twenty years is the Sir William Wills Hall, above right, in the grounds of Queen's University. Designed before the war by John McGeogh, also in the picture, in association with Edward Maufe, it was only recently completed.





The Housing Architect of Belfast, J. W. Adamson (above), has a large job on his hands; his department has to cater for a greatly increased population (now over 400,000) in a city which, apart from blitzed areas, has very few suitable housing sites.



houses at Whitewell and Banbridge and those at Lisburn, where Bell and Malcolmson have built over 300 traditionally constructed houses, all with mono-pitch roofs reminiscent of the type introduced by T. F. O. Ripplingham, in his Admiralty houses, at Antrim in 1945.

During the war, and immediately afterwards, the Belfast Corporation building department combined the practically negligible work on schools with that of housing, all under R. S. Wilshire, who has been responsible for such excellent pre-war schools as those at North Road and Botanic Gardens. At first the main concern was to get houses up quickly in city areas to make up for the loss through enemy action. One thousand temporary prefabricated Arcon bungalows were built, along with about four hundred converted dwelling or Nissen huts and, more recently, the one new corporation housing scheme which has real architectural distinction—that at Shore Road, by R. H. Wilshire.

As soon as the new school projects were under way the Corporation formed a separate city housing architect's department, under J. W. Adamson, and at the end of 1950 the completed number of houses and flats and permanent aluminium houses was about 2,000, as compared with some 200 completed by the end of 1948. During this year and next year some 2,800 more houses should be ready for occupation. As all the Corporation building must be carried out

within the city boundary (and incidentally all the architects and their assistants should be drawn from within this radius) there has been difficulty in obtaining suitable sites. One of the solutions to the problem of lack of sites is the provision of flats. Until now Belfast has had no flats. The city has practically no slums on the scale of those in the industrial towns of England and no tenement blocks of any kind. The first block of flats in course of construction is at Annadale Embankment, overlooking the River Lagan. This block of 60 flats, of Orlit construction, will have six shops and a consulting room for a dentist and a doctor. Another scheme now going ahead is for three-or-four-storey flats on a bombed city site.

It is important to notice that the Corporation has private architects engaged on its housing schemes (Henry Lynn at Castlereagh, and John MacGeagh and Ostick and Williams on re-development schemes for bombed areas, as well as on a block of flats, with eight shops, between Finaghy and Malone). The private building mentioned at the beginning of this account of housing work is, of course, under the control of the Corporation within the city area.

No consideration of Ulster post-war housing is complete without some mention being made of the work of the Borough and Rural Councils and their architects. They have been responsible for a little over half the total number

On the far left, Mr. Adamson and his assistant watch the erection of Belfast's first block of flats. These flats (60), of Orlit construction, will overlook Belfast Lough. Mr. Adamson hopes to have 2,200 more houses completed by late 1952.

Left, bottom, J. W. Adamson is seen showing Councillor Murray, chairman of the Edinburgh Housing Committee, what progress is being made on the Highfield Estate, which will have 750 houses when completed. Right, this farmer on the Hillford Road (with the city boundary at the bottom of the field) might find himself in Belfast's green belt when the boundary is extended to allow for further development beyond.



of homes produced in Ulster since 1945. Most of the schemes are small and poorly designed but the standard set by the Housing Trust is having an influence here. In March of this year the Ministry of Health and Local Government invited entries for a bronze medal competition for the best designed urban or rural housing estates completed in Northern Ireland since the recommencement of building in 1945. This competition has been organized on the same lines as the one held in England last year.

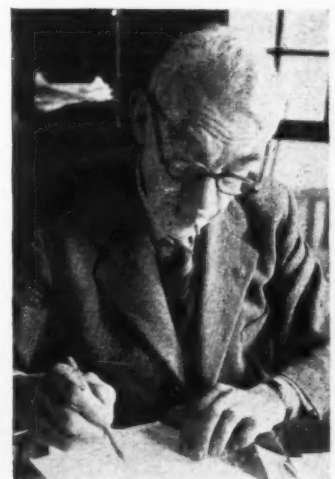
FACTORIES FOR THE ENGLISH

Apart from housing, the main work required by the government, as a client, includes factories and hospitals. The government's own Board of Works and Public Buildings is responsible for police stations, employment exchanges, post offices, telephones and other services.

The building of factories after the war was considered of primary importance by the government. Manufacturers from England were encouraged to come over to Northern

Ireland and open branch works by the fact that the government was ready to build factories for their occupation. There are new factories at Banbridge (Down Shoe Co. W.D.R. and R. T. Taggart, architects), at Coleraine (Bengers Ltd., Hobart & Heron, architects), at Larne (Pye Radio Co., Ferguson & McIlveen, architects), and several extensions and conversions by architects, A. F. Lucy, Bell & Malcolmson. Ferguson & McIlveen have designed the new factory at Castlereagh, which houses the present Festival of Britain Farm-Factory Exhibition. The biggest linen works in the world are the York Street Flax Spinning Mills, which were badly bombed during the war and are now being rebuilt by the original architects, Samuel Stevenson & Sons, who are probably the only Ulster architects to carry out industrial work in Eire and in the United Kingdom.

The Northern Ireland Hospitals Board is run as a government department and is responsible for 62 existing hospitals. The Board has an ambitious building project which is, in many ways, in advance of the hospital building programme



On the left is R. S. Wilshire, Education Architect, (also above) at the Glenard Primary School, which is the first post-war Corporation school of traditional construction.

in England. This may be one of the reasons why so many English architectural firms are actively interested in the work. Before the war much of the hospital architecture here was concerned with the conversion of the old work-houses into new hospitals and in the country many of the old T-shaped plan units survive. A new hospital building by Ferguson & McIlveen will be opened shortly at Newtownards, while at Ballymena a Geriatric unit by T. T. Houston & Co. has been completed. Work is in progress on a large home for nurses at the Royal Victoria Hospital, Belfast (Easton & Robertson, architects). And at Downpatrick, J. M. Sheppard & Partners, of London, are engaged on extensions and alterations. At Londonderry this same firm has designed a new mental hospital. Here, too, the design of a new general hospital is in the hands of Yorke, Rosenberg & Mardall. Though it must be admitted that the designs of these hospitals may prove to be a contribution to contemporary architecture, it seems curious that the Hospitals Board has not given local architects an opportunity of proving their ability. Even if these architects could have worked in collaboration with the English architects, the results would have been beneficial all round.

A new hospital department is the Northern Ireland Tuberculosis Authority set up by the Minister of Health in 1946. Much of the architecture in the hands of the Authority is bound to be of the piece-meal extension and conversion type. Its biggest project is at Brookhill, near Lisburn, where a TB Hospital and colony with 500 beds is to be

erected. The architects are S. W. Millburn & Partners, of Sunderland.

Much of the finest work done in Belfast and throughout the province has been that of the Board of Works and Public Buildings, with T. F. O. Ripplingham as chief architect. Although these buildings are mainly pre-war, they are well worth mentioning because the tradition of finely proportioned, dignified post offices and police stations (to quote only two examples) is one that it is hoped will be continued.

If we consider the work of local authorities, we must look first at that done by the Belfast Corporation Schools Section (the housing has already been described) under R. S. Wilshire. So far the post-war school programme in Ulster is not by any means on the same scale as that in England. Apart from a few aluminium schools (there is one near Holywood and another at Ballynahinch) nearly all the new schools date back to 1939 or earlier. (And one of the only permanent post-war school is that by T. F. O. Ripplingham in the Cregagh Housing Estate.) With few exceptions school work carried out by the Regional Education Committee and the borough councils is also pre-war.

The Belfast Corporation City Surveyor's Department is responsible for maintenance and new building connected with parks, cemeteries, baths, welfare offices, markets, libraries, museums and art galleries. There is a fairly extensive building programme here, under H. Swann.

Under the heading of local authorities can be included the several new Health Centre projects. One at Armagh, by



In charge of the building of post offices and other public buildings in Northern Ireland is T. F. O. Ripplingham, chief architect, under the Director of Works, to the Ministry of Finance, pictured (left) in the drawing office which is occupied by fifty architects and assistants. On his left is Mr. McLay and on his right Mr. Reilly, two senior architects of the department. Below, houses on the Cregagh estate designed by T. F. O. Ripplingham for the Housing Trust shortly after the war. The estate won this year's Northern Ireland MOH Bronze Medal for an urban scheme. The awards of Bronze Medals were made recently, independently of the English awards last year, and were for three categories of housing—rural, urban and schemes by architects in private practice.





T. A. Houston, above right, one of the younger generation of private architects in Belfast, was born at Crawfordsburn near Belfast, studied at Edinburgh, has been in private practice since 1949, and designed both the houses illustrated on this page. His wife, Joan, right, also studied at Edinburgh, and can probably claim to be the only practising woman architect in Northern Ireland. She works in the Corporation Housing Architect's Department. Above, Mr. Houston watches James Latimer, one of his assistants, rowing on the River Logan, upstream from Belfast. Below, Mr. Houston is seen in the living room of "Greensleaves" at Craigavad. This bungalow is on the south-east shore of Belfast Lough. The house (1,800 sq. ft.) cost £5,000. Right, Mr. Houston designed "Counterpoint," built on Harmony Hill, some miles to the south-west of Belfast. This bungalow (1,500 sq. ft.) stands in 2½ acres of ground and cost £4,200.





The Architects' Department of the Northern Ireland Government MOH does no design work but exists purely as a vetting body. Above, Dame Dehra Parker, Minister of Health to the Northern Ireland Government, thanks the committee which made the recent Bronze Medal awards to architects. First from the left is Mr. Aitken, chief architect to MOH, second is A. F. Lucy and third is R. H. Gibson, president of the RSUA.

Houston & Beaumont, in the Mall (the centre of Georgian building), will be erected soon and there is news that Cookstown is to have a town hall at a cost of £27,000.

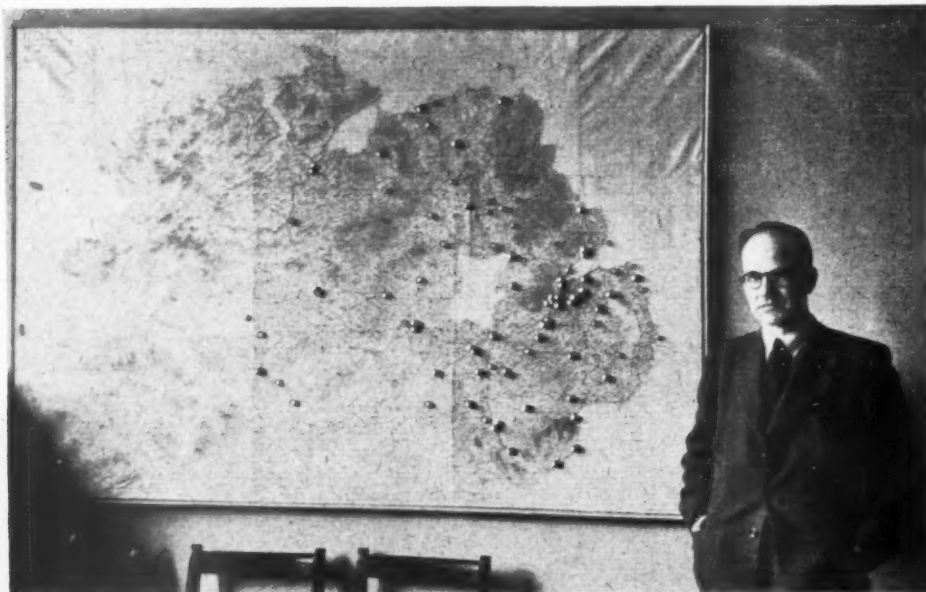
What has been done in the way of building new churches and halls, shops, cinemas, hotels and pubs? The church in Ulster is very alive and it is not surprising that there are a great number of new church projects on the way, although, by an arrangement with the government, only a few new church schemes may be started each year and so the most recent church project, unless it has priority, will take its place, so to speak, far down the queue. One of the first permanent church buildings nearing completion is St. Andrew's Church at Gregagh (T. T. Houston & Co.). This will eventually become the church hall, when the main church is built later on.

The new Sir William Whitla Hall (architect: John McGeagh, in association with Sir Edward Maufe) was started before the war, though it was completed only re-

cently. It is the only great hall built in Belfast over the past twenty years and it has a position, a dignity and repose that is worthy of its purpose.

There are no new cinemas being built and only one conversion job—in Great Victoria Street. This site was the birthplace of Lord Kelvin, the physicist. In the thirties the building was transformed into a cinema and called the "Kelvin." It has a new façade by Henry Lynch-Robinson.

Most of the new shops have been designed by the English architects of multiple firms and their appearance over the past year or so—dressed, with few exceptions, in a somewhat flashy modern style—will have an influence on local shop designers. There have been no new hotels in Ulster during the past thirty years, for the great railway expansion at the turn of the century left a legacy of many grimly impressive station hotels. At present, however, work is being completed on a new LMS hotel in York Street, Belfast (British Railway architects). What of public-houses?



James Cairncross, left, is the chief architect to the Housing Trust, which is under the chairmanship of Sir Lucius O'Brien. The map indicates places where the Housing Trust has estates completed and in the process of being built. Above, a Housing Trust estate. This one, consisting of 48 houses, is at Gilford. The Trust provides houses where rural communities have no facilities for designing and building their own houses.



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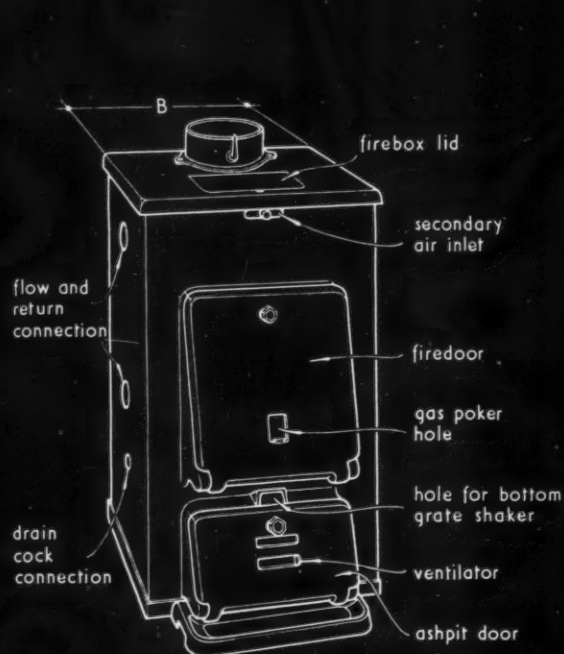


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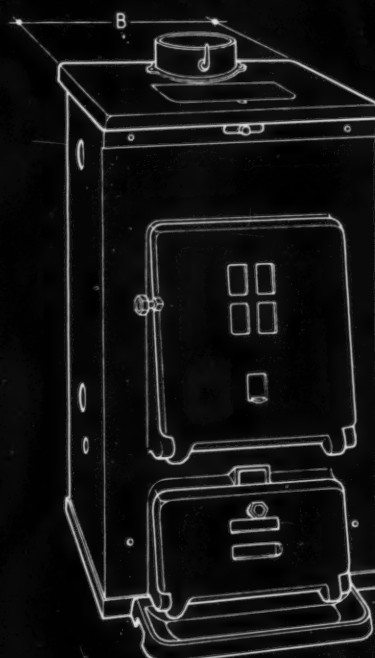
WATER HEATING | UNITS | SOLID FUEL

32.B1

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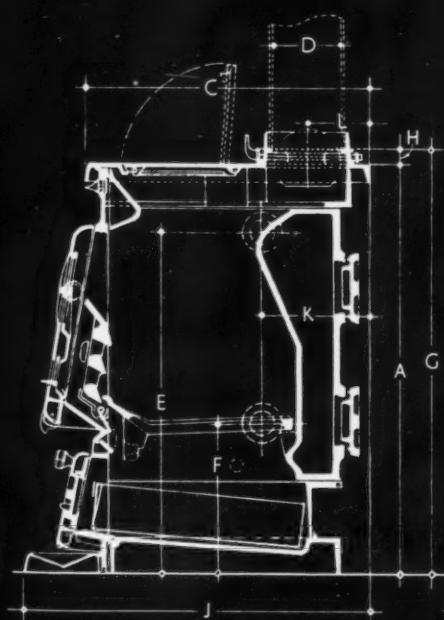


21M, 25M.



30M, 41M, 55M, 65M, 80M.

on models 55M,
65M and 80M
flow and return
connections are
situated at
the back



TYPICAL SECTION.

model	21M	25M	30M	41M	55M	65M	80M
A	1'-9½"	1'-11¼"	2'-1¾"	2'-5¾"	2'-5"	2'-5"	2'-9½"
B	1'-2¼"	1'-2¼"	1'-4¾"	1'-4¾"	1'-6¼"	1'-6¼"	1'-6¼"
C	1'-3½"	1'-3½"	1'-6"	1'-6"	1'-10"	1'-10"	1'-10"
D	4"	4"	4½"	4½"	6"	6"	6"
E	1'-5¾"	1'-6¾"	1'-9¾"	2'-1¾"	2'-1"	2'-1"	2'-5½"
F	8"	9¾"	9¾"	9¾"	10"	10"	10"
G	1'-10½"	2'-0¼"	2'-2¾"	2'-6¾"	2'-6¾"	2'-6¾"	2'-10¾"
H	1"	1"	1"	1"	1¼"	1¼"	1¼"
J	1'-7½"	1'-7½"	1'-10½"	1'-10½"	2'-2"	2'-2"	2'-2"
K	6¼"	6¼"	6¾"	6¾"	flow and return connections on centre line of back		
L	3½"	3½"	3¾"	3¾"	4½"	4½"	4½"
flow and return pipe sizes (i/d)	fine cast boiler		1¼"	1¼"	1¼"	1¼"	1½"
	Bower Barffed boiler		1"	1"	1"	1"	1¼"

TABLE OF DIMENSIONS.

32.B1 'TAYCO' DOMESTIC HOT WATER SOLID FUEL BOILERS

This Sheet describes a range of domestic hot water boilers. There are seven models available having outputs ranging from 21,000 to 80,000 B.Th.U./hour. The boilers may be used solely to provide a hot water supply to sink, wash basin and bath or in combination with one or more radiators (according to the size of the boiler : see second table below) and a towel rail to give both a hot water supply and partial central heating.

With suitable fuel the boiler will remain alight for over 10 hours making possible a 24-hour hot water service. A vibratory type of bottom grate is fitted for the removal of ash while the fire is burning. This is operated with all doors closed to prevent the emission of dust.

Construction

The boilers are designed to conform to B.S. 758 : 1945 *Small domestic hot water supply boilers for solid fuel* and incorporate the basic principles embodied therein. Control of combustion is a positive factor and the highest possible heat/fuel ratio is therefore assured.

Rating

Hot water supply: The following table shows the output of the various models and also gives the recommended hot water cylinder capacities.

Model	Hot water supply only			Capacity of h.w. cylinder (gal)	Heating only	
	B.Th.U./hr.	Gal./hr. max.			B.Th.U./hr.	Radiation surface (sq. ft.)
		100° F.	150° F.			
21M	21,000	42	21	30	9,240	63
25M	25,000	50	25	35	11,000	75
30M	30,000	60	30	35-45	13,200	90
41M	41,000	82	41	45-55	18,500	125
55M	55,000	110	55	65-70	24,500	165
65M	65,000	130	65	75-85	26,500	180
80M	80,000	160	80	90-100	32,000	220

Hot water supply and partial central heating: The following table shows the radiation surface possible when the boiler is used to provide both hot water supply and partial central heating. It also gives the recommended hot water cylinder capacities. These figures apply only where the whole system is compact, with short primary flow and return pipes and without a secondary circulation to the hot water supply, and where the cylinder and pipes are suitably lagged.

Model	Radiation surface* (sq. ft.)	Capacity of h.w. cylinder (gal.)
21M	12	25
25M	12	30
30M	30	30
41M	60	30
55M	75	40
65M	90	40
80M	90	55

* The figures given are for radiators only. A towel rail may be added to each installation.

Fuel Recommended

Gas coke nuts (No. 3 for models 21M, 25M and No. 2 for models 30M, 41M, 55M, 65M, 80M), anthracite boiler nuts or similar graded fuels give best results.

Operation

All doors are machine-ground to an air-tight fit and combustion is controlled by means of a sliding tapered ventilator in the ashpit door. A secondary air inlet is provided near the top of the boiler in addition to a butterfly damper in the flue nozzle.

Maintenance

The ash container should be emptied every day and the vibratory grate frequently operated, the flue kept clean and, in hard water districts, the boiler regularly cleared of deposit.

Soft Water

If the boiler is to be used with soft water Bower-Barffing should be specified. Copper boilers are also available if required.

Finish

The standard finish of the boilers is grey or green mottled enamel with black enamelled hot-plate and ashtray. Boilers may be supplied finished in cream and black or other colours if required.

Compiled from information supplied by :

Robert Taylor and Co. (Ironfounders), Ltd.

Head Office : Larbert, Stirlingshire.

Telephone : Larbert 444.

Telegrams : Tayco, Larbert.

London Office : 66, Victoria Street, S.W.1.

Telephone : Victoria 3972.

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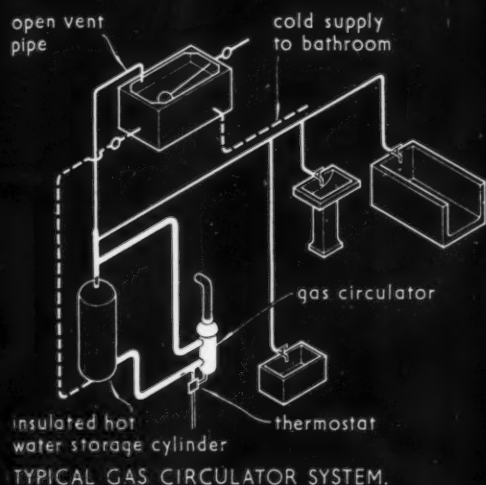
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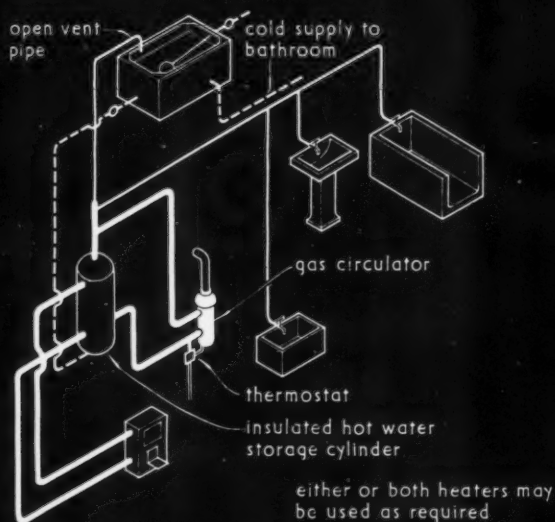
WATER HEATING | UNITS | GAS

32.C11

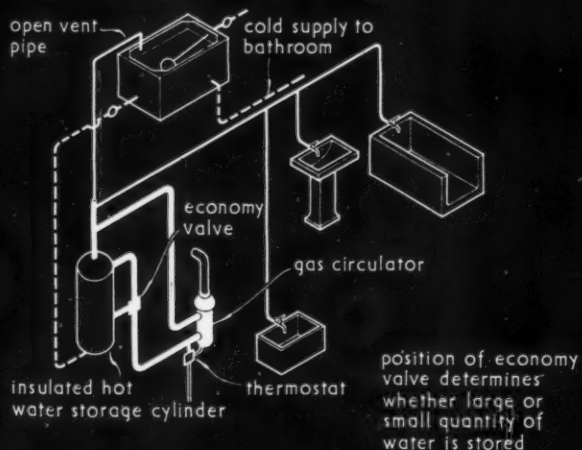
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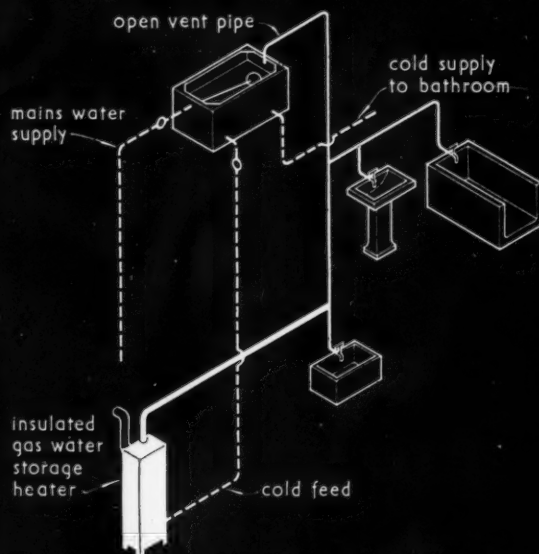
TYPICAL GAS CIRCULATOR SYSTEM.



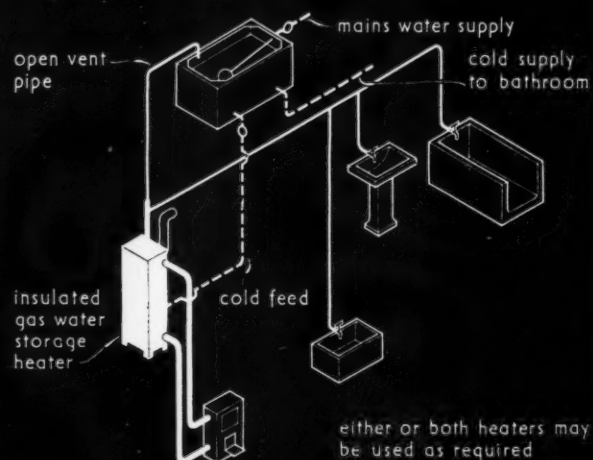
COMBINED GAS CIRCULATOR AND SOLID FUEL BOILER SYSTEM.



GAS CIRCULATOR DIVIDED STORAGE SYSTEM.



TYPICAL GAS WATER STORAGE HEATER SYSTEM.



COMBINED GAS WATER STORAGE HEATER AND SOLID FUEL SYSTEM.

type of heater	overall dimensions		
	height (in)	width (in)	depth (in)
circulator, wall mounted	16-32	7-14	5-13
circulator, floor mounted	16-32	10-20	14-28
storage, sink	26-28	8-14	6-11
storage, multi-point	23-66	14-34	10-27

TYPICAL DIMENSIONS. note: heights, widths and depths given are not respective

— gas supply — hot water pipes
 - - - cold water supply — insulated hot water pipes

KEY.

DOMESTIC GAS CIRCULATORS AND STORAGE WATER HEATERS: TYPICAL INSTALLATIONS.

Compiled from information supplied by The Gas Council.

32.C11 DOMESTIC GAS CIRCULATORS AND STORAGE WATER HEATERS

This Sheet summarises the main points to be considered when planning the installation of gas-heated water storage systems.

General

Circulator: This is a water heater for connecting to an existing hot water storage cylinder. It may be fitted as an independent unit or in conjunction with a solid fuel system. With the use of an economy valve and return connections from two points on the cylinder, the amount of hot water stored may be regulated to suit the demand.

Storage heater: This is a complete unit, including a storage cylinder, usually heavily insulated; it may be of the sink or multi-point type.

Both circulators and storage heaters are thermostatically controlled, and may be of high or low recovery rate. They provide hot water which may be drawn at a fast rate of flow, if necessary at several points simultaneously. They are completely automatic, but may be operated intermittently for greater economy in use. Almost all storage heaters give stratification of the stored hot water so that small quantities may be drawn off shortly after lighting and before the whole of the tank is filled with hot water. They can be fitted independently or in conjunction with a solid fuel system.

Applications

Gas storage water-heaters and circulators are particularly useful under the following circumstances:

- (a) self-contained storage heaters for use as all-the-year round hot water systems giving a full service or as alternatives to solid fuel systems with retention of full rate of flow at all hot taps, especially where the storage in existing systems is inadequate;
- (b) circulators for the same purpose where the existing storage is satisfactory;
- (c) sink storage heaters as auxiliaries to a storage system to supply sink or basin when the full storage is not in use (or to avoid too long a draw-off pipe from the existing system) or as independent heaters to supply hot water to isolated sinks.

Types and Characteristics

Type	Storage capacity (gal.)	Gas input		Initial heating time in min. for full capacity (raised 80° F.)	Flues
		B.Th.U. per min.	Cu. ft. per hr. (500 B.Th.U. gas)		
Sink	1-2	100-180	12-22	6-25	Not normally required
Self-contained (small)	15	100-165	12-20	110-190	Normally required
Self-contained (intermediate)	13-18	460	55	36-50	Required
Self-contained (large)	25	750	90	40	Required
Circulators (small)	20	100	12	250	Normally required
Other circulators	20-50	250-500	30-60	50-250	Required

Note: The water supply for all types is from a cistern with the exception of the sink type or certain types fitted with integral ball-valve feed cistern, the supply for which may come from a cistern or the mains.

Installation

Position of circulator: A circulator must be fixed in such a position that it is below the top of, and adjacent to, the cylinder or tank and preferably it should be connected directly thereto with independent flow and return pipes. A minimum difference of level of three feet below the flow connection point on the circulator heater and the flow connection point on the cylinder or tank is desirable to ensure satisfactory circulation and to prevent the water becoming overheated.

Position of storage water heater: A storage water heater should be positioned as near as possible to the draw-off tap likely to be used most frequently. Convenience of flue installation should also be taken into consideration.

Layout: See Sheet 32.C10.

Gas pipes: See Sheet 37.D2.

Water pipes: See Sheet 32.C10.

Ventilation

Provision for permanent ventilation must be made in any room or space in which a heater is fitted.

Flues

See Sheets 30.B1 and 30.B2.

Architects' Drawings

These should indicate all the positions at which a supply of hot water will be required. The following information should also be given:

- (a) the positions of bath, sink, basins, water and gas service pipes, runs of cold water pipes, water and gas controls, cisterns, and solid fuel boilers;
 - (b) the positions and sizes of flues, of cylinders or tanks, and layout of hot water pipes of any existing system;
 - (c) the materials to be used for walls, partitions and floors, pipes and hot water cylinder or tank.
- It is recommended that the gas undertaking should be consulted in the planning stage.

Further Information

More detailed information will be found in British Standard Codes of Practice:

CP 331.103 (1947) *Gas installation pipes*, CP 331.104 (1947) *Flues for gas appliances*, CP 332.201 (1947) *Domestic hot water supply by gas*, and B.S. 1250: Part 1: 1945 *Domestic gas appliances for immediate post-war housing*.

This Series of Sheets deals with the provision of service and installation pipes, meters, flues and all other considerations involving the installation of gas equipment concerning the architect.

Compiled from information supplied by:

The Gas Council

Address: Gas Industry House, 1, Grosvenor Place, London, S.W.1.

Telephone: Sloane 4554.

Telegrams: Gascil, Knights, London.

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W. Granville Smyth (above), like so many other Ulster architects, is able to build up his practice mainly by designing houses for private clients. Below, Mr. Smyth, in front of a bungalow, completed last September, at Holywood, on the south-east shore of Belfast Lough. Right, the architect and Douglas Wilson, the client and owner of the house.



There is still a social stigma attached to drinking in pubs. Drinking is a serious business and cannot be taken lightly, gaily or socially. But times are changing; cocktails are almost a habit among a few, and more and more publicans are providing new lounge-bars (as "shop fittings") for clients who like soft lights and glamour with their spirits. In this line the architect of much of the Castlereagh Farm-Factory Exhibition, Henry Lynch-Robinson, has developed a style of interior decoration all his own, which perhaps reminds one of his talent for stage design. A new lounge-bar interior which compares favourably with the work of Lynch-Robinson is the Elk Inn at Dundonald, Belfast, by T. T. Houston and William McVeigh.

HISTORY OF BUILDING IN BELFAST

Before discussing the work of the Royal Society of Ulster Architects, let us look briefly at the history of buildings in Belfast.

In the middle of the 18th century, Belfast was only a small Irish harbour town, with a population of about 9,000 (one tenth the size of Dublin at the same date). By the end of the century the linen trade and smaller industries had so expanded that in 1813 the population was 29,000. Fifty years later the population was 120,000. Today it is 452,000, and Belfast is the largest city in Ireland, containing one-third of the whole population of Northern Ireland. Much of the great industrial and commercial expansion

of Belfast is due particularly to the establishment of adequate harbour facilities and to the introduction (later) of power looms which, at first, worked both cotton and linen thread. Shipbuilding and rope-making were then (and still are) the two other major industries. And then, of course, tobacco manufacturing and engineering have an important place.

The two architects who changed the face of Belfast and transformed it into a great city were Sir Charles Lanyon (1813-1889) and his pupil, who afterwards became his partner, William Henry Lynn, who was born some twenty years after Lanyon and died in 1915. Apparently both architects could work in either the classical or the Gothic style as required and Belfast citizens did not seem to have many controversies over the relative moral values of the two styles. Lanyon, who was the more classical of the two, was also an engineer. He was made Lord Mayor of Belfast in 1862 and was president of the Royal Institute of the Architects of Ireland in that same year and until 1868. W. H. Lynn worked as a partner with Lanyon on the Italiannate Belfast Customs House, but his main buildings were designed alone. A young Newry man, William J. Barre, was just as many sided as Lanyon and Lynn.

By 1900 Belfast had developed all the trappings of a city—there were banks, warehouses, libraries, churches, departmental shops, railway stations and horse trams but the civic conscience of the city was still set on more new



building projects. Before long Belfast had a Cathedral (the foundation stone was laid in 1899), and a competition for a city hall was won by Sir Brumwell Thomas (at the age of twenty-five). This building, in full-blown Edwardian Baroque, was completed in 1906 and took the place of the old White Linen Hall. Another Edwardian building which this time only half-ousted a Georgian one is the College of Technology. This blocks out part of the fine old façade of the Belfast Academical Institution (1812) designed by Sir John Soane. Other civic buildings constructed at the time were the headquarters of the Presbyterian Church (1901 Scottish baronial), and Fisherwick Church. Most of the building materials used for the development over this span of 50 years were local granite, grey and red sandstone and imported Portland stone. It was unusual, at this time, to find a large building of brick, and as Belfast is a city on mud, piling had to be provided in most cases.

THE ARCHITECTS' SOCIETY

It was during this great spate of building that the Ulster architects formed their own Society as a branch Society of the Royal Institute of the Architects of Ireland, which



Student life in Belfast is as vigorous as elsewhere. Although most architectural students prefer to work as assistants in the offices of architects, studying for their exams. at night (there is no school of architecture) they may attend the School of Technology, which trains students up to intermediate standard. Left, students taking one of the papers of the RIBA Intermediate External exams. in the building of the Royal Society of Ulster Architects. In the picture above left, Patrick McClean carries his board and T-square back to his uncle's office, where he is an assistant, after the exam. At the end of the street is the Albert Clock, a Belfast landmark designed by W. J. Barre and erected 1865-68. Above, a respite from architecture can always be obtained at Robinson and Cleaver's fourth floor restaurant, where there is a lunch-time mannequin parade. Here student-assistants Eric Elliott and Roy Jackson are seen.

had been founded as long ago as 1839. Sir Thomas Drew, who was engaged on the building of St. Anne's Cathedral and was, at that time, President of the RIAI, became the first President of the Ulster Society. And before long the Society was making its opinions felt in a Bill on the Control of Elevations, which the Belfast Corporation proposed to lay before Parliament at Westminster. Apparently the most offensive clause in the Bill was the one in which the city surveyor was given the right to a final decision, without appeal, on the question of elevations and heights of buildings. The Bill went as far as Westminster before the controversy ended in favour of the architects, though Belfast then, as now, was one of the few cities in which the city surveyor was senior to the architect's department. Eight years after the formation of the Society the RIBA agreed that the Ulster Society and the Irish Institute "were to utilize their joint influence on any question which would affect the interests of the profession in Ireland."

Many of the most notable architects of the city have been presidents of the Society; men like Sir Thomas Drew, John Seeds, R. S. Wilshere and F. McArdle. Today the president is R. H. Gibson. He has been a real power in the

Society for forty years and his architectural achievements have been widely recognized, for his passion for good craftsmanship has been apparent in the many private houses he has designed. Mr. Gibson can with equal facility judge a fresian or a picture, and he is a lover of good living in all its aspects. Perhaps his very bearing is a reminder to the young architect of those spacious days when private practice could depend on rich and lavish private clients. The vice-president of the Society is J. M. Aitken (originally a Scotsman), who has a slight Dublin brogue and a taste for light woolly tweeds. He is chief architect to the Ministry of Health and Local Government and has always been concerned, in his career, with planning and housing. He was at Geneva, last November, as chairman of a Working Party at the International Housing Research Conference.

The Society's rooms are in the Old Museum Buildings. These are late Regency in style and were built by Duff & Jackson in 1831. Here all the meetings of the Society are held in appropriately dignified surroundings where the atmosphere of good wood and fine leather is dominant and where a cheerful, efficient feminine secretarial staff is somehow not out of place.

Right, Mr. Beaumont, for the last thirty-two years principal of the Art School at the School of Technology, is seen here studying copies of the Sir Edwin Lutyens Memorial volumes with students K. Patton and I. Kilpatrick. Below, two architectural students doing life drawing from plaster casts. Centre, right, are the first and second prize winners, (A. F. Martin and C. F. D. Dunbar) of the recent competition for a recreation centre, sponsored by the Royal Society of Ulster Architects. Architectural and art students combine, bottom, right, for the making of paper sculpture decorations in a room loaned to them in the Ulster Arts Club.





An exhibition of contemporary architecture is being held at present in Belfast. Sponsored by CEMA it has been brought into being by three architects and three students. Above are five; left to right, Dennis O'D. Hanna, J. V. T. Scott, Max Clendinning, Ian Campbell and Philip Bell. Dennis O'D. Hanna, an architect who probably knows more about the history of Ulster architecture than anyone else in Belfast, puts a finishing touch (right) to his exhibition for the promotion of the preservation of the countryside, which, it is hoped, will tour towns in Ulster, after its initial fortnight at the Sir William Wills Hall. Left, J. V. T. Scott, architect organiser of the exhibition.



Since 1947 the Student Group of the Society has been very active under the leadership of young designers such as Max Clendinning, Robin Walsh, Ian Campbell, Roy Jackson and Raymond Leith. There is no aspect of modern architecture (to the student this embraces everything from gramophone records to silent films) for which the Student Group does not show enthusiasm. The Group has created the only recognizable centre for architectural students that exists in Ulster today.

One of the jobs of the RSUA is, of course, to educate the public. There have not been many public exhibitions, mainly because the layman in Ulster has been slower than the English layman in taking an interest in architecture. But since the end of the war a remarkable change has taken place and already Belfast is challenging Dublin, which has always been taken for granted as the cultural centre of Ireland.

This Festival Year has provided the RSUA with an opportunity that seldom comes the way of a provincial society with limited resources. In association with CEMA (Northern Ireland) a sum of £3,000 was made available to the Society for the staging of an "Exhibition of Architec-

ture." A Festival committee was set up by the Society under the chairmanship of R. H. Bell which decided that two competitions should be organized and that the resulting drawings should provide material for selection as exhibits. The Student Group was quick in making it known that it was ready to play its part, and three of its members were appointed to a sub-committee of six known as the Design Group (J. V. T. Scott, architect-organizer), whose duty it was to work out the form of the exhibition. It was obvious that to put the theme across to the public some special exhibition structure would be needed; eventually war-damaged premises in the centre of Belfast were chosen, as they provided opportunities for interesting and original treatment. Only the first floor of what had been a block of offices and shops remained and with this rather picturesque raw material as an inspiration the Design Group set to work. The Exhibition was opened on May 29 and for two months the Ulster public will have a chance of seeing something of what the architect has done in Northern Ireland over the past four centuries. Perhaps the highlight of the whole display is the full scale living room with an informal garden beyond. Here can be seen modern furni-

ture, specially designed by the organizers, and the effect of this contemporary furniture will surely be unparalleled for the public have not had the opportunity of seeing any of the modern design-school exhibitions which have been such a feature of post-war London.

It is to be hoped, too, that the photographs and drawings of modern architecture will cause the public to open its eyes in admiration as well as astonishment. The Bronze Medal Housing Scheme will be on view and, in addition to this, visitors will see the two Festival-sponsored competitions, one for a Seaside Hotel near Belfast and the other for a Recreation Centre at Enniskillen, Co. Fermanagh. The prize-winning designs, which may even attract a client, were chosen by Desmond (now Professor) Fitzgerald—one of Ireland's most distinguished modern architects.

Several members of the Student Group were successful in the Recreation Centre Competition, and such success against English-trained competitors is remarkable when one remembers how little architectural education there is in Ulster. The students themselves are well aware of the disadvantages they labour under and many of them feel that the RSA Student Group helps them to educate themselves while they are spending, on an average, twice as long in the process of becoming qualified than their contemporaries across the water.

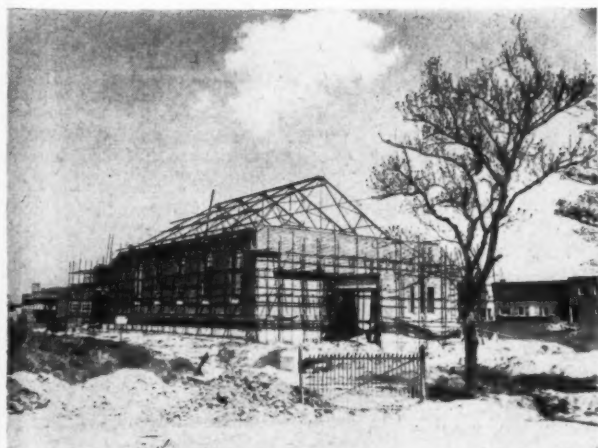
METHOD OF TRAINING

Most architects were articled to firms and took all RIBA examinations externally. This system of training is still prevalent and budding architects must pick up what training they can in offices and at part-time courses (correspondence or otherwise). Their one advantage over school-trained students is the close connection they have with actual building work. By the time they reach twenty most of the students have put up a building of their own, or have personally supervised all aspects of building construction in their offices. But their creative imagination has been stunted and so little, if any, of the routine office work can have the breadth and vision and stimulus of studio design.

The opinions of the students themselves on this problem of education were brought out in a small discussion group which they held recently. Every student at the meeting complained about the amount of time taken up in preparing to pass the examinations externally, and they all felt that a great distance separated them from the Institute at Portland Place; this sense of remoteness breeds a diversity of opinion as to what the examiners in London really want. Obviously a School of Architecture is desperately needed in Ulster's own Queen's University.

The Society has been in touch with the University on

Mr. McElroy, centre right, is known by most architects in Belfast, as he supplies drawing office requisites. Here he is seen selling "only the best pencils" to William McVeigh, a partner of T. T. Houston & Co. Below, left, the Northern Ireland government permits a certain number of churches to be built every year and the one shown below, left, designed by T. T. Houston & Co., is on the Creyagh Estate. Interior redecoration are also carried out by this firm; as, for instance, the first floor bar of the Elk Inn, at Dundonald, below right.





Val Smyth is one of the few Belfast architects to live above his office. Here he is on the balcony, with his daughters Sheila (the elder) and Hilary, looking over College Gardens.



The Bell brothers, Roger, left, and Philip, both trained at Liverpool, and have their office in the same block as John McGeagh, who designed the Sir William Wolfe Hall. Philip Bell has designed one of the largest post-war housing schemes, at Lisbon. The brothers' partner, Mr. Malcolmson, is with Mies van der Rohe in Chicago.

this matter for many years. And credit must be given to the RSUA for keeping the question of architectural education before the public over half a century.

AN APPROACHING MATURITY

It is important when judging Ulster architecture to always take into account the fact that most of the architects' clients have been pioneers with not much time to develop visual appreciation. The upsurge of real creative talent which is at last finding an outlet is of tremendous significance and may tempt the best designers, painters, writers and musicians to stay in Ulster and to go on working among their own people. We know that the evolution of

any city must be dominated at first by the raw pioneer and that only afterwards, when traditions have begun to grow and more leisure is possible, do people come to feel the need for true civilized living. Belfast is a hundred and fifty years old and now seems ready to enter upon a more mature stage of her development. Already some of the post-war architecture in Ulster has demonstrated this approaching maturity. And now, in 1951, the Ulster architects and students (self educated though they may be) are ready with all their native gifts of energy and drive to display their ability and to guide the taste of the public. It may not be too optimistic to say that on entering this second half of the century Ulster will see the development of its most significant architecture yet.



Once in a while the Ulster Arts Club, which is in Great Victoria Street, holds an open night, as on this occasion, the first night of the Northern Ireland Festival Company's four-week season, at the Grand Opera House, Belfast. The paintings form an exhibition of work by Club members, which was opened two days later by Tyrone Guthrie, director of the Festival Company. Although it is claimed that many architects are members of the Club, only one was found to be present on this occasion—Edward Kilpatrick, on the extreme right. He is a Belfast man, has been in private practice since 1936 and is, at present, concentrating on the design of schools.

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TECHNICAL SECTION

In this, the second part of his article on "Floors for Houses,"* the Technical Editor asks, "Are wooden floors necessarily cheaper than the practicable alternatives?" and points out that the question, "Could concrete floors be used on a larger scale?" is even more difficult to answer.

FLOORS FOR HOUSES

Part II

By R. Fitzmaurice.

A considerable amount of information on the costs of alternatives to wooden floors was given in the paper by O. J. Masterman (AJ, July 13, 1950). But this is a very difficult subject because there is no such thing as a fixed cost for timber floors or for the alternatives. It is characteristic of the building industry that the price range is very wide. Consequently Mr. Masterman gave costs, not as a single figure, but as two figures, between which the actual cost might be expected to fall. Mr. Masterman's figures have not been challenged, and it can be assumed, therefore, that they provide a reasonable basis on which to work, when amended to provide for recent increases in wages and material prices.

The alternative types of floor described were all reinforced concrete floors of one kind or another, since these are most likely to be used at the present time, for both technical and economic reasons. The problem is further complicated by the fact that the effect of the recent rise in timber prices has not yet been reflected in tenders or cost of work. In this article, the writer has assumed that the basic price of timber has risen by 50 per cent., i.e., from £70 per standard, as quoted by Mr. Masterman, to £105 per standard. Moreover, the recent increase in the wages of building workers has to be reflected in costs.

GROUND FLOORS

Mr. Masterman dealt mainly with roofs and first floors, but it is necessary to examine the case of ground floors in a little more detail. The concrete slab on solid fill has been adopted almost universally on grounds of timber economy and has been compulsory. The question as to whether it is the cheapest solution does not arise at the moment, but, from the point of view of the firms who have made a large investment in the production of coverings for concrete floors, the future trend is all important. In the rather remote contingency of a free supply of timber, shall we revert automatically to the traditional timber floor on sleeper joists?

The cost of a concrete slab on solid fill increases rapidly as the amount of under-building increases. Since there is no under-floor ventilation to worry about, the solid floor can be kept considerably lower on a flat site than would be permissible for a wooden floor.

The comparative costs for a timber floor, with floor finish 20 inches above the foundation concrete and a concrete slab on hard core filling at the same level would be as follows:—

Timber floor on sleeper walls—50 yds. super—

	£	s.	d.
Boarding	22	10	0
Joists	15	0	0
Sleeper walls, materials	7	10	0
Concrete oversite materials	12	0	0
Total materials	57	0	0
Labour in sleeper walls	5	10	0
Labour filling boards and joists	10	0	0
Labour placing concrete oversite	8	0	0
Total labour	23	10	0

or 32s. 2d. per yd. super.

Concrete Slab on 20-in. hard core fill 50 yds. super

from Chart B Masterman's paper plus labour increase.
Cost material and labour is £62 0s. 0d.
or 24s. 9½d. per yd. super.

If the covering material for the concrete slab can be obtained for 7s. per sq. yd., or less, the solid floor becomes cheaper. At higher prices for the covering the suspended wooden floor remains cheaper. On the other hand, where the hard core fill is less than 20 in., as is frequently the case, the differential in favour of the solid floor is considerably increased.

SUSPENDED FLOORS

Reinforced concrete suspended floors fall into three main types: *in situ*, precast and composite, the last consisting of precast elements such as joists and filling blocks, with some site concreting. All types of floors need to be screeded as a final operation to receive the final floor covering.

As might be expected, the cheapest floor slab of tee section cast *in situ*. On the first cost is the plain reinforced concrete general principle that the simplest solution is the cheapest, this is what one would expect to find. There are, however, certain obvious drawbacks. In the first place there is the question of shuttering. The builder has to carry a stock of the necessary shuttering and props and, since re-use is essential these days, these items have to be maintained and kept in repair. Secondly, provision has to be made for the passage of pipes and for fixings. There is nothing difficult about this, but it does mean that someone has to make up his mind in advance and stick to it, and someone has to think about these things at the right time. This is foreign to the normal practice in house building, where we just knock a hole in the wall when a pipe or a wire has to be led through. It is probable that the appropriate charge is added to the account for this.

COSTS

Now let us look at the costs themselves. The simple *in situ* slab of tee section is the cheapest of the various alternatives shown by Mr. Masterman. Screeded ready for the covering its price range is a little less than that of the conventional board and joist floor. Since, however, in the case of the board and joist floor the tenant is expected to provide his own covering, and since, in the case of the reinforced concrete floor it has to be provided for him, the difference in cost is,

in fact, a little less than the cost of the covering for the concrete. We are justified in concluding that the cheapest concrete floor, complete with covering, will cost just about as much as the most expensive timber floor uncovered. Against this, it is necessary to realize that the man who provided the cheapest concrete floor would probably be one and the same person as the man who would provide the cheapest wooden floor.

It is interesting to note how the costs are made up, and the following analysis is for a first floor of a house, about 50 sq. yds. in area, in a 5-in. reinforced concrete slab, with plain mesh reinforcement, with 1-in. screeding on the top and a plastered ceiling underneath. The total site cost (excluding profits and overheads), taking the middle of the range quoted by Mr. Masterman is £70 and now would be £76. This could be made up as follows:—

	£	s.	d.
Materials in concrete slab (reinf. incl.) ..	33	10	0
Materials in screed and plaster soffit ..	10	10	0
Use and waste of shuttering	4	10	0
Total Materials	48	10	0
Labour in fixing steel, mixing, hoisting and placing concrete	11	0	0
Labour in screed and plaster soffit	7	10	0
Labour in erecting and striking shuttering ..	9	0	0
Total Labour	27	10	0
Labour and Materials	76	0	0

In comparison, the costs of labour and material in a board and joist floor with plaster-board soffit are as follows:—

	£	s.	d.
Materials in joists, boarding, etc.	55	0	0
Materials in plasterboard, scrim and skim coat plaster	11	10	0
Total Materials	66	10	0
Labour in fixing joists, strutting and boarding	10	0	0
Labour fixing plasterboard and skimming ..	4	10	0
Total Labour	14	10	0
Labour and materials	81	0	0

The above costs are costs per house, and it is interesting to compare them in terms of costs of the various constituent items per sq. yd.

	£	s.	d.
Cost of 5-in. concrete slab per sq. yd. ..	1	3	2
Cost of screed per sq. yd.	3	0	0
Cost of ceiling per sq. yd.	3	10	0
Total cost per sq. yd. (without covering) ..	1	10	5
Cost of joists, strutting, boards etc., per sq. yd.	1	6	0
Cost of skimmed plasterboard ceiling, per sq. yd.	6	5	0
Total cost per sq. yd. timber floor ..	1	12	5

The comparison now is as follows:—

	£	s.	d.
Uncovered timber floor	81	0	0
Concrete floor with acceptable covering (7s. 6d. per sq. yd.), laid ready for occupation	95	0	0
Concrete floor without covering	76	0	0

The final cost for the timber floor should be increased by the cost of providing a covering to a similar standard and this would not be less than £15. Having done this the concrete floor is then cheaper.

In the case of the concrete floor the labour cost is a little over half the material cost and the possibility exists of effecting some economy. In particular, the shuttering labour cost is high and there is probably scope for the development of simple permanent shuttering which can be erected and dismantled rapidly. The edges of the floor are always a difficult problem in shuttering and there is scope for a device to deal with this. As regards the materials cost it is evident that systems of floor construction which reduce the volume of solid concrete are going to be advantageous. Air is cheap. So far as floors cast *in situ* are concerned it seems that the concrete rib and arch, formed by arched shuttering, is likely to be the most economical and it should be possible to work

* The first part appeared in the AJ for April 26, 1951.

towards the lower cost figure given in Mr. Masterman's paper with a well-organized team. The hollow filler block is a way of obtaining the voids in a floor cast *in situ* but the amount of void obtained is less.

PRECAST CONCRETE FLOORS

It remains, then, to examine the precast concrete floors. They have the great advantage of eliminating shuttering completely, and, at the same time, when well made and well designed, they can comprise a considerable volume of voids. Moreover, they represent in the aggregate a very large potential production capacity. From the figures given above, however, it would seem that the structural element in precast concrete floors should not exceed 23s. 2d. per sq. yd. when hoisted and fixed in position if it is to be fully competitive. In view of the handling and transport costs, this does not leave much margin for the manufacturers of the units.

The composite type of floor, consisting of a precast joist, with some kind of filling block to span between the joists, is one which has met with a certain success in use. It lends itself well to the use of prestressed concrete joists and then makes a floor which is highly economical in material. If this type of floor is to be competitive with the *in situ* floor, both the joists and filler blocks need to be reduced in price to the absolute minimum. This means a mechanized production of joists and filler blocks. Taking Masterman's Type III, design AI, the joists might go in at 9s. 6d. to 11s. per sq. yd. fixed, and this would leave 12s. to 13s. 6d. per sq. yd. for the filler blocks hoisted in position and jointed in mortar. This would be a keen price but not an impossible one. The key to the problem is in mechanized production. This means standardization in lengths of spans, and a sufficient volume of business to enable the machines to turn over continuously. The former is not a difficult condition, but it would be a rash venture to set up the necessary manufacturing capacity at this moment.

HOLLOW CLAY BLOCKS

There is yet another type of floor which has been widely developed in some European countries as a substitute for timber in houses.* It is rather a curious hybrid, but it competes with normal reinforced concrete floors, both *in situ* and precast. This type of floor is manufactured by the builder on the building site and consists of floor beams of hollow clay pots, laid end to end, and with deep grooves or slots in which reinforcement can be placed. The slots or grooves are then filled with mortar. When the mortar hardens there is produced a reinforced concrete and hollow pot beam which can be hoisted into position and used without shuttering. Sometimes additional reinforcement and site concrete are added when the beams are in position, but for small spans and light loads the beams are adequate with a simple screeding. This type of construction has the advantage that the builder can produce beams of the exact lengths to suit a variety of spans. There is no transport cost for complete beams, no shuttering and manufacturing overhead charges are reduced to the minimum.

Comparative costs of these floors are very conjectural because there has been no considerable experience of them in England. In Italy before the war, the composite floor was 20 per cent. cheaper than the equivalent solid reinforced concrete slab, and the Austrian version showed a slightly greater economy. If these results could be reproduced in Britain today—and this is a very large IF—the costs should be as follows:—

Cost of floor less covering, per sq. yd., 30s. 5d. less 20% = 24s. 4d.

Cost per sq. yd. at which clay or other blocks would have to be provided, 14s.-16s.

This type of development is clearly worth investigating, for if the economy over the solid reinforced concrete slab which the Italian floors showed could be realized, then the price of the floor structure plus a covering at 7s. 6d. per sq. yd. would be cheaper than a timber floor.

The conclusions to be drawn are evident. At present levels of costs and prices, the simplest reinforced concrete suspended floor with an acceptable covering, costs, in the medium range, £15 more than the conventional wooden floor.

There are developments, such as light prestressed concrete components for domestic floor loads, which might enable the price of concrete floors to be reduced, and which would enable the small builder to dispense with wood in floors. Also there are types of site-manufactured floor beams which have met a need in some continental countries and might be equally useful here.

LARGE SCALE USE OF CONCRETE FLOORS

Could concrete floors be provided on a large scale as an alternative to wooden floors? This is a difficult question to answer. Circumstances might arise which would necessitate further reductions in the amount of imported wood available for housing, and, supposing that this were to happen, should we be able to carry on? The answer is, of course, that we should. There would doubtless be a check in our progress, and almost certainly costs would rise initially because it is not possible to achieve the necessary technical skill in a moment, nor can the necessary manufacturing capacity be created instantly.

Some of the more far-sighted of our housing architects have already realized these things and have placed orders on a limited scale for reinforced concrete flooring components, in order to obtain the necessary operating data and to create manufacturing capacity on a pilot scale in their regions. As a measure of prudence this would seem to be admirable, but, unfortunately, the scale of these developments has not been sufficient to influence the situation viewed nationally.

We do know that there are plenty of keen builders in the industry who could adapt themselves quickly to a change in the situation as regards the supply of wood for floors. It would be an effort because the art of concrete construction has not made much headway in the United Kingdom so far as building proper is concerned. A very large amount of the concrete which goes into house building is very bad concrete indeed by the standards which are expected in public works. This, however, could be overcome by the dissemination of information on the subject in the form of leaflets and instructions to workmen and supervisors and by training of the additional labour required for concreting. Equally, the design data for suitable floor systems could be standardized and widely disseminated.

What would be the effect of these things on building labour? Carpenters would be badly hit. There are mitigating circumstances, however. Carpenters are perhaps the most adaptable of all forms of building labour and they would be needed to shutter the *in situ* work. And they could very well set and fix precast concrete components; for, in principle, the work is the same as the setting of timber. Also, of course, the total amount of labour in the wooden floor is very small.

There would remain a certain number of architects and builders who would be unable themselves to design or to provide concrete floors. This number would probably be considerable. For them it would be necessary to employ the many specialist firms who already exist and to expand their productive capacity as necessary.

The conclusion is that after an initial check it would be possible to provide reinforced concrete floors for the first floors of houses

There is the possibility that the need to save another half standard of timber per house might become acute. In view of this, it would be prudent to encourage those builders who are prepared to make the effort to adapt themselves, by giving them pilot orders in the way that some of the more far-sighted housing authorities have already done.

Useful preparatory work could be done, by bodies such as BRS, MOW and the Cement and Concrete Association, in producing instruction manuals and leaflets for guidance of supervisors and workers.

The question of the availability of materials still remains to be considered.

Finally it is of the utmost importance that where timber is used it should be treated as the valuable commodity which it truly is. All forms of waste are to be deprecated and the "rule of thumb" should no longer govern its use. It is hoped to deal with this aspect in a subsequent issue of the JOURNAL.

As an appendix to R. Fitzmaurice's article, D. N. Chester, lecturer in economics at Nuffield College and leading economist on the Building Research Board, has written the following short article in which he discusses, from the economic standpoint, the desirability of importing timber for flooring.

FLOORS FOR HOUSES

Part III

By D. N. Chester

To make a full judgment on the desirability, from the economic viewpoint, of the substitution of covered concrete floors for timber floors, one must consider the comparative total costs of each form of flooring; the availability of the alternative materials, including the source of supplies, whether home or foreign; and the net effect on our balance of payments of any such change.

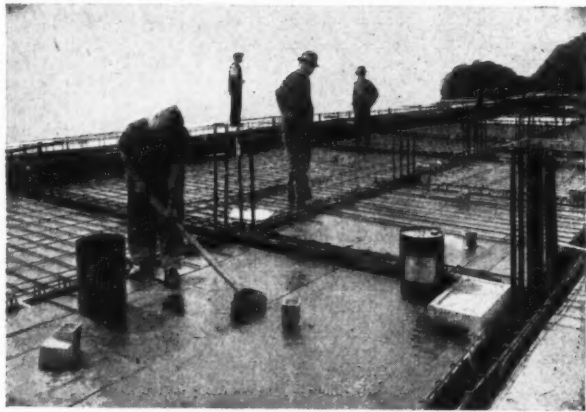
The comparative total costs have already been set out and need only be summarized here. The comparison differs between the ground and other floors, being most favourable to covered concrete on the ground floor but becoming increasingly favourable to timber floors as the floor height increases.

For ground floors the total cost of a timber floor on sleeper walls is £80 10s. (32s. 2d. per yard super) as against the uncovered concrete slab floor of £62 (24s. 10d. per yard super). Allowing 7s. 6d. per sq. yd. for covering (*i.e.* £18 15s.) the covered concrete floor works out at a fraction above the suspended wooden floor.

The difference between a wooden and an uncovered concrete first floor is £5 in favour of the latter. If an acceptable covering is added (at 7s. 6d. per sq. yd. or say £19)

* See Information Centre item 19.116, AJ, April 12, 1951.

LET THERE BE NO DOUBT ABOUT REDALON



REDALON Liquid Cement Retarder has been specified by Architects and Engineers, and used by Contractors voluntarily since 1927, but even so there are still those who would like to use Redalon, because they have heard it is good, but wonder if it is really safe. The answer is, of course, yes. The following points will, I hope, remove all doubts.

WHY USE REDALON ?

It provides an efficient suction-key over the whole surface, whereas hacking only gives a key at the best over 33½ per cent. of the area and weakens the concrete.

DOES IT ATTACK THE REINFORCING ?

Redalon Liquid has no deleterious effect on steel. Splashes of Redalon, which might get on to the reinforcing, would not affect the adhesion.

WILL IT PENETRATE TOO FAR ?

The maximum penetration of Redalon when painted on the shuttering is ¼ in. to ½ in. It only retards the setting. It does not kill the cement.

DOES IT ROT THE CONCRETE ?

If all the Redalon painted on the shuttering, even on a 4 in. wall, treated both sides, were mixed up in the concrete, the final strength of the concrete would not be reduced.

WHAT ABOUT THE RED COLOURING ?

It is a water solvent colour released by the lime in the cement. It has no retarding properties. Concrete made with the coloured water is the same strength as with main water.

IS IT ECONOMICAL ?

It is cheaper to use Redalon than to hack. Furthermore, the shuttering is easier to strike. There is no suction, and the shuttering does not require scraping.

WHAT IS REDALON ?

REDALON Liquid is a series of chemicals in Varnish form used to retard the surface cement skin allowing it to be brushed off when striking the shuttering thus providing a natural key.

HOW IS IT APPLIED ?

By brushing on to the wood or steel shuttering immediately or months before pouring the concrete.

* * *

REMEMBER !

No Redalon Bonded plaster has ever fallen—even when subject to bomb damage.

Cecil Kahn



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Subways, London Airport
Housing Estate, Liverpool
L.T.E. Headquarters, Broadway, S.W.1



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A flat roof is as watertight as its joints.

The problem of making watertight expansion joints in flat concrete roofs can be solved by the use of Expandite rubber waterstops.

These waterstops were developed in the first place for sealing joints in hydraulic structures and are widely used by hydraulic engineers.

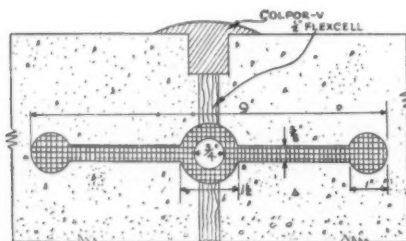
Three different sections are available, and, as shown in the illustrations below, the complete joint consists of the

waterstop, Flexcell cane fibre joint filler, and a surface seal of one of the Expandite rubber-bitumen sealing compounds.

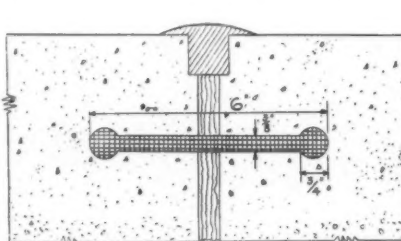
This is but one example of the general problem of sealing joints where there is movement. Government, Consulting and Municipal Engineers are constantly sending us drawings and asking for our suggestions on the treatment of joints in all types of structures. Can our Technical Department be of assistance to you?

Sealing 'joints which move' is our speciality.

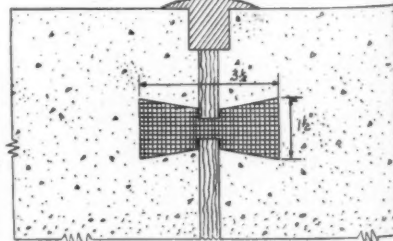
TYPE A TO ACCOMMODATE EXTREME MOVEMENT IN TENSION OR SHEAR



TYPE B FOR JOINTS WHERE RELATIVELY LESS MOVEMENT IS ANTICIPATED



TYPE C, A MORE ROBUST SECTION FOR JOINTS WITH COMPARATIVELY SMALL MOVEMENT



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the advantage swings in favour of the timber joist floor to the extent of £14 per house. The question is: Should preference now be given to concrete in view of the saving in timber imports and, therefore, in the apparent gain to the United Kingdom's balance of payments?

From a general point of view the international trade considerations are little different from those dictated by domestic economies. *Prima facie*, if there are two ways of achieving the same object the cheaper is the best from the point of view of both internal and external economies, even if the cheaper method uses more imported materials. For the use of more expensive methods raises the cost level of the country and therefore of the prices it wants for its exports to be profitable. The choosing of higher cost methods may, therefore, result in a reduction in the country's exports greater than the savings in imported materials achieved by the new process and so the country's balance of payments would be worsened.

The validity of this general approach may be vitiated by various other factors. For one thing it assumes that international trade is reasonably free and that countries will buy and sell strictly in accordance with relative prices and will be influenced by changes in these prices. It also assumes that prices reflect the true supply and demand position for particular raw materials and are not being maintained at an artificial level by administrative or financial action. In the case of timber, for example, the supply in this country is not sufficient to meet all the demand at the price ruling, high though this be. Presumably if supplies were unrationed and there were no price control the demand would rise, this would cause a rise in prices. This may apply to some extent to cement also but it is possible that at ruling prices the shortage of timber is greater relatively than the shortage of cement and that, if this is so, the true price of timber, *i.e.*, the price necessary to satisfy all demand, would require to be raised more than the price of cement. At least this appeared to be the position before the recent big increase in timber prices.

INTERNATIONAL TRADE

Let us now examine in more detail the international trade implications of the greater substitution of concrete for timber in house floors. A high proportion of the houses being built at present already have covered concrete ground floors. So far this policy has been forced on the government and the local authorities by the shortage of timber. The recent increase in softwood prices, bringing the cost of the timber floor to virtually the same price as that of the covered concrete floor, is an additional reason for the use of the timber substitute. The argument in favour of concrete ground floors must clearly be reinforced now that the marked price differential in favour of timber has disappeared and an extension of the use of concrete is indicated. It is, however, the extension of the use of timber substitutes to the first floor which raises new and wide ranging considerations.

The timber floor requires about $\frac{1}{3}$ standard per house, making 100,000 standards for a programme of 200,000 houses per annum. As this timber has to be imported, imports could be reduced by this amount—at least so far as housing needs were concerned. Presumably if imports were cut we would stop buying either from the dearest market or the most difficult market from the viewpoint of currency. The United States is the main high cost and hard currency supplier, so, at first sight, existing contracts allowing, the savings would be from that country. We are now to pay about £100-£110 per standard for softwoods so the saving might be of the order of £10-£11 million.

The materials in substitution for timber would be roughly as follows:—

The reinforced-concrete slab *in situ* for 200,000 houses

Mild steel rod ($\frac{3}{4}$ in. diameter and down)	60,000 tons
Cement	245,000 "
Sand in concrete screed	500,000 cu. yds.
Coarse aggregate in concrete	700,000 "
Asphalt tile, $\frac{1}{2}$ in. thick	19,000 tons
Stone filler	11,200 "
Asphaltic or resinous binder	12,000 "
Pigment	120 "

IMPORTING ALTERNATIVE MATERIALS

Now, of the alternative materials, only asbestos needs to be imported. Some of the pigment material may also come from abroad but this is so small that it can be ignored. In 1950 about a third of our total imports of asbestos fibre came from Canada and most of the remainder from Africa. The average import price for the kind used for making asphalt tiles is about £20 per ton so that if we had to import a further 19,000 tons it would mean about £400,000 of which half might be spent in Canada and half in Africa.

Though cement is not normally an import, the increased demand would have to come from somewhere, either by increased production, decreased home consumption for other purposes or decreased exports. In 1950 we exported 1,833,577 tons of cement at an average price of about £4 10s. per ton. If the whole of the 245,000 tons had to come from reduced exports the loss to our balance of trade would thus be, say, £1½ million.

Next there is the supply of mild steel rod. This is undoubtedly a major difficulty, for the material is already in short supply. Failing increased home production which would take time anyhow, certain other users would have to be cut and possible exports eliminated or reduced. Even then it is by no means certain that such a comparatively large addition to the steel requirements of the building industry could be met. Assuming, however, that exports could be met or steel used at home which might otherwise be exported and allowing about £30 per ton, this would involve about £2 million.

The steel difficulty would probably make it necessary to explore alternative forms of concrete construction. Prestressed concrete, for example, offers a large saving both in reinforcement and concrete and a proportion of the houses could use this form of construction. Prestressed concrete first floors would require about 25 tons per 1,000 houses of high tensile steel (about 100 tons/sq. in.) as against the 300 tons of mild steel rod per 1,000 houses required for the reinforced concrete slab floors. There would also be some saving in cement.

EXTRA LABOUR REQUIRED

Some allowance must be made for the extra labour required to produce the other home-produced materials and for the actual construction of the floor. The latter is probably the main factor, for the covered concrete first floor requires about £20-£25 per house more in wages than does the timber floor. On a programme of 200,000 this gives an extra wage bill of £4-£5 million, which is equivalent to about 11,000 extra operatives. This number would have to come from other building work or would be taken from other industries or the housing programme would have to be reduced by the amount necessary to enable the present labour force to tackle the extra work. If most of it came from other industries some would perhaps be making for the home market and some for export. It is difficult, indeed virtually impossible, to follow all the possible combinations, *e.g.*, some of the labour transferred might have been using

imported materials. At a guess we might put their potential exports at, say, £2-£3 million.

On these very rough figures it would seem that there might be a saving of about £3-£5½ million to our balance of payments. The margin is not great and as the figures are largely guesses an accurate balance sheet might show a larger or a smaller saving.

There remain three other important factors to be considered. Firstly, so far we have been assuming that Britain can sell substantially any amount and variety of exports she so wishes. But the 1951 Economic Survey shows that we are likely to be faced with the problem of raising the sum of our visible exports and re-exports from £2,200 million to £2,750 million. And the Survey is not optimistic about our chances to achieve this increase and so balance our external accounts. Will other countries increase their purchases of our manufactured goods to this amount? If not, the mere fact that we have goods to offer will not help. We may, therefore, be driven to cut down our imports and make do with home-produced alternatives even though the labour to be engaged on these alternatives might otherwise be engaged on making goods for sale abroad. In this case, the gain to our balance of payments would be nearer the order of £9-£10 million, *i.e.*, the reduced imports of timber offset by the increased imports of asbestos.

TIMBER SUPPLIES

Secondly, the discussion assumes that sufficient supplies of timber are available for purchase. The Price Committee of 1948 was, however, not very optimistic. They foresaw "an acute scarcity of softwood in relation to potential requirements." Only the return of the USSR and Finland to a pre-1939 level of deliveries would markedly improve the situation and there is no sign of this happening. Instead national defence programmes are raising consumption in various countries and making it more difficult for this country to obtain supplies. Should the international situation deteriorate one need not be reminded of how vulnerable is a large part of our present supplies, for nearly half our 1951 imports may come from Eastern Europe. It may be that, should such a situation arise, the housing programme would be suspended but, should this not be the decision, the search for home-produced substitutes for timber would have added importance.

COVERINGS

Thirdly, in calculating the import costs of concrete versus timber flooring, we have, in the case of the concrete floor, given values for the materials in the covering. In the case of timber floors, this has been ignored. From the point of view of the building authorities this is reasonable, as representing the costs involved in providing the house. But it is not common for a timber floor to be used for long without some covering, usually linoleum, as a minimum. This is provided by the tenant at his own cost. Nevertheless it represents a cost, a good proportion of which will be for imported material—cork, linseed oil, resin, jute. Thus there is a hidden factor, when the comparison of timber and concrete floors is made, which, taking the broadest view, operates in favour of the concrete floor with the covering provided by the authority. Only those with full access to all the facts of the supply position of the various materials and of the effect on that position of the rearmament programme are in a position to make final judgment. But, clearly there is sufficient evidence, reinforced by the recent increase in timber prices and of the export problem posed by the 1951 Economic Survey, to justify the urgent consideration of, and probably a more favourable attitude towards, the greater use of concrete floors for houses.



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A further selection of photographs of BIF stands at London and West Bromwich, together with a description of exhibits related to heating by an architect who specialises in this subject.

BRITISH INDUSTRIES FAIR

HEATING EXHIBITS

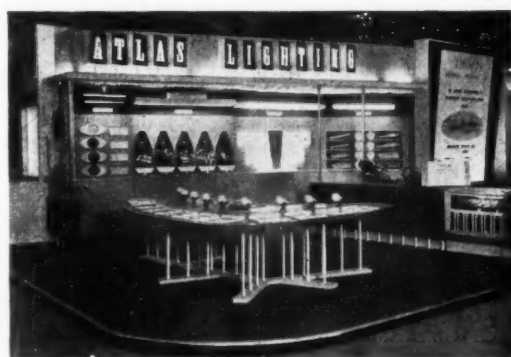
There is no doubt that, for the majority of purposes, solid fuel remains the cheapest heating medium, but high labour costs may seriously reduce this advantage. The stand of the Coke Department of the Gas Council included some new coke-burning equipment for central heating, which can achieve not only a high degree of thermal efficiency but also a reduction in the labour costs of attendance. Some of this equipment is already on the market.

New boilers on show included the Janitor "Cokette," a gravity-fed, natural draught boiler, with electrical thermostatic control. Various models of this boiler are suitable for space heating and indirect hot-water supply for both small and large houses.

A successor to the "Selfstoke" boiler, by

Above, stand for Chloride Batteries Ltd. at Birmingham, designed by Warnet, Kennedy and Associates.

Right, stand for Thorn Electric Industries Ltd. at Birmingham, designed by Peter Bull and Harding Dunnell. Below, stand for the Port of London Authority, at Birmingham, designed by J. Lansdell.





Focus on Floors

A well-known architect remarked recently that he had experienced as many failures or partial failures in flooring as in all other finishes put together. His assessment of the reason for this state of affairs was the absolute economic necessity for trying out new materials coupled with the difficulty of getting really accurate and impartial information on the performance of the materials. It was largely to overcome this difficulty that the Semtex Flooring Service was brought into being. Briefly stated, the Service aims to make available for the solution of a given problem, a knowledge of flooring problems more complete than could possibly come within the experience of any architect or firm of architects; to supply and install any of the floor finishes listed below: and, if desired, to maintain by contract in good condition any floor finish installed by the Company. If you would be interested in such a service, why not discuss your next flooring problem with us? Semtex Floor Surfacing include: SEMASTIC DECORATIVE TILES · SEMASTIC DOMESTIC TILES · INLAID RUBBER & LINOLEUM · FLEXIMERS · CORK, CERAMIC & TERRAZZO TILES.

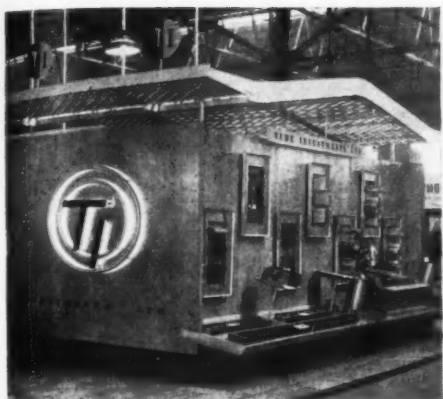
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Above, part of stand for Tube Investments Ltd. at Birmingham, designed by Hugh Casson. Right, stand for Gaskell & Chambers Ltd. at Earls Court, designed by S. P. Jordan.



the same makers—Brockhouse, was also on show. This is known as the "Cokamatic." It is made with capacities of $\frac{1}{2}$ million BThUs upwards, and will burn anthracite as well as coke. It has full automatic control.

A newcomer of French design was the "Bouellat". This is a water-tube boiler, for which numerous advantages are claimed; notably, that it is readily adapted to any type of fuel or firing method. As shown at the BIF, it has an "Earlymill" stoker, adapted, of course, to the burning of coke.

Finally, there was a new Bidgood stoker, applicable to most types of boiler, which employs the "down jet" principle of combustion, developed by the BCURA, for which extreme efficiency is claimed.

The Coke Department of the Gas Council has been largely instrumental in developing these various items of equipment, which mark a real advance in high-efficiency solid-fuel heating.

Below, part of stand for Permal Ltd. at Birmingham, designed by S. P. Jordan. Below right, stand for Gent & Co. Ltd. at Birmingham, designed by Jack Howe.





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Buildings Illustrated

The following lists of sub-contractors are those unavoidably held over from last week.

Festival of Britain 1951. Minerals of the Island. (Page 651.) Architects: Architects' Co-operative Partnership. Consulting engineers: Ove Arup & Partners. General contractors: Richard Costain Ltd. Sub-contractors: handrails, balusters, etc., E. C. Blackmore Ltd.; flooring, Morris Bowden Plastic Co. ("Weyrock"); footbridge, Horseley Bridge & Thomas Piggott Ltd.; smoke generation equipment, Airscrew Jewood Ltd.; roofing felt, Macartneys Ltd.; quarry tiling, Camden Tile & Mosaic Co., Ltd.; pitchmastic paving, Ragusa Asphalte Paving Co., Ltd.; sanitary fittings, Pryke & Palmer Ltd.

Festival of Britain, 1951. Entrance canopy and pay kiosks at Chicheley Street entrance. (Page 651.) Architects: Architects' Co-operative Partnership. Consulting engineers: Messrs. Ove Arup & Partners. General contractors: Richard Costain Ltd. Sub-contractors: Pay kiosks supplied by Holoplast Ltd. and erected by Messrs. Firmin & Collins; electric wiring, Troughton & Young Ltd.; electric light fixtures, The British Thomson-Houston Co., Ltd., Troughton & Young Ltd.; door furniture, Dryad Metal Works Ltd.; built-in furniture for pay kiosks, Firmin & Collins.

Festival of Britain, 1951. Administration and Royal Pavilion. (Page 652.) Architects: Architects' Co-operative Partnership. Consulting engineers: Ove Arup & Partners. General contractors: Richard Costain Ltd. Sub-contractors: Fabrication and erection of Royal Pavilion, Samuel Elliott & Sons Ltd.; steel windows and doors, Williams & Williams Ltd.; flooring tubes and beams, Morris Bowden Plastic Co.; steel trusses, English Bridge & Structural Engineering Co. Ltd., and Sommerfelds Ltd.; bipods, tubes and beams, Scaffolding (G.B.) Ltd.; terrazzo tiling, Jaconello Ltd.; strip flooring, Horseley Smith & Co.; flagstaff, Camper & Nicholson Ltd.; tile paving, Carter & Co. (London) Ltd.; pitchmastic floors, Ragusa Asphalte Paving Co. Ltd.; felt roofing, Macartney Ltd.; sanitary fittings and chrome curtain track, Pryke & Palmer Ltd.; patent glazing, British Challenge Glazing Co. Ltd.; French polishing, Turners Polishing Ltd.; painting, Kings (BDJ) Ltd.; tiling & paving, W. B. Simpson & Sons Ltd.; double leaf gates to Royal Pavilion, A. J. Binns Ltd.; erection of canopies, Carter Horseley Ltd.; mahogany screen, Linden Doors, Ltd.; doors, Harland & Wolff Ltd.; James Gibbons & Co. Ltd., Flush Woodwork Ltd.; aluminium windows, Williams & Williams Ltd.; other windows, Holcon Ltd.; strawboard slabs, Stramit Boards Ltd.; hardwood handrail, Montague Meyer Ltd.; wallbrackets, etc., Merchant Adventurers of London Ltd.; cappings, flashings, etc., Fredk. Braby & Co. Ltd.; anodized aluminium, Acorn Anodizing Co. Ltd.; water heater, Aidas Electric Ltd.; mortice door lock, Comyn Ching & Co. (London) Ltd.; coat hooks, Mountford Bros. Ltd.; aluminium primer, Northern Aluminium Co. Ltd. ("Noral"); insulating fill, Huntley & Sparks Ltd. (Cabots Quilt).

Festival of Britain, 1951. York Road Screen, etc. (Page 653.) Architects: Architects' Co-operative Partnership. Consulting engineers: Ove Arup & Partners. General contractors: Richard Costain Ltd. Sub-contractors: "Aluminex" patent glazing, Williams & Williams Ltd.; steelwork, Dawnays Ltd.; rings for and fixing of canvas panels, Scaffolding (G.B.) Ltd.; paybox units and w.c. cubicles, Holoplast Ltd.; strip flooring, Horseley Smith & Co. Ltd.; benches, post boxes, etc., Samuel

Elliott & Sons; fencing and gates, A. J. Binns Ltd.; operator's kiosk, Fredk. Sage & Co. Ltd.; fans and shutters, Saunders & Taylor Ltd.; steelwork to kiosks and control points, K. & J. Sommerfeld Ltd.; information kiosks, Harris & Sheldon Ltd.; flooring in CID offices, B. Holden & Co. Ltd.; cold-room, Pressed Steel Co. Ltd.; work to fairway, J. Whitehead & Sons Ltd.; asbestos cement decking, Boddy Roofing Co. Ltd.; fencing and gates and fixing w.i. railings, A. Binns Ltd.; insulating board, Tentest Fibre Co. Ltd., Insulatail Services Ltd. ("Celotex"); asbestos cement PO, Universal Asbestos Mfg. Co. Ltd.; metal faced plywood, Venesta Ltd. ("Permaply"); flush doors, John Sadd & Sons Ltd.; trench covers, Gardiner Sons & Co. Ltd.; domed roof lights, Pilkington Bros. Ltd.; mortice locks, etc., Jas. Gibbons, Ltd.; cover strips, Rippers Ltd.; sawn and wrot deal, Montague Meyer Ltd.; rainwater shoes, Fredk. Braby & Co. Ltd.; screens, hanging canopies, PO counter, etc., Samuel Elliott Ltd.; CID office doors, P. C. Henderson Ltd.; kitchen fittings, James Stott & Co. (Engrs.) Ltd.

Festival of Britain, 1951. Transport Pavilion. (Page 661.) Architects: Arcon. Consulting engineer: F. J. Samuely B.Sc.(ENG.), A.M.I.C.E., M.I.STRUCT.E. General contractors: Richard Costain Ltd. Sub-contractors: Precast floor units, Wm. Cubitt & Co.; pre-cast stair units, Liverpool Artificial Stone Co., Ltd., Costain Concrete Co., Ltd., Girlingtonstone; structural steel, The Appleby-Frodingham Steel Co., Ltd.; special roofings, Turner Bros., Asbestos Co., Ltd.; roofing felt, The Ruberoid Co., Ltd.; glass, Pilkington Bros. Ltd.; patent glazing, windows, doors, Williams & Williams Ltd.; floorings, terrazzo, Art Pavements & Decorations Ltd., tiles, Carter & Co. (London) Ltd., magnesite, S. Bennett & Co.; asphalte, Cawood Wharton & Co. Ltd.; cork, Phillips Floors Ltd.; electric wiring, Troughton & Young Ltd.; electric light fittings, Troughton & Young (Lighting) Ltd., The British Thomson-Houston Co., Ltd., Wessex Guild; sanitary fittings, Pryke & Palmer Ltd.; metal balustrades and handrails, Wainright & Waring Ltd.; plastic finishes, Holoplast Ltd., Warerite Ltd.; clocks, Baume & Co. Ltd.; signs, Milner Grey; paint, R. Gay & Co.

Festival of Britain, 1951. The Country Pavilion. (Page 672.) Architect: Brian O'Rourke, A.R.A., F.R.I.B.A. Consulting engineers: R. T. James & Partners (in collaboration with Freeman, Fox & Partners). General Contractors: Richard Costain Ltd. Sub-contractors: Dome lights, British Challenge Glazing Co.; structural steelwork, S. & C. Walsley Ltd.; asbestos sheeting, Universal Asbestos Manufacturing Co. Ltd.; wood wool roofing slabs, Halcrete (Precision Panels) Ltd.; roofing felt, F. McNeill & Co. Ltd.; steel windows, steel louvers and gearing for canvas louvers, Henry Hope & Sons Ltd.; floor slabs, Concrete Ltd. ("Bison"); tubular steel gates, animal pens, "Supa Tracks," sliding door gear, trough flower boxes, G. W. King Ltd.; aluminex patent glazing and screens, Williams & Williams, Ltd.; metal lathing and plaster, wavy wall and suspended ceilings, Expanded Metal Co. Ltd.; handrailing, S. W. Farmer & Son Ltd.; tubular steelwork, Scaffolding (Great Britain) Ltd.; air conditioning for animals and plants, Ozonair Ltd.; wiring and conduits, Troughton & Young Ltd.; door furniture, The Willen Key Co. (1946) Ltd.; canvas and booms, Deans Blinds (Putney) Ltd.; tower for wind pump, W. H. Smith & Co.; paintwork on asbestos, Tretol Ltd.; stone paving, Gilliam & Co. Ltd.; cold room, Pressed Steel Company Ltd.; title lettering, Dales Lettering Ltd.

Festival of Britain, 1951. Homes & Gardens. (Page 674.) Architects: Bronek Katz & R. Vaughan, A.R.I.B.A. Assistant architect: W. J. Meyer. Consultants: R. T. James & Partners. General Contractor: Holland & Hannen and

Cubitts Ltd. Sub-contractors: Structural steel, Steel Scaffolding (Big Ben) Ltd., Boulton & Paul Ltd.; special roofing, Universal Asbestos Co. Ltd.; door furniture, Dryad Metal Works Ltd., Ingerson Locks Ltd.; casements, Williams & Williams Ltd.; folding gates, Potter Rax Ltd.

Festival of Britain, 1951. Television Pavilion. (Page 678.) Architect: Wells Coates, O.B.E., R.D.I., F.R.I.B.A. Assistant architects: Peter Bender, A.R.I.B.A., Denys Hinton. Consulting engineers: R. T. James and Partners. General contractors: Holland & Hannen and Cubitts Ltd. Sub-contractors: excavation, Willment Bros. Ltd.; asphalte, Ragusa Asphalte Paving Co. Ltd.; structural steel, and steel staircases, Steel Ceilings Ltd.; composition flooring, Semtex Ltd.; electric wiring, Engineering Service Installations Ltd.; electric light fixtures, General Electric Company Ltd.; door furniture, Ingersoll Locks Ltd., Forson Engineering Co.; furniture, Dunn's of Bromley.

Festival of Britain, 1951. "1851" Pavilion. (Page 678.) Architects: James Gardner and Hugh Casson. Display designer: Christopher Ironside. General contractors: Messrs. Holland & Hannen and Cubitts Ltd. Sub-contractors: fabrication and erection, Messrs. Metallform Ltd.; glass & glazing, Messrs. Pugh Bros. Ltd.; display contractors, Messrs. Cockade Ltd., S. E. W. Models & Displays; amplification system, Recorded Sound Ltd.; electric lighting, Engineering Services Installations Ltd.; pelmets, Story & Co. Ltd.; model of the Crystal Palace building, Hunting Aerosurveys Ltd.; fibrous plaster, G. J. Green & Sons.

Festival of Britain 1951. The Lion and Unicorn Pavilion. (Page 679.) Architects: R. Y. Goodden, R.D.I., A.R.I.B.A., F.S.I.A., R. D. Russell, R.D.I., F.S.I.A. Chief Assistant: John Morton, A.R.I.B.A. Consulting engineers: R. T. James & Partners. Consultant engineer for lamella roof: E. Lewis. General Contractor: Holland & Hannen and Cubitts Ltd. Sub-contractors: Steelwork, S. & C. Walsley Ltd.; lamella roof, J. Long & Sons (Bath) Ltd.; main windows and glazing, James Clark & Eaton Ltd.; external rendering and all plasterwork, Thomas & Frediani; joinery, John Sadd & Sons Ltd.; York stone floor, Brookes Ltd.; oak floor to gallery, Horseley Smith & Co. (Hayes) Ltd.; ventilation, Via-Duct Heating & Ventilating Co. Ltd.; electrical installation and plumbing, Engineering Service Installations Ltd.; precast concrete floor units to gallery, Girlingtonstone Manufacturers; roof coverings, Ruberoid Co. Ltd.; sanitary fittings, Adamsez Ltd. The Unicorn Restaurant. General Contractor: Holland & Hannen and Cubitts Ltd. Sub-contractors: Canvas and rigging, John Edgington & Co. Ltd.; main masts, The London Aluminium Co. Ltd.; joinery, J. Long & Sons (Bath) Ltd.; roof covering, Ruberoid Co. Ltd.; sanitary fittings, Adamsez Ltd.; electrical installation, plumbing and ventilation, Engineering Service Installations Ltd.; kitchen equipment, James Stott & Co. Ltd.; hazel fence, S. Davis & Sons.

Festival of Britain, 1951. Waterloo Bridge Gate, Harbour Bar, Thames-side Restaurant. (Page 681.) Architects: Fry, Drew & Partners. Consulting engineers: Ove Arup & Partners. General contractor: Kirk & Kirk Ltd. Sub-contractors: Water heaters, Aidas Electric Ltd.; windows, Aygee Ltd.; steelwork, etc., Alphamin Ltd.; handrailing, Allen and Greaves Ltd.; acotile flooring, Armstrong Cork Co. Ltd.; lighting fittings, Best & Lloyd Ltd.; neon lighting, clocks, Baume & Co.; reinforcement, British Reinforced Concrete Engineering Co. Ltd.; tiles, Carter & Co. (London) Ltd.; gates and sculpture, turntable, H. & C. Davis & Co. Ltd.; finish to barriers, Dover Ltd. ("Doverite"); steelwork, English Bridge and Structural Engineering Co. Ltd.; sanitary fittings, B. Finch & Co. Ltd.; sanitary ware and ironmongery, W. N. Froy & Sons Ltd.; steel plate, S. W. Farmer & Son Ltd.; handrailing and perforated

sheets, G. A. Harvey & Co. (London) Ltd.; lift, Hammond and Champness Ltd.; maple flooring, James Latham Ltd.; decorative lettering on glass, The London Sandblast Decorative Glassworks Ltd.; signs, The Lettering Centre; special primer undercoat, International Paints Ltd.; plumbing and ventilation, Matthew Hall & Co. Ltd.; furnishing, Maple & Co. Ltd.; paints and distempers, Nicholls and Clarke; glass discs and domes, Pilkington Bros. Ltd.; cloakroom fittings, Rennis Ltd.; roofing and ceilings, Sundeala Board Co. Ltd.; steelwork, Scaffolding (Gt. Britain) Ltd.; electrical work, Troughton & Young Ltd.; glazing, sliding doors and windows, Williams & Williams Ltd.; suspended ceilings, The Merchant Trading Co. Ltd.

Festival of Britain, 1951. Administration Building, Staff Canteen and Decorative Screen. (Page 683.) Architect: Edward D. Mills, F.R.I.B.A. Assistant architects: Graham Partridge and Barbara Trasler. Consulting engineers: R. T. James & Partners. General contractors: Holland & Hannen and Cubitts Ltd. Sub-contractors: Excavation and demolition, Willment Bros Ltd.; steel frame, S. & C. Walmsley Ltd.; plumbing and hot and cold water services, Matthew Hall & Co. Ltd.; sanitary fittings, Stitsons Sanitary Fittings Ltd.; electric lighting and drainage, Engineering Service Installation Ltd.; electric light fittings, Troughton & Young Ltd.; The Merchant Adventurers of London Ltd.; The General Electric Co. Ltd.; flooring, composition tile, Armstrong Cork Co. Ltd.; coloured cement, The Cement Marketing Co. Ltd.; roofing, F. McNeill & Co. Ltd.; glazing, James Clark and Eaton Ltd.; aluminium patent glazing, Williams & Williams Ltd.; perforated metal staircases, risers and pressed steel lockers, G. A. Harvey & Co. Ltd.; suspended ceilings, Eastwoods Specialists Ltd.; asbestos sheeting, The Universal Asbestos Manufacturing Co. Ltd., erected by the Boddy Roofing Co. Ltd.; rendering, The

Cement Marketing Co. Ltd.; electric clocks, Baume & Co. Ltd.; fire alarms, Standard Telephones and Cables Ltd.; public address installation, Central Rediffusion Services Ltd.; hollow clay blocks, The London Brick Co. Ltd.; hardwood staircase treads and handrails, John Sadd & Sons Ltd.; galvanized sinks, Stitsons Sanitary Fittings Ltd.; canvas panels and sun blinds, Deans Blinds (Putney) Ltd.; asbestos cement cable ducts, Turners Asbestos Ltd.; kitchen equipment, R. & A. Main Ltd.; extraction hoods and ventilation, Matthew Hall & Co. Ltd.; cold room installation, The Lightfoot Refrigeration Co.; goods lifts and service lifts, W. Walker Ltd.; paints and distempers, The Cement Marketing Co. Ltd.; Silixine Paints Ltd.; George Wadsworth & Son Ltd., Tretol Ltd. (chlorinated rubber paint); Staffordshire blue bricks, B. Finch & Co. Ltd.; expanded metal lathing, The Expanded Metal Co. Ltd.; quarry tiles, Wiggins-Sankey Ltd.; flush doors, John Sadd & Sons Ltd.; joinery J. Long & Sons (Bath), Holland & Hannen and Cubitts Ltd.; gas-fired boiler, Ideal Boilers Ltd.; w.c. partitions, Venesta Ltd. *Decorative Screen:* Facing bricks, The London Brick Co. Ltd.; steel screen masts, Concrete & Structural Products Ltd.; screen bracing, Scaffolding (Great Britain) Ltd.; external lighting, The General Electric Co. Ltd.; staircases, handrails, etc., J. Long & Sons (Bath) Ltd.

Festival of Britain, 1951. Sport Section. (Page 686.) Architects: Gordon & Ursula Bowyer, A.A.R.I.B.A. Consulting engineer: L. L. Kenchington, B.Sc.(ENG.), A.M.I.C.E., A.M.I.STRUCT.E. General contractors: Kirk & Kirk Ltd. Sub-contractors: steelwork, Johnson Bros. (Steel Erectors) Ltd.; special metalwork, George Johnson Bros. Ltd.; canvas awnings, John Edgington & Co., Ltd.; electrical, Troughton & Young Ltd.; general display contractor, Russell Bros. (Paddington) Ltd.; special displays, Reliance

Shopfitters Ltd.; display contractor (Fishing Section), Frank, Batty & Smith Ltd.

Festival of Britain, 1951. Seaside. (Page 686.) Architect: Eric Brown, A.R.I.B.A. Assistant architect: Christoph Bon, E.T.H. (ZURICH). Consulting engineers: R. T. James & Partners in association with Freeman, Fox & Partners. General contractors: Holland & Hannen and Cubitts Ltd. Sub-contractors: mast structure, Stewarts and Lloyds Ltd., British Ropes Ltd.; velariums, John Edgington & Co., Ltd.; welding, London Welding Co.; special structures, Morfax Ltd.; display, W. A. Norris.

Festival of Britain, 1951. Temporary Booking Office for the Royal Festival Hall. (Page 687.) Architect: Sergei Kadleigh, A.R.I.B.A. General Contractor: Richard Costain Ltd. Sub-contractors: Dampcourses, roofing felt, "Astos," The Ruberoid Co. Ltd.; vertical reeded glass, James Clark & Eaton Ltd.; seating charts, "Synchrophone" Ltd.; electric light fixtures, Merchant Adventurers of London Ltd.; door and window furniture, Dryad Metal Works Ltd.; decorative plaster panels, A. Walton; garden and plants, Gilliam & Co. Ltd.; signs, The Lettering Centre; paint, R. Gay & Co.

Corrections

In our issue for May 10, 1951, the following names of contractors for the Royal Festival Hall were published incorrectly.

Esdaile, David & Co., Ltd., should have read David Esdaile & Co., Ltd.; H. H. & Cubitts, Ltd., should have read Holland & Hannen and Cubitts, Ltd.; The London Sand Blast Decorative Glass Co. should have read The London Sand Blast Decorative Glass Works Ltd.; Pilkington, Ltd. should have read Pilkington Brothers, Ltd.

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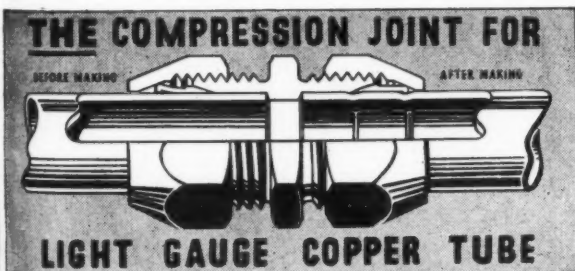
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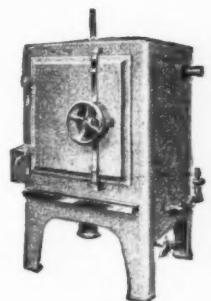
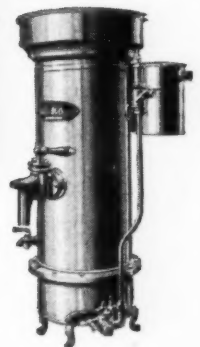
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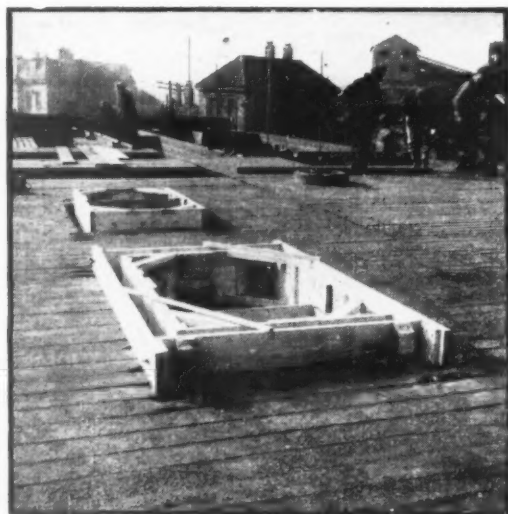
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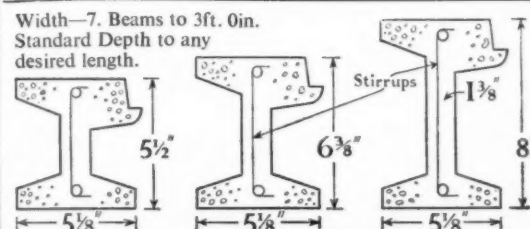
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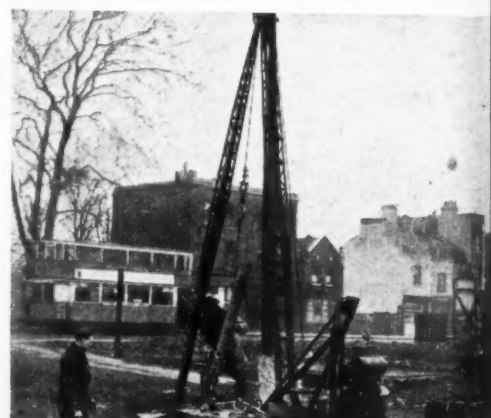
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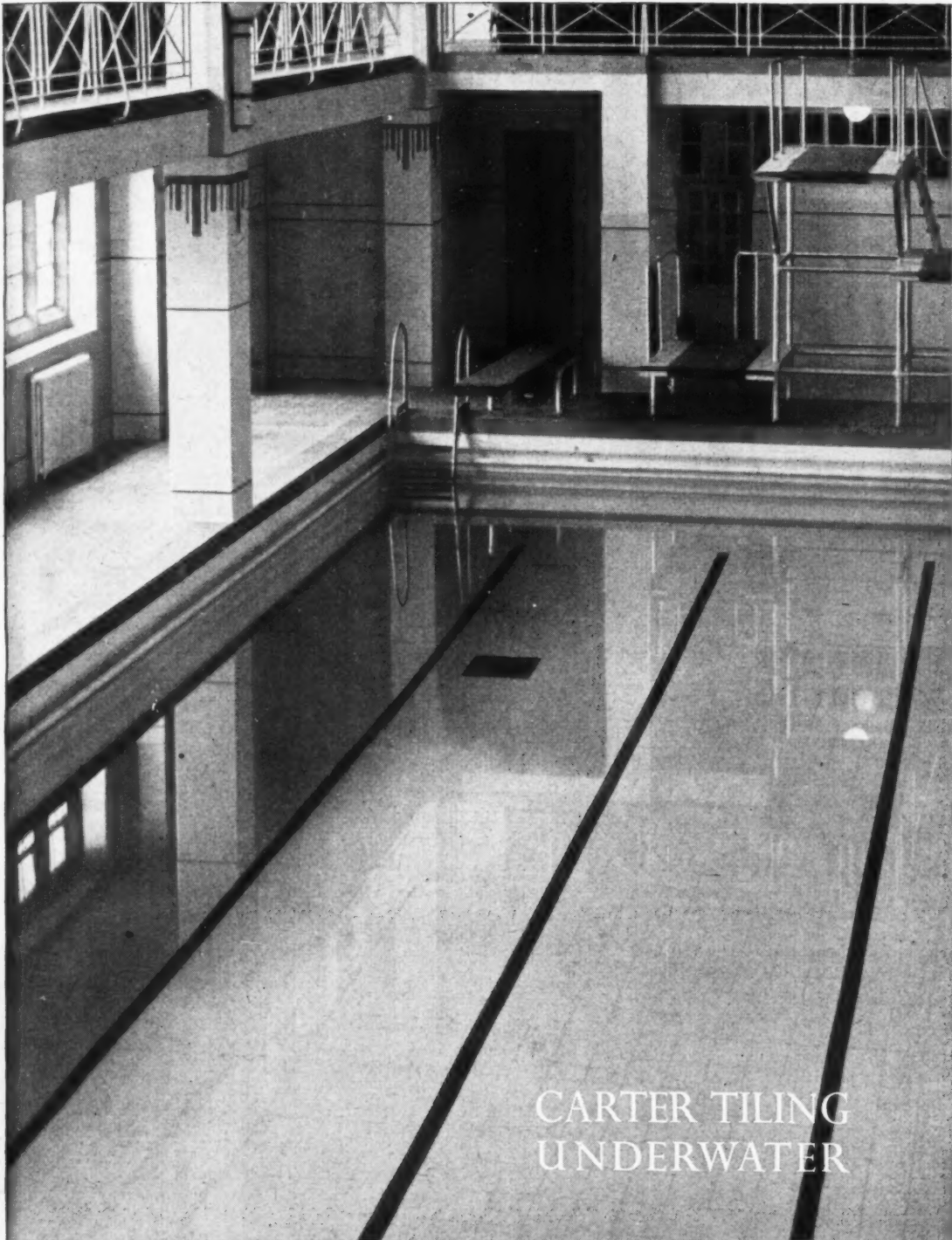


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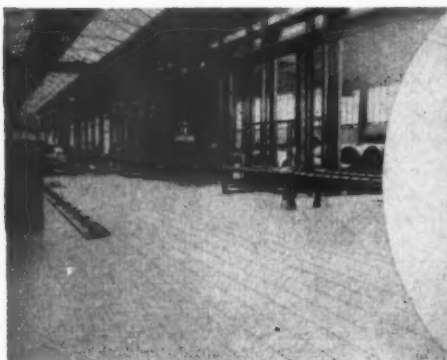
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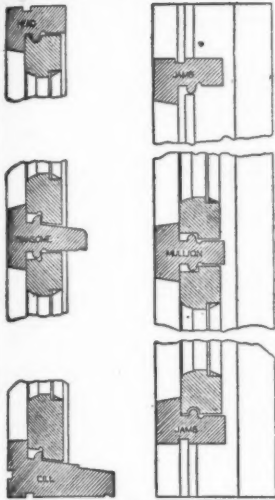
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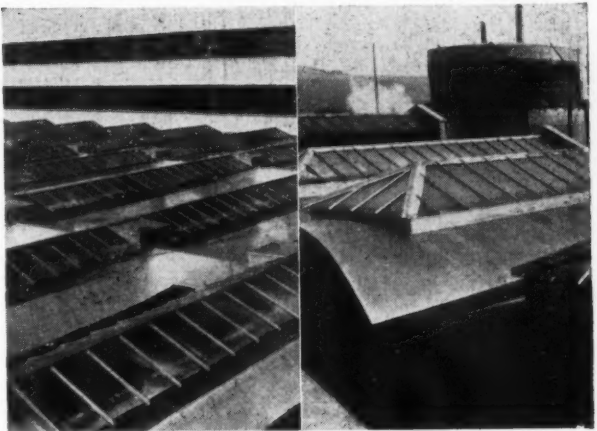
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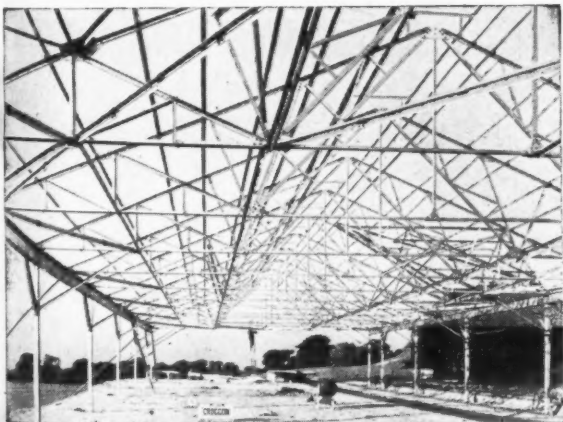
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Replies to Box Numbers should be addressed to "The Architects' Journal," at the address given above.

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BOROUGH OF WIDNES.

BOROUGH ARCHITECT'S DEPARTMENT.
Applications are invited for the appointment of an **ARCHITECTURAL ASSISTANT**, at a salary in accordance with A.P.T., Grade IV, of the National Scale of Salaries, commencing at the minimum of the grade.

Applicants must be Student R.I.B.A., and have worked in an architectural office for at least two years subsequent to having passed the Intermediate Examination.

The appointment will be subject to the National Scheme of Conditions of Service as adopted by the Council, and to the Local Government Superannuation Act, October, 1937, and to the successful candidate passing a medical examination.

Applications, stating full particulars of age, experience and qualifications, etc., together with the names and addresses of two referees, to be sent to the Borough Architect, Brendan House, Widnes Road, Widnes, not later than Friday, 8th June, 1951.

Canvassing, directly or indirectly, will disqualify.

FRANK HOWARTH,

Town Clerk.

Town Hall, Widnes.

7th May, 1951.

2563

BOURNEMOUTH MUNICIPAL COLLEGE OF ART.

Principal: **FREDERIC E. COUNTRY**, Arch. Dept.
Required to begin duties, if possible, in September, an **ASSISTANT TEACHER** of Architectural subjects. The successful candidate must be an Associate R.I.B.A., and need not have previous teaching experience. Salary: Burnham Scale A (with industrial and/or teaching increments and with graduate and training additions). Forms and particulars from the Principal. 2616

LONDON COUNTY COUNCIL.

Applications are invited for positions of **ARCHITECTURAL ASSISTANT** (salaries up to £500 basic a year) in the Housing and Valuation Department. Commencing salaries will be determined according to qualifications and experience. Engagement will be subject to the Local Government Superannuation Acts, and successful candidates will be eligible for consideration for appointment to the permanent staff on the occurrence of vacancies.

All rates of pay up to £600 a year (basic) are at present subject to an addition of 10 per cent.

Successful candidates will be required to assist in the design, layout and preparation of working drawings for housing schemes, cottages and multi-storey flats, and will be employed in the Housing Architect's Division.

Forms of application may be obtained from the Director of Housing, The County Hall, Westminster Bridge, S.E.1 (stamped addressed envelope required and quote reference A.A.1). Canvassing disqualifies. (816) 2615

COUNTY COUNCIL OF RENFREW.

Applications are invited for the following appointments in the County Engineer's Department:

(a) **SENIOR ARCHITECTURAL ASSISTANT.** Salary scale, A.P.T. V-VI (£570-£710 p.a.).

(b) **INTERMEDIATE ARCHITECTURAL ASSISTANT.** Salary scale, A.P.T. I-II-III (£430-£535 p.a.).

Applicants should have wide experience of Local Authority Housing and Public Buildings. Preference will be given to members of the R.I.B.A. and the R.I.A.S.

The appointments are subject to the provisions of the Local Government Superannuation (Scotland) Act, 1937. Applications, stating age, qualifications and experience, together with copies of two recent testimonials, should be lodged within 10 days with the County Clerk, County Buildings, Paisley.

15th May, 1951.

2628

COUNTY BOROUGH OF SOUTHAMPTON.

BOROUGH ARCHITECT'S DEPARTMENT.

Applications are invited for the following positions:

(a) **SENIOR QUANTITY SURVEYOR.** Grade VII (£685-£760).

(b) **ASSISTANT QUANTITY SURVEYOR.** Grade V (£570-£620).

(c) **JUNIOR QUANTITY SURVEYING ASSISTANT.** General Division (£150-£425).

(d) **ASSISTANT PLANNING OFFICER.** Grade VI (£645-£710).

(e) **JUNIOR PLANNING ASSISTANT.** General Division (£150-£425).

(f) **ARCHITECTURAL ASSISTANT.** Grade I (£440-£485).

(g) **JUNIOR ARCHITECTURAL ASSISTANTS.** General Division (£150-£425).

Applications, on forms obtainable from L. Berger, Dip.Arch., A.R.I.B.A., Borough Architect, Civic Centre, Southampton, should be returned not later than 11th June, 1951.

2691

COUNTY BOROUGH OF GREAT YARMOUTH.

APPOINTMENT OF JUNIOR ASSISTANT ARCHITECT.

Applications are invited for the appointment of Junior Assistant Architect in the Borough Engineer's Department, for housing and general work, at a salary in accordance with A.P.T., Grade II (£420-£465). Candidates must have had a sound training in an architect's office, but not necessarily with Municipal experience. The appointment will be terminable by one month's notice on either side, subject to the provisions of the Local Government Superannuation Act, 1937, and to the passing of a medical examination.

Applications, stating age, qualifications and experience, together with the names of three persons to whom reference may be made, should be enclosed in an envelope endorsed "Junior Assistant Architect," and must be received by me not later than Friday, 8th June, 1951. Canvassing will be deemed a disqualification, and candidates must disclose in writing any relationship to any member of, or holder of, any senior office under the Council. Candidates who fail to do so will be disqualified and, if appointed, will be liable to dismissal without notice.

FARRA CONWAY,

Town Clerk.

Town Hall, Great Yarmouth.

17th May, 1951.

2656

CITY OF COVENTRY.
ARCHITECTURAL AND PLANNING DEPARTMENT.

In view of considerable expansion in the Housing and Schools Programme in Coventry, additional architectural staff is required, and applications are invited from Associate Members of the Royal Institute of British Architects.

Vacancies exist on the establishment on Grades A.P.T. V, A.P.T. VI, and A.P.T. VII, and applications for these proposed appointments should be made on the forms available from the undersigned, to be returned not later than 18th June, 1951.

All applicants are expected to belong to an appropriate organisation as referred to in Paragraph 44 of the "Charter."

D. E. E. GIBSON,

City Architect and Planning Officer.

1a, Warwick Row, Coventry.

22nd May, 1951.

2701

CITY AND COUNTY OF NEWCASTLE-UPON-TYNE.

CITY ARCHITECT'S DEPARTMENT.

Applications are invited for the undermentioned appointments in two newly-formed subsections of the City Architect's Department, under the control of the Chief Assistant Architect in charge of Housing, to deal with:—

(a) The immediate implementation of a large programme of normal housing;

(b) The development of a New Neighbourhood Unit comprising some 3,000-3,500 multi-storey flats and, in addition, extensive central area flat development.

(a) NORMAL HOUSING.

TWO SENIOR ASSISTANT ARCHITECTS.

A.P.T. VII (£635-£710).

ONE SENIOR ASSISTANT ARCHITECT.

A.P.T. VI (£595-£660).

ONE SENIOR ASSISTANT ARCHITECT.

A.P.T. V (£520-£570).

ONE ASSISTANT ARCHITECT. A.P.T. IV

(£480-£525).

ONE ASSISTANT ARCHITECT. A.P.T. III

(£450-£495).

(b) MULTI-STORY FLATS.

ONE PRINCIPAL ASSISTANT ARCHITECT.

A.P.T. IX (£750-£900).

ONE SENIOR ASSISTANT ARCHITECT.

A.P.T. VIII (£685-£760).

ONE SENIOR ASSISTANT ARCHITECT.

A.P.T. VII (£635-£710).

TWO SENIOR ASSISTANT ARCHITECTS.

A.P.T. VI (£595-£660).

ONE ASSISTANT ARCHITECT. A.P.T. III

(£450-£495).

Applicants for appointments in Grades V to IX should be Associates, R.I.B.A., and training at a recognised School of Architecture will be considered an advantage. Applicants for appointments in Grades III and IV should at least have passed the Intermediate R.I.B.A. Examination.

All applicants should possess a contemporary outlook and considerable aptitude in matters of architectural design, together with a vigorous approach to problems of construction. Previous experience of housing and/or flat schemes is desirable for all senior appointments and essential for the post of Principal Assistant Architect, A.P.T. IX (multi-storey flats).

The appointments will be subject to the National Conditions of Service as adopted by the City Council, to the provisions of the Local Government Superannuation Act, 1937, and to one month's notice on either side. The successful candidates will be required to pass a medical examination.

Applications, stating position applied for, age, particulars of training, qualifications, experience, present and past appointments, together with copies of two recent testimonials and the names and addresses of two persons to whom reference may be made, should be addressed to George Kenyon, A.R.I.B.A., A.M.T.P.I., City Architect, 18, Cloth Market, Newcastle-upon-Tyne, 1, not later than 7th June, 1951.

JOHN ATKINSON,

Town Clerk.

Town Hall, Newcastle-upon-Tyne, 1.

11th May, 1951.

2604

CAMBRIDGESHIRE COUNTY COUNCIL.

COUNTY PLANNING DEPARTMENT.

MODEL MAKER.

Applications are invited for the appointment of an experienced Model Maker, on Grade A.P.T. I, of the National Joint Council's Scales (salary £440 to £485 per annum).

The successful applicant will be responsible for preparing all types of models for architectural and Town Planning purposes, and for the preparation of exhibition material.

The appointment is subject to the provisions of the Local Government Superannuation Act, 1937, the Council's Conditions of Service, and to the successful candidate satisfactorily passing a medical examination.

Applications, stating age, past and present appointments (with dates), experience, qualifications, present salary, and the names of two referees, should be received by the undersigned not later than 11th June, 1951. Photographic examples of the applicant's own work should if possible accompany the application.

CHARLES PHYTHIAN,

Clerk of the County Council.
Shire Hall, Castle Hill, Cambridge. 2641

BOROUGH OF BLYTH.

BOROUGH ENGINEER'S DEPARTMENT.

Applications are invited for the appointment of a **JUNIOR ARCHITECTURAL ASSISTANT**. The salary for the appointment will be fixed within Grade II, £470, rising to £515, or Grade III, £500, rising to £545, of the A.P.T. Division, according to experience and qualifications.

Candidates should have passed the R.I.B.A. Intermediate Examination or its equivalent.

The appointment is subject to the Local Government Superannuation Act, 1937, one month's notice on either side, and the successful candidate passing a medical examination.

Applications, endorsed "Junior Architectural Assistant," stating age, qualifications and experience, must be delivered to the undersigned, with copies of three recent testimonials, not later than 18th June, 1951.

Canvassing will disqualify, and applicants should disclose relationship with any member or official of the Council.

EDWIN W. CARTER,

Town Clerk.

"Dinsdale," Marine Terrace, Blyth,

Northumberland. 2660

LONDON COUNTY COUNCIL.

ARCHITECT'S DEPARTMENT.

Applications are invited for positions of **ARCHITECT**, Grade III (£550-£700) and **TECHNICAL ASSISTANT** (up to £580) for architectural work on new housing, schools and other public buildings. The positions are superannuable, and the above rates are subject to an addition of 10 per cent. on the first £600 and 7½ per cent. on any remainders. Application forms from the Architect, The County Hall, S.E.1, enclosing stamped and addressed foolscap envelope and quoting AR/EK/A. Canvassing disqualifies. (514) 3914

MINISTRY OF WORKS.

There are vacancies in the Chief Architect's Division for **ARCHITECTURAL ASSISTANTS** and **LEADING ARCHITECTURAL ASSISTANTS**, with recognised training and fair experience. Successful candidates will be employed in London and elsewhere on a wide variety of Public Buildings, including Atomic Energy and other Research Establishments, Telephone Exchanges and Housing.

Salary: Architectural Assistants, £340-£575 per annum; Leading Architectural Assistants, £570-£675 per annum. Starting pay will be assessed according to age, qualifications and experience. These rates are for London; a small deduction is made in the Provinces.

Although these are not established posts, some of them have long term possibilities, and competitions are held periodically to fill established vacancies.

Apply in writing, stating age, nationality, full details of experience, and locality preferred, to Chief Architect, Ministry of Works, Abell House, John Islip Street, London, S.W.1, quoting reference WG10/BC. 2217

BOROUGH OF SUTTON AND CHEAM.

APPOINTMENT OF ARCHITECTURAL ASSISTANT.

Applications are invited for the appointment on the staff of the Borough Engineer and Surveyor of an Architectural Assistant, Grade VI, of the A.P.T. Division of the National Scale of Salaries (£645 per annum, rising to £710 per annum), plus "London weighting" of £30 per annum. Applicants should be suitably qualified, with good general experience in housing and public buildings. The appointment, which is terminable by one month's notice in writing on either side, is on the permanent staff of the Corporation, and is subject to the provisions of the Local Government Superannuation Act, 1937. The successful candidate will be required to pass a medical examination.

Forms of application may be obtained from Mr. N. H. Michell, A.M.I.C.E., M.I.Mun.E., Borough Engineer and Surveyor, to whom they should be returned not later than Wednesday, 6th June, 1951, endorsed "Architectural Assistant."

Canvassing, directly or indirectly, will be a disqualification.

A. PRIESTLEY,

Town Clerk.

Municipal Offices, Sutton, Surrey.

May, 1951.

2605

EAST RIDING OF YORKSHIRE COUNTY COUNCIL.

COUNTY PLANNING DEPARTMENT.

Applications are invited for the appointment of a **SENIOR PLANNING ASSISTANT, A.P.T.**, Grades V-VI. The commencing salary will be fixed according to experience and qualifications. Candidates must be Associate Members of the Town Planning Institute or hold equivalent qualifications. The Officer will be required to provide a car, and travelling allowance will be paid in accordance with the scale adopted by the County Council.

Appointments will be to the permanent staff and are subject to the National Joint Council's conditions of service as adopted by the County Council. Appointments will be terminable by one month's notice on either side, and will be subject to the Local Government Superannuation Act, 1937. Selected candidates will be required to pass a medical examination to the satisfaction of the County Medical Officer of Health. Applications, stating age, qualifications and experience, should be received by the undersigned not later than Saturday, the 23rd June, 1951, and should be accompanied by copies of two recent testimonials. (Canvassing, either directly or indirectly, will be a disqualification, and relationship to any member or senior officer of the Council must be disclosed.)

T. STEPHENSON,

Clerk of the Council.

County Hall, Beverley.

2672

LIVERPOOL REGIONAL HOSPITAL BOARD.

Applications are invited for the permanent pensionable appointment of **ASSISTANT QUANTITY SURVEYOR**, in the Regional Architect's Department (Quantity Surveyor's Section), situated at 88, Church Street, Liverpool, 1.

Applicants should preferably be Corporate Members of the Royal Institute of Chartered Surveyors, having passed the Final Examination in the Quantities Sub-Division, and should have had experience in "taking-off" and settling Contractor's Final Accounts.

The work to be undertaken will include the preparation of Bills of Quantities for work carried out by the Department, in addition to other duties concerned with Private Architects and Quantity Surveyors.

Salary £635, rising by annual increments of £25 to a maximum of £710 per annum, in accordance with A.P.T., Grade VII. (The salary scales are at present under review.)

Applications, stating age, education, qualifications, experience, present and previous appointments, salary, together with the names and addresses of three referees, should be sent to the undersigned at 19, James Street, Liverpool, 2, not later than 18th June, 1951.

VINCENT COLLINGS,

Secretary to the Board.

2667

LINDSEY COUNTY COUNCIL.

COUNTY ARCHITECT'S DEPARTMENT.

Vacancy on the permanent staff for—
(a) **JUNIOR QUANTITY SURVEYOR, A.P.T.**, I, £440 to £485. Applicants should have experience in abstracting and billing and able to take off for small schemes.

Vacancies on the temporary staff:—
(b) **TWO ASSISTANT ARCHITECTS**, for the duration of 12 months. Applicants need not have previous Local Government experience, but preference given to persons having successfully completed a full time course at a School of Architecture, Grade Va, £600 to £670, or Grade VI if Associate R.I.B.A., £645 to £760.

N.J.C. Conditions of Service. Canvassing will disqualify. Relationship to a member or senior officer of the Council is to be disclosed in writing with application.

Applications, stating age, qualifications and experience, with names of persons to whom reference can be made, to be sent to the undersigned not later than Tuesday, the 12th June.

A. RONALD CLARK, A.R.I.B.A.,

A.M.T.P.I. County Architect.

County Offices, Lincoln.

2692

COUNCIL OF THE COUNTY OF ABERDEEN.

COUNTY ARCHITECT'S DEPARTMENT.

Applications are invited for appointment as **ASSISTANT QUANTITY SURVEYOR**. The salary scale applicable to the appointment is £520, rising by annual increments to £660 per annum.

Candidates should have passed the Intermediate Examination of the Royal Institute of Chartered Surveyors (Quantities Division).

The appointment is subject to the Local Government Superannuation (Scotland) Act, 1937, and the successful candidate will require to pass a medical examination.

Conditions of appointment and forms of application are obtainable from the undersigned, and should be returned completed not later than Monday, 4th June, 1951, together with two recent testimonials and the names of two referees.

The County Council will be prepared to make housing accommodation available to the successful candidate within a reasonable time, if required. Canvassing of members of the Council, directly or indirectly, in connection with the appointment shall disqualify the candidate.

CHAS. HORNAL,

County Clerk.

County Buildings, 22, Union Terrace,

Aberdeen.

16th May, 1951.

2657

COUNTY BOROUGH OF BURTON-UPON-TRENT.

Applications are invited for the following appointments in the Architectural Office of the Borough Surveyor:—

(a) **ASSISTANT ARCHITECT, Grade V, A.P.T.** Division.

(b) **ASSISTANT ARCHITECT, Grade VI, A.P.T. Division.**

Preference will be given to candidates who have passed the Final Examination or part of the Final Examination of the Royal Institute of British Architects.

The appointments will be subject to the provisions of the Local Government Superannuation Act, 1937, to determination by one month's notice on either side, and to the successful candidates passing a medical examination by the Medical Officer of Health.

A Corporation house will be made available if required.

Applications, stating the appointment for which application is made, age, qualifications and experience, and accompanied by copies of three recent testimonials, must be delivered in sealed envelopes to the Borough Surveyor, Town Hall, Burton-upon-Trent, not later than 10 a.m. on Monday, 11th June, 1951.

H. BAILEY CHAPMAN,

Town Clerk.

Town Hall, Burton-upon-Trent.

24th May, 1951.

SOUTH CAMBRIDGESHIRE RURAL DISTRICT COUNCIL.

APPOINTMENT OF ARCHITECTURAL ASSISTANT.

Applications are invited for the appointment of Architectural Assistant in the department of the Council's Architect, Salary within Grades III to V, A.P.T. Division of the National Scales (£500-£620), according to qualifications and experience.

Architectural experience in housing is necessary, and candidates must be capable of surveying, levelling, and preparing detailed drawings and specifications.

The appointment will be subject to the provisions of the Local Government Superannuation Act, 1937, the National Conditions of Service, to a satisfactory medical examination, and to one month's notice in writing on either side.

Applications, stating age, present salary, experience and qualifications, together with copies of two recent testimonials, should reach the undersigned not later than the first post on Tuesday, the 12th June, 1951.

Housing accommodation in the rural district may be provided for the successful candidate in due course if required.

Canvassing, directly or indirectly, will disqualify.

B. G. CRAFT,

Clerk to the Council.

County Hall, Hobson Street, Cambridge.

2698

AMENDE.

FULHAM BOROUGH COUNCIL.

SENIOR ASSISTANT ARCHITECT.

Applications are invited for this appointment in the Architectural Section of the Housing and Public Buildings Department.

Salary: A.P.T., Grade VI (£625 × £20 (2) × £25 (1))—£690 per annum, including London weightings.

Applicants should be Registered Architects experienced in designing and dealing with large contracts through all stages. The successful applicant will be employed in a senior capacity in connection with the planning, design and execution of large schemes of flats and public buildings. Lack of previous experience in a Municipal office will not debar applicants from consideration.

Applications on forms obtainable from me: closing date 18th June, 1951.

CYRIL F. THATCHER,

Town Clerk.

Town Hall, Fulham, S.W.6.

2699

HAMPSHIRE COUNTY COUNCIL.

Applications are invited for the appointment of a **TECHNICAL ASSISTANT** on Grade III of the National Scales (£500-£545), to work in the North-East Area Office of the County Planning Department at Basingstoke. Candidates should have passed the Intermediate Examination of the Town Planning Institute or of a related professional body, and have had experience in the Planning Department of a Local Planning Authority. In the event of an applicant being appointed who does not hold the requisite qualification, the appointment will be made at a suitable point in Grade I-II of the National Scales, pending the passing of the requisite examination. The appointment is pensionable and will be subject to a satisfactory medical report.

Officers using their own cars when travelling on County Council duties will receive travelling allowances on the County Scale for the time being in force.

In approved cases, the County Council are prepared to assist newly appointed staff to meet removal expenses.

No form of application is issued, but applications, stating age, education, qualification and experience, together with a copy of one testimonial and the names and addresses of two persons to whom reference may be made, should be sent to the County Planning Officer, Litton Lodge, Clifton Road, Winchester, not later than the 15th June, 1951.

G. A. WHEATLEY,

Clerk of the County Council.

The Castle, Winchester.

22nd May, 1951.

2700

CITY OF BRADFORD. CITY ENGINEER AND SURVEYOR'S DEPARTMENT.

Applications are invited for the appointment of **SENIOR ASSISTANT ARCHITECT** (Post No. 156), at a salary in accordance with Grade A.P.T., VIII, of the National Scales, i.e., £735-£810 per annum.

The department has a large housing programme in hand and the work involved in the design and construction of housing estates, houses, flats, shops, etc., as well as the planning problems associated with central area redevelopment, offer many opportunities for a well qualified Assistant Architect with a sound knowledge of contemporary design and construction.

The appointment is subject to the Local Government Superannuation Act, 1937, including medical examination. Application must be made to the City Engineer and Surveyor for form of application (quoting post No.), to be returned together with details of experience and not more than three testimonials, to the undersigned, not later than 10 days after the insertion of this advertisement. Canvassing will disqualify.

W. H. LEATHEM,

Town Clerk.

Town Hall, Bradford.

2702

SUDAN GOVERNMENT.

The Public Works Department requires a **DISTRICT ENGINEER**, aged 26 to 34, for service in the Sudan. The duties consist of the organisation and control of the construction and maintenance of buildings, roads, and other works.

Candidates should be Corporate Members of the Institution of Civil Engineers or hold qualifications exempting them from Parts A and B of this Institution's Associate Membership Examination, or be Associates of the Royal Institute of British Architects.

Appointment will be either on Long Term Contract for 12 years, on a salary scale £E617 to £E1,150, with special post-service gratuity; or on Provisional Fund Contract at higher rates of pay and different post-service benefits.

Cost-of-living allowance, varying between £E142 and £E352 per annum, according to the number of dependants, is at present payable, and, subject to certain limitations, an outfit allowance of £E60 is payable on appointment. There is at present no income tax in the Sudan. Free passage on appointment. Further particulars and application form may be obtained on application in writing to: Sudan Agent in London, Wellington House, Buckingham Gate, London, S.W.1. Please mark envelopes "District Engineer 4/19." 2666

HORNCHURCH URBAN DISTRICT COUNCIL.

Applications are invited for the appointment of **CHIEF ARCHITECTURAL ASSISTANT** in the Engineer and Surveyor's Department. Salary in accordance with Grade VIII of the National Scheme, viz., £735, rising by annual increments of £25 to a maximum of £810.

Applicants must be Associates of the Royal Institute of British Architects.

The Council will assist with the provision of housing accommodation for the successful applicant if required.

Full details of the appointment and form of application can be obtained on application to the undersigned, by whom completed applications should be received not later than the 11th June, 1951.

P. L. COX,

Clerk of the Council.

2685

CRANBROOK RURAL DISTRICT COUNCIL.

HOUSING ARCHITECT.

Applications are invited for whole-time ARCHITECT to the Council in connection with the Council's new Housing Schemes. The term of the appointment will, subject to satisfactory service, be for five years, or such longer period as may later be arranged with the Officer.

Applicants must be Associates of the R.I.B.A., and any other qualifications will be an additional recommendation. Previous experience of supervising and superintending the erection of houses under Contract is essential.

Duties of the appointment are:—
(a) To prepare layouts for site development; plans and types of houses, specifications, and bills of quantities.

(b) To supervise the carrying out of the work under Contract for site development and the erection of the houses, and generally to perform the duties of Architect under the Contracts.

(c) To deal with the final accounts arising under the Contracts in conjunction with the Chief Financial Officer.

Officer will not be allowed to engage in private practice as an Architect or to undertake private work.

The salary will be at a rate, according to age, qualifications and experience, of between £750 p.a. and £900 p.a., rising from the commencing salary actually arranged, by five annual increments of £30 p.a. A travelling allowance for the use of the Officer's car on official business will be arranged. The appointment will be determinable by three months' notice on either side.

Housing accommodation will be offered the successful applicant.

Applications, on the form obtainable from the undersigned, and giving the names of three referees, must be received by me, marked "Architect." Application not later than Wednesday, 13th June, 1951.

Canvassing in any form will disqualify.

By Order.

P. G. BANFIELD,

Clerk to the Council.

Council Offices, Cranbrook.

24th May, 1951.

2708

**NORTHAMPTONSHIRE COUNTY COUNCIL.
COUNTY ARCHITECT'S DEPARTMENT.**

Applications are invited for:—
(a) ASSISTANT ARCHITECT. A.P.T., V (£570-£600 p.a.).

Candidates should have passed the Intermediate Examination of the R.I.B.A. and be studying for the Final Examination. Good general experience in design and construction are essential, and a knowledge of school work is desirable.
(b) ASSISTANT ARCHITECT. A.P.T., III (£500-£545 p.a.).

Candidates should have passed the Intermediate Examination of the R.I.B.A. Some practical office experience with a local authority will be regarded as an advantage.

The above posts are established and superannuated. The County Council have adopted the National Scheme of Conditions of Service for Local Government Officers. If a selected candidate is married, is unable to obtain a house in or near Northampton and is compelled to maintain his family elsewhere, his salary will be temporarily increased by 25s. per week, together with such sum as will reimburse him for the cost of a third-class return railway ticket to his family's home once every two months, his circumstances to be reviewed by the appropriate Committee of the Council every three months.

(c) CLERK OF WORKS (TEMPORARY),
Wellingborough (£500 p.a.).

Applications are invited from qualified tradesmen who have had exceptional experience in the building industry, to act as Clerk of Works on the construction of a secondary modern school. The above appointments will be determinable by one month's notice on either side. The successful candidates will be required to pass a medical examination before the appointments are confirmed.

No forms of application will be issued, but candidates should forward particulars of age, education, qualifications and experience, together with a copy of one recent testimonial and the names, status and addresses of two other persons to whom reference can be made, in an envelope endorsed "Staff," to the County Architect, County Hall, Northampton, so as to reach him by Friday, 8th June, 1951.

Canvassing, either directly or indirectly, will be a disqualification.

J. ALAN TURNER,

Clerk of the County Council.

County Hall, Northampton. 2678

**CARDIGANSHIRE COUNTY COUNCIL.
COUNTY ARCHITECT'S DEPARTMENT,
ABERYAYRON.**

Applications are invited for the following appointments:—

(a) QUANTITY SURVEYOR. Salary A.P.T., Grade VIII (£685-£760).

Applicants should be thoroughly experienced in the preparation of estimates, Bills of Quantities, Interim Valuations, and Final Accounts for all types of Buildings, and should be Associates of the R.I.C.S.

The commencing salary will be fixed in accordance with the successful candidate's experience.

(b) ARCHITECTURAL ASSISTANT. Salary A.P.T., Grade III (£450-£495).

Applicants should preferably have passed the Intermediate Examination of the R.I.B.A., and should have good general experience in Architectural work.

The commencing salary will be fixed in accordance with the successful candidate's training and experience.

The above appointments will be subject to one month's notice on either side, the provisions of the Local Government Superannuation Act, 1937, and the passing of a medical examination.

Applications, suitably endorsed, stating age, qualifications, details of experience, previous and present appointments, present salary, and the earliest possible date when available, together with two recent testimonials and the names of two referees, are to be delivered to the undersigned on or before 14th June, 1951.

The Council regret that they are not in a position to assist in finding living accommodation.

J. E. R. CARSON,

Clerk of the County Council.

Cambrian Chambers, Aberystwyth, Cardiganshire. 2676

WELSH REGIONAL HOSPITAL BOARD.

Applications are invited for the following appointments on the permanent staff of the Architect's Division:—

(a) ONE ASSISTANT ARCHITECT. A.P.T., VIII. Salary £685-£760.

(b) TWO ASSISTANT ARCHITECTS. A.P.T., V. Salary £595-£660.

Candidates for both posts must be Registered Architects and have passed the Final Examination of the Royal Institute of British Architects. They should have had a wide experience in planning and construction and in the preparation of working drawings, etc. Experience in the planning and design of important hospital buildings would be an advantage.

The above appointments are superannuable, and are terminable by one month's notice on either side.

Applications, stating present appointment, age, qualifications and experience, with the names of two referees, should be addressed to the Secretary of the Board, Temple of Peace and Health, Cathays Park, Cardiff, to reach him not later than 20th June, 1951. 2675

**METROPOLITAN BOROUGH OF
PADDINGTON.
HOUSING DEPARTMENT: ARCHITECTURAL
SECTION.**

**APPOINTMENT OF ASSISTANTS IN THE
QUANTITY SURVEYING SUB-SECTION.**

Applications are invited for the following permanent appointments, which are subject to the National Joint Council's Service Conditions, the Borough Council's Superannuation Acts, and to one month's notice on either side:—

(a) SURVEYING ASSISTANT (Male) (Clerical Division) (£445-£490 per annum).

(b) ACCOUNTS CLERK (Male) (General Division) (£245 at 21 years of age, rising by age increments to £425 at 30 years of age). The above scales are supplemented by "London weighting" allowance of £20 at ages 21 to 25; £30 at 26 years and over.

Candidates for post (a) should have experience in building work and quantity surveyors' duties generally, and the starting salary will be fixed according to the qualifications and experience of the successful candidate.

Candidates for post (b) should be familiar with accounts for building work; experience in the preliminary stages of working up bills of quantities will be an advantage.

Both posts afford opportunities and experience for candidates studying for Quantity Surveying Professional Examinations.

Candidates for each appointment must furnish information under the following headings:—(i) age; (ii) qualifications; (iii) present and previous appointments, with dates and salaries; (iv) experience, and (v) give the names and addresses of three referees. Covering envelopes must be endorsed with the name of the post for which application is made, and should reach me by 10 a.m. on 11th June, 1951.

Candidates must state, in writing, whether, to their knowledge, they are related to any member or senior officer of the Council.

Canvassing, directly or indirectly, will disqualify.

W. H. BENTLEY,

Town Clerk.

Town Hall, Paddington, W.2. 2673

**COUNTY BOROUGH OF WEST HAM.
BOROUGH ARCHITECT AND PLANNING
OFFICER'S DEPARTMENT.**

Applications are invited for the following post on the permanent establishment of the Department, in connection with the Reconstruction Programme of the Borough:—

SENIOR ASSISTANT ARCHITECT. A.P.T., Grade VIII (£735-£825-£810 p.a., plus London allowance).

Applicants should be A.R.I.B.A., having considerable experience in the Housing and/or Education works, and should be capable of taking complete charge of Contracts.

Application forms (returnable by 18th June, 1951), obtained from Borough Architect and Planning Officer, Thomas E. North, F.R.I.B.A., 70, West Ham Lane, E.15. 2679

**COUNTY BOROUGH OF SOUTH SHIELDS.
APPOINTMENT OF SENIOR ARCHITECTURAL ASSISTANT.**

Applications are invited for the above appointment on the permanent staff of the Borough Engineer's Architectural Section, from persons who have passed the Final Examination of the R.I.B.A.

The salary payable will be Grade VII of the N.J.C. Scales (£635-£710), according to qualifications and experience.

Housing accommodation can be made available to the successful applicant if necessary.

The selected applicant will be required to pass a medical examination, and the appointment will be subject to the provisions of the Local Government (Superannuation) Act, 1937.

Canvassing will be a disqualification, and candidates must disclose any relationship to members or senior officers of the Council.

Application forms to be obtained from the Borough Engineer, Town Hall, South Shields, should be returned not later than Wednesday, 20th June, 1951.

HAROLD AYREY,

Town Clerk.

Town Hall, South Shields. 2714

**BOROUGH OF EALING.
BOROUGH ENGINEER AND SURVEYOR'S
DEPARTMENT.**

**APPOINTMENT OF ARCHITECTURAL
ASSISTANT.**

Applications are invited for the permanent appointment of an Architectural Assistant, in accordance with Grade VI of the A.P.T. Division of the National Joint Council's Scales, at a salary commencing at £645 per annum and rising by annual increments to £710 per annum, plus £30 London weighting.

Applicants must either be Associate Members of the Royal Institute of British Architects or possess a recognised equivalent qualification. Preference will be given to candidates with Municipal experience.

The Council are unable to provide housing accommodation for the successful candidate.

Forms of application, together with conditions of appointment, may be obtained from the Borough Engineer and Surveyor, Town Hall, Ealing, W.5, and must be returned to me not later than the 11th June, 1951.

E. J. COPE-BROWN,

Town Clerk.

Town Hall, Ealing, W.5. 2684

**CITY OF BIRMINGHAM EDUCATION
COMMITTEE.
COLLEGE OF TECHNOLOGY, BIRMINGHAM.
DEPARTMENT OF BUILDING AND CIVIL
ENGINEERING.**

Applications are invited for the following full-time teaching appointments:—

(1) SENIOR LECTURER IN QUANTITY SURVEYING and associated subjects.

Candidates must be Fellows or Associates by examination of the Royal Institute of Chartered Surveyors or possess an equivalent qualification.

The successful applicant may be required to teach all necessary subjects up to the standard of the Final Examinations of the R.I.C.S. and other appropriate Institutions.

(2) SENIOR LECTURER IN BUILDING SCIENCE.

Candidates must have a sound knowledge of physics, chemistry, and mathematics to the standard of an Honours Degree.

Some experience in Applied Science (preferably in Building or Civil Engineering) is also essential.

The successful applicant may be required to teach Building Science up to the standard of Higher National Diplomas and Certificates in Building, and the R.I.B.A. Science Board Report.

The successful candidates will be expected to commence duties on 1st September, 1951.

Salary for Senior Lecturers will be in accordance with the Burnham (Further Education) Scale (men: £1,000-£25-£1,150).

Further particulars and form of application may be obtained from the Registrar, College of Technology, Suffolk Street, Birmingham, 1, on receipt of stamped addressed foolscap envelope. Completed forms should be returned to him not later than two weeks after the appearance of this advertisement.

C. McCRAW,

Clerk to the Governing Body. 2686

NORTH THAMES GAS BOARD.

An ASSISTANT SURVEYOR is required in the Clerk of Works Section, Chief Engineer's Department, Westminster. Applicants, who should have passed the Intermediate Examination of the R.I.C.S. or hold an equivalent qualification, should be capable of setting out industrial buildings and civil engineering products, and of making accurate surveys of works areas and industrial buildings. Ability to drive a car would be an advantage. Starting salary would be not less than £500 p.a.

The appointment is of a permanent nature, and pension arrangements will be discussed with short list candidates.

Applications, giving age, full particulars, and details of previous appointments, should be sent to the Staff Controller, North Thames Gas Board, 30, Kensington Church Street, London, W.8, quoting reference number 995, to reach him not later than the 6th June, 1951. 2674

HIS MAJESTY'S COLONIAL SERVICE.**GOLD COAST.**

Two vacancies exist for TOWN PLANNING OFFICERS in the Town and Country Planning Board, Gold Coast. One officer will be required to plan new towns for the Volta River project. The appointment will be on 3 years' probation for pensionable employment or on contract/gratuity terms in the salary scale £720-£1,300 per annum, the point of entry being determined by war service and experience. A temporary cost-of-living allowance of £114-£150 and an outfit allowance of £30-£60 are also payable.

Free passages are provided once each year for the officer, his wife and up to 3 children under the age of nine years. Quarters, if available, are provided at a rental of £60 to £90 per annum, and leave is granted at the rate of one week for each month of residential service in a tour of 18 to 24 months. Candidates, up to the age of 45, must hold the qualifications of A.M.T.P.I. (or have passed the Final Examination conducted by the Town Planning Joint Examination Board) and A.R.I.B.A., A.M.I.C.E., or A.M.I.Man.E., and have three to five years' experience in a Town Planning Office.

Candidates should write to the Director of Recruitment, Colonial Office, 2, Sanctuary Buildings, Great Smith Street, London, S.W.1, giving brief particulars of age, qualifications and experience, and quote No. 27281/26. 2715

Tenders for Contracts

6 lines or under. 12s. 6d.: each additional line, 2s.

**METROPOLITAN BOROUGH OF
PADDINGTON.****ERECTION OF MULTI-STORY FLATS,
HALFIELD ESTATE, BISHOP'S BRIDGE
ROAD.**

Applications (to be received by the undersigned on or before 14th June, 1951) are invited from Builders and Contractors who wish to be considered by the Borough Council for inclusion in the list of those to be invited to submit a tender for the above works.

The contract embraces the erection and completion of 4 ten-storey and 3 six-storey blocks of flats of reinforced concrete box frame construction.

The seven blocks comprise 386 flats of various types, and the contract will include for the whole of the work to the superstructure of these blocks. In the case of four blocks the piling work and the site clearance and levelling immediately surrounding the blocks will have formed part of a previous contract. The remainder of the site clearance (other than demolition) and levelling,

the site roads and paths, drains, retaining walls and other external services, will be included in the present contract. The area of the site is approximately seven acres.

The Council require to be satisfied that Contractors wishing to tender have had previous experience of substantial works of this nature. If it is intended to let to sub-contract the reinforced concrete work, information will be required as to the intended sub-contractor, together with particulars of works of a similar nature which that sub-contractor has carried out.

Applicants are required to submit similar particulars of their own works, and of the local authorities and/or architects under whose supervision they have carried them out, with details of the nature and scope of the contract in each case and the date when it was completed.

It is anticipated that Bills of Quantities will be available towards the end of June, and applicants should state what permanent site staff and labour force they anticipate will be available for this work should they be appointed as Contractors.

Contractors included in the list of those invited to submit tenders will be required to make a payment of a deposit of £50, on receipt of which the Bills of Quantities will be sent to them. This deposit will be refunded on receipt of a bona fide tender. Instructions with regard to tenders, including the date on which they are to be returned to the Council, will be notified when the documents are issued to those Contractors invited to tender.

The Council do not bind themselves to accept the lowest or any tender.

W. H. BENTLEY,
Town Clerk.

Town Hall, Paddington, W.2.
17th May, 1951. 2642

Partnership

6 lines or under, 12s. 6d.; each additional line, 2s.

PARTNERSHIP.

A.R.I.B.A. A.A. Dipl. (40), having small A. London practice, including connections with public departments, seeks amalgamation or association with larger firm of Architects in order to increase scope of activity. Box 2704.

Architectural Appointments Vacant

4 lines or under, 7s. 6d.; each additional line, 2s.

BIRMINGHAM.—Architects require keen ASSISTANT; qualified or approaching R.I.B.A. Final; commercial and industrial work. Watson, Johnson & Stokes, Victoria Square. 2465

QUALIFIED ARCHITECTURAL ASSISTANT (under 30) required by Architect with large and varied practice, Bloomsbury area. Understanding of contemporary design and construction essential, good draughtsman with office experience. Write, stating age and experience, to Box 2646.

EAST AFRICA.—Vacancies for qualified and unqualified ASSISTANT ARCHITECTS and ARCHITECTURAL ASSISTANTS in Kampala, Jinja and Nairobi. Reply, giving full particulars of training, experience, copies of testimonials, age, marital status, date available, and recent photograph, to H. G. Radford, A.R.I.B.A., & Partners, Head Office, P.O. Box 1500, Kampala, Uganda. 2613

The CO-OPERATIVE WHOLESALE SOCIETY, LTD., invite applications for appointments as SENIOR ARCHITECTURAL ASSISTANTS, on the staff of the Manchester Architect's Department at a commencing salary of £550-£650 per annum, according to experience and ability.

Applicants, who must have had practical office experience, are required to have a sound knowledge of building construction and be able to produce working drawings and details from sketch plans. Experience in the design and planning of modern industrial and commercial buildings will be considered an advantage.

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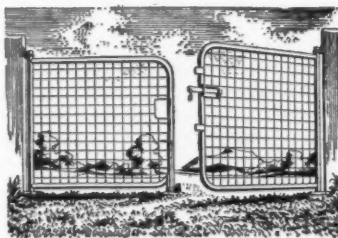
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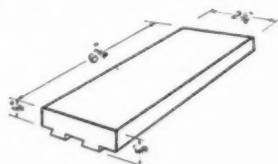
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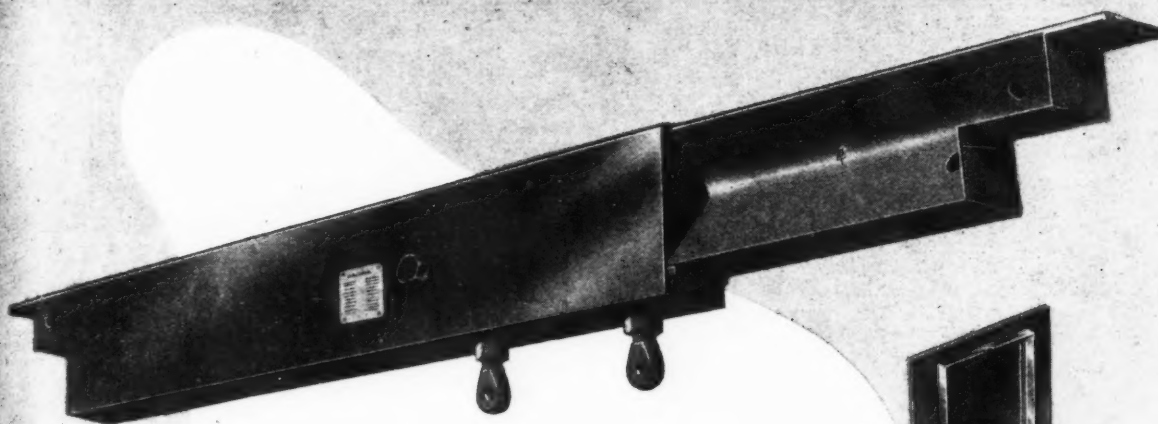


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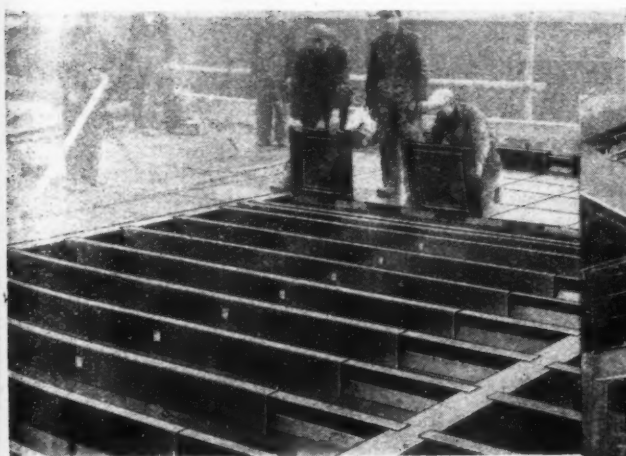
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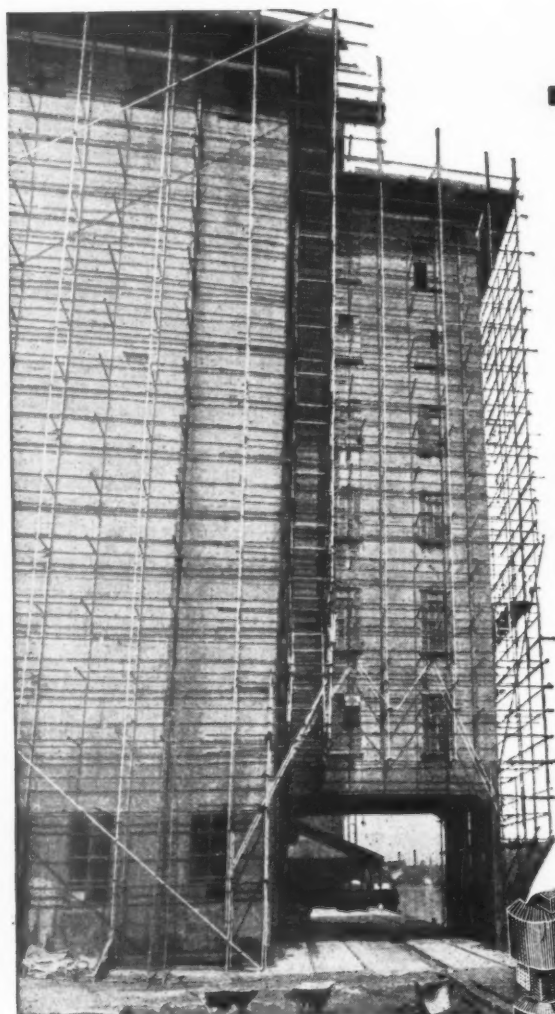


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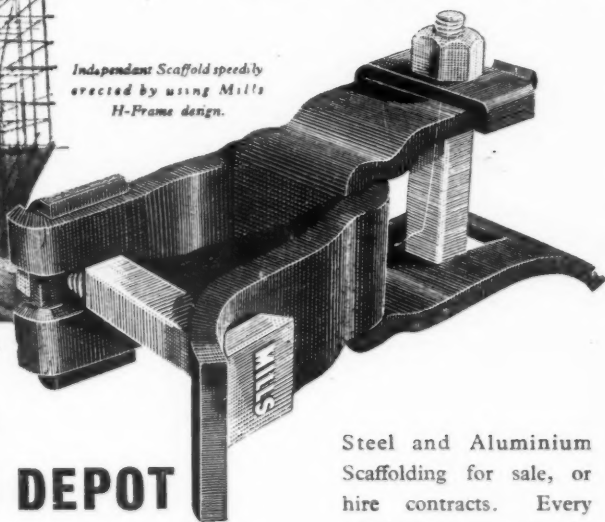


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