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THE ARCHITECTS' JOURNAL

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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.

IGE	Institution of Gas Engineers. 17, Grosvenor Crescent, S.W.1.	Sloane 8266
IHVE	Institution of Heating and Ventilating Engineers. 49, Cadogan Square.	Sloane 1601/3158
IIBDID	Incorporated Institute of British Decorators and Interior Designers. Drayton House, Gordon Street, W.C.1.	Euston 2450
ILA	Institute of Landscape Architects. 12, Gower Street, W.C.1.	Museum 1783
I of Arb	Institute of Arbitrators. 35/37, Hastings House, 10, Norfolk Street, Strand, W.C.2.	Temple Bar 4071
IOB	Institute of Builders. 48, Bedford Square, W.C.1.	Museum 7197/5176
IR	Institute of Refrigeration. Dalmeny House, Monument Street, E.C.3.	Avenue 6851
IRA	Institute of Registered Architects. 47, Victoria Street, S.W.1.	Abbey 6172
ISE	Institution of Structural Engineers. 11, Upper Belgrave Street, S.W.1.	Sloane 7128
IWA	Inland Waterways Association. 14, Great James' Street, W.C.2.	Chancery 7718
LDA	Lead Development Association. Eagle House, Jermyn Street, S.W.1.	Whitehall 7264/4175
LMBA	London Master Builders' Association. 47, Bedford Square, W.C.1.	Museum 3891
LSPC	Lead Sheet and Pipe Council. Eagle House, Jermyn Street, S.W.1.	Whitehall 7264/4175
MARS	Modern Architectural Research Group (English Branch of CIAM). Secretary: Trevor Dannatt, 6, Fitzroy Square, W.1.	Euston 7171
MOA	Ministry of Agriculture and Fisheries. 55, Whitehall, S.W.1.	Whitehall 3400
MOE	Ministry of Education. Curzon Street House, Curzon Street, W.1.	Mayfair 9400
MOH	Ministry of Health. 23, Savile Row, W.1.	Regent 8411
MOHLG	Ministry of Housing and Local Government. Whitehall, S.W.1.	Whitehall 4300
MOLNS	Ministry of Labour and National Service. 8, St. James' Square, S.W.1.	Whitehall 6200
MOS	Ministry of Supply. Shell Mex House, Victoria Embankment, W.C.	Gerrard 6933
MOT	Ministry of Transport. Berkeley Square House, Berkeley Square, W.1.	Mayfair 9494
MOW	Ministry of Works. Lambeth Bridge House, S.E.1.	Reliance 7611
NAMMC	Natural Asphalte Mine-Owners and Manufacturers Council. 94-98, Petty France, S.W.1.	Abbey 1010
NAS	National Association of Shopfitters. 9, Victoria Street, S.W.1.	Abbey 4813
NBR	National Buildings Record. 31, Chester Terrace, Regent's Park, N.W.1.	Welbeck 0619
NCBMP	National Council of Building Material Producers. 10, Storey's Gate, S.W.1.	Abbey 5111
NFBTE	National Federation of Building Trades Employers. 82, New Cavendish Street, W.1.	Langham 4041/4054
NFBTO	National Federation of Building Trades Operatives. Federal House, Cedars Road, Clapham, S.W.4.	Macaulay 4451
NFHS	National Federation of Housing Societies. 13, Suffolk St., S.W.1.	Whitehall 1693
NHBRC	National House Builders Registration Council. 82, New Cavendish Street, W.1.	Langham 4341
NPL	National Physical Laboratory. Head Office, Teddington.	Molesey 1380
NSA	National Sawmilling Association. 14, New Bridge Street, E.C.4.	City 1476
NSAS	National Smoke Abatement Society. Chandos House, Buckingham Gate, S.W.1.	Abbey 1359
NT	National Trust for Places of Historic Interest or Natural Beauty. 42, Queen Anne's Gate, S.W.1.	Whitehall 0211
PEP	Political and Economic Planning. 16, Queen Anne's Gate, S.W.1.	Whitehall 7245
RCA	Reinforced Concrete Association. 94, Petty France, S.W.1.	Abbey 4504
RIAS	Royal Incorporation of Architects in Scotland. 15, Rutland Square, Edinburgh.	Fountainbridge 7631
RIBA	Royal Institute of British Architects. 66, Portland Place, W.1.	Langham 5721
RICS	Royal Institution of Chartered Surveyors. 12, Great George St., S.W.1.	Whitehall 5322/9242
RFAC	Royal Fine Art Commission. 22A, Queen Anne's Gate, S.W.1.	Whitehall 3935
RS	Royal Society. Burlington House, Piccadilly, W.1.	Regent 3335
RSA	Royal Society of Arts. 6, John Adam Street, W.C.2.	Trafalgar 2366
RSI	Royal Sanitary Institute. 90, Buckingham Palace Road, S.W.1.	Sloane 5134
RIB	Rural Industries Bureau. 35, Camp Road, Wimbledon, S.W.19.	Wimbledon 5101
SBPM	Society of British Paint Manufacturers. Grosvenor Gardens House, Grosvenor Gardens, S.W.1.	Victoria 2186
SCR	Society for Cultural Relations with the USSR. 14, Kensington Square, London, W.8.	Western 1571
SE	Society of Engineers. 17, Victoria Street, Westminster, S.W.1.	Abbey 7244
SFMA	School Furniture Manufacturers' Association. 30, Cornhill, London, E.C.3.	Mansion House 3921
SIA	Structural Insulation Association. 32, Queen Anne Street, W.1.	Langham 7616
SNHTPC	Scottish National Housing. Town Planning Council. Hon. Sec., Robert Pollock, Town Clerk, Rutherglen.	
SPAB	Society for the Protection of Ancient Buildings. 55, Great Ormond Street, W.C.1.	Holborn 2646
TCPA	Town and Country Planning Association. 28, King Street, Covent Garden, W.C.2.	Temple Bar 5006
TDA	Timber Development Association. 21, College Hill, E.C.4.	City 4771
TPI	Town Planning Institute. 18, Ashley Place, S.W.1.	Victoria 8815
TTF	Timber Trades Federation. 75, Cannon Street, E.C.4.	City 5051
WDC	War Damage Commission. 6, Carlton House Terrace, S.W.1.	Whitehall 4341
ZDA	Zinc Development Association. Lincoln House, Turl Street, Oxford	Oxford 47988

John Goodger looks far ahead

"If I'm to spend my life supplying windows" reasons John Goodger, Williams & Williams area manager of the Eastern Counties "I'd better know all about them". So, acquiring a derelict stable, he puts in—with his own hands—metal windows, door frames and Aluminex patent glazing and, in doing so, makes himself a lovely home. "If I'm to give proper service in this vast area" he goes on "I must get around faster." His speedometer appears permanently fixed at 60 m.p.h. In short, here's a young man whose life is his job, who thinks further than the day after tomorrow, and who has his own service team of draughtsmen, estimators and fixers as a result. A useful chap to have at your call!

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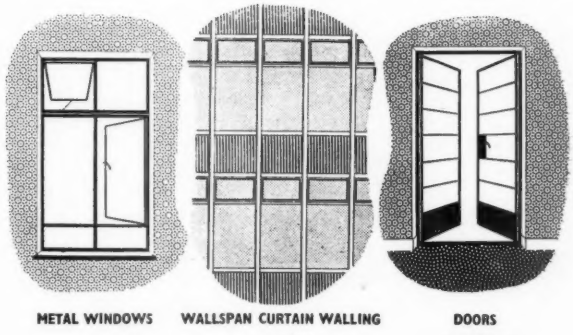
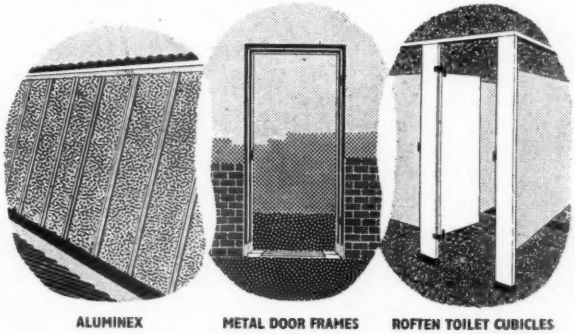


METAL WINDOWS WALLSPAN CURTAIN WALLING DOORS



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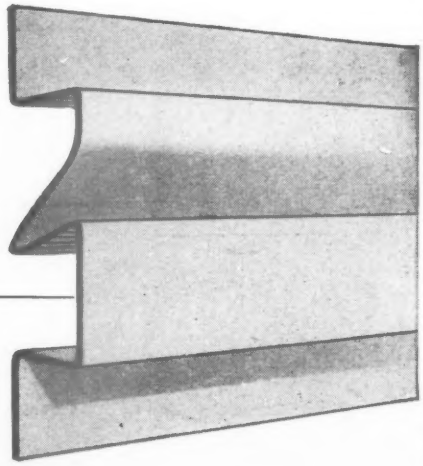

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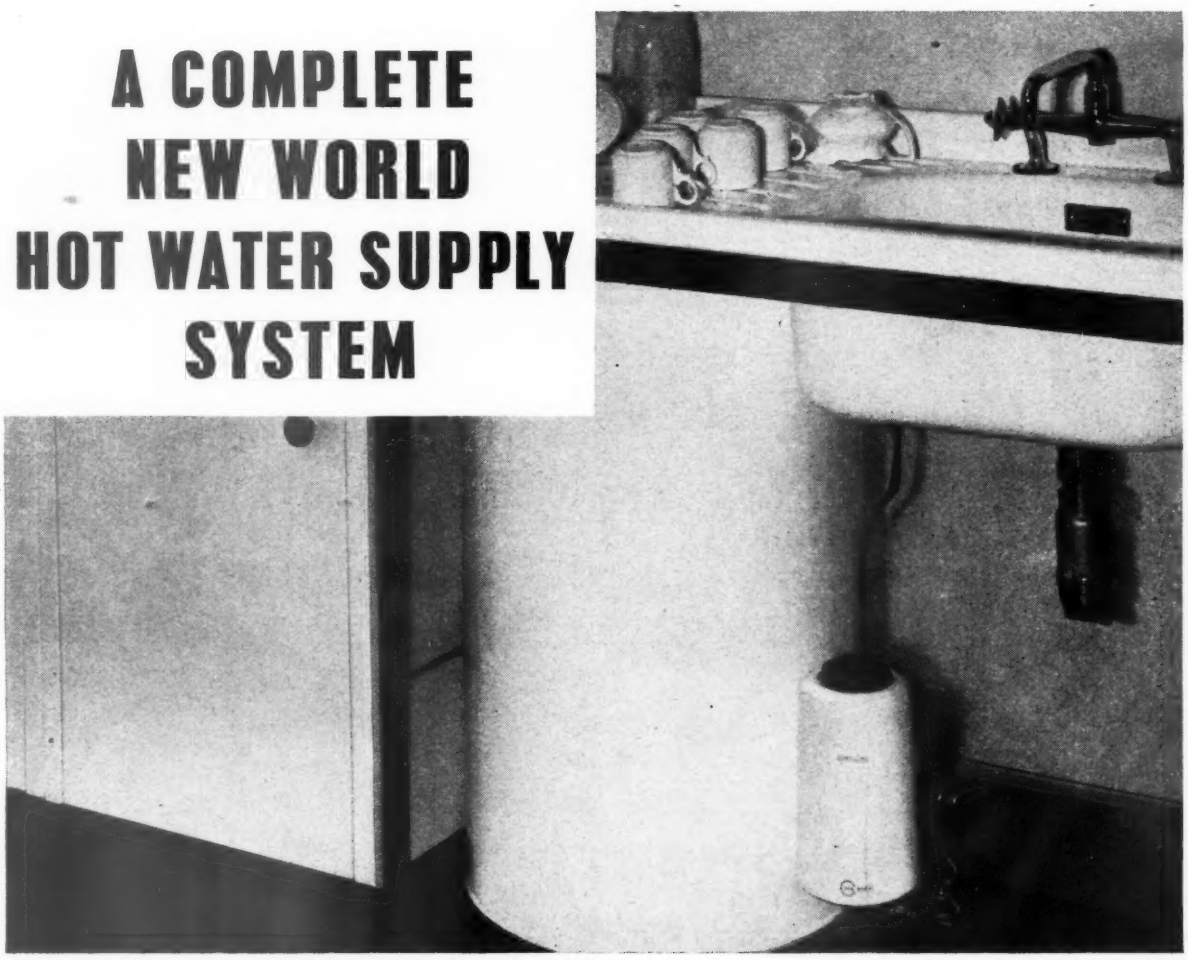

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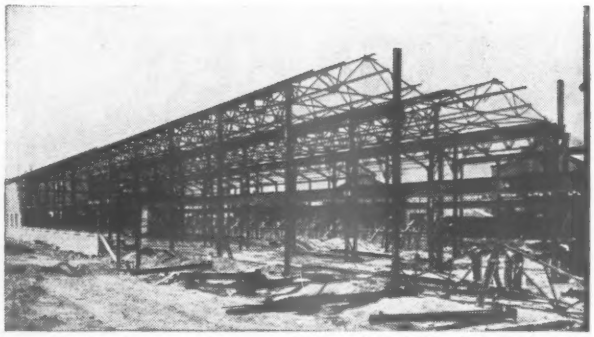
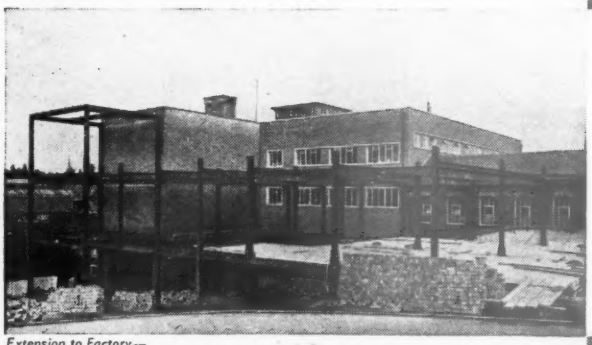


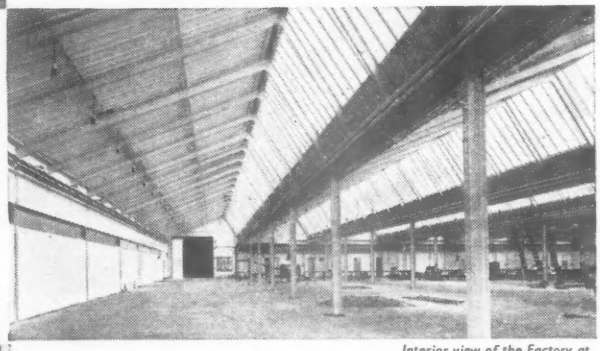
Stores building in course of erection for National Gas & Oil Engines Limited.



Extension to Factory—
Messrs. F. E. Fox & Son Limited, Batley. Biscuit Manufacturers.
Architects: Smith & Curry, Heckmondwike.

Multi-storey

Welded or...



Interior view of the Factory at Barnsley, Messrs. Brook Motors Ltd.

Birlec Ltd., Birmingham. Stores Building.

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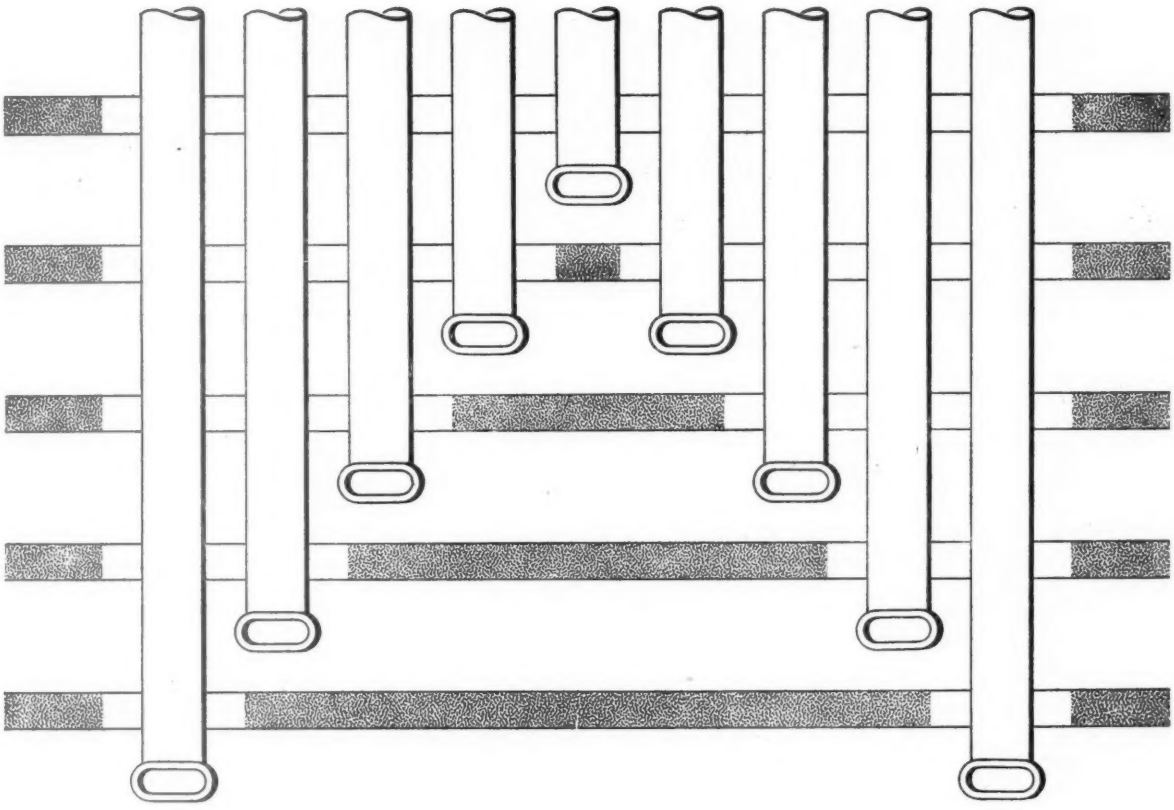

20th CENTURY FLUES

Tall blocks of flats are already an accepted feature of Britain's urban skyline. There will be more of them, since the economics of modern housing allow the authorities little choice. With tall flats come big problems for the designer of heat services, anxious to satisfy authority's demand for economy and the dweller's wish to control his own fuel bill. On the important question of flue design for tall buildings the Gas Industry has accumulated much information and done much research. Architects and builders occupied, or likely to be occupied, with plans for flat blocks over six storeys high are invited to make full and free use of the results of this work, either by personal call at the Area Gas Board or by using the form below.

Heat Service

The Gas Industry will be glad to discuss with you the question of heat services and flues. If you have a specific problem, please write in detail. Alternatively, you can use this coupon. In either case, your inquiry should be addressed **to your Area Gas Board or to the Gas Council, 1 Grosvenor Place, London, S.W.1.**

I/We would like to receive the latest information on flue design.

NAME .....

.....

ADDRESS.....

.....68

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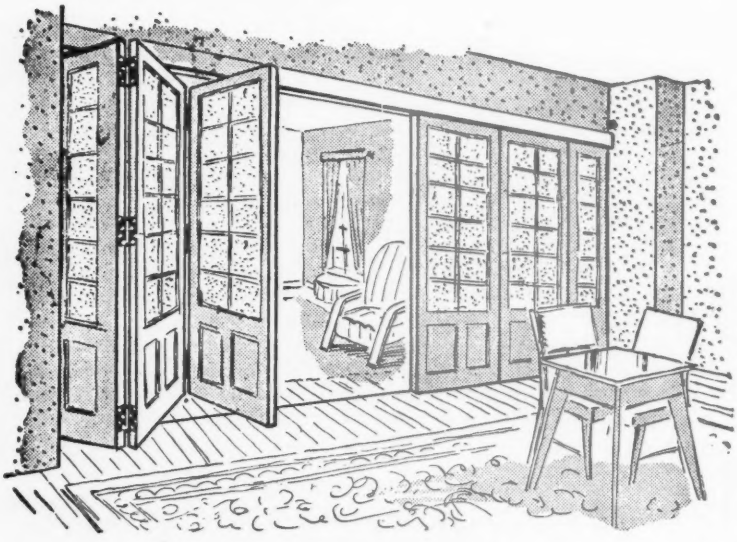
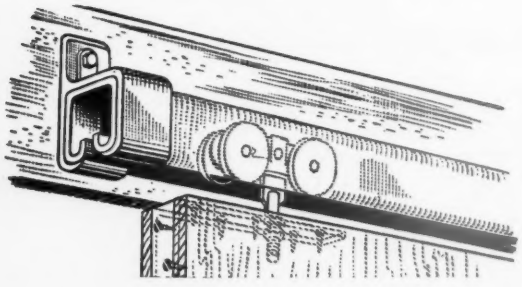
ROUND-THE-CORNER GEAR



CENTRE HUNG FOLDING GEAR



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THE STRAIGHT-SLIDING GEAR is shown on the left and is possibly the most simple of all sliding door gears and can be used on single, double or triple tracks.

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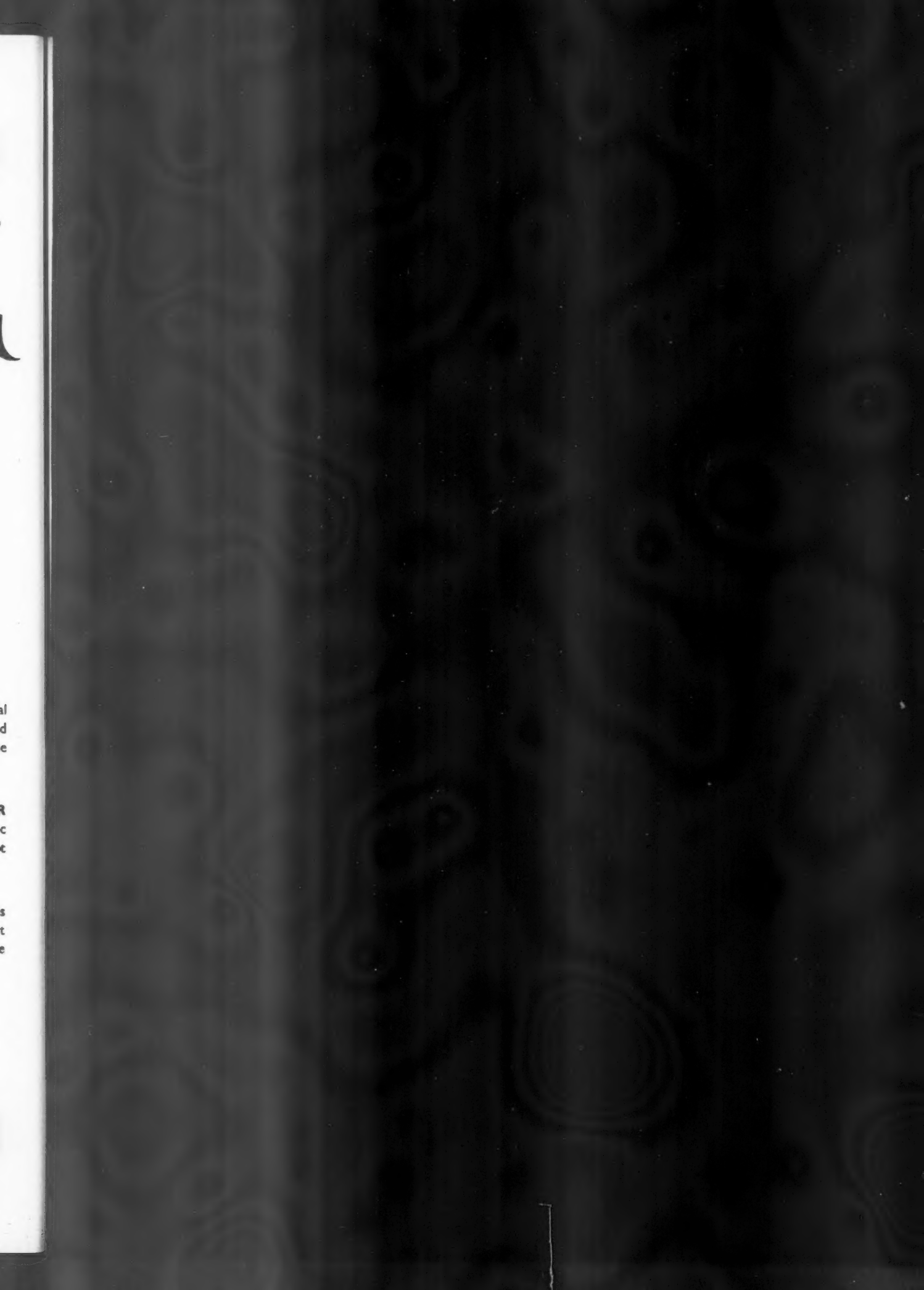


The Glass Age Development Committee

A committee of architects and engineers, convened by Pilkington Brothers Limited, is making proposals for the development of the Soho Area, and a preliminary survey of the project has already been published.

This Glass Age Development Committee consists of:

G. A. Jellicoe, F.R.I.B.A., Edward D. Mills, F.R.I.B.A., Ove Arup & Partners.

THE SOHO PROJECT—2

The three main development proposals are:

i To create a great weather-protected and air-conditioned shopping and office precinct, free of traffic but accessible for goods, private cars, helicopters, and existing public communications.

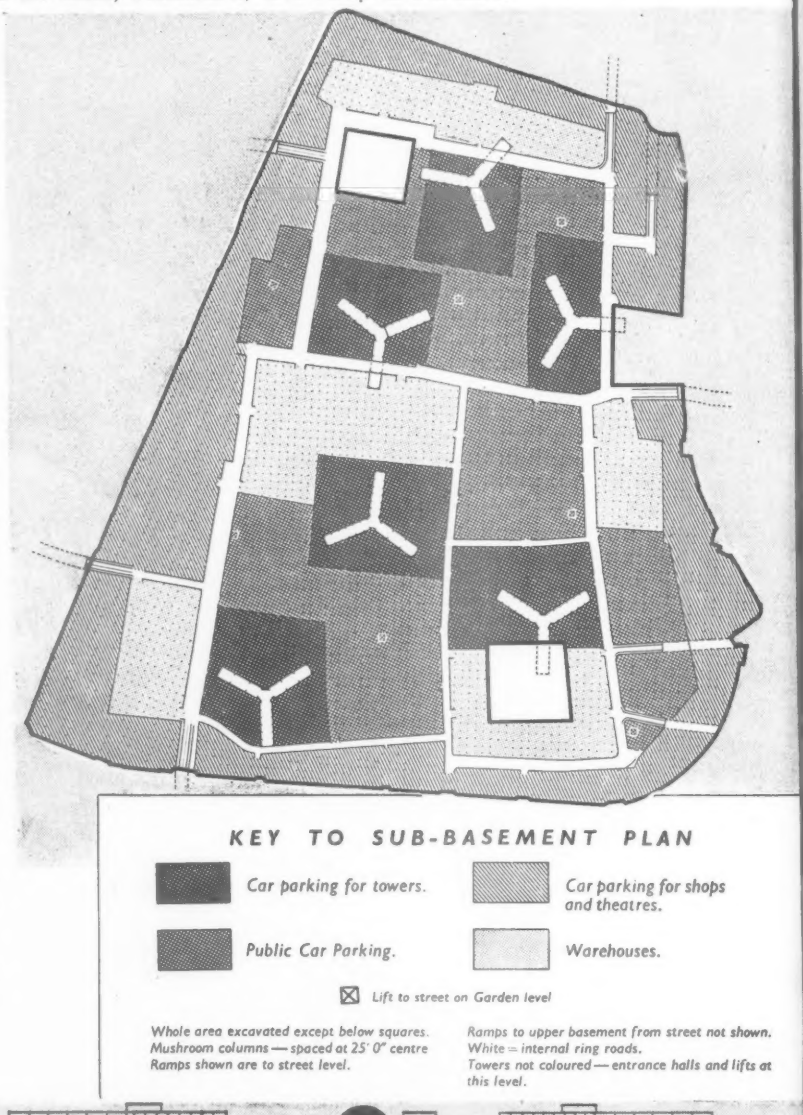
ii To create six 24-storey blocks of good-class residential flats.

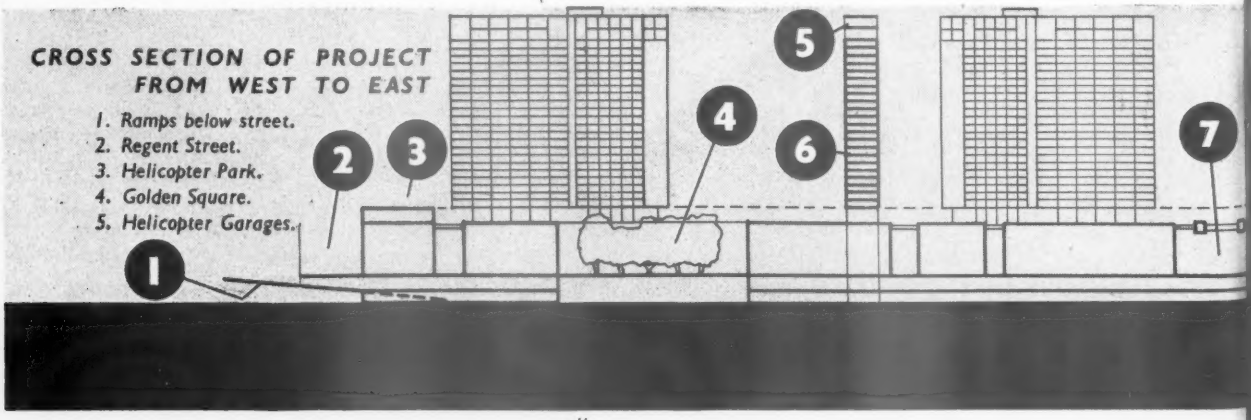
iii To create a spacious open-air entertainment centre, as a supplement to the existing indoor entertainment.

All the proposals made for this project are practical possibilities. The techniques and materials to execute them exist now. Some details of their application are given on these two pages—others will be published in further reports. A preliminary survey has already been published.

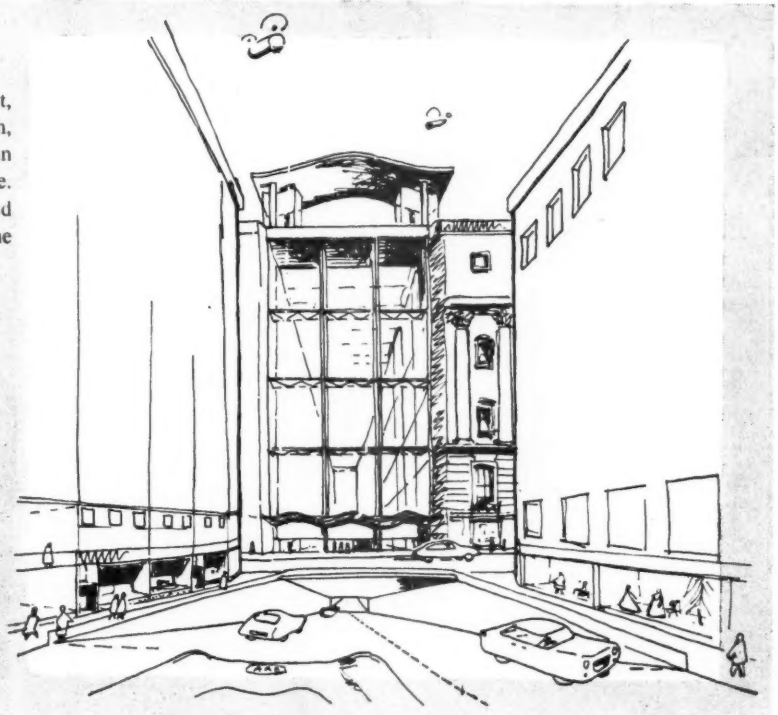
THE SUB-BASEMENT

Below ground floor level there are two basements: the upper for goods traffic and storage; the sub-basement solely for private cars. The two types of traffic are thus separated, and the two basements are approached by tunnels underneath the surrounding traffic roads. The system adopted for the tunnel approaches is normally to stop up the end of an existing road, which works easily enough on the existing gridiron system of roads.



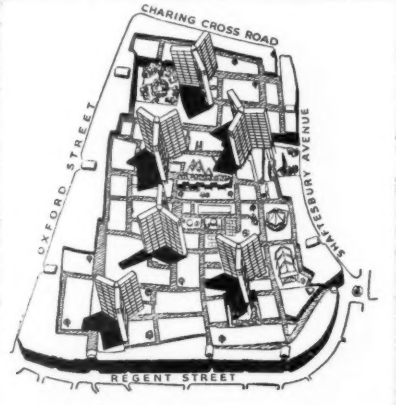


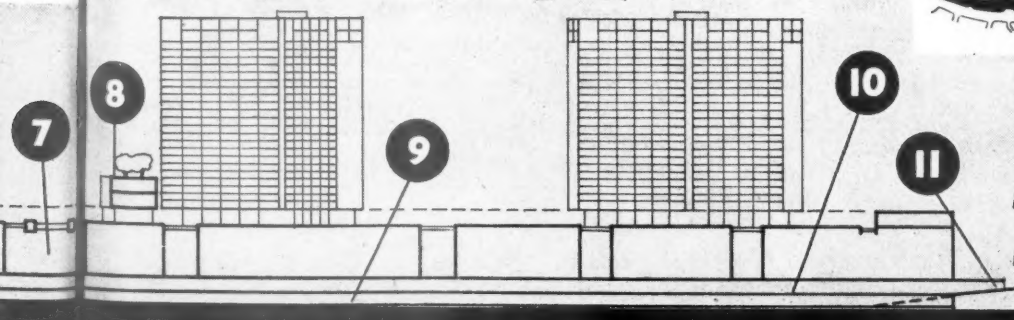
Right: View across Regent Street, showing ramp for cars underneath, with entrance to the pedestrian air-conditioned precinct above. The front is in double glazing, and there is a glass lift approach to the helicopter landing stages.



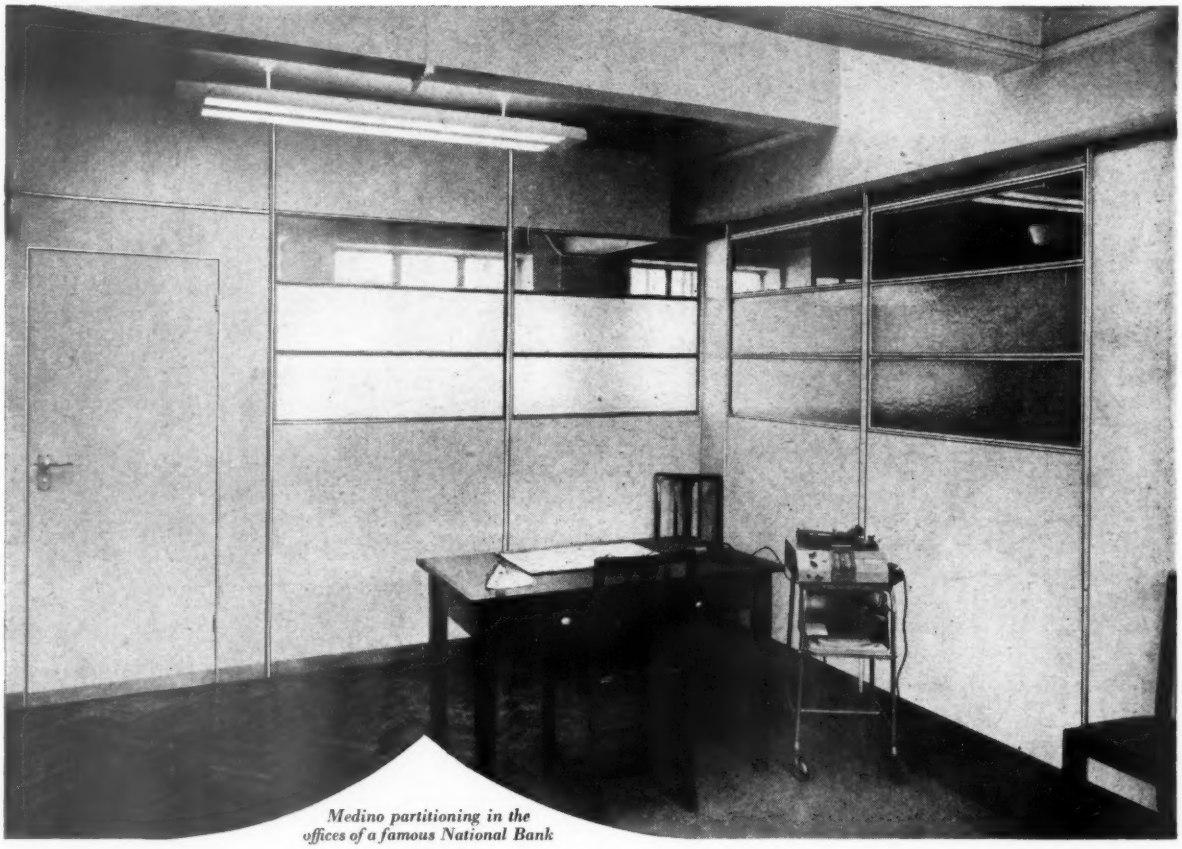
Below: The interior of the sub-basement, showing the private car approach to the entrance hall of one of the tall blocks of flats. The reinforced concrete pattern of the ceiling could be a variation of the mushroom form of construction as developed by Nervi.

General view of project.





6. *Tower of flats.*
7. *Covered Market.*
8. *View Terrace.*
9. *Lower Basement—Car Parking.*
10. *Upper Basement, shops and warehouses.*
11. *Charing Cross Road.*



Medino partitioning in the offices of a famous National Bank

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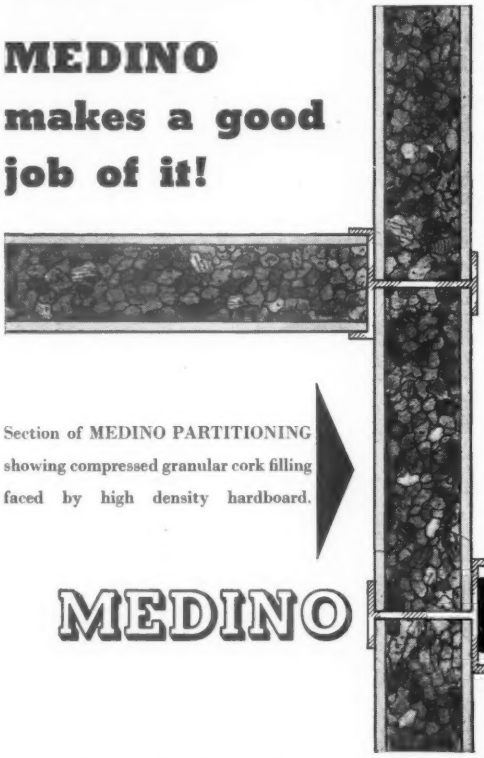

Section of MEDINO PARTITIONING showing compressed granular cork filling faced by high density hardboard.

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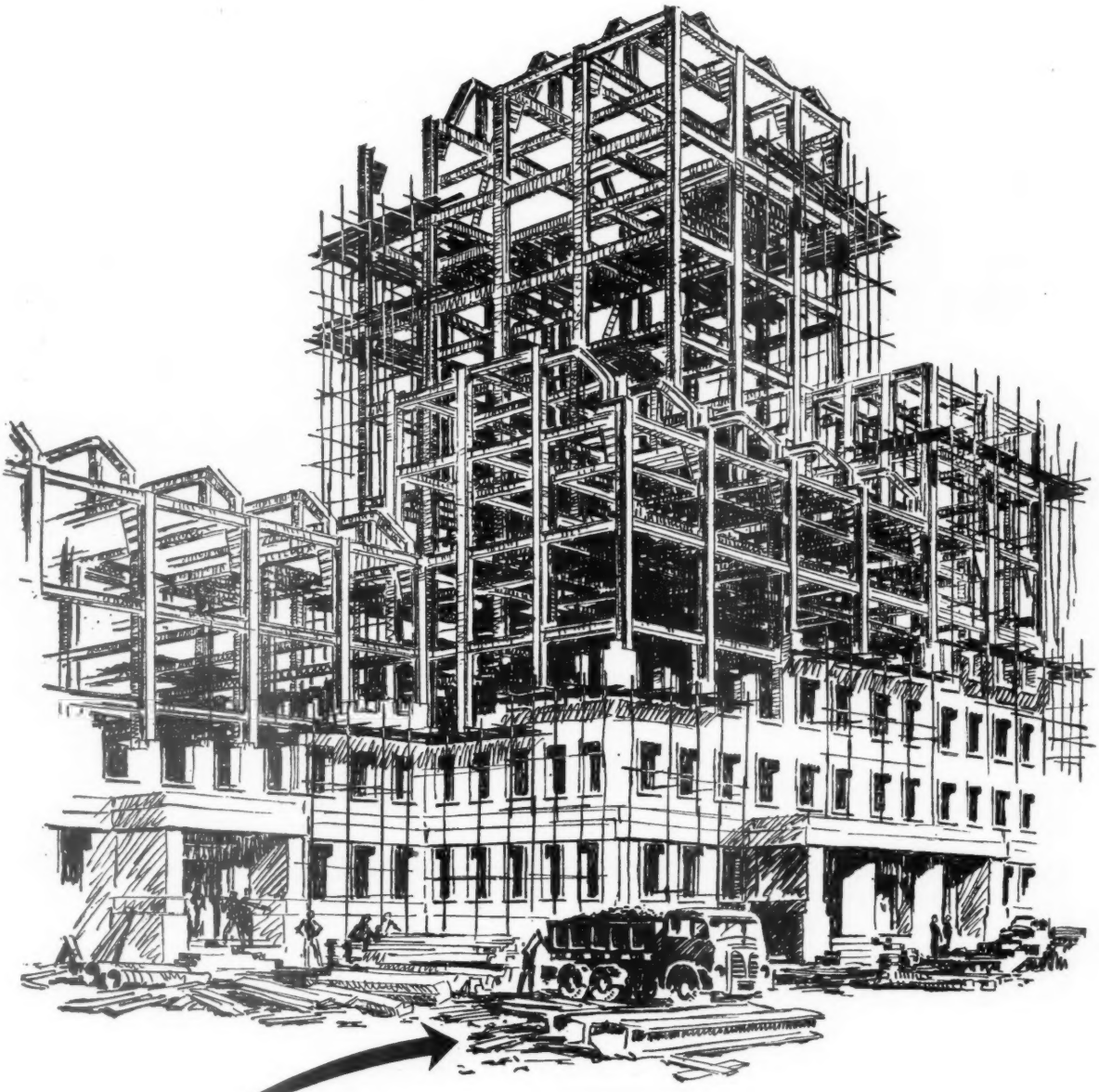

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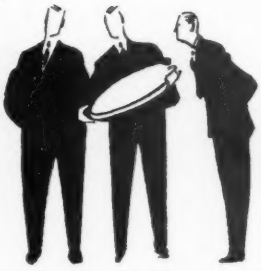

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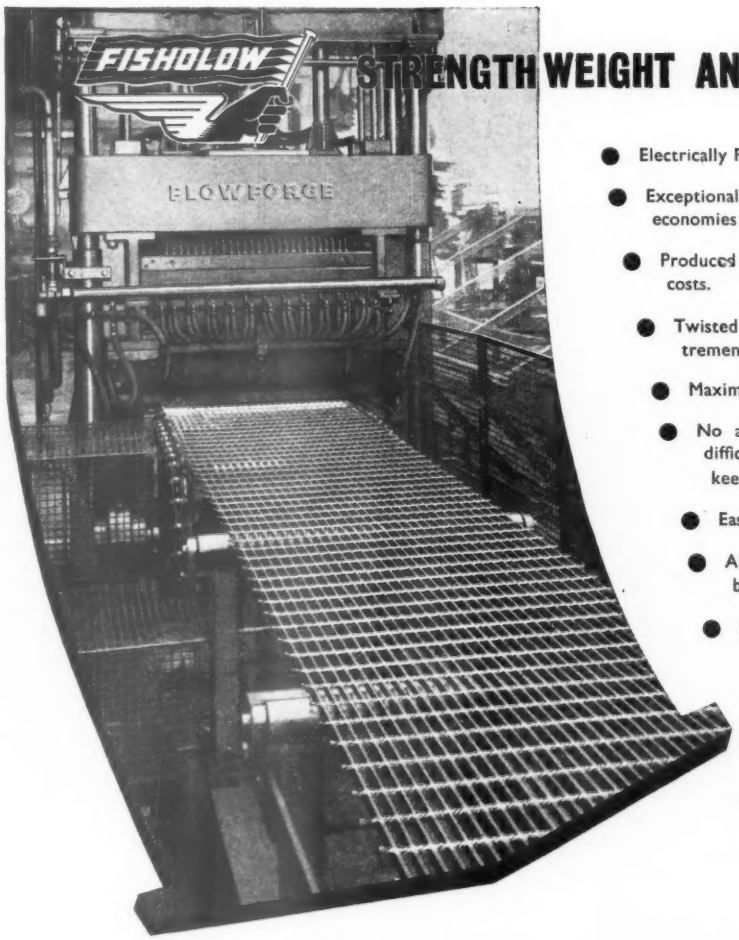

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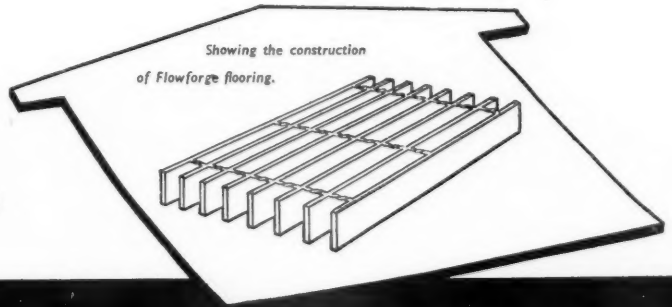

Showing the construction of Flowforge flooring.

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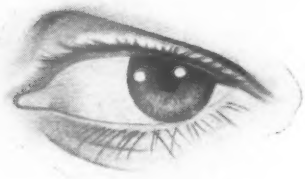
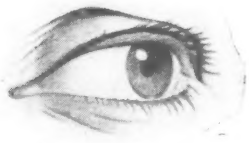
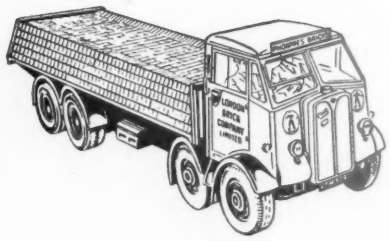


you look...





All over the country you see increasing evidence of the efforts we are making to satisfy growing demands, with more kilns now producing more and more bricks and blocks, and with organised distribution by road, rail and water.

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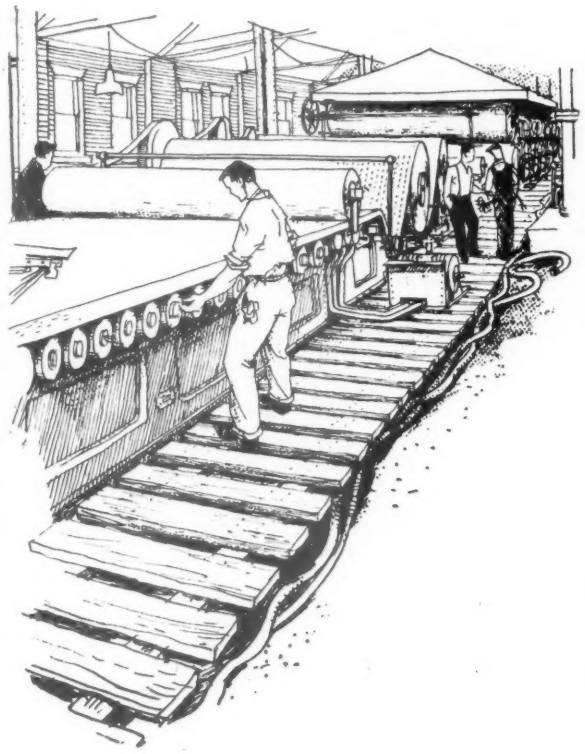
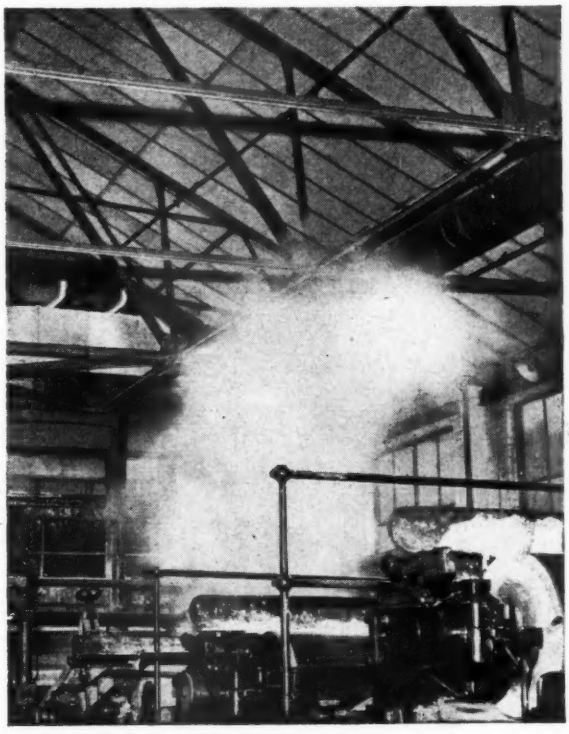
BY APPOINTMENT
BRICKMAKERS TO
THE LATE
KING GEORGE VI
LB30

"the place is full of steam...





... "The place is full of steam all day"—they told us at Cray Valley Paper Mills—"and dries out again at night. We can't have water dripping off the ceiling on to the machines." The ceiling, in other words, had to stand unlimited absorption and drying-out. It also had to be fire-proof, and to last indefinitely. A clear case for "Asbestolux", in fact. Time, humidity, heat, cold, chemicals, fungi, none of them can affect "Asbestolux", a silica-bonded pure asbestos board, which is made without cement. As for fire-resistance, a recent public test showed "Asbestolux" sheet standing up to a 1800°F flame for 13 days, 10 hours a day, without there being even the first sign of structural failure.

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said Shadrach, Meshach and Abednego

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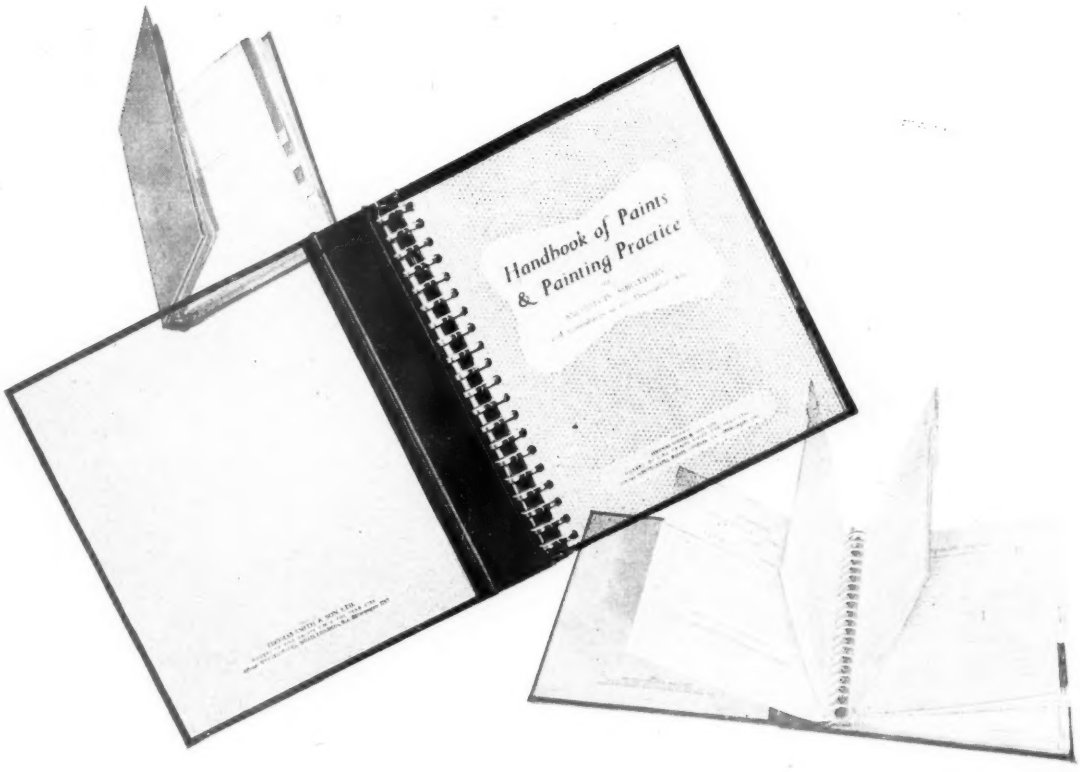

This invaluable Handbook is available free to Architects

The Smithson Handbook is a summary of the knowledge gained in seven generations of paint-making. It is an authoritative reference book setting out, in easily accessible form, facts and figures which may help when a painting problem arises. It deals with the nature and effects of colour; preparation and application; calculations of areas, spreading capacities and application time; and a very comprehensive series of specifications covering most types and conditions of surfaces and finishes.

Architects who are interested in the problems of surface protection and decoration are cordially invited to write for a copy.

Smithson

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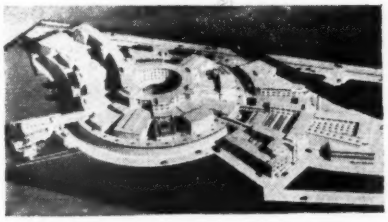

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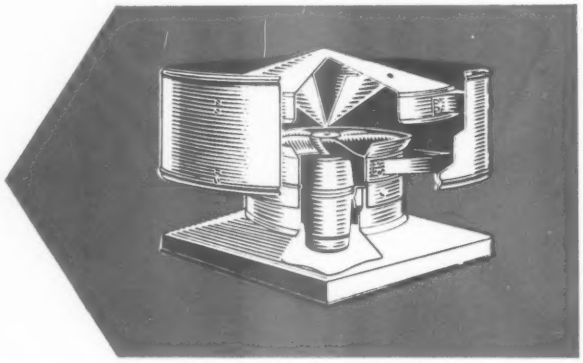

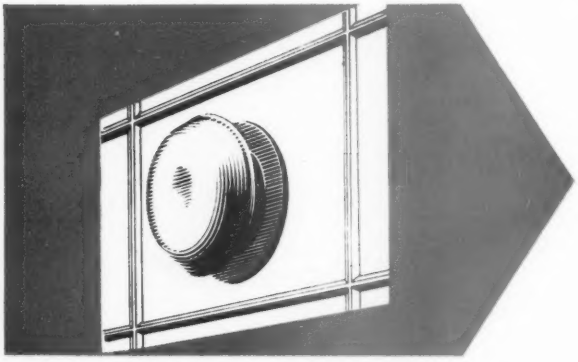

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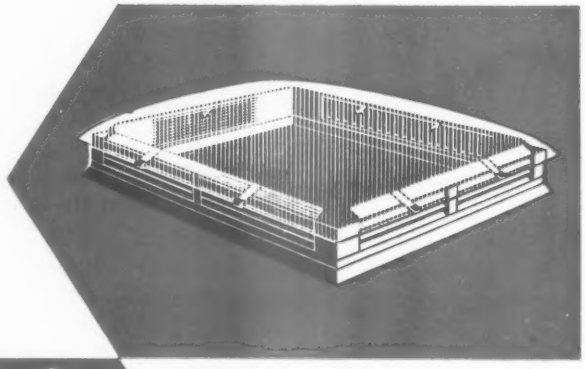

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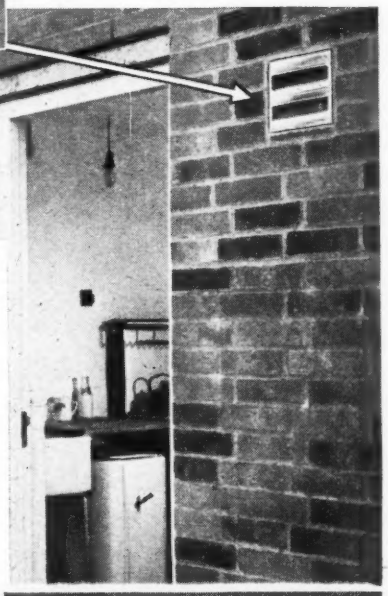

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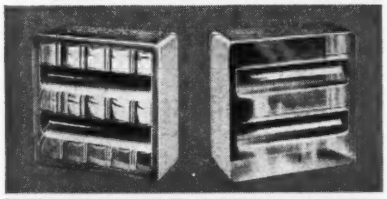

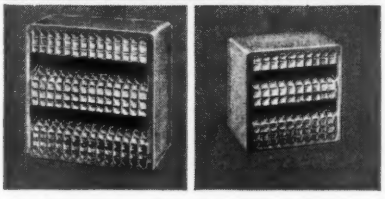

THE CLARK-EATON ALL-GLASS 'VENTIBLOCK'

(Patent Nos. 552195, 583552. Further patents pending.)
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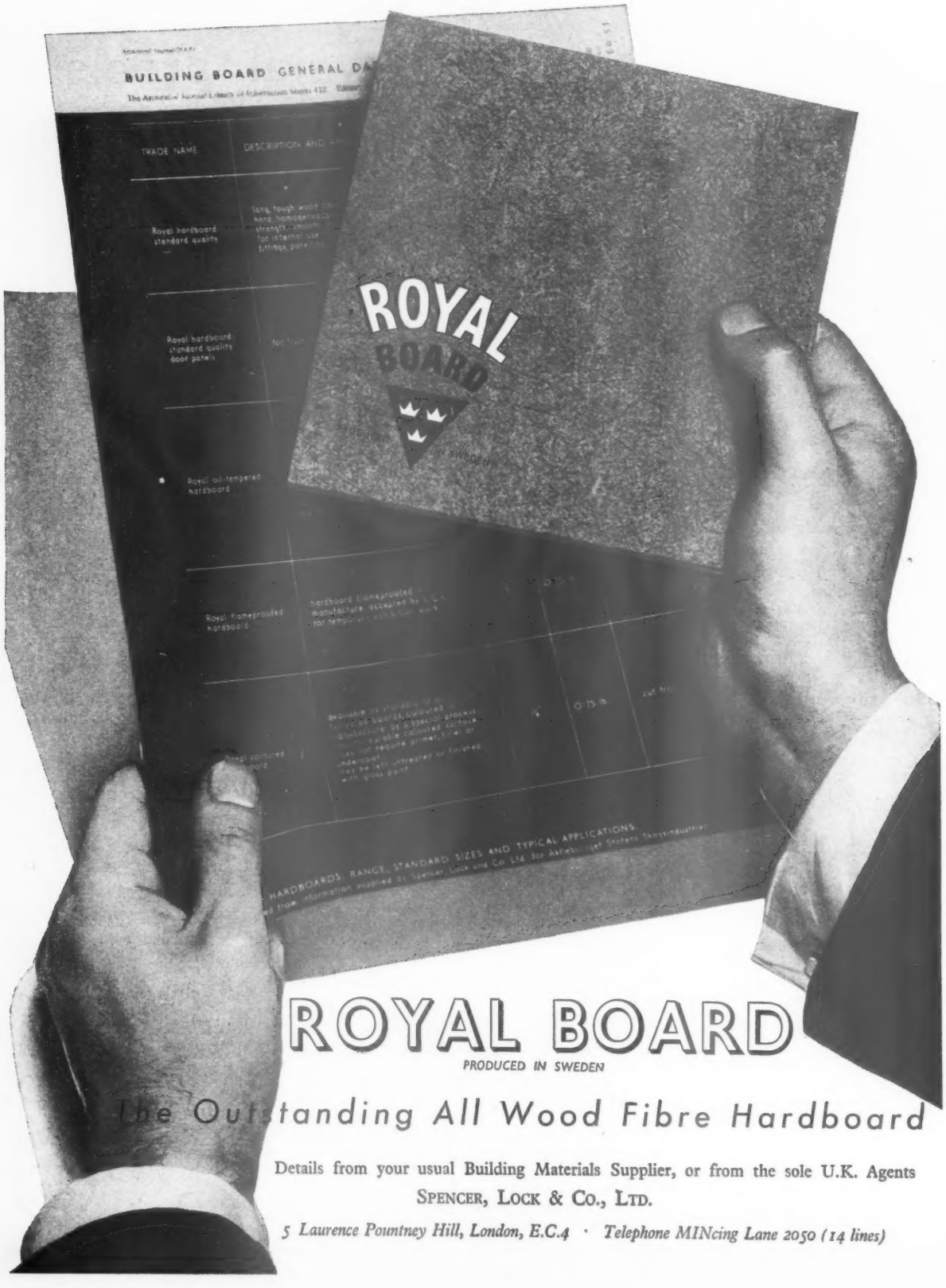

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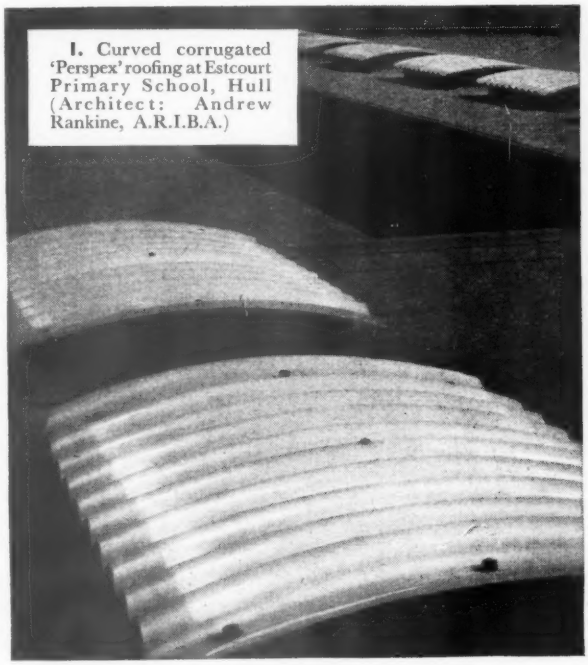
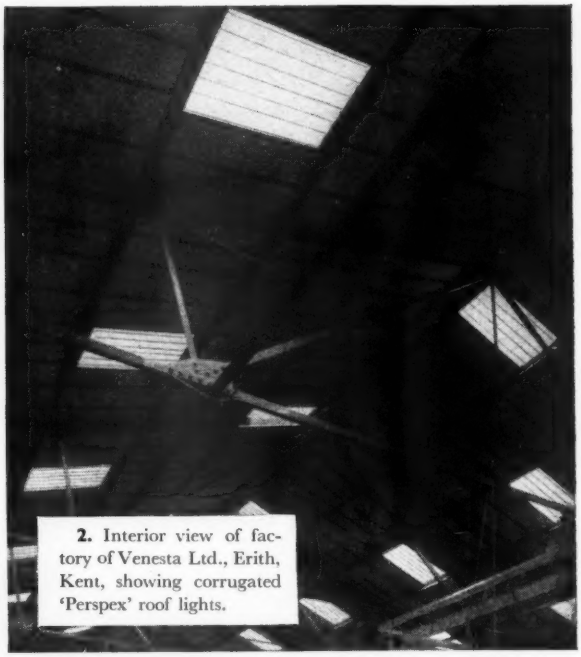


1. Curved corrugated 'Perspex' roofing at Estcourt Primary School, Hull (Architect: Andrew Rankine, A.R.I.B.A.)



2. Interior view of factory of Venesta Ltd., Erith, Kent, showing corrugated 'Perspex' roof lights.

Whatever you are building, from a school to a factory, the answer to your daylighting problem may well be corrugated 'Perspex'. At your service in clear sheet or opal and a range of colours where required, to check dazzle and glare while transmitting an outstandingly high percentage of natural light. Transparent 'Perspex' transmits 92% of visible light, opal 80%.

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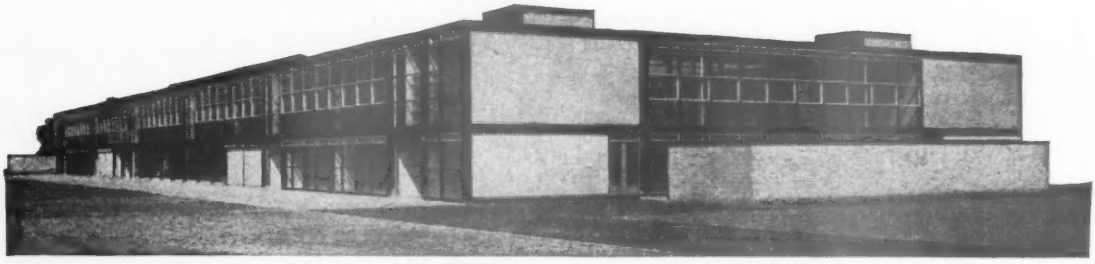

Architects : Allison and Peter Smithson A/ARIBA. *Consultant Engineers : Ove Arup and Partners.*

Hunstanton Secondary Modern School — a completely welded structure

The steelwork to this fine modern building has interesting features. Allison and Peter Smithson have used the steel to support, define and ornament the whole. Ove Arup's design, based on the plastic theory evolved by Professor Baker of Cambridge University, necessitated all-welded construction of the highest standards at works and on the site.

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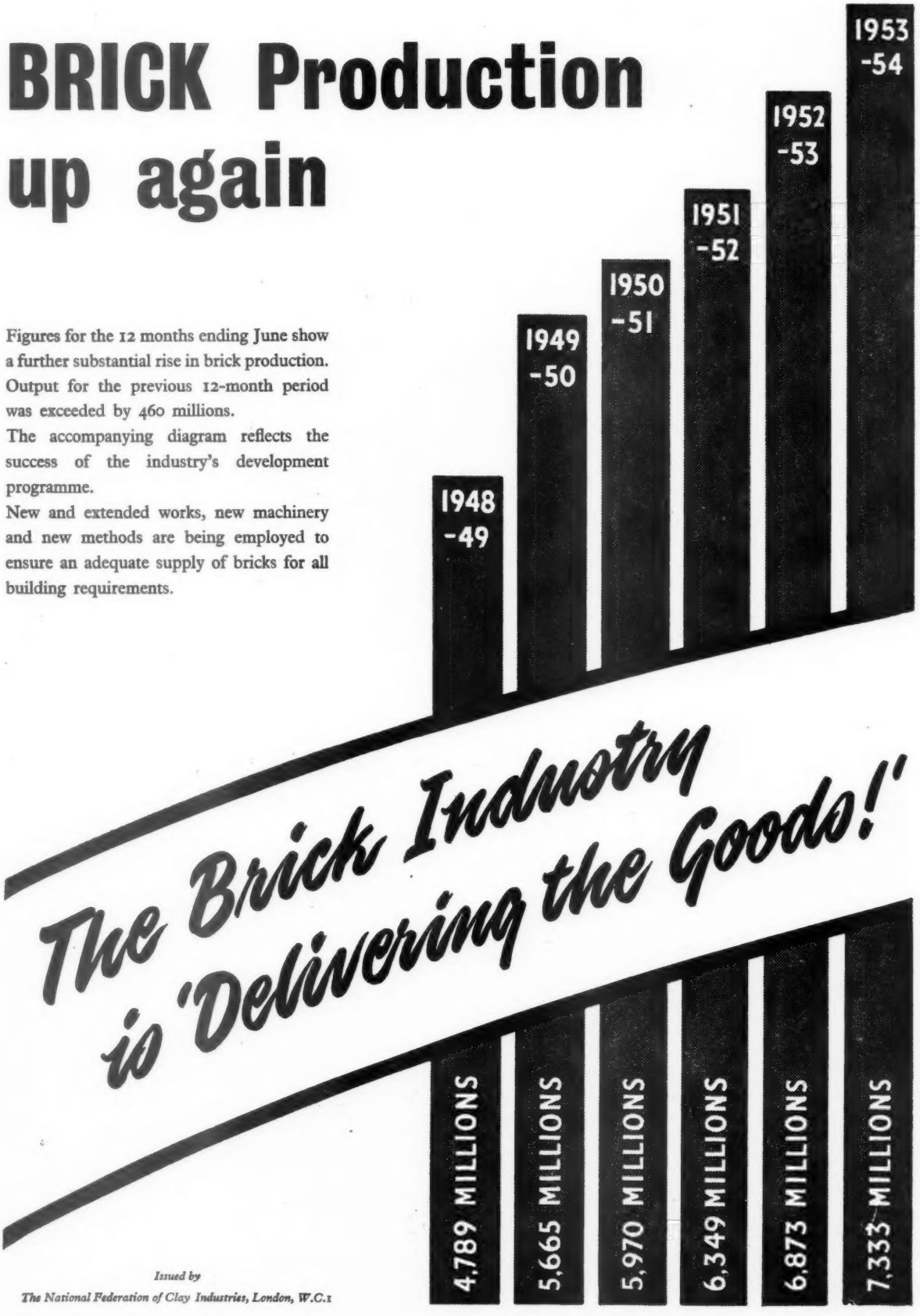
The accompanying diagram reflects the success of the industry's development programme.

New and extended works, new machinery and new methods are being employed to ensure an adequate supply of bricks for all building requirements.



The Brick Industry is 'Delivering the Goods!'

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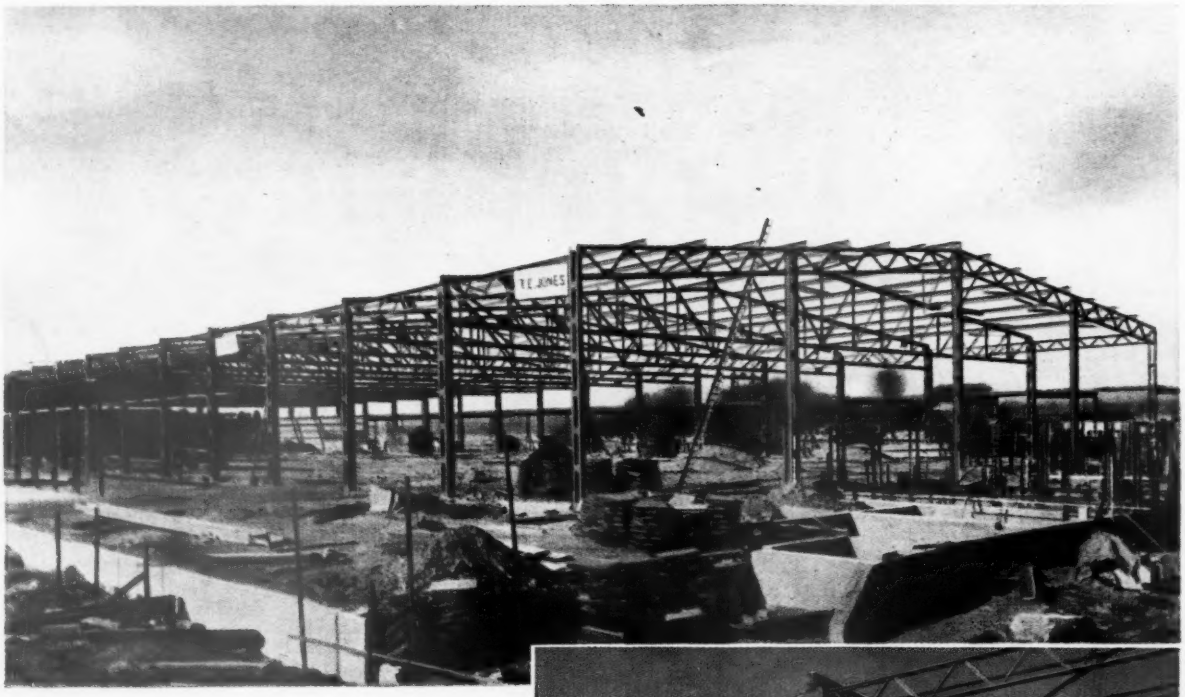
The National Federation of Clay Industries, London, W.C.1



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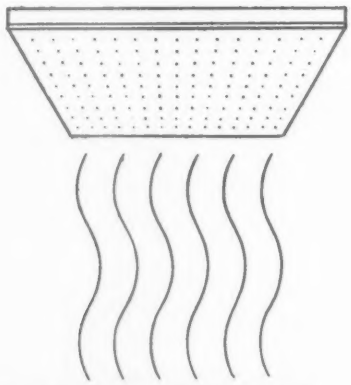

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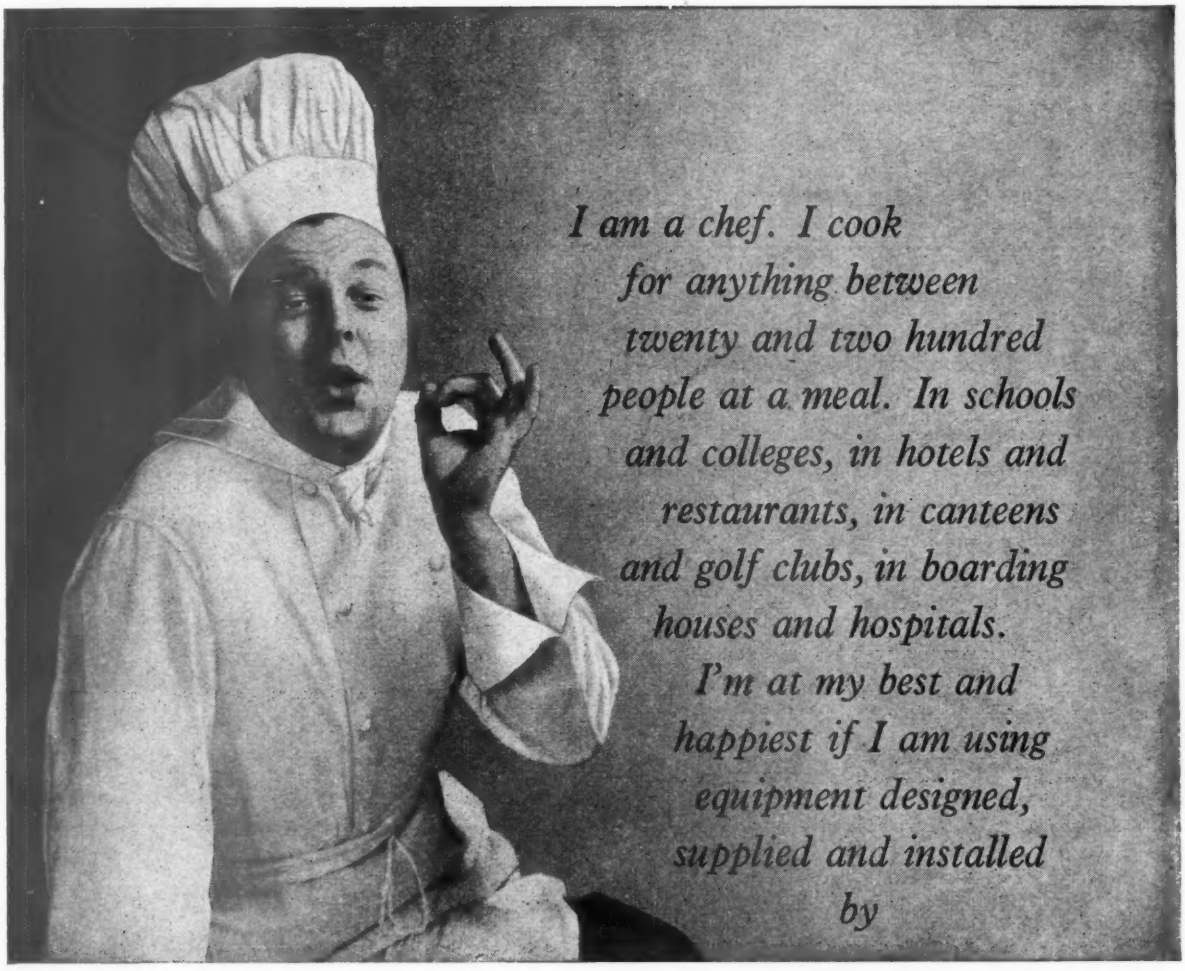

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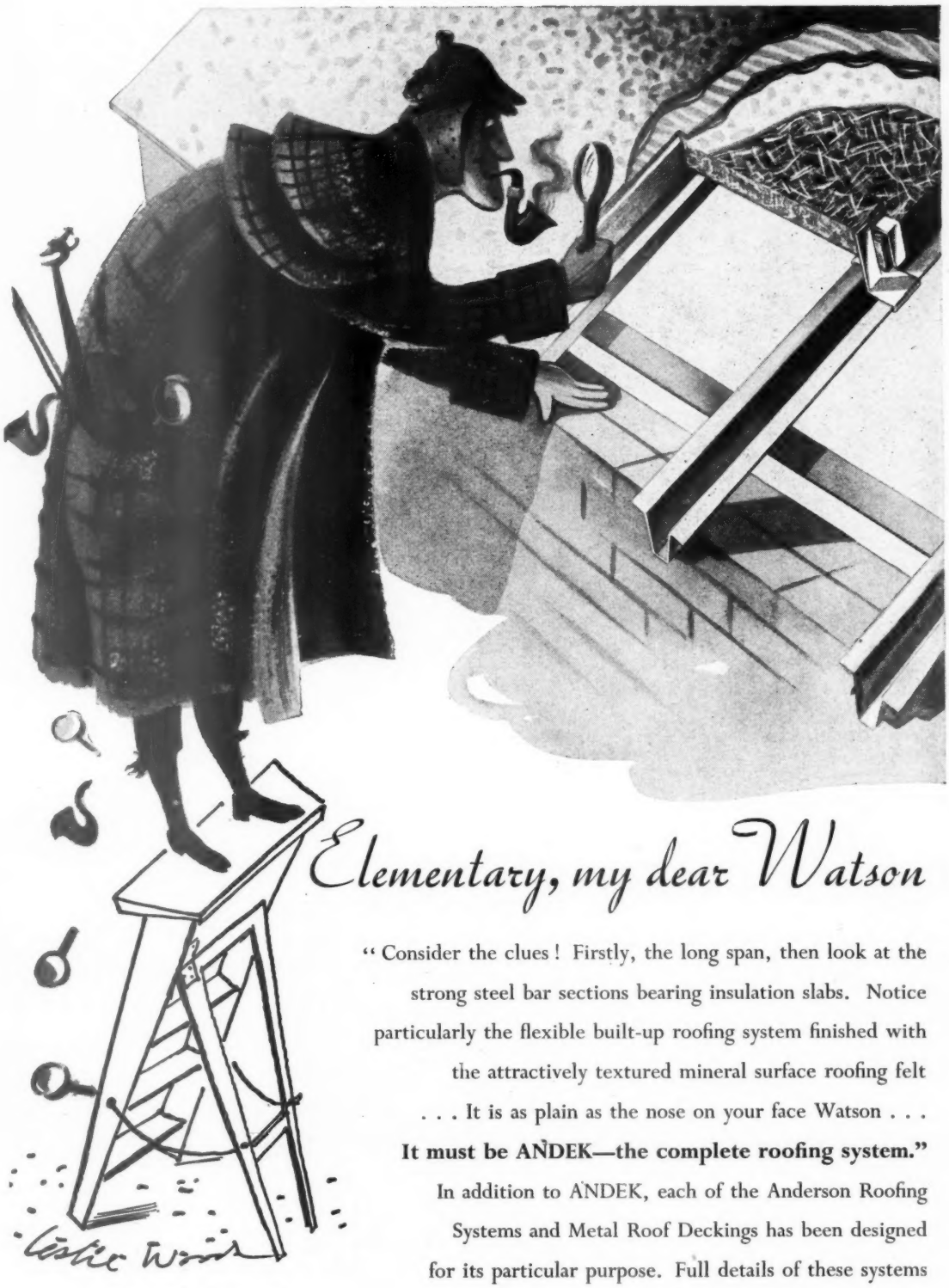

By permission of the Trustees of the late Sir Arthur Conan Doyle.

Elementary, my dear Watson

"Consider the clues! Firstly, the long span, then look at the strong steel bar sections bearing insulation slabs. Notice particularly the flexible built-up roofing system finished with the attractively textured mineral surface roofing felt . . . It is as plain as the nose on your face Watson . . . **It must be ANDEK—the complete roofing system.**"

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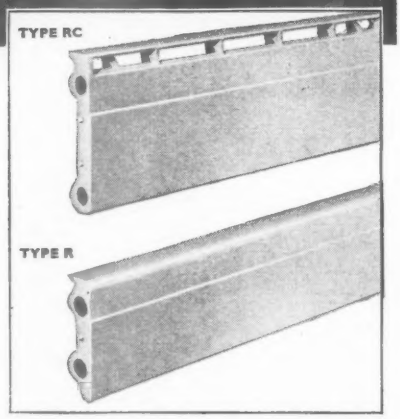
Outputs in B.Th.U.'s per hour per linear foot.

Mean water temp. in heater	160°F				170°F				180°F				190°F			
Room Temp.	55°	60°	65°	70°	55°	60°	65°	70°	55°	60°	65°	70°	55°	60°	65°	70°
6" high Type R	200	185	175	165	225	210	200	185	250	235	220	205	275	260	250	235
9" high Type RC	510	470	450	420	570	530	510	470	630	600	570	530	690	660	630	600

These figures were achieved in conjunction with a Crane Boiler



The main illustration shows 9" high type 'RC' sections installed. This type is particularly suitable for offices and public buildings such as libraries and art galleries, etc. Also for rooms in private houses with large windows and low sills. Manufactured in 2' lengths only. The 6" type 'R'—for flats and houses—is also manufactured in 2' lengths. On walls where heating is not required, matching wood skirting can easily be included for continuity. Both types are normally delivered unassembled unless otherwise instructed. Standard pipe connections ¾" — both types. Crane Skirting Heating is designed for inclusion in buildings in the course of construction, but can also be installed in existing property.

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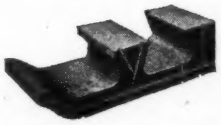

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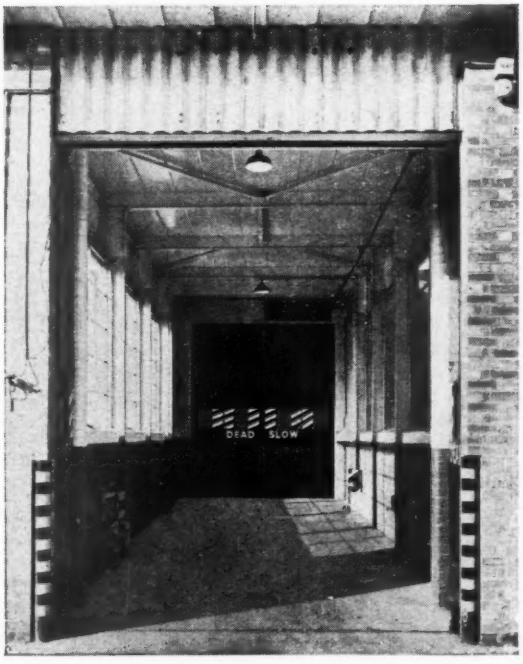

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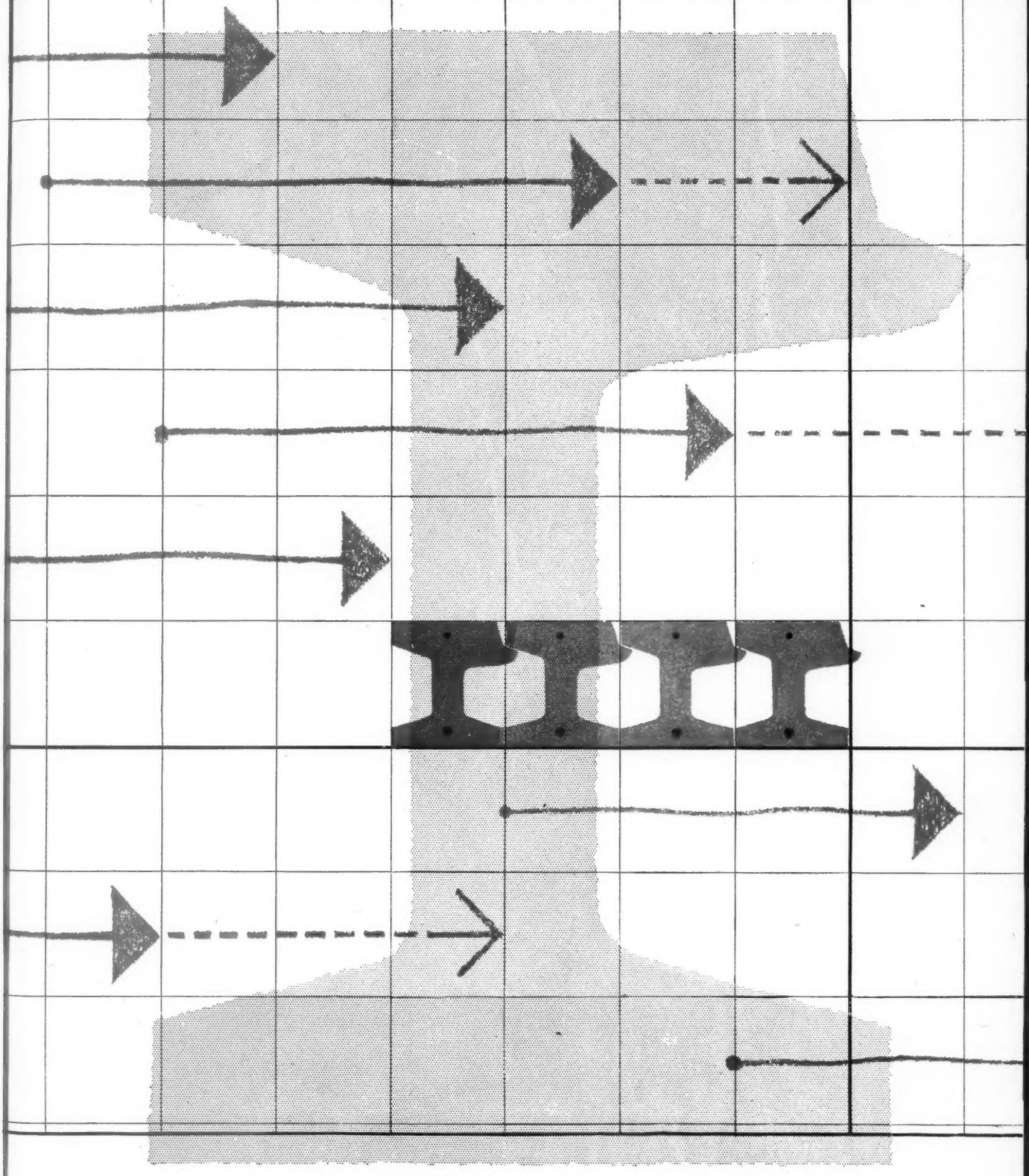

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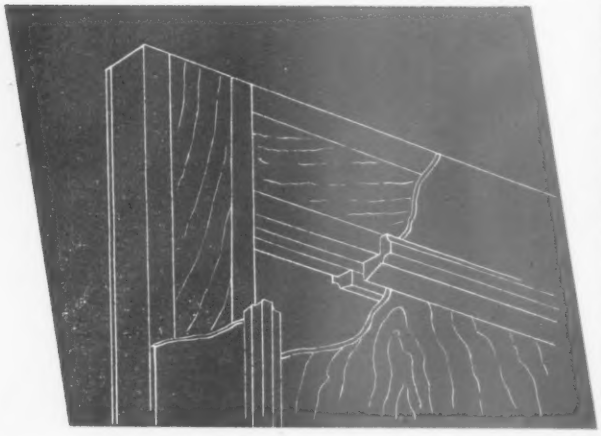

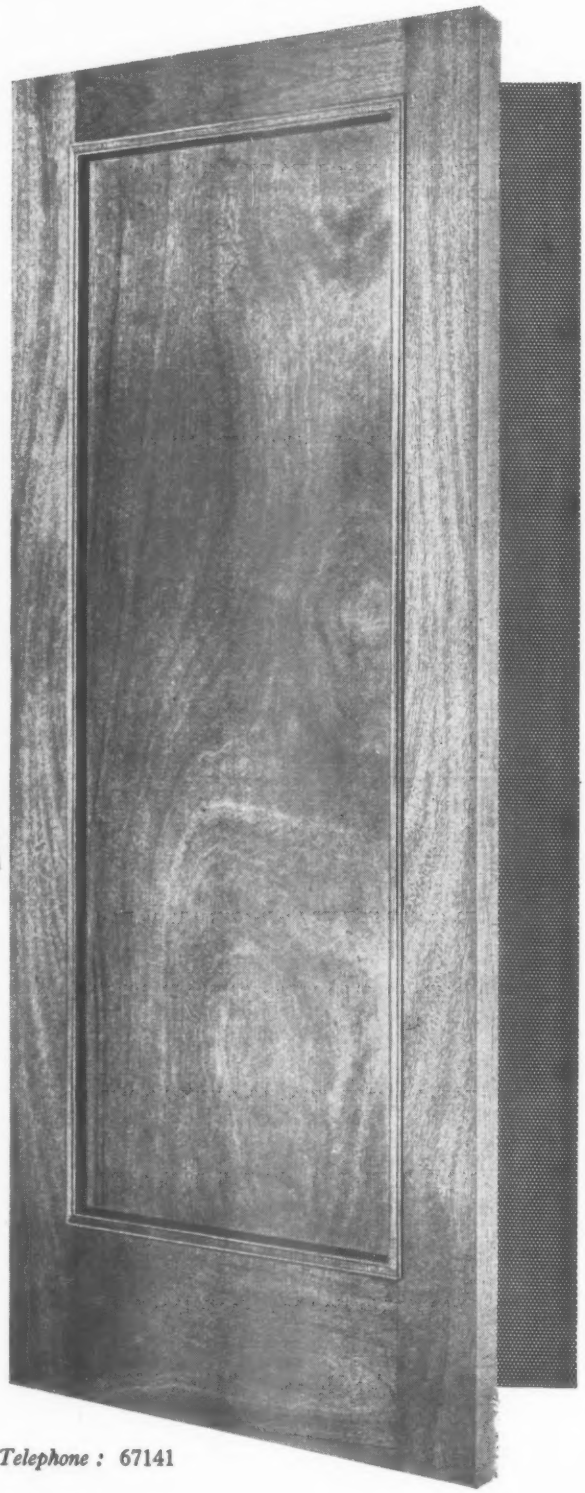

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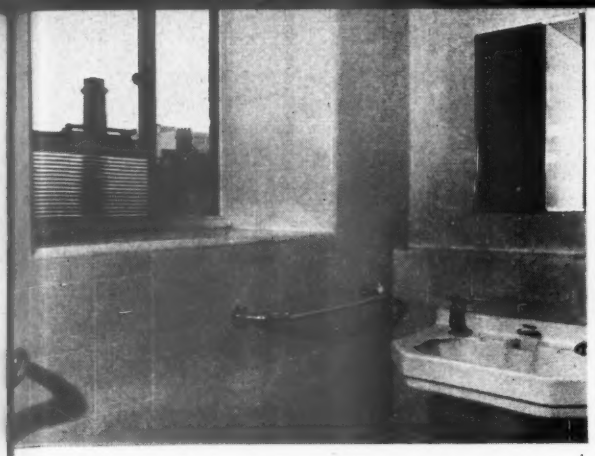

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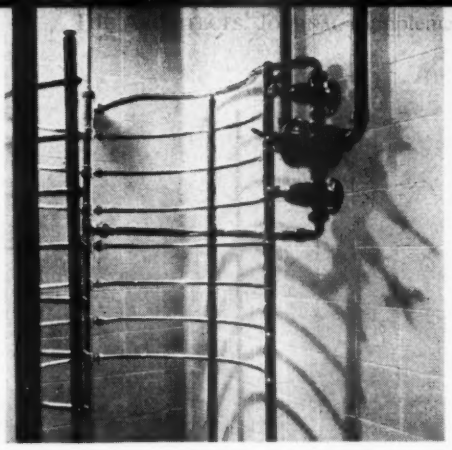

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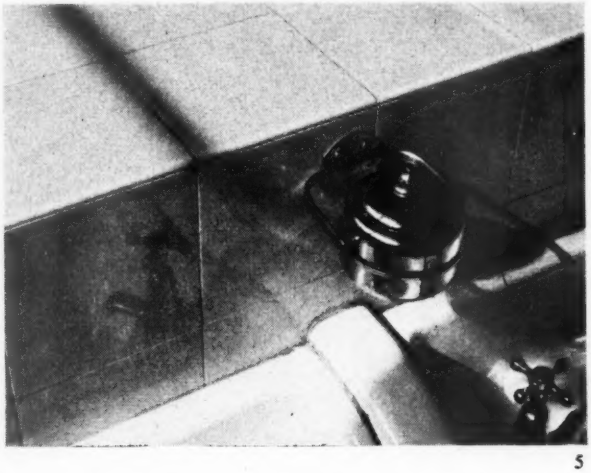

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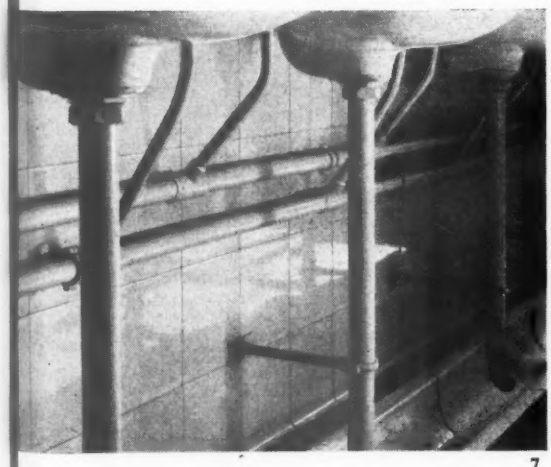

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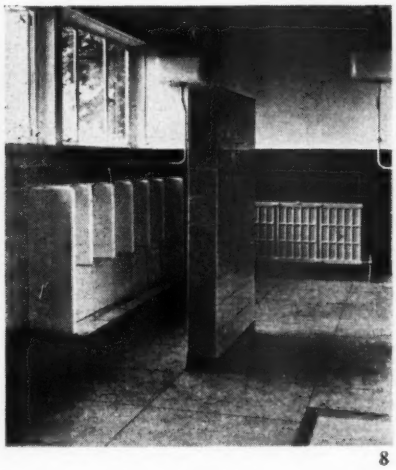

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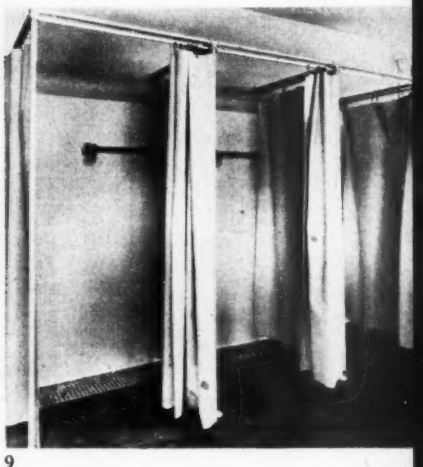

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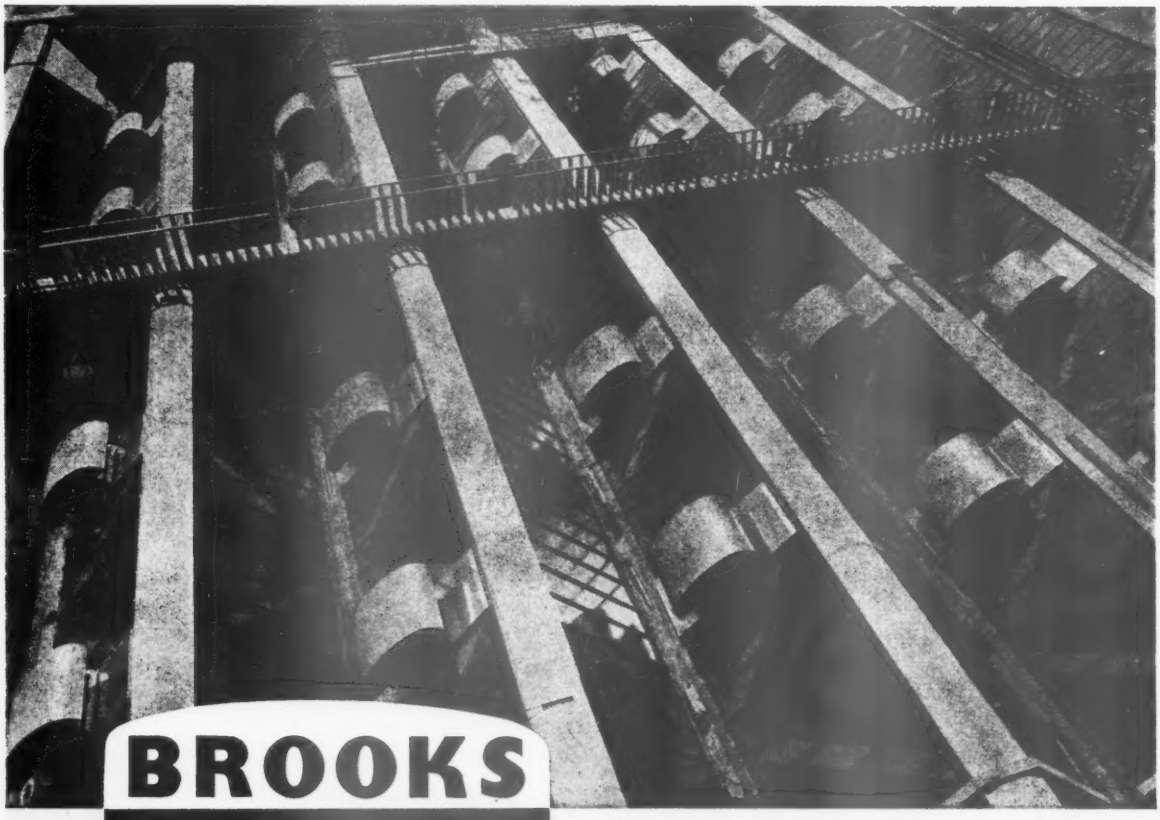

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New high output MARVEC Fire

heats up to 2,250 cu. ft. and supplies hot water

SPECIFICATION Vitreous enamelled cast-iron fire front. Combined hook-on trivet and extension piece. Plain cast-iron interior sealing frame to fit behind tile or precast surround. Firebrick lined firebox; removable bottom grate; restrictable throat.

Wrought welded or copper boiler with 1 in. connections on top. Sealing rings for pipes passing through casing. Self-contained boiler flue and damper and lift-off back-plate. (Cast-iron interior frame, enamelled to match fire front, can be supplied.)

COLOURS Beige mottle or black. Allustre A2. Alisheen black, bramble, bronze or copper. Hook-on trivet — black vitreous enamel.

STRUCTURAL OPENING

Minimum Dimensions

Width :	20 ins.
Depth :	13½ ins.
Height from hearth level to underside of lintel :	33 ins.

Alternative adaptors are available to suit tile surrounds with 2⅜ ins. and 4⅜ ins. return to wall.

FIRE OPENING IN SURROUND

Width :	16 ins.
Height :	22 ins.

GAS IGNITION Connections ¼ in. B.S.P. on either hand. Provision can be made for a concealed gas connection.

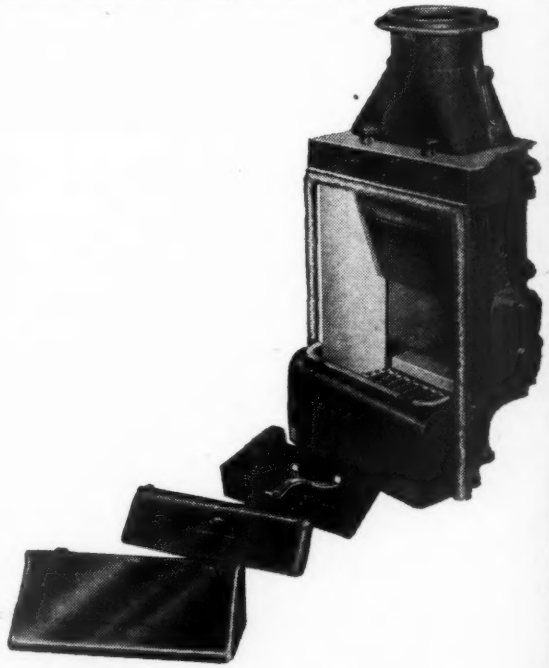
SPACE HEATING CAPACITY If provision is made to introduce convected air to the living room, a room of 2,250 cu. ft. can be heated.
If convected air is used for warming other rooms, full heating up to 1,750 cu. ft. is provided, and background warmth for other rooms up to a total of 2,000 cu. ft.
Note: These figures apply to rooms of normal construction.

BOILER OUTPUT Maintainable maximum 9,000 B.Th.U. per hour.
Provided the system is compact the boiler can heat a towel rail in addition to supplying domestic hot water. If the boiler is not used to provide domestic hot water, 45 sq. ft. of radiation surface (including unlagged piping) can be heated.

HOT WATER SYSTEM The recommended size of cylinder is 30 gallons (direct or indirect). The cylinder must be lagged and should be fixed vertically as near as possible to the boiler. In no case must flow and return pipes exceed 30 ft. each in length. Pipes longer than 15 ft. must be lagged. The draw-off pipe to the taps must be a dead leg connection from the expansion pipe.

The fuel-saving RESTRICTABLE THROAT

. . . a curved plate in the flue outlet. Adjustable so that chimney throat can be wide or narrow. It effectively controls room ventilation, saving heat and eliminating draughts.



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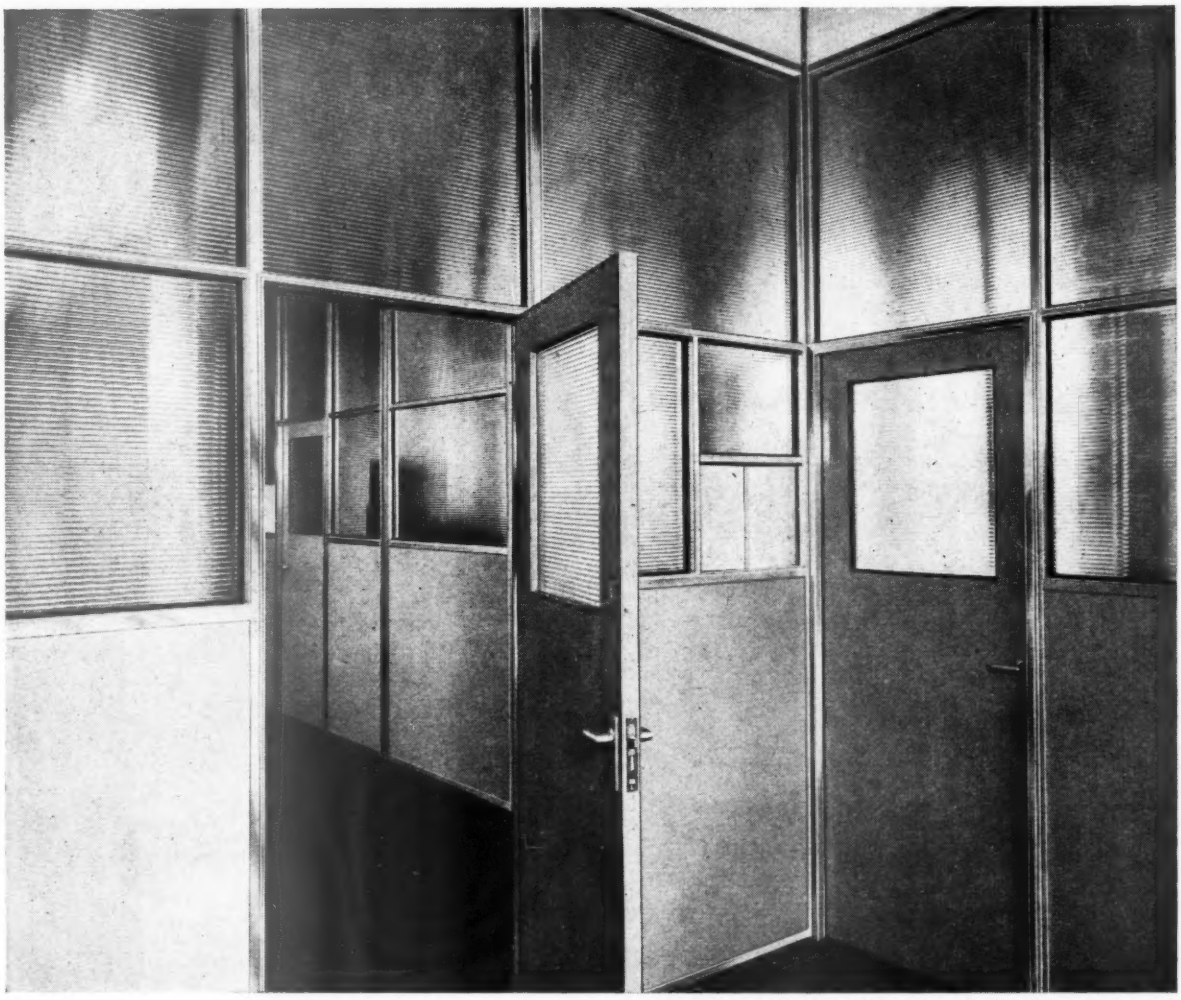


Type 'F' Partition in the offices of The Printing Trades Alliance, London, E.C.4

Announcing

a new system of construction

Developed in the light of wide experience gained in the fabrication of all classes of partitioning and internal cladding, the Anderson Type 'F' system of construction offers the following advantages:—FLEXIBILITY OF DESIGN, VARIETY OF PANEL FINISH, ACOUSTIC CONTROL, MODERN CONSTRUCTION, LIGHT WEIGHT, SPEEDY ERECTION, EASY REMOVAL AND RE-ERECTION.

● *Type 'F' Partition is the latest addition to the Anderson range. The framing, formed of extruded aluminium sections, embodies special features including rubber glazing beads and rubber inserts in architraves to eliminate noise and vibration. Choice of panelling may be made from a variety of attractive sheet materials. Enquiries are invited. Please ask for literature.*

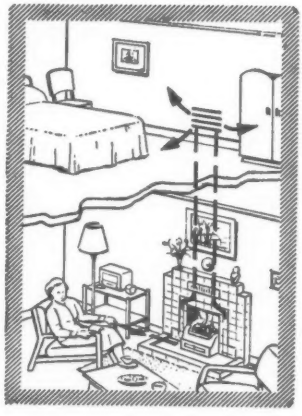
HIGH-GRADE PARTITIONING BY A·C·C

ANDERSON CONSTRUCTION CO. LTD.
CLIFTON HOUSE, EUSTON ROAD, LONDON, N.W.1 EUSTON 7465

Agents throughout the United Kingdom and Overseas

Controlled Comfort

by Convection



Heating by convection—which really means "warmed air" —is the modern, economical and satisfactory way of making the most of Solid Fuel and the best of the appliances. Control of the burning rate of the fire and of the flow of warmed air is simple and effective.

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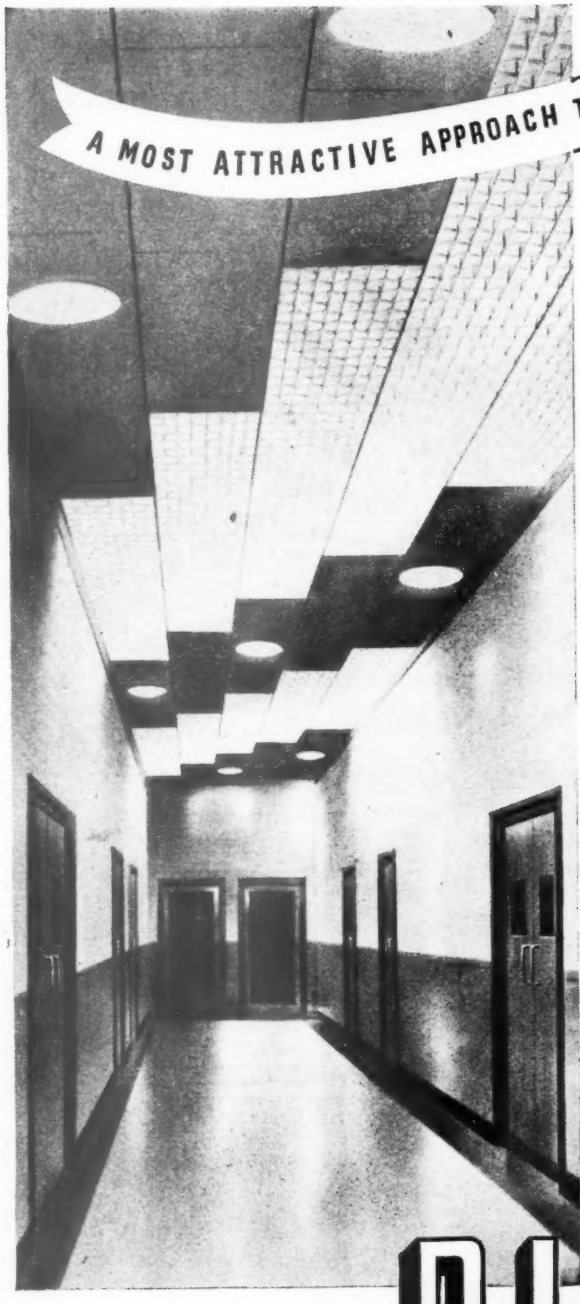

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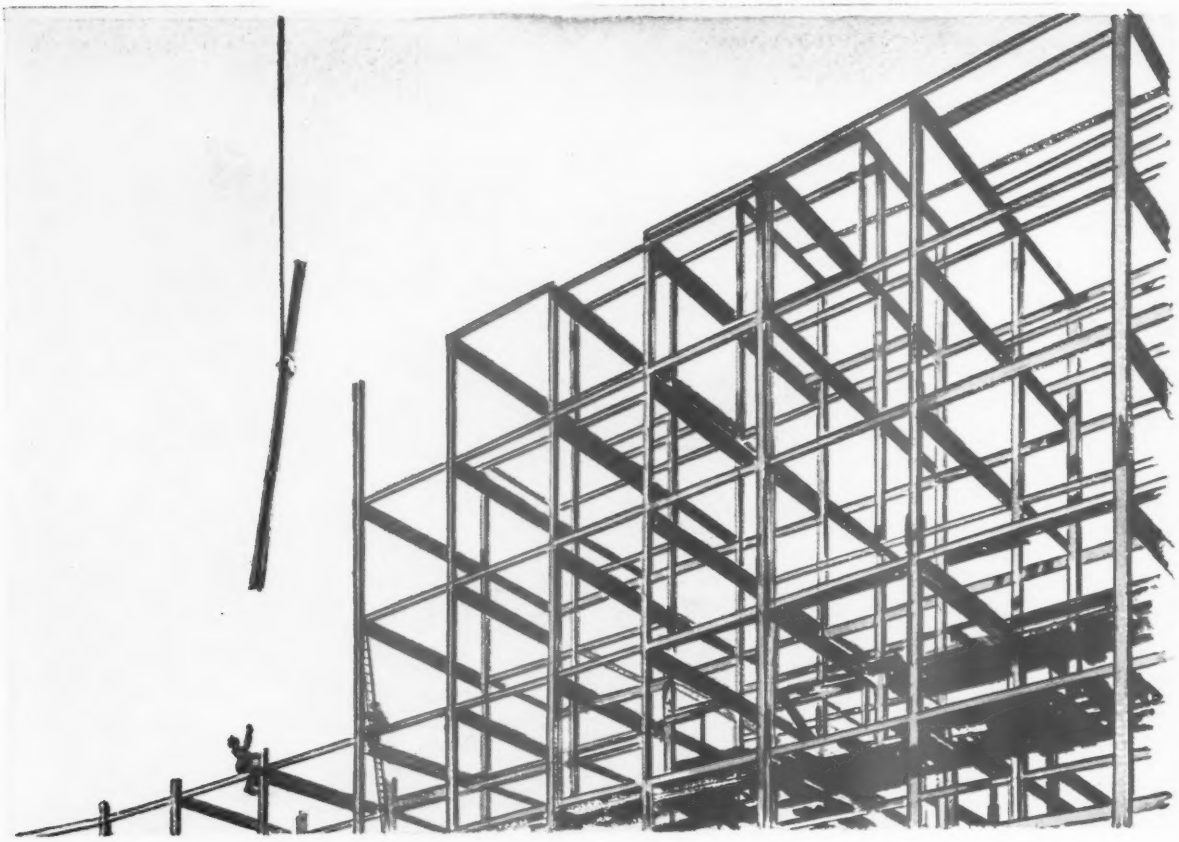

Rebuilding programmes

Steel production continues to increase, and many rebuilding programmes are now going ahead.

Steelwork has achieved its outstanding acceptance by reason of its unique combination of economic advantages. Time is gained by fabricating the steel members while the site is still being cleared and the foundations laid: later, the various trades can get to work on the lower floors while the framework of the upper floors is being erected, and a great proportion of the interior construction can be 'dry' work, reducing delay before occupation.

Furthermore, the framework is a 'grid' of great accuracy, assisting the other trades and simplifying the installation or alteration of partitions. Thus, from every aspect, steelwork leads to an earlier occupation of the building and thereby to a better return from the investment.

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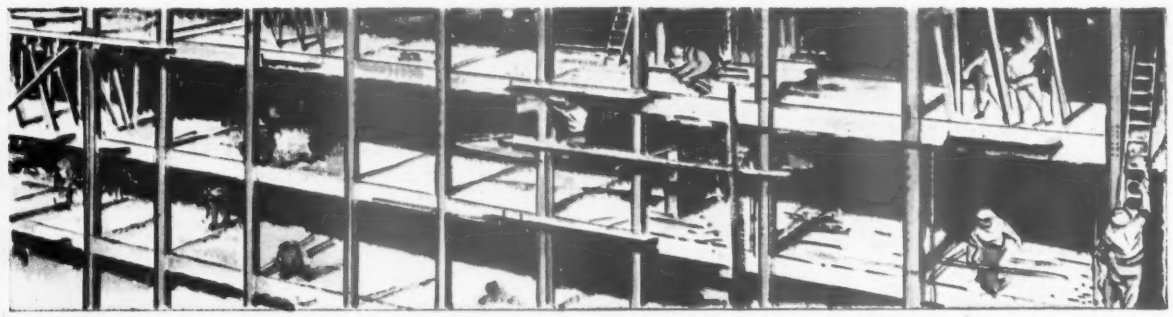

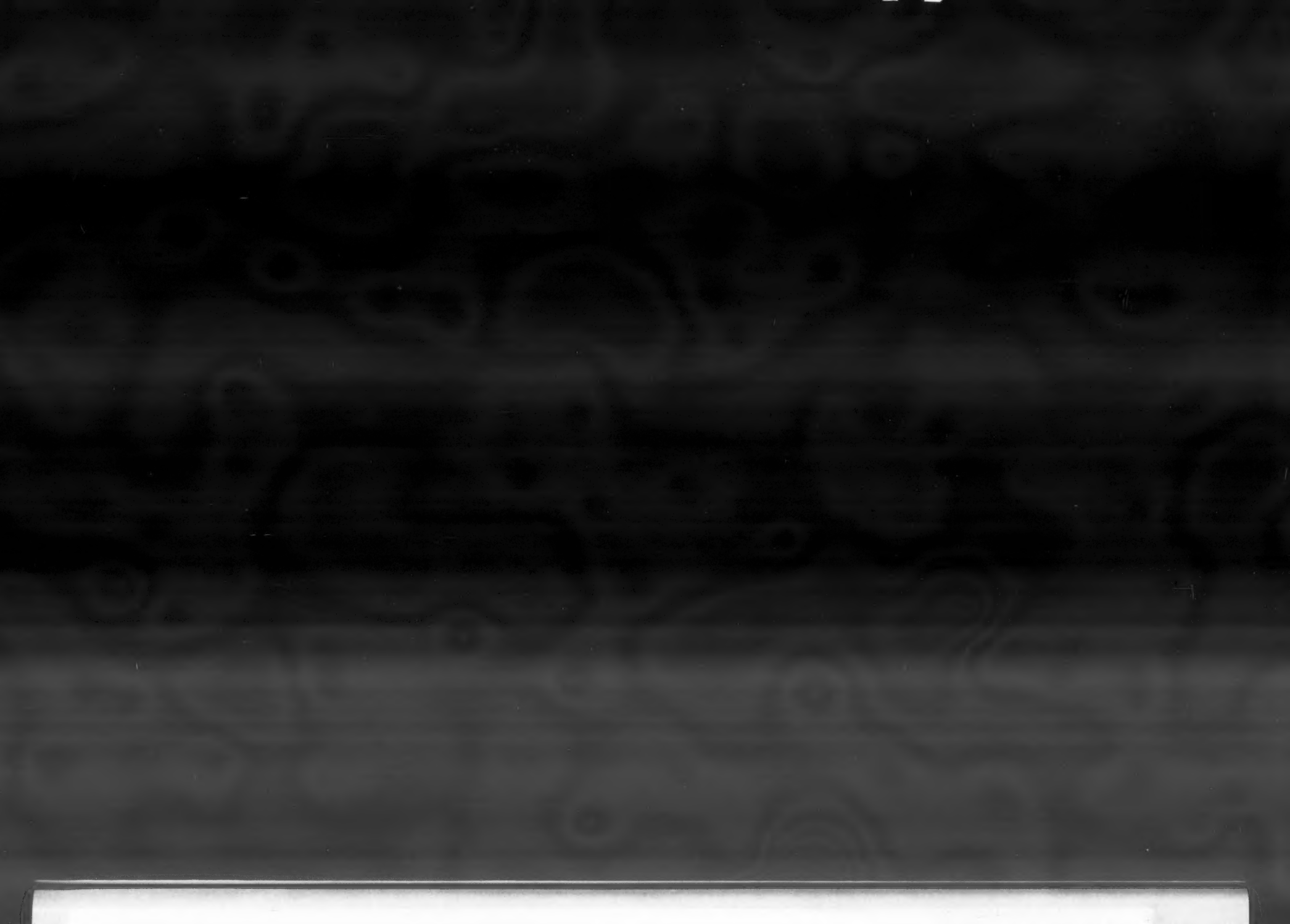

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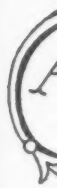

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THE ARCHITECTS' JOURNAL

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No. 3117 November 25, 1954 VOL. 120

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LOW-COST HOUSING

The Canterbury City Architect's Department have succeeded (with the help of BRS) in building 36 terrace houses for less than £1,000 each. This achievement brought the MOHLG parliamentary private secretary—Mr. Deedes—down to Canterbury on Monday of last week to look at them. But the Ministry's interest started much earlier than this, for it was at their invitation that the city embarked upon the venture. ASTRAGAL has long wondered why the Housing Ministry has not set up a development section like that of the MOE, and he hopes that success at Canterbury may encourage them to do so.

*

Straightforward construction seems to be the main idea here—floors and roofs spanning from party wall to party wall, with timber framed and rendered panels for the front and back walls on the first floor.* The sort of thing in fact that young architects show to builders, who say: "That's all very well but. . . ." The sort of thing also that (so ASTRAGAL is told) next year's JOURNAL Guest Editors will be considering in their programme on Building Costs.

EARTHMOVERS AND HAMBURGERS

The Public Works Exhibition at Olympia was one of the most important manifestations of its kind that we have seen for a long time. It showed an industry which, though it works in the open air and in inhospitable surroundings, has largely solved the problem of mechanizing itself as fully as its circumstances allow.

*

Looking at these blue, orange, red, or yellow masses of machinery—scrapers, graders, angle-dozers, draglines, pipe transporters and the like—one felt that the men who design them have a feeling of the power and force that they dispense. The great brutes of earthmovers not only *are* enormously powerful, but they *look* it too, and this muck-shifter's rhetoric spreads even to the ca'f-dozers and bijou scrapers in the half-ton class.

*

Munching a "glorified hamburger," appropriately named (in these circumstances) a "Wimpey," ASTRAGAL reflected that although contractors' plant and civil engineering equipment do not fascinate the architect at present, they will probably interest him more when their effect on cost and design is better understood. Not a very profound thought—but just you try to be profound with a mouthful of "Wimpey."

HOW TO GET ON AND HORRIFY PEOPLE

One of ASTRAGAL'S scholarly advisers, who has been listening to Professor Blunt's recent lectures on Philibert de l'Orme—architect to that intelligent woman Diane de Poitiers, mistress of Henri II of France— reports a thought-provoking allegory from the *Treatise* which the *Grand Constructeur* wrote in the fifteen-sixties. Two engravings show the Good Architect, and the Bad. The latter is walking through a desert and stubbing his feet against the rocks; he has no hands, signifying incompetence in execution, and no eyes either, for obvious reasons; and in the background is a brutish and old-fashioned building.

*

Philibert's Good Architect, by contrast, stands in a garden full of good things and all the newest fangles in building. He has wings on his heels, signifying activity; he wears the robes of a learned man; he has four hands, signifying competence and capacity in execution, and with one of these hands he passes a scroll of instruction to an eager pupil. And he has three eyes, one to study the works of God and of the Ancients, one to oversee his own constructions and one to look into the future in order to guard (how did you guess?) against the calumnies and malevolence of his contemporaries.

*

ASTRAGAL is generous-minded enough to offer his column to any wing-heeled triclops with four hands who has the interests of the profession at heart. But

* Full details will be published in a later issue.

he very much fears that this invitation will be read only by the third and most cautious eye.

GROPIUS

Plenty has been written about the *Bauhaus*, in Britain, Germany and America; so much so that too many people think of Gropius solely as the man who took it over from Van de Velde and built it up as an educational centre of world-wide influence. That was an important achievement indeed, but Gropius's influence on modern architecture goes wider and deeper, as Sigfried Giedion's book* on the man and his work, published this week, makes very clear.

*

The Bauhaus was only one example of his ability to see ahead. Throughout his career he has shown the same ability in many fields: in building technique, in planning (remember his design for tall slabs of flats in parallel formation on a rural site at Windsor, as early as 1935), in teaching (his influence on American architecture while Professor at Harvard was profound and continues to spread even after his retirement) and nowadays in administration. The subtitle of Dr. Giedion's book is noteworthy. Gropius's ideas on how architects should change their relationship with the builder and the engineer is surely a forecast of all our futures.

*

This book gives the best account available of Gropius's career, his architecture and the ideas that have inspired both. The collection of illustrations (140 pages of them) is exhaustive and includes not only his completed buildings but innumerable projects, many of which turned out to be prophetic. It is not generally known how many important projects belong to his American phase. One of the most recent is illustrated here. Giedion's text, like everything he writes, admirably places Gropius's achievements in the perspective of architectural history.

TOO HIGH FOR AN ARCHBISHOP

Quite a lot of people must have winced when they heard the Archbishop of Canterbury, in his speech at the Pilgrims' Dinner, go out of his way to say that he thought a twenty-seven storey office block utterly out of place in the City of London. ASTRAGAL cannot help wondering how the archbishop, as head of one of England's largest real-estate organizations, expects city landowners to get a reasonable return on their property without building high, or whether the Primate is aware of all the argy-bargy that has been going on in various quarters about how to build tall blocks without ruining the city, where to put them, how many to permit and all the rest of it.

*

In any case, it would seem that in some circles high-rise offices are now to be equated with horror comics.

BUILDING EDUCATION

No architect who has the long-term interest of building at heart should miss the "50 Years of Building Education" exhibition at the Building Centre which the LCC School of Building, Brixton, has organized. (Closing on December 1). The exhibition tells more about the past than the present and serves to remind us what a job it is to bring together people who have been kept firmly apart for so long. ASTRAGAL, who likes deeds more than words, was surprised that no mention is made in the exhibition of the School's joint programmes he has heard of in which the building students make what the architectural students think up. Perhaps we shall hear more of this in time.

*

At the opening ceremony the Minister of Works presented two prizes offered by the Building Centre, one to the best student of architecture and the other to the best student of building. They each got £25 and had to use it for some educational end. The builder winner chose to use his for a study of mechanization in building, the architect for a visit to Italy. . . .

This photograph of a model of Boston Back Bay Centre, the largest project in which Walter Gropius has been associated, is taken from the ARCHITECTURAL PRESS *publication, "Walter Gropius," which is reviewed by* ASTRAGAL *on this page. The scheme includes a 40-storey office building, an hotel, a motel, an exhibition hall, a convention hall and a wide pedestrian way.*

**Walter Gropius: Work and Teamwork*. By S. Giedion. London. The Architectural Press. Price 42s.

Housing Improvements

To many people this may seem a depressing scene. But the buildings, which are about seventy years old, are structurally sound and in excellent repair. They contain potentially good living accommodation, as the JOURNAL'S Guest Editor, Felix Walter, points out in his article on Housing Improvement in this issue. On page 648 he explains how, by the demolition of island blocks within estates such as this, and a certain amount of internal improvement, our cities can be provided with additional housing that is up to current standards.

SUMMER SCHOOL FOR WINTER READING

A great deal of sense, wit and erudition is bandied about at the average Summer School, and the pity of it is that it then runs to waste—the lecturers lose their scripts, the students forget what was said, and turning up the notes they made in the heat of the day, find that they have become unintelligible. Praise is due then to the York Institute of Architectural Study for issuing key papers from their various post-war schools in a neat volume—*Studies in Architectural History**—and thus preserving the cream of what was said.

*

The contents have the unmistakable Summer-School stamp: there are the famous lecturers with a single subject, repeating the act that they have done here, there and everywhere, simply slipping in a couple of local references (like the Workers' Playtime comics who mention the works manager by name); there are the devoted pieces of local research, done with care and discrimination (excellent work on villages, both quick and dead, in this volume), and the slapdash pieces of local research, done for the sake of the Summer School. There are the great scholars who have been invited to speak because their work has brought them up against some local problem; who come and deliver a discourse which would be of sensational importance anywhere—in this case Professor Wittkower explaining the importance, on a global scale, of York Assembly Rooms.

*

And there are the unexpected papers which reflect original thought and research of a kind that ought to be going on in some major metropolitan institution but, even nowadays, seems only to be done in the provinces. Anybody who wants to know how one can begin to study the way we experience the spaces between buildings—streets, squares, courts and places—should get a copy of this book right away, and read D. G. Thornley's paper on *Space and Form in Civic Design*. This relates what we would call Townscape experience to what we know about the mechanics of human perception. As an attempt to lay the foundations of a proper aesthetic of the street, ASTRAGAL finds this altogether admirable.

ASTRAGAL

* York, St. Anthony's Press, 15s.

POINTS FROM THIS ISSUE

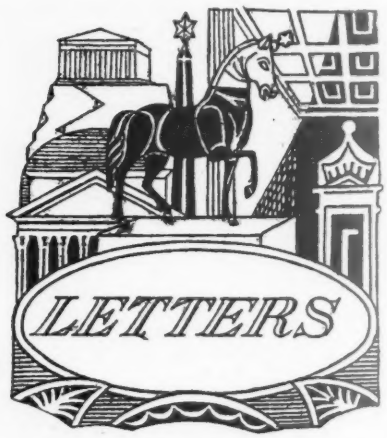
The Editors

IMPROVING WHILE WE PLAN

THE other day Percy Johnson-Marshall spoke at the AA on the replanning of the Stepney-Poplar area. Any sceptics who heard his enthusiastic, quick-fire talk must have had their faith in planning restored. Many of us are too selfish and too unimaginative to give much thought to something that cannot be completed during our lifetime; and it is pleasant to be reminded not only that the machinery for long-term planning is continually working, but also that there *are* such men as Mr. Johnson-Marshall—men who are working with their feet on the ground *and* their heads in the clouds.

But if we are guilty of ignoring the things that are being done now for the future of our cities, we are also guilty—and this is more serious—of ignoring their present state. Too little is done to make our slum areas liveable-in today. Yet many of them—particularly those which were developed in Victorian times—*could* be made to contain reasonable housing accommodation at a reasonable cost. Estates such as the one illustrated opposite are made up of solid buildings which it would be wasteful to destroy at the moment, even if the country could afford to do so. They could be improved by internal re-planning—so that each dwelling had amenities it now lacks, and by the demolition of one or two complete blocks—so that more light and air was available to those remaining.

This is one of the types of improvement which are discussed in an article on page 643 by the JOURNAL'S Guest Editor (Conversions), Felix Walter, who has spent several months—since he wrote his last series of articles for us—studying all aspects of the question of conversions and improvements. His findings will be published in the JOURNAL during the next few weeks.



Laurance M. Wulcko
Honorary Secretary of the Camping Club

Sylvia Crowe, F.I.L.A.

Sheila Haywood, A.R.I.B.A., F.I.L.A.

The Caravan Problem

SIR,—Your caravan issue of November 4 is to be heartily commended, with some reservations.

In the first place, I should like to point out that the Camping Club, equally with the Caravan Club, is a responsible body fostering the interests of mobile caravanners through its section, The British Caravanners Club. Indeed this Committee, which was formed more than twenty-five years ago, is chiefly responsible for the fact that any liberty at all now exists for mobile campers and caravanners.

We, like all sensible people, deplore the present tendencies so well described in your journal, but unfortunately, the law in dealing with "movable dwellings" can see no difference between a solitary bivouac tent and a colony of "shacks." The first and most essential step before any improvement in the present situation can be hoped for, is to find some legal formula which will deal with holiday camps, immobilised caravans and the like, while letting the mobile camper and caravanner be free to roam, but so far, nothing has been produced on these lines. The only concrete proposals which have been brought forward in the legislative field are ones which while designed to deal with the abuses we all deplore, must inevitably make more difficult the path of the wanderers. Consequently, very reluctantly, my Committee finds it necessary to oppose these proposals. We should, however, welcome a serious effort to deal with the problem.

In conclusion, and writing quite personally, I do not agree with your designation of caravanning or camping, as escapism. In many cases escapism is responsible for persons taking up these pastimes, but camping is really an art, in the sense that it requires skill and knowledge directed to the accomplishment of a purpose, namely self-contained mobility. Camping opens many doors to the enterprising and it is heartening to see that despite the deplorable aspects of the activity which you record, there are still many young people who engage in true camping. I doubt, however, if they can do what I was able to do between the wars, and that was to travel 1,650 miles to the Pyrenees and back and spend a fortnight in the mountains for a total cost of £8; nevertheless the economic aspect of camping is still an important factor, since it enables one to travel far more than would otherwise be possible, and travel, at all ages, is a part of education.

LAURANCE M. WULCKO.

London.

SIR,—The plea for the encouragement of "Lone Wolf" caravans, as opposed to camp-herds, is one with which every individualist must sympathise. But if the suggested licences were issued to permit camping on any vacant ground, how long would the wolves remain lone? The extent to which a 25 ft. caravan can be camouflaged by even the most efficient Commando is limited, and the evidence of where my caravan has rested is likely to remain, if only in the form of wheel-tracks and crushed herbage. One well-behaved caravan every few miles is harmless enough, but one every 50 yards becomes a nightmare. Nor can one fail to sympathise with the farmer, who on going out to call the cows in, finds his field strewn with impeccable caravanners, armed with permits and intending to stay the week.

A possible solution would be for the camping licences to be endorsed for certain counties, the endorsements for any one area being limited to the number which could be absorbed without turning the countryside into suburbia. With this could be combined a policy of providing suitable sites for one or two caravans on waste land in inconspicuous sites.

SYLVIA CROWE.

London.

SIR,—I was very much attracted by Sylvia Crowe's plan for a caravan camp at Sutton-on Sea. During a fairly extensive survey of sites for the Caravan Club, I found that it was (naturally enough) always the woodland sites which were most successful. Orchards, rhododendron woodlands or the birch/pine heaths and woods typical of the sandier soils, with their smallish scale and gaiety of contrast, seemed particularly well suited to holiday sites.

There is here, however, something of a vicious circle. A site which is already attractive and well-treed will often be refused planning permission on the grounds of damage to amenity. New planting on a bare site, however extensive, is apt to be damaged, if not obliterated, if the site is to be used soon after planting. (Few operators can afford either the time or the fencing which would otherwise be needed.)

A more liberal policy towards camping in existing woodlands, with the site so designed that it can revert to forestry or other uses with the least possible disturbance, seems a reasonable solution.

SHEILA HAYWOOD.

London.

[May we take this opportunity of thanking the Caravan Club, for whom Mrs. Haywood acts as architectural adviser, and their associated magazine, *The Caravan*, for the help they gave us in the preparation of our special issue on the caravan problem. Many of the photographs we published were supplied by them. Others were lent to us by the magazine "Modern Caravan."—EDS.]

MOHLG

Housing Increases

The number of houses built in Great Britain in September was 31,413, the highest September figure since the war and the third highest monthly figure since the war. Of these, 22,404 were built for letting and 9,009 for sale.

During the first nine months of this year private builders in Great Britain completed 64,450 houses, an increase of 50·6 per cent. on the figure for the first nine months of 1953.

NEW YORK

Distinguished Architects Collaborate

A new building for Distillers Corporation—Seagrams Ltd., in New York city, is to be designed by Mies van der Rohe and Philip Johnson, in association with Kahn and Jacobs.

COVENTRY

Civic Theatre

A civic theatre is to be built in Coventry (the architect is D. E. E. Gibson, the City Architect). It will form part of a new composite building to be put up in Corporation Street, where it will lie behind a frontage of shops and store-rooms with three floors of one-room flats above them. (Some of these flats will be let furnished to actors and other members of the theatre company. This will be the first civic theatre in England to be built as such.

The civic theatre at Coventry grows out of the need felt a few years ago for the city to make its contribution to the "continuance and development" of the Arts Council's Midland Theatre Company, which Coventry shares with three neighbouring towns. The City Council then made the company a grant, out of a ½d. rate, part of which was kept back towards the cost of buying, converting, or building a theatre when restrictions should at last be relaxed or removed. The fact that the new theatre is to be built as part of a composite scheme makes it difficult to give an exact idea of its cost. For the scheme as a whole the cost will be: site, £38,000; building, £164,369; and miscellaneous expenses, £6,000, making £208,369 in all.

The scheme is to be paid for out of a 40-year-loan, instead of, as is usual, a 30-year one; and the next step is the local inquiry to be held by the Ministry of Housing and Local Government as the sanctioning authority under the 1948 Act.

CONVERSIONS

A Film and a Book

Allied Ironfounders Ltd. have just issued a new 100-page booklet entitled *Improvements and Conversions* and a film entitled *There's a job to be done.*

These are in the nature of a follow-up to the booklet and film of "The Stockton Test," and they centre round the Housing (Repairs and Rents) Act, 1954. The booklet, which gives a straightforward description of the workings of the Act together with a wide selection of typical conversion plans, will be sent to architects interested in the subject. The film is in the nature of a political discussion on the merits and demerits of the Act, and is intended chiefly for local authorities and housing organisations.

AA

Costing Methods

At the Architectural Association on November 9 a "Forum" was held on a new development in costing methods that is being put into practice in Austria, under the ægis of the US Special Mission for Economic Co-operation.

The first vehicle for the costing system was a settlement of 15 pre-fabricated houses built near Vienna. For this, tenders were invited on a nation-wide basis, and in the tendering document each component was separately priced in a sixfold breakdown: material, labour and overheads *on-site;* and material, labour and overheads *off-site*. If they so wished, tenderers could submit prices for the whole settlement, for one house or even for one component. They were also asked to put in figures for quantities of 100 and 1,000. W. K. Wittausch and Ernst Hoch, who told the AA gathering what had been done, pointed out that the aim of the whole scheme was to bring into being a pre-fabrication industry (for home and export), while the aim of the tendering method was to "make contractors think afresh" about the whole problem of costing and quantity production.

Results so far achieved were said to be both encouraging and revealing.

GUEST EDITORS, 1955

The costing method referred to in this note will be reviewed by the JOURNAL'S *Guest Editors for* 1955, *as part of their programme of investigation into the Cost of Building. The names of these Guest Editors will be published shortly.*

PUBLIC WORKS

Exhibition and Congress

The Public Works and Municipal Services Congress and Exhibition were held at Olympia from November 15-20. The exhibition was devoted chiefly to contractors' plant and civil engineering equipment. Of the papers given at the Congress, the most interesting to architects was one by J. Mercer, Assistant Chief Engineer to Crawley Development Corporation, on "The Effect of Modern Tendencies in Estate Layout on the Cost of Future Maintenance and Servicing." Mr. Mercer discussed the incidence of maintenance cost on the four type layouts given in MOHLGs "Houses, 1953" and made the point that such questions as the annual upkeep of grass verges, refuse collection and water supply tend to off-set the savings in first cost of some of the proposed model layouts.

ABT

Statement on BAG

The ABT has issued the following statement:

"The British Architectural Guild have issued a statement to the effect that whilst the ABT have been in discussion with the RIBA about representation of salaried architects, the Association came to an agreement with the ASW and AUBTW to admit members of those two organizations as members of the ABT. The statement concludes that '. . . the resulting governing body (of the ABT) must be so diluted by the Trades that the profession of architecture will have very small representation . . .'

"It is surprising that the BAG have waited nearly four months to comment on a matter which was the subject of a press report on July 30 and in making their belated comment ignore a clarifying statement by the Association which was published on August 13. That statement explained that the rules of the ABT had never allowed craftsmen (or 'tradesmen' as the BAG prefer to call them) to become members of the ABT and the new arrangements with the ASW and AUBTW had not changed that position in any way. The arrangements between the ABT and the ASW and AUBTW were designed to meet the needs of clerks of works who were formerly craftsmen.

"If the BAG were aware of the published explanation when they made their recent statement it can only be concluded that they were deliberately misleading the profession. If they were not aware of the explanation it can only be concluded that they have not exercised the care in checking their facts, which is the first duty of any organization seeking to establish a reputation as an authoritative and responsible body.

"It may be of interest that the agreement to which they refer was first made in 1943 and was amended in March of this year—two months before the discussions with the RIBA were decided upon. It is also a fact that at the moment architects and architectural assistants are the largest single category in the ABT, and if more architects join us their increased numbers are bound to be reflected in the various committees and Council of the Association.

"The BAG suggest that the whole question of representation should be taken out of the hands of the major professional body (the RIBA) and put into the hands of an independent Committee, perhaps sponsored by the architectural journals. The 21,000 members and students of the Royal Institute may not always agree with their leadership and may at times feel impatient of them. Nevertheless, they will treat the timing and contents of this latest suggestion with the same caution as they treated the advent of the BAG."

EXHIBITION

Bavarian Rococò at the V and A Museum

A correspondent writes the following:

"Absolutism was the keynote of eighteenth century Europe—Ruler and Church, as supreme heads of the social order, concerned to demonstrate publicly their function within the system, used art as one means to this end." I wonder what any of the white and pink cherubs with their chubby faces and golden wings would say to this high-handed quasi-Marxist bombast (curiously coming from "American" Germany) from the introduction of the catalogue to the *Exhibition of Bavarian Rococc* now on view at the V and A Museum. In any case the eighteenth century also saw the end of absolutism; and indeed as Prof. Pevsner has convincingly pointed out in a lecture in connection with the exhibition, Rococo art was a curious mixture of popular and court style; the architects like Michael Fischer and the sculptors like Igner Günther were workshop-trained masons and carvers, not astronomers or captains in the army. They filled the new style coming from France with a new vitality and a firm religious belief. Far from being frivolous these figures of dancing and whirling saints, acting the scene they represent, painted in light colours of enamel brilliance, were created out of a sense of deepest veneration. What is curious is the mixture of extreme naturalism of detail and an unearthly lightness of the sculpture.

The eighteenth century, too, saw the discovery—in Europe at least—of porcelain (there are some enchanting Chinamen and figures from the Commedia dell' Arte) as well as a great flourishing of lacquerwork here represented by a table and clock in yellow (very rare), red and black lacquer in the Chinoiserie taste, one of the adjuncts of Rococo. But what is Rococo? Above all, how can it be recognized? Very simply, by its asymmetry. All ornament (there is a large piece of wall panelling in white and gold) ends with a one-sided twist, all figural composition is lopsided. Its very lack of logic is its greatest charm. One could only wish that something of the atmosphere of the original setting had been recaptured, a few rich velvety golden curtains to relieve the austerity of the V and A or at least some greenery to protect the putti from draught.

DIARY

Seminar: Books and the Modern Movement III. Talk by Reg Butler on "The Meaning of Modern Sculpture," by R. H. Wilenski. At the ICA, 17-18, Dover Street, W.1. 8.15 p.m. Members 2s. 6d., guests 3s. 6d.
NOVEMBER 25

The Victorian and the Modern Movement in Architecture. A course of six University of London Extension Lectures in association with the Chelsea Society, given by R. Furneaux Jordon. Fifth and sixth lectures: *Pioneers of the Modern Movement* and *Today and the Future.* At Crosby Hall, Cheyne Walk, S.W.3. 8.15 p.m.
NOVEMBER 25 AND DECEMBER 2

Some Problems of a Rural District Council. Talk by A. H. W. Oliver, chairman of the Housing Committee, Wokingham RDC, Berks. At the HC Trust, 13, Suffolk Street, Haymarket, S.W.1. 1.15 p.m.
NOVEMBER 30

Lead for Building. Film at the BC, 26, Store Street, W.C.1. 12.45 p.m.
DECEMBER 1

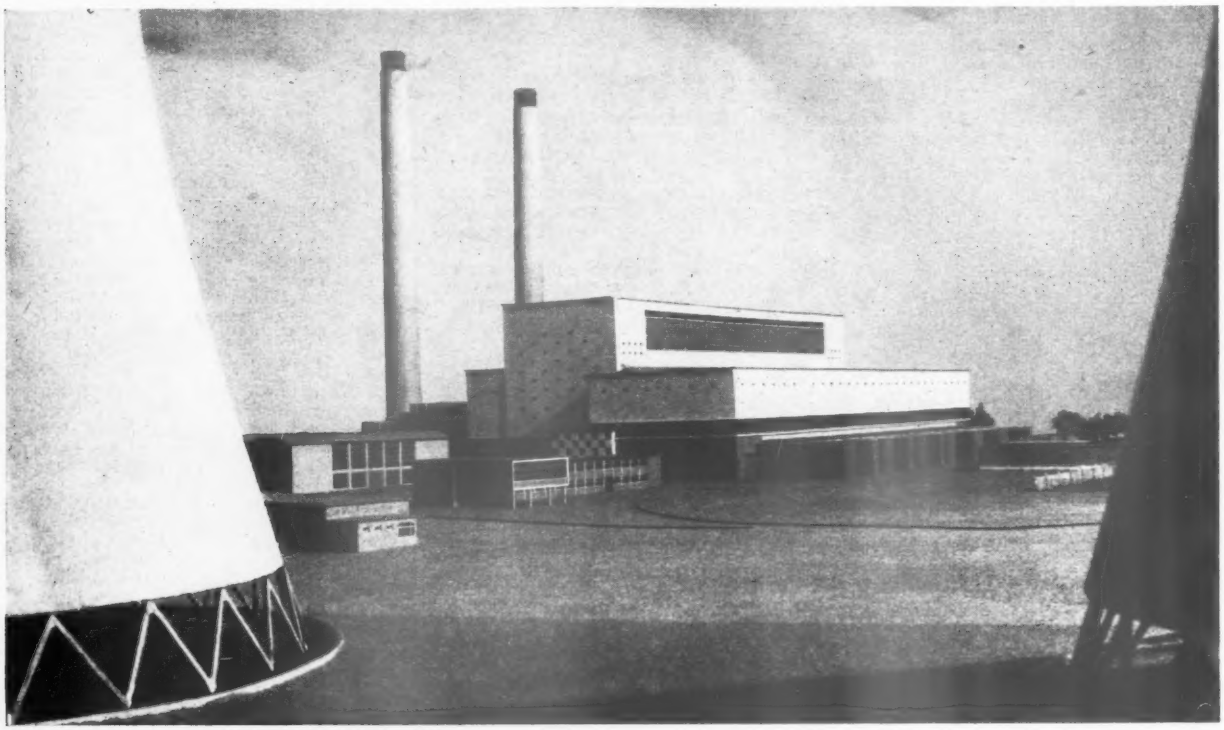
The Profession of the Land. Talk by P. H. White at an Engineers' Guild Ltd. (Metropolitan Branch) Meeting. At the Caxton Hall, S.W.1. 6 p.m.
DECEMBER 2

The Landlord and Tenant Act, 1954. Talk by W. E. A. Bull. At the RICS, 12, Great George Street, S.W.1. 5.30 p.m.
DECEMBER 6

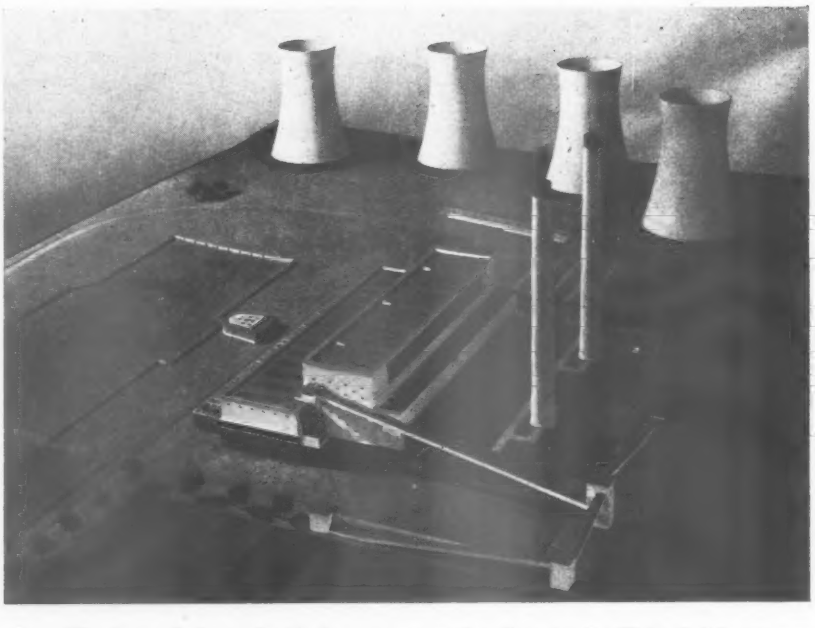
Trip to Peking. Lecture by Sir Hugh Casson. At the AA, 34, Bedford Square, W.C.1. 8 p.m.
DECEMBER 6

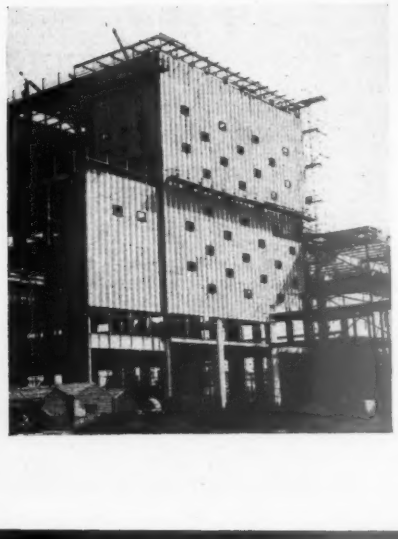
Building in Singapore: An Historical Review of Tropical Architecture. Illustrated talk by T. H. H. Hancock. At the AA, 34, Bedford Square, W.C.1. 6.15 p.m.
DECEMBER 8

PROPOSED POWER STATION, CASTLE DONINGTON



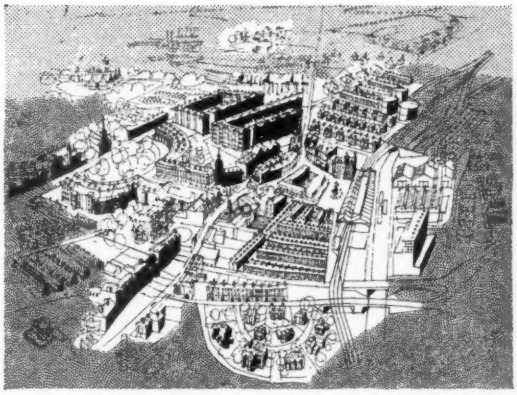
The proposed power station for the British Electricity Authority at Castle Donington, Leicestershire, was designed by Clifford Tee and Gale. Above and right are two views of a model. It is thought that this project is one of the first of its kind where the architects were called in at the outset and were able to influence the layout of the roads and the placing of the cooling towers. The architects have attempted to bring the whole mass of the power station into scale with the cooling towers, which are designed in a wide sweep around the west side of the





site. The base of the main block up to operating floor level will be clad in concrete blocks, finished externally in the local Mount Sorrel aggregate, exposed. Above this level the cladding, seen in progress photograph, left, is asbestos cement sheeting. The roof of the main block will be of lightweight steel decking and the turbine house is to be lined internally with an asbestos insulating board. The number of subsidiary buildings has been reduced by the grouping of various elements under one roof. The consulting engineers are Freeman, Fox and Partners, the quantity surveyors, Leitch & Samuel, and the general contractors, Taylor Woodrow Ltd. The steel contractors are Sir William Arrol & Co. Ltd.

Earlier in the year the JOURNAL'S *Guest Editor for* 1954, *Felix Walter, wrote several articles on the conversion of large dwellings into units of accommodation. Since then he has been making a study of all aspects of the question of conversions, and the results of this investigation are to be published during the next few weeks. This first article in the series deals with improvements of existing dwellings. In it he discusses—among other matters—the possibility of improving the more solidly built type of city slum area, the question of improvements in rural areas and the conditions under which a Ministry improvement grant may be obtained. Next week Mr. Walter will write about problems of ownership and management.*



HOUSING IMPROVEMENTS

Any distinction between improvement and conversion presents its own difficulties, but for the purpose of this article, which is concerned only with the former, conversion implies a change of use or of the number of units created rather than merely the addition of amenities—whilst improvement infers the raising of standards within an existing house or block of dwellings.

"Adaptation," a half-way house between the two, is in fact only an ill-contrived means of providing additional units without offering tenants the privacy and self-sufficiency of a home. Immediately after 1945 there may have been some justification for these adaptations to meet, or partly meet, the dearth of accommodation, but anything short of self-contained flats, maisonettes or houses should be discouraged, and even prohibited, on the grounds of inadequacy and inconvenience of arrangement. Too many requisitioned properties have been crudely adapted and it is no longer good enough to re-name a large Victorian drawing-room "kitchen-living room" because a sink and single drainer have been fixed in one corner and a doubtfully-ventilated cupboard—the larder—in another. Floor space is too valuable to be misused, and one must remember that many families now housed in this type of accommodation are neither accustomed to such a large room, nor do they like it. And in any case they can ill afford to furnish or heat it.

Many local authorities are keenly sensitive to the needs of those occupying primitive dwellings—but the smaller 19th century terrace housing, whatever its age or condition, is often considered fit only for replacement by monstrous blocks of multi-storey flats. Some authorities go further by condemning the principles of patching or improving short-life property as an uneconomic step, without regard for the existing discomfort of the occupants.

But slum conditions are not necessarily the product of monotonous planning, high densities, neglected repair or the demon landlord. They are due rather to a psychological state of mind which has no desire to improve or even to maintain personal standards. Thus, alongside the provision of baths and hygienic cooking facilities there must also be moral re-education for those in need. Desirable as model conditions may be, the country cannot afford wholesale reconstruction and it would be foolish to believe it possible or necessarily desirable. In addition, it is debatable whether living in flats or isolated new estates would be the personal choice of many awaiting removal from their condemned homes. Flats, in particular, have limited appeal and communal areas are a poor exchange for the small back yard.

Back yard and garden

In fact the back yard is an essential to those who prefer the small compact house: it provides a limited but convenient space for clothes drying, for standing the bicycle in safety, and for doing odd household repairs and hobbies; here also there is a place for the pram near enough for easy supervision. Planners, with their impersonal tendencies, are inclined to overlook the day-to-day needs and habits of the family, and these are eventually lost amongst the broad conceptions of immense high-density point-blocks set in open spaces. And the theory behind these schemes often fails the practical test: how for instance are small children to be supervised when playing in communal areas if their parents are several storeys up, or out of sight of the area?

A problem of resettlement

The compulsory uprooting in clearance areas tends to effect the middle-aged and older people more than those with young families. Many have lived in the same houses for 30 or 40 years, and these people are reluctant to be moved away from their centres of employment, friends and local amenities—especially when they have also to face higher rentals which so many of them can ill afford. Yet although every encouragement must be given to the redevelopment of the worst areas, where health may be jeopardised by prevailing conditions, those in authority must cease to judge others' preferences by what happens to suit themselves. The small shop owner abominates the loss of his livelihood as much as the family its home—the fundamental need surely is for the retention of existing community life for those who prefer it and the reconstruction of the worst areas in scale with what remains.

Justification for improvement

But apart from the welfare of the individual, there are other considerations which support the principle of improvement. Admittedly improvement fails to provide additional units of accommodation but it does guarantee existing dwellings against deterioration and subsequent demolition, which means a further family on the housing list. With the type of labour normally engaged on such work, there could be no serious effect on the building industry as a whole. There is also the humanitarian approach which Mr. Macmillan has stressed on several occasions: the time has come when the needs of many thousands of families who still use the kettle-filled portable bath, and who are without main water supply or a private w.c., must be given more than sympathy.

The life of buildings

As the age of a building increases so does the amount spent on repairs, and the limit is reached when repairs become replacements. It is impossible to assess with accuracy the life of a building, and any estimate of economic life will depend on one's ability to anticipate future social and economic demands. Because of their merits, or perhaps because clearance and reconstruction were less economical than preservation, many buildings have survived several centuries—and even temporary buildings constructed for short-term needs exceed generally the period for which they are designed. For instance, in Racquet Court, off Fleet Street, in London, may be found a temporary building erected immediately after the Great Fire of London in 1666. This building is still being used in much the

This new development in Battersea portrays, alongside the old backyards in the distance, the inhumanity of communal playgrounds and drying spaces which are unrelieved by nature and the everyday clutter of domestic life. The lack of privacy in this somewhat austere setting seems to impart an atmosphere of restraint upon the flat dwellers. But the small back gardens of the distant old houses offer, as pockets of private land, countless benefits to individual family life. Before these personal amenities are destroyed, the urgent need or demand for even a miniature sized garden should be assessed against the alternative of a dreary stretch of communal tarmac.

same way as it was in the 17th century.*

Assuming a building to be structurally sound, its life depends upon its general demand which fluctuates with social change, economic standards and redevelopment schemes—and its replacement is decided by the current rebuilding costs and its enhanced powers of earning compared with its present value and the income it attracts. Private enterprise is unlikely to take any great interest in demolition and reconstruction, and particularly repair and improvement, unless backed by economic motives. Since most areas calling for improvement carry low rentals, their liability will probably become that of the local authority unless sufficient incentive can be offered to the private landlord: and as the local authority are partially reimbursed for loss incurred, why then should the private landlord run the risk without similar safeguards?

The legacy of substantially-built 19th century houses is a mercy in many ways, for in present financial circumstances we have been presented with buildings having an economic life, however socially obsolete the layouts may be. The larger house capable of conversion offers fewer problems than the smaller terrace dwelling requiring improvement—for although its structural life may be far from spent, the drop in the value of money and the freezing of rents under the Rent Restriction Acts have created a back-log of essential repairs, quite apart from the need for improvement.

Life and capital outlay

The cost of repair and improvements falls into short- and long-term periods, the latter being more than about fifteen years. When considering the maximum capital outlay for any particular case, there are many factors one has to bear in mind—perhaps the most important being the estimated life of the building; its scheduled life if within—or likely to be within—a redevelopment area of a local authority; whether or not the property is to be offered for sale when improved, and the method of raising capital.

To assess the " reasonable expense " of repair and improvement, there is no rule of thumb, but one or two methods have been suggested from time to time and all apply to comparatively long-term improvements. One is that the estimated costs should not exceed 50 per cent. to 66 per cent. of the estimated value of the house when the work is complete. Another is based on a multiple of the rateable value—twelve times has been suggested. But with such a variety of differing circumstances, each case must be assessed independently; Birmingham's average figure, in March, 1954, for complete renovation of its many back-to-back dwellings was then £195 each—with a maximum of £350. But even then, bathrooms and hot water supply are not provided, owing to the restricted life of the houses.

Short-life by Birmingham's standards is five years and less, with specified expenditure for the last three years. Houses for demolition within two years receive only minor first aid costing £10 to £15. On other short-life dwellings the rates are as follows:—3 year life £40; 4 year life £60; 5 year life £80.

Until the passing of the new Act this year, all houses were rent-restricted so that no capital outlay on repairs could be retrieved —and the only increase permissible was 8 per cent. on the cost of such improvements as a new electrical installation where none existed before, or a new w.c. where a dwelling was within its own curtilage and had not one previously. With the removal of rent restriction from all local authority controlled tenancies, it will be interesting to discover how rents will be affected in future.

Standardizing improvements

The greater proportion of houses needing improvements are the 19th century two- and three-storey terrace types built after the introduction of bye-laws in about 1875. Houses of pre-bye-law era in industrial centres qualify generally, if at all, for minimum repair pending demolition—since they are usually the poorest of the housing stock and must be the first to go. In the Hulme area of Manchester there are many of this

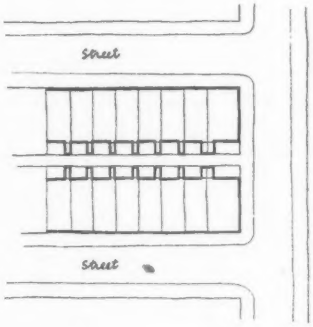
* Design in Town and Village, Part III W. G. Holford.

variety between 1830-50, as in other industrial centres, and from the street elevation they appear reasonably sound and tidy, but this is deceptive. Party walls are only 4½ in. thick, the back yard is really far too small to be of any value and the approaches are almost beyond repair.

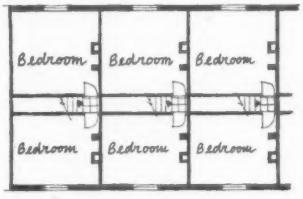
But the bye-law houses offer greater opportunity. Built with Victorian solidity, the structures are good for many years hence and with the introduction of current amenities these dwellings can provide reasonable living standards. A number of authorities are considering ways and means for setting in motion improvement campaigns—Nottingham's housing architect has prepared a series of standard schemes based on half a dozen repetitive type plans. These show what can be done—the provision of bathrooms, kitchens, hot-water supplies, electrical installations and complete repair and redecoration inside and out. For these types shown here the appropriate cost per dwelling based on rough outline specifications is: repairs, £170; improvements, £400; total, £570.

The rateable values of such dwellings range between £7 and £11, and after improvement they are likely to rise by about £2. Precisely how these proposals will be applied to the individual dwelling remains to be decided, but where the owners are prepared to accept offers to purchase from the City of Nottingham, these dwellings will be completely overhauled. When complete details are available, it is expected that alternatives to purchase may be proffered—the underlying intention being to assist where reasonably possible.

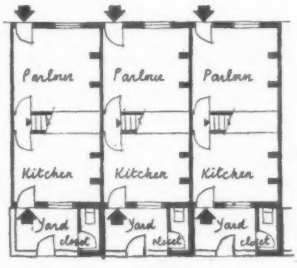
At Stockton and Croydon houses similar in character have been the subject of experiments by private enterprise companies, but the real problem is this—how can the owner-occupier or the landlord of only one or two of these terrace dwellings carry out



Site plan

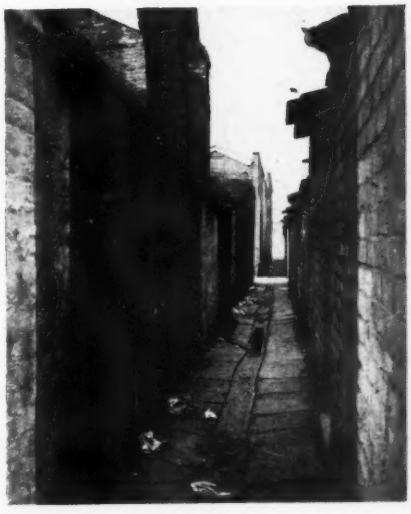


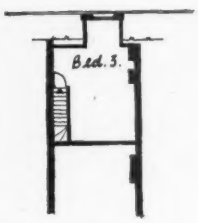
First floor plan



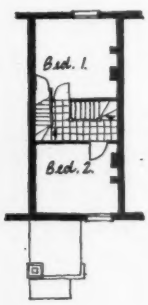
Ground floor plan [Scale: ⅛" = 1' 0"]

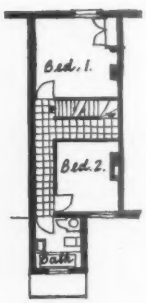
The trim appearance of these terrace houses, with their painted doors and window reveals, merely conceals the desperate shoddiness and disrepair of their back yards (about 54 sq. ft.), and the garbage-strewn passage alongside them. But these yards, although much too small to be of practical value, do not in themselves alone condemn the houses; it is the party wall 4½ in. thick that relegates them to the level where demolition is the only solution. Four-roomed urban houses can be improved to the greatest advantage when yards are sufficiently large to accommodate small extensions for kitchens and bathrooms, for in this way sleeping space is not lost. For the single couple living alone in such a house it would be reasonable to encroach upon the second bedroom for bathroom facilities; there is a definite scarcity of single bedroom houses for old people, who can do without unnecessary floor space and these smaller units should be included amongst the normal family-sized houses.



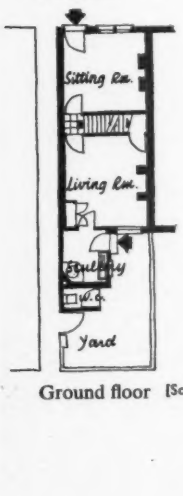


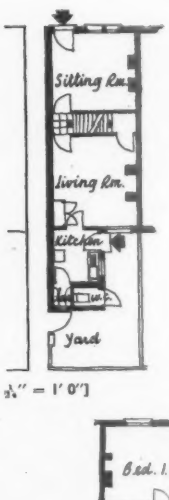
Second floor





First floor

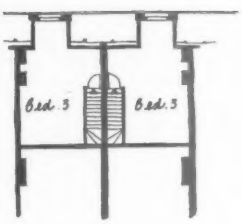


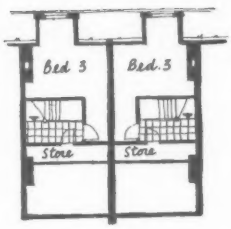


Ground floor [Scale : $\frac{1}{8}$" = 1' 0"]

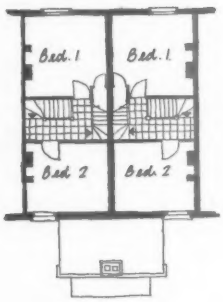
Extreme left, No. 10 Kentwood Road, Nottingham, before improvement. Left, after improvement

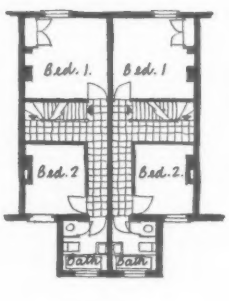
Right, Nos. 20-22 Kentwood Road, before improvement. Extreme right, after improvement



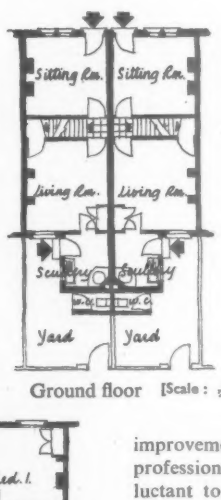


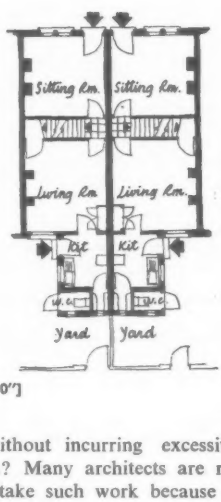
Second floor





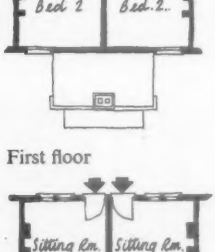
First floor

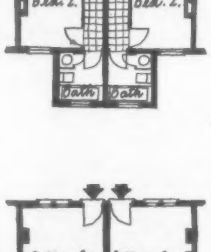




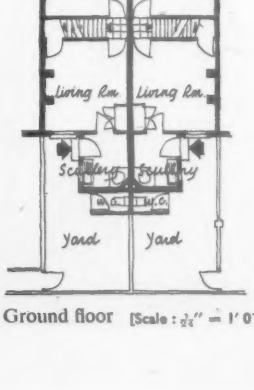
Ground floor [Scale : $\frac{1}{8}$" = 1' 0"]

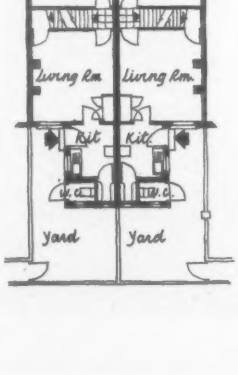
Right, Nos. 32-34 Kentwood Road, before improvement. Extreme right, after improvement





First floor





Ground floor [Scale : $\frac{1}{8}$" = 1' 0"]

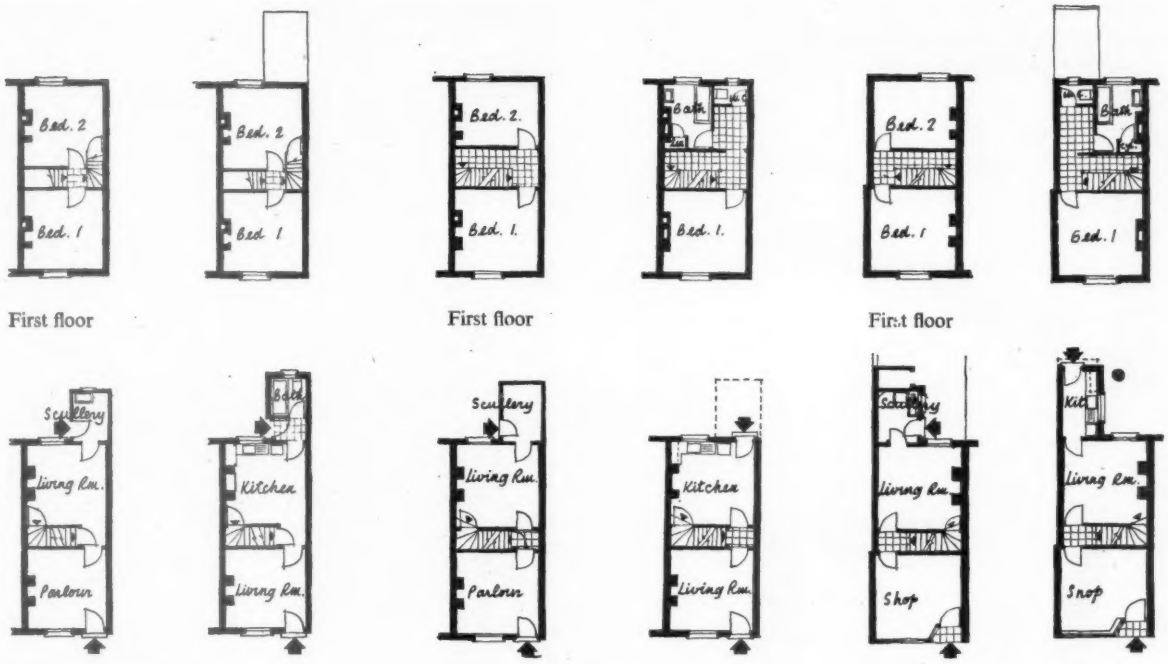
The houses in Kentwood Road, Nottingham, suffered considerable war damage from incendiary bombs and in several cases, being practically gutted, they were all but rebuilt. In this process of reinstatement properly equipped kitchens and bathrooms were included as well as domestic hot-water installations. The average combined cost of repairs and improvements to each dwelling was approximately £1,280. Architect for these schemes and those at the top of page 647 : C. A. Pilkington, Nottingham's Housing Architect.

improvements without incurring excessive professional fees? Many architects are reluctant to undertake such work because it fails to pay.

Professional assistance

At the request of the Minister of Housing and Local Government, the allied societies of the RIBA have prepared lists of members willing to undertake improvement and conversion work in each area. These lists have now been distributed to County, County Borough, Borough, Urban and Rural district authorities to whom the general public can apply for names of local architects prepared to offer these services.

Another method is to enlist the support of the allied societies of the RIBA in a slightly different way. A panel of local architects could be created to prepare surveys of the smaller standard-type dwellings in their area with alternative schemes for improvement depending on the flexibility of the house types considered. Estimates could be given for each scheme and a simple statement could be drawn up to show the equivalent cost either in the form of rent increase or rates of repayment in the case of grant and/or loan aid. Once this basic information had been prepared, a few small contracting firms could be invited to join in



An attempt is being made in Nottingham's Housing Architect's Department to meet the need for improved conditions in houses with a reasonable expectation of life. These efforts are for the benefit of the private owner as well as for the Authorities' tenants. The majority of cities and large towns contain several standardized type plans of terrace houses, often peculiar to their own areas. In this case, Nottingham's problems are unusual because of the undulating nature of the land around the centre of the city. Three typical repetitive terrace house arrangements have been used to show how such property may be improved, the cost of this work as well as expense of repairs and the effect these improvements will have upon rateable values. The estimates quoted are average figures since the state of repair of each individual dwelling will vary considerably. In the case of the two-storey house (above, left) the total cost of £570 is made up as follows: Improvements £400, Repairs £170. Rateable values at present range between £7 and £11; after improvement these figures will be increased by approximately £2. The three-storey house (above) and the two/three storey shop (above, right) follow a similar pattern with regard to capital outlay but rateable values are more variable. The present r.vs. for the three-storey house lie between £9 and £11, though a small proportion are as low as £7; houses with shops at street level vary more so but as a rule rateable values are not likely to be increased by more than £2 in either case after improvement.

the scheme. To publicize these facilities, sample improvements might be carried out which, when completed, would be open to inspection by the public.

Although the panel of architects would be reimbursed for their services, the underlying intention would be to initiate a scheme (not altogether philanthropic) but which would assist people who cannot afford professional advice. There might be a standard charge for the scheme and for supervision, and this would be included as one of the items making up the overall cost. The charge itself could be assessed on the initial cost of the standard scheme prepared plus supervision, and spread over an assumed number of dwellings which might be improved. The panel might expect a loss in the early stages, but the success of the proposal would depend on a careful study of local needs before the schemes are prepared.

It would be necessary to consult the RIBA where the scheme might contravene present professional regulations. But the profession must adjust itself either to social change and demand or lose its value through inflexibility—and in cases, therefore, where members can show some genuine need for adjustment of procedure to meet current problems, there ought to be little antagonism from the Institute's Council.

Improvements by self-help

A further method which could be adjusted to assist the smaller landlord and owner-occupier is the self-building housing association. To meet this particular need, the associations could be composed of those living in the same street and in the same type of house; improvements could follow a standard pattern or they could be modified to suit each member's needs and pocket. And here again the local panel of architects in the area could be of immense help.

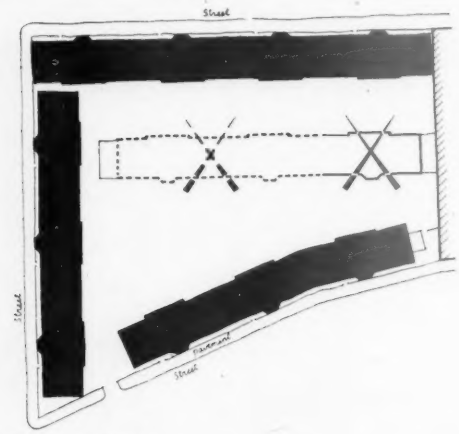
Without the existence of this panel, assistance could be obtained from a local architect or from the National Federation of Housing Societies. In a later article in the JOURNAL, Ernest Watkins will discuss the procedure to be followed in the formation of housing associations—it should appeal to many with time to spare and sufficient initiative backed by the desire to improve their own homes. In areas where a fair response might be expected, a series of instructional talks might be given to the public—but only after local householders had been circularised with a carefully prepared explanation of the whole scheme. The type of work envisaged is illustrated on this page by Nottingham's standard plans, prepared by Housing Architect C. A. Pilkington, and the extension to 18, Vera Street, Manchester, prepared by Alfred Gray.

Ground floor before improvement [Scale : 1/8" = 1' 0"]

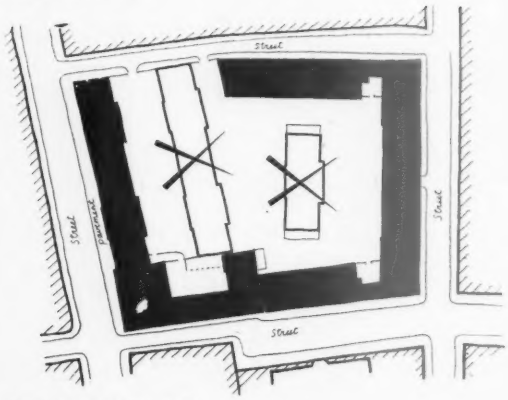
Ground floor after improvement

No. 18, Vera Street, Manchester

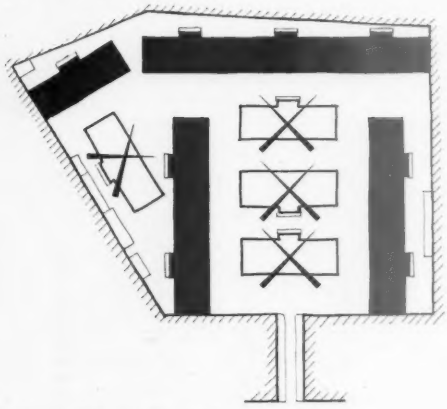
The arrangement of bathrooms and kitchen in this small extension contravenes model byelaw 97 (4) and the reduction in the area of the backyard from about 154 to 70 sq. ft. would be considered unfavourably by many local authorities. But with the total floor area of the two-storey house being not more than 575 sq. ft. (excluding the new extension) any further encroachment upon this limited space would be unwise. It is perhaps for this reason that some local authorities refuse permission to develop but at the same time condone the work if carried out.



Scheme A (right)



Scheme B (below right)



Scheme C (opposite page)

Before one can attempt to make better use of the 19th century tenement dwellings, the estate as a whole must be considered. In the three examples illustrated here, the buildings are far too congested with the result that habitable rooms on lower floors receive inadequate natural illumination. Standards could be improved by the demolition of a few buildings, as shown, thus creating a greater sense of space and the opportunity to improve these conditions further by the planting of trees and sturdy shrubs to relieve the immense brickwork facades. It is well to remember that trees are inclined to reduce the noise from children playing within an enclosed court and for this purpose alone their introduction would be an advantage. The next step is the conversion of the remaining buildings into self-contained flats with their own bathrooms and kitchens; this aspect is discussed and illustrated elsewhere. It is all too simple to suggest that blocks should be demolished; one has to remember that the tenants in these blocks must be rehoused. If this problem can be overcome, and in time it obviously can be, let us hope that these opportunities to improve surroundings in an imaginative manner will not be overlooked. Wartime bombing has assisted in demolition but unfortunately many of the blocks which should have disappeared still remain. In the case of example A, part of the central block was removed by enemy action but one would welcome the demolition of the remainder to open up this large internal court to all the buildings around it. (Note, the blocks marked with a cross are those causing the greatest obstruction.)

Housing associations and improvement

The main purpose of improvement is to provide better conditions for those living in substandard accommodation. Precautions may be necessary at times to prevent invasion from outsiders who can better afford these improved conditions and the higher rents which they command. Housing associations or trusts which renovate property, generally buy up vacant dwellings, improve and re-let them and see to it that only local families are reaccommodated.

There is no reason therefore why "street" housing or co-operative associations should not be formed to improve the members' own homes. With an efficient secretary, considerable duplication could be eliminated and a

general saving in over-all costs could be effected by bulk purchasing of material and careful phasing of the work—and professional charges would be reduced where identical or similar schemes were adopted. One possible obstacle might be the reluctance of some owners to make over their property to the association, but this could be overcome by an agreement whereby all members' houses would revert to their ownership when the entire improvement programme is complete. To make this arrangement optional might introduce complications; perhaps all but one or two members would resume ownership and the association would be forced to continue for their benefit.

Improvement by partial demolition

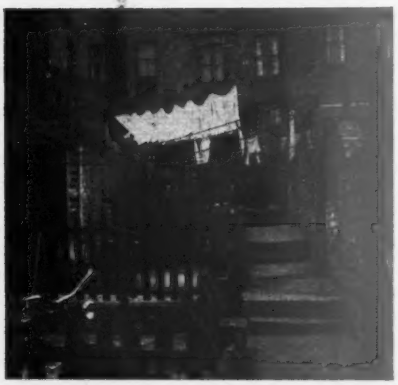
Many tenement blocks erected after 1860 or thereabouts remain structurally sound and frequently well maintained. How, by rehabilitation internally, this primitive accommodation can, at reasonable expense, provide new self-contained flats with present-day amenities is described elsewhere. High density site development of these blocks, however, instills gloom and claustrophobia into any redevelopment—and one solution is to introduce partial demolition to provide light, air and a sense of space around those blocks which remain.

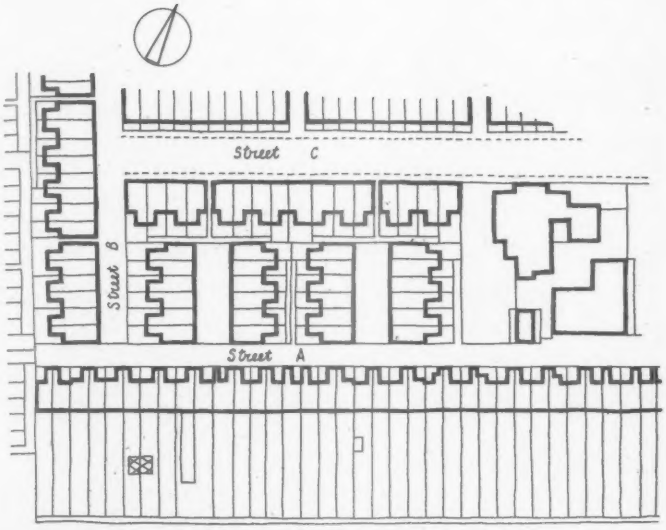
A typical example is St. Martin's Cottages in Liverpool, now in process of conversion (AJ March 18). The removal of the central blocks will open up the whole site and increase the space between the remaining units from 25 feet to over 70 feet. The environment is typical of industrial development and the lack of any vegetation is deplorable .

The tenements in London shown on this page offer less opportunity than the Liverpool example. Blocks mostly adjoin the street pavements and, short of extensive demolition with the loss of much habitable floor space, congestion can scarcely be relieved. But these central area sites are valuable plots and the inadequacy of accommodation, by current standards, is a sound reason to press for improvement. Blocks not dissimilar to these, and many years ago condemned as unfit for human habitation by artisans for whom they were designed, are now let as office suites commanding high rentals in central London. The shortage of domestic accommodation demands better conditions by improvement rather than a complete change of use. The block plans show how these sites could be opened up. With internal replanning to provide self-contained flats in place of rented rooms with communal wc's and washing facilities, these black spots could be transformed into valuable housing communities with a further long lease of life. This method of partial demolition to improve environment might be applied to smaller scale congestion. What appears at first glance to be just another slum area may contain thoroughly sound building which, if thinned out, could provide reasonable homes. Frequently, such areas are quite small and therefore present fewer problems in the rehousing of occupants. An example of this is to be found in Nottingham (see page 650); the locality consists of terrace houses built during the first quarter of the 19th century on one side of the street, whilst on the other there are bye-law houses in blocks at right-angles to the public way. Historically interesting as the former may be—they have a second storey used originally as family workrooms when lacemaking was a homecraft—these buildings are really due for clearance. But the other houses would benefit from thinning since the distance between the terraces is less than 22 feet. Back yards which are now very small could be extended and the remaining area developed as play space or pocket-sized formalised gardens where residents could sit. Temporary or permanent planting could be introduced, depending on the life of the remaining buildings in the area, and this would be decided by the City's redevelopment plan.

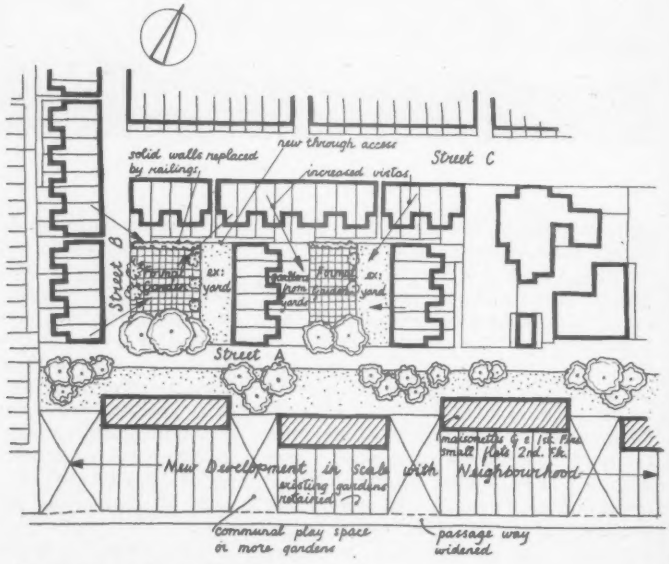
Landscaping, even of the most elementary type, is rarely considered at all, and it deserves greater respect than it receives. Whether a development is of long- or short-term duration, permanent or temporary planting, even if only modest in conception, should form an integral part of the improvement scheme; trees and shrubs which can withstand industrial atmospheric pollution are available and ought to be used. Lack of knowledge or experience may be more responsible for their absence than lack of funds, and in a later article on townscape and amenities advice is provided on the selection of plants as well as methods of temporary planting.

Partial demolition can be applied to congested two storey housing areas as well as to five and six storey tenement buildings. It is again a matter of opening up vistas and of providing more open space within localities containing dwellings of sound construction which can be improved to conform with the requirements of the Housing Repairs and Rents Act, 1954. A small section of the neighbourhood adjoining Pleasant Row in Nottingham is illustrated here to show how, by removal of alternate terrace house blocks, a great number of dwellings around the site can benefit in so many ways. At present the area between the main terrace elevations is only about 25 ft. and the yards at the rear are far too small, though nevertheless useful to the families in these houses. With the alternate blocks demolished, the distance between front and rear of the remaining terraces is increased to more than 80 ft. and areas are formed of sufficient size to justify some modest planting and the extension of the individual yards. The endless row of three-storey terrace houses (the uppermost floors were used originally as workrooms for lace-making when a home craft) on the south of Pleasant Row are beyond improvement, but here there might be a new development in scale with the surrounding property to retain the neighbourhood scale.





Pleasant Row, Nottingham, before development [Scale : $\frac{1}{1200}$" = 1' 0"]



Pleasant Row after development

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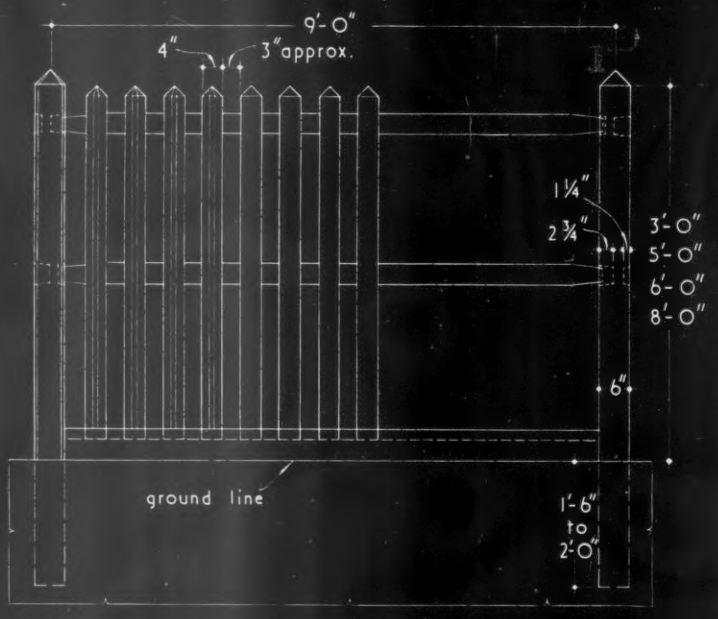
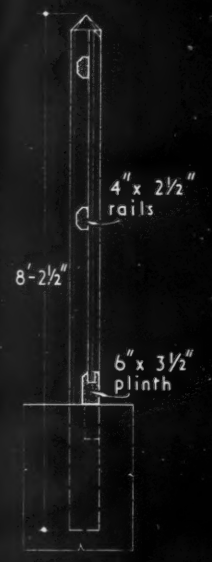
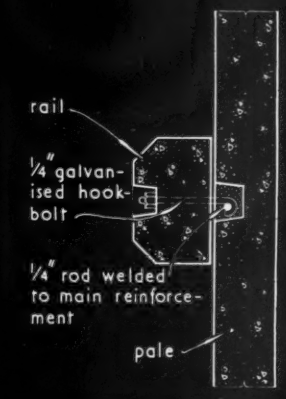


elevation

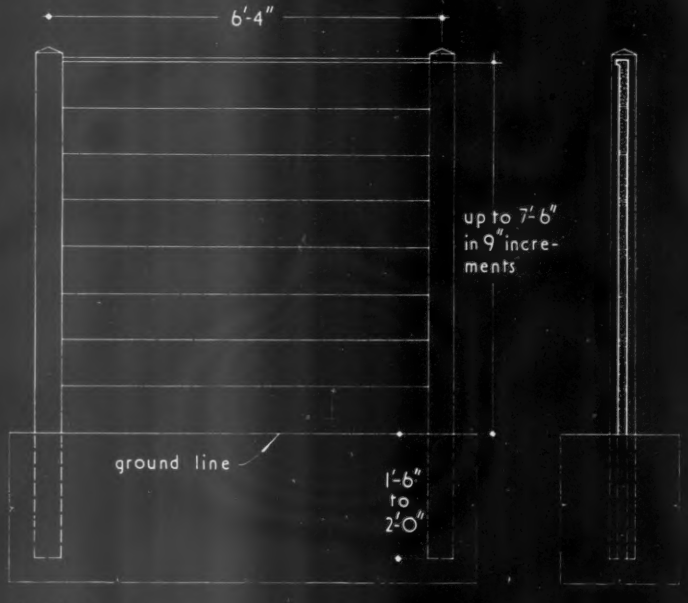


section



detail of fixing of pales

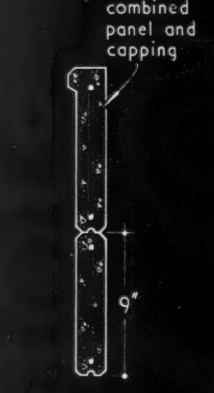
PALISADE TYPE. (patent applied for)



elevation

section

plan thro' post



section thro' panels

palisade type

SOLID PANEL TYPE.

CRANKED POST (for barbed wire).
a similar post is available for the solid panel type

REINFORCED CONCRETE FENCING. Manufacturer: Bell and Webster Ltd.

26.C2 REINFORCED CONCRETE FENCING

This Sheet deals with reinforced concrete fencing and describes two standard types, open palisade and solid panel.

General

Reinforced concrete fencing is durable and requires no maintenance. Damaged units in both types can be replaced without moving the posts. Both types of fencing may be adjusted to suit reasonable gradients.

Construction

All concrete units are manufactured from vibrated concrete reinforced with mild steel. Reinforcement is accurately placed in position to ensure even and sufficient coverage.

Open palisade type : This consists of posts, rails, plinth and pales: for fencing up to 6 ft. 0 in. high, cranked posts to take three strands of barbed wire may be supplied. The pales are fixed by the patented hook-bolt method illustrated on the face of the Sheet, so that no fixing is visible on the front of the pale. The rails can be removed without moving the posts as a deeper mortice is provided in one side of the post than the other.
The mild steel reinforcement in the individual components is as follows :—

Posts	Four $\frac{5}{16}$ in. rods.
Pales	Three $\frac{3}{16}$ in. rods.
Rails	Four $\frac{1}{4}$ in. rods.
Plinths	Two $\frac{1}{4}$ in. rods, two $\frac{3}{16}$ in. rods.

Solid panel type: The posts are grooved on either side to take the horizontal panels. These panels are tongued and grooved: normally the panels are vee-jointed on both sides, but an alternative panel is avai able with weathered ship-lap joint. The top panel has an integral capping. Fencing up to 6 ft. 0 in. high may be supplied with cranked extensions to take barbed wire.
The reinforcement in the individual components is as follows:—

Posts	Four $\frac{5}{16}$ in. rods with laterals.
Panels	Six $\frac{3}{16}$ in. rods, two longitudinal and four lateral, forming a welded frame.

The two types of fencing may be adjusted to suit gradients. In the case of the open palisade type, the rails are tapered at the ends to allow slight vertical adjustment in the sockets of the posts, so that the rail may be set obliquely. In the solid panel type, the panels can be stepped on sloping ground.

Sizes

Open palisade type: The posts are 6 in. square in section and are at 9 ft. 0 in. centres. There are normally 13 pales to each bay giving a gap of approximately 3 in. between pales: an industrial type is also available with 15 pales to each bay, giving a gap of $2\frac{1}{8}$ in. between pales on the 8-ft. fence. The heights in which the fencing is obtainable are 2 ft. 9 in., 3 ft. 6 in., 4 ft. 9 in., 6 ft. 0 in., and 7 ft. 9 in. to tops of pales.

Solid panel type : The posts are 5 in. square in section and at 6 ft. 4 in. centres. The panels are 9 in. deep. The fencing is obtainable in heights up to 8 ft. 3 in., in 9 in. increments.

Components may be cast in special lengths to form closing units where required.

Modifications

Variations based on the standard units can be carried out to suit individual requirements e.g. perforated panels, rearrangement of pales, special heights, etc.

Gates

Gates may be supplied in metal or timber to suit the type of fencing used: they are specially made to individual requirements.

Finish

The fencing normally has a plain concrete finish, but the manufacturer can supply other finishes to suit particular needs.

Further Information

The manufacturer maintains an erection service which will off-load, erect and take full responsibility for the handling of the components in any part of the country.

Compiled from information supplied by:

Bell and Webster Limited.
Address: Essex Road, Hoddesdon, Herts.
Telephone: Hoddesdon 3737.

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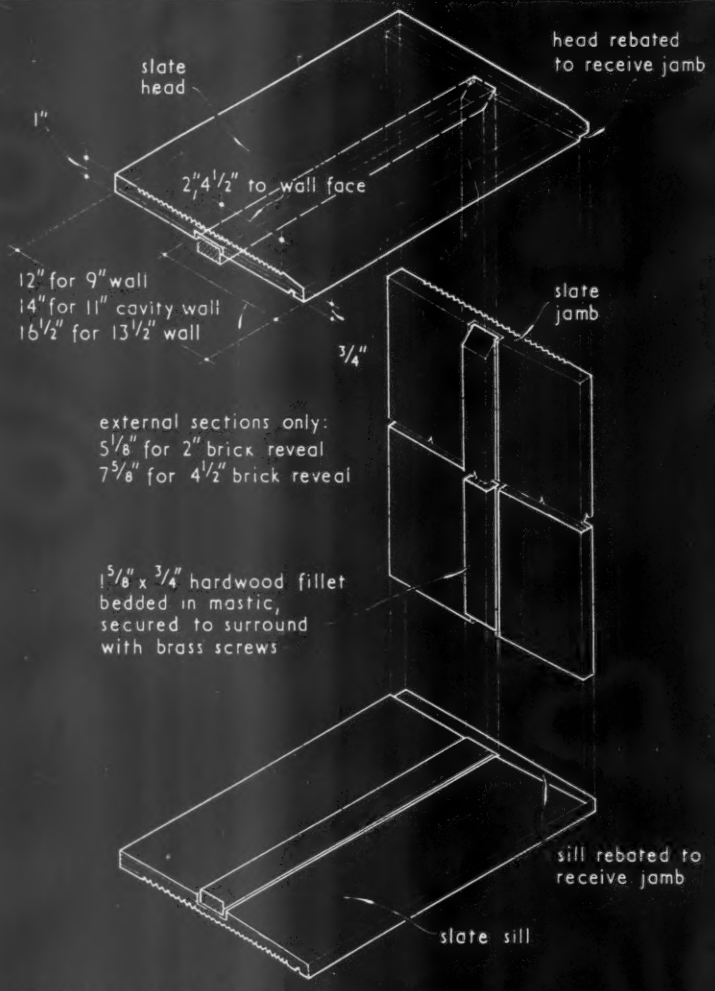
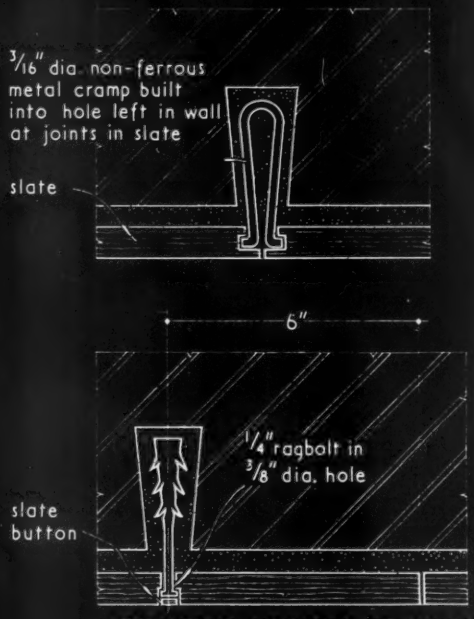
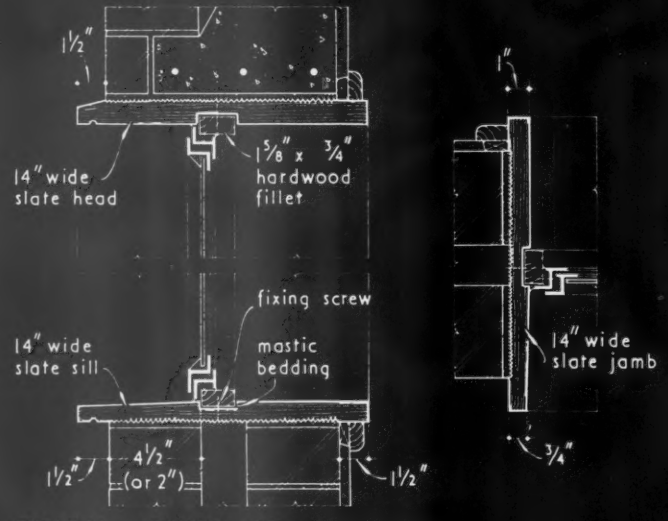


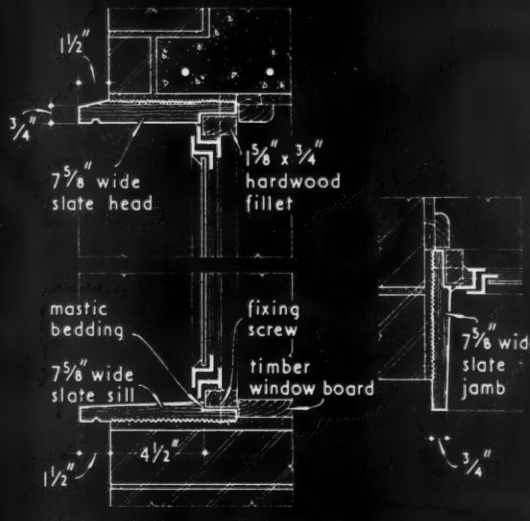
ISOMETRIC VIEW OF SLATE SURROUND.



ALTERNATIVE METHODS OF FIXING SURROUND TO STRUCTURE (for heads and jambs exceeding 6'-0").



TYPICAL FIXING OF SURROUND INCLUDING WINDOW BOARD.



TYPICAL FIXING OF EXTERNAL SECTION ONLY.

·WINCILATE· SLATE SURROUNDS FOR WINDOWS. Manufacturer: The Bow Slate and Enamel Company Limited.

24.Z2 ·WINCILATE· SLATE SURROUNDS FOR WINDOWS

This Sheet describes Wincilate slate window surrounds. The isometric sketch shows a typical slate surround and the lower details show typical fixings. Slate window sills are described on Sheet 24.Z1.

Description

The Wincilate window surround is an extension of the use of the combined sill and window board and the external sill illustrated on Sheet 24.Z1. It forms a complete frame for any type of window. This Sheet illustrates the application of standard sections and shows how the sills, jambs and heads can be satisfactorily jointed.

Sizes

The surrounds are 1 in. thick, weathered so that the external edge is reduced to $\frac{3}{4}$ in. Standard sections may be 12 in., 14 in. or $16\frac{1}{2}$ in. (including window boards) for 9 in., 11 in. and $13\frac{1}{2}$ in. walls respectively, or $5\frac{1}{8}$ in. and $7\frac{5}{8}$ in. (external section only) for brick reveals 2 in. or $4\frac{1}{2}$ in. wide. In addition to the standard sections, purpose-made surrounds may be fabricated to any width and for any position of the window in the surround. Sills, heads and jambs are made in lengths to suit any standard metal windows, with or without timber surrounds, or timber windows. The maximum length normally available is 6 ft. 0 in.

Fixing

No cramps or dowels are needed to fix the four pieces of the surround to the structure: the rebates in head and sill hold the jambs in position. The typical fixing details on the face of the Sheet show a surround including window board and an external section only. Alternative methods are shown for fixing the slate to the structure at head or jambs where the length of surround exceeds 6 ft. 0 in.

Finish

Surrounds are supplied in their natural blue-grey slate colour, with the surface polished smooth.

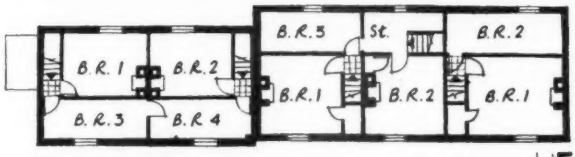
Compiled from information supplied by:
The Bow Slate and Enamel Company Limited.
Address: British Railways Bow Depot, Old Ford Road, Bow, London, E.3.
Telephone: Advance 2203-5.

The rural problem

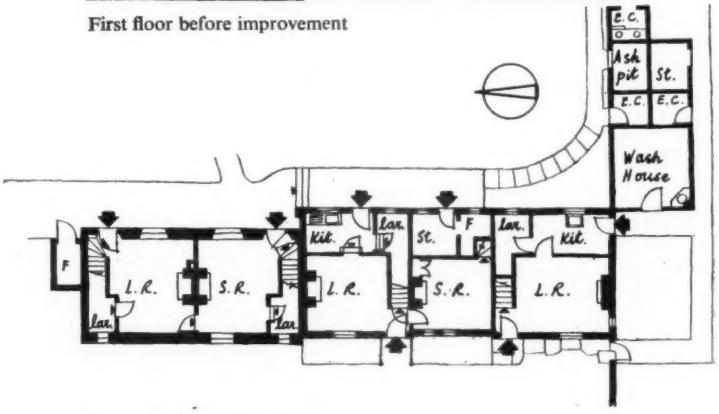
Although the fundamental problems in urban and rural areas are basically similar, the scattered and frequently isolated dwellings in country districts prohibit economic large scale improvement schemes. And it is true to say that however serious conditions may be, these are mitigated to some degree in rural surroundings by the natural sufficiency of open space, fresh air and vegetation. To the town-dweller the rural slum represents a group of picturesque cottages, or the dream cottage with roses round the door and a wealth of old oak inside. To the "foreigner" these conceal so much that is amiss:—rising damp and wavy loose brick floors; immense draughty chimneys; whippy first floors which encourage hair brushes to fall off dressing-tables as one moves around the room; water supply drawn by bucket from the well; waste water thrown out of the back door because of the drainage; the winter's night visit to the E.C. down the garden, and many other tiresome shortcomings which are unfamiliar to the townsman but which have become everyday habits to his rural counterpart.

The lack of main services in isolated areas adds to the problem, and unless local authorities apply intelligently the Housing Ministry's latest pronouncements on minimum standards to attract grants and loans (Circular 36/54 dated April 20, 1954) there seems little hope for the improvement of these more isolated rural "slums" and dilapidated properties. Paragraph 11 of this circular lays down a 12-point means test which, though softened by paragraph 12, still leaves much to be desired.

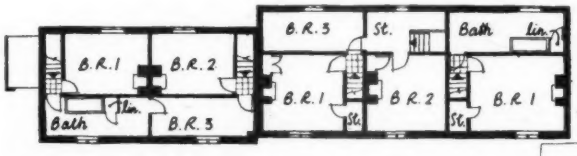
The effect of this somewhat negative assistance is that the drift of isolated cottages into speculators' hands for improvement and resale will continue—and the agricultural worker's need for accommodation near his employment will thereby increase. Many land workers prefer to live near their jobs and it is questionable whether village community groups are the best location for their new homes. This point of view is comparable with planning authorities' current aversion to dormitory towns. The demand is then for more flexible financial assistance to encourage owners to improve these remotely placed dwellings for their employees.



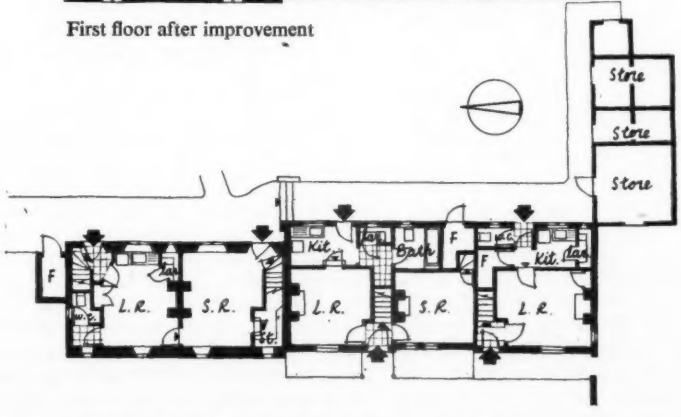
First floor before improvement



Ground floor before improvement



First floor after improvement

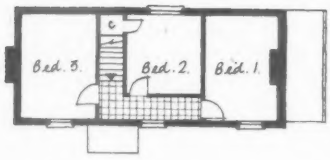


Ground floor after improvement [Scale: $\frac{1}{24}$" = 1' 0"]

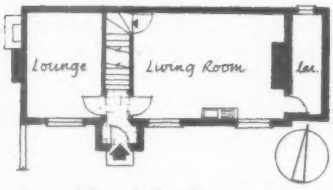
These three cottages contained few amenities before improvement for they were typical rural dwellings with the familiar earth closet, the copper and the sink without hot water. New kitchens, larders, bathrooms and a domestic hot water supply have been provided within the existing units; in addition, the buildings have been completely repaired and redecorated inside and out. One could perhaps comment on the first-floor bathroom layouts and the omission of lavatory basins in all three units but the general intention—to bring these rural cottages back into circulation—has been fulfilled. The approximate costs per cottage were:

Improvements	£275	76·3% *approx.*
Repairs	£85	23·7% *approx.*
	£360	100%

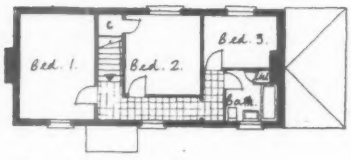
This example, an old farmhouse, was in the centre of a new housing estate. Rather than demolish the house it was decided to retain the farmhouse and to plan the estate around it. All amenities were lacking apart from the kitchen sink. Kitchen and larder are provided in a new extension, the flagstone flooring in the living room was replaced by a timber floor and a bathroom formed at first floor level. Domestic hot water is supplied by a solid fuel stove with back-boiler. The approximate cost of the work was £925, subdivided as follows: Improvements £785, 84·8 per cent. approx. Repairs £140, 15·2 per cent. approx. The rateable value as a farmhouse was £8. After improvement this was raised to £22.



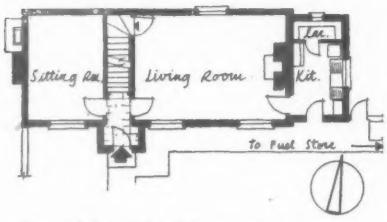
First floor



Ground floor before improvement



First floor



Ground floor after improvement
[Scale : $\frac{1}{4}$" = 1' 0"]

Qualifying for an improvement grant

The latest instructions passed to all housing authorities by the Housing Ministry (Circular 36/54 dated April 20, 1954)—referred to above—is of some importance for a number of points have been clarified, conditions have been modified and the financial provisions changed. The subsequent remarks apply to conversions as well as to improvements for which grant aid is being sought.

(a) *Physical limitations of buildings concerned.* In deciding whether or not an application fulfils the standard of requirements after improvement or conversion, the circular referring to a previous instruction states that these standards should " be applied in each case with due regard to the physical limitations of the building concerned and to what public utility services were reasonably available to it." This view is again stressed and although local authorities are now empowered to deal with the majority of applications without needing to ask for waivers, " the Minister will always be willing to consider the exceptional case in which a waiver is thought to be needed." (Para. 12.)

(b) *The standard of requirements.* The following twelve points set forth the standard to which an improved or converted dwelling must comply after improvement or conversion—but even this modified standard sets considerable obstacles in the way of the rural applicant because the dwelling must:—(1) Be in a good state of repair and substantially free from damp. (2) Have each room properly lighted and ventilated. (3) Have an adequate supply of wholesome *water laid on inside the dwelling.* (4) Be provided with efficient and adequate means of supplying *hot water* for domestic purposes. (5) Have an internal or otherwise *readily accessible water closet.* (6) Have a *fixed bath (or shower)* preferably in a separate room. (7) Be provided with a *sink* or sinks and with suitable arrangements for the *disposal of waste water.* (8) Have a proper *drainage system.* (9) Be provided in each room with adequate *points for gas or electric lighting* (where reasonably available). (10) Be provided with adequate facilities for *heating.* (11) Have satisfactory facilities for storing, preparing and cooking food. (12) Have proper provision for the storage of fuel (where required).

Note: The italics are the author's.

(c) *Applicant's financial resources.* Because some local authorities have rejected applications for grant aid on the grounds that applicants were " financially able to do the work without one," the Minister has made it quite clear that a private owner's " financial resources are wholly irrelevant to the question whether or not an improvement grant should be made." And in para. 17 he explains that " if this process (of becoming slums) can be arrested by timely improvement or conversion at a charge to rates and taxes appreciably less than that imposed by building a new house to replace a slum, it is only elementary prudence to encourage the owners to do the necessary work."

(d) *The range of grant aid.* The minimum cost of work which can qualify for grant assistance has been reduced from £150 to £100. Whereas before April 21, 1954, the maximum cost of work could not exceed £800 per unit created, no limit now exists, although the grant itself cannot exceed £400 except in special circumstances.

(e) *Professional advice and fees.* The Ministry states in the Circular " it is desirable that improvement schemes should be prepared and carried out with proper professional and technical advice " and that steps have been taken to prepare lists of architects and surveyors who would be willing to advise on such work in their own areas. As to professional fees, these may now be included in the estimated cost of works of improvement or conversion. In para. 19 it is not stated specifically that out-of-pocket expenses may also form part of the total cost, but reference is made to " reasonable expenditure " on such professional fees. It might well be argued that professional services could not be given without incurring normal travelling and other out-of-pocket expenses and that where these are reimbursed by the client they constitute " reasonable expenditure." Until a test case comes before the Ministry, there can be no clear-cut decision but it seems likely that anything but excessive charging would be considered favourably.

A

B

C

D

Assuming that expenses may be included, the architect applying for grant aid on behalf of his client cannot anticipate his ultimate outgoings before the work is even approved nor can he guarantee that the cost of the work itself will tally in all respects with his estimates. Grants are normally paid by instalments so that any reasonable cost variation in work or fees and expenses can be adjusted in the payment of the final instalment—in other words, an undertaking by a local authority to meet 50 per cent. of an improvement or conversion is not necessarily a rigid contract. And it seems fair to expect that a local authority will be prepared to consider variations either way so long as these adjustments are in scale with the original application, and that any expenditure in excess can be adequately justified, assuming always that the total grant does not exceed £400.

(f) *Works likely to attract improvement grants:* Any proposals submitted for financial assistance must, as far as local conditions allow, include works covered by the 12-point standard, outlined in section (b) above. It must be remembered that grants are provided only for works of improvement and conversion and that the costs of repairs are the entire responsibility of the owner. In preparing details for an application these two distinct operations must be quite separate—so that estimates for both are easily obtainable. The following list, though incomplete in itself, is a selection of the more common operations which would qualify for an improvement grant:—

(1) *Water Supply.* Main water supply installed within the dwelling or an "adequate supply of wholesome water" laid on from some other source.
(2) *Solid fuel appliances.* Replacement of old grates by up-to-date appliances—such as the multi-purpose stove which cooks and provides hot water as well as heating the room.
(3) *Bathrooms.* Providing a new fixed bath and lavatory basin to replace the tin bath and wash-stand.
(4) *Hot water supply.* A new appliance (as in (1) above) or an independent boiler to provide hot water with services to the new fittings—to replace the kettle on the hob and the wash copper.
(5) *Water closets.* New drainage installations connected to public sewers or with new independent disposal plants instead of the earth or chemical closet.
(6) *Lighting.* Lighting and power installations to replace the oil lamp and candle.
(7) *Gas service.* To supply cookers, refrigerators, etc.
(8) *Natural lighting.* The provision of larger windows with proper opening lights to replace small openings and fixed lights.
(9) *Staircases.* The removal of the dark and tortuous narrow stair replaced by one of easy "going" with proper handrails.
(10) *Damp-proof courses.* The introduction of a DPC where none previously existed—this is an improvement rather than a repair.
(11) *Increased ceiling heights.* Increasing ceiling heights of upper floor rooms where the roof construction permits.

Essential repairs

Even though an applicant may wish to carry out some, or all, of the improvements referred to above, such work in itself would fail to attract a grant unless the dwelling is in a good state of repair and conforms as far as possible with the 12-point standard. The following references to repairs are intended more as reminders than anything else:—

Chimney stacks: In older property these may be unsafe and may have to be rebuilt from roof level. Those in better condition may only require the rebedding of top courses, with new flaunchings and repointing—and don't forget that the top six courses or so should be built in cement mortar.

Flashings: The material for flashing depends on the estimated life of the building. Where standards permit, lead is ideal, copper is good, but for the smaller property of limited life, zinc is quite adequate. Cement fillets, although generally all that is found in the form of weather protection on older roofs, are too rigid and should never be retained.

External pointing: In a brick-faced building repointing is an expensive but necessary item. Care should be taken to relate the strength of the mortar to the type of facing brick. Brick facings are perhaps one of, if not the best of external finishes—so before deciding to render the walls, make sure the brickwork cannot be repaired and repointed as economically.

Porous brickwork: Where atmospheric pollution is at its worst in industrial areas, avoid external rendering which, even if painted or distempered regularly, looks shabby in a few weeks—apart from the fact that it is a costly item. Clear liquid waterproofers are on the market but if more than these are needed, a stone paint direct to brickwork is a possible alternative. The better brands last as long as fifteen years or more, even though initially expensive—but they do maintain the wall "texture" which tends to reduce apparent shabbiness.

Bulging Walls: Many cross-walls in older dwellings were not bonded to the outside structural walls: without this tie, they are inclined to bulge. The only remedy is to shore

(A) Sole and heel in Brimingham where the old bay windows are removed and replaced by new standard metal windows which have little relationship to the rest of the elevations. Certainly this patching of back-to-back houses is a short term policy, but is it really more expensive to repair those original bay windows? (B) One of the purposes of the backyard—somewhere to hang the bath. (C) One of Birmingham's headaches—small family engineering works mingling with domestic quarters. (D) Another use for the backyard—somewhere to dry Dad's trousers.

Local Authority improvements in Cambrian Road, Richmond. This crude approach to cutting maintenance and repair costs by slicing off porches (right) isn't good enough. It spoils the whole street character and mutilates the proportions of the individual elevation. These houses can be assumed to stand for at least another half century. Such a massacre should be strongly discouraged.

up temporarily and rebuild the defective sections, bonding into cross walls or providing some other adequate tie.

Gable Ends: Examples have been found where these are only 4½-in. thick and are quite useless as weather protection. Rendering here is justifiable and one of the proprietary water repellants should be incorporated. But the number of cases of this type must be small and mostly caused by partial demolition due to bombing.

Roofs: After any period of neglect these require considerable attention—often complete stripping and renewal. Decayed slates and fractured tiles must be removed and it is generally more economical to strip the lot if the coverings need much more than individual replacement. Where a number of houses are being repaired, the best of the old material can often be reused on one pitch with new covering material on the other. Roofs, when stripped of their coverings, are found occasionally to be insufficiently strong to support tiles or slates. To avoid the expense of new timbers or the strengthening of those existing in a short-life dwelling, an alternative lightweight material such as asbestos tiles should be considered.

Gutters and down-pipes: Faulty gutters, down-pipes and rainwater disposal in general can be responsible for endless trouble throughout the whole structure of a house. Pipes and gutters should therefore be very carefully overhauled; gutters should be laid to correct falls and be capable of emptying rainwater in each section; joints should be properly bedded and bolted together; down-pipes frequently fail where least painted and they should be kept well away from walls to allow inspection and proper maintenance. Down-pipes should always discharge through shoes into gulleys below—and should not be carried straight down into the ground with an elbow bend connecting the rainwater drain. This latter practice looks very tidy but that is all in its favour—debris and leaves washed off roof slopes eventually find their way down to the bend and there start building up a blockage.

Rainwater disposal: From gulleys at the foot of down-pipes, drains should run either to a surface water sewer, drain or ditch, or to a series of properly constructed soakaways some distance from the house. Water butts storing rainwater should have overflows larger than their supply pipes and the former should also discharge into a soakaway. Dry rot and foundation settlements are both caused frequently by faulty drainage arrangements and it is surprising that more care is not taken to provide against them.

Excrescences and features: To avoid unnecessary maintenance expenses, unattractive embellishments which complicate roof forms or project beyond structural walls can often be removed. But discrimination must be used—the most elementary house designed with a bay window, and possibly repeated at first floor level, can look unpleasantly naked with its adornment removed. Economics can never be overlooked when dealing with the repair and maintenance of smaller property, but there must be a limit when amenity and usefulness cease to be at the mercy of ruthless patching. Bays and similar features at times lend character to a room which is otherwise devoid of any, and this is applicable externally as well. Therefore, consider the outlay carefully before falling for the simplest solution.

Damp proof courses: Buildings lacking damp courses and with a fair life ahead can be improved considerably if provided with one —and this is less costly than might be supposed. Short sections of walling can be tackled at a time to avoid the expense of temporary support. For this type of D.P.C., staggered courses of slates or engineering bricks set in cement mortar are perhaps the most easily installed.

Tiled Floors: After years of wear, when tiles are loose, chipped or fractured, they are replaced more economically with pitch-mastic flooring, or something similar, on a new cement screed.

Brick Floors: Flooring of this type is found more frequently in rural areas—the bricks, generally worn and uneven, are laid in sand directly on to the ground. These are best replaced by a waterproof concrete slab, or by a waterproof membrane within the slab, with a finish to suit the use of the room.

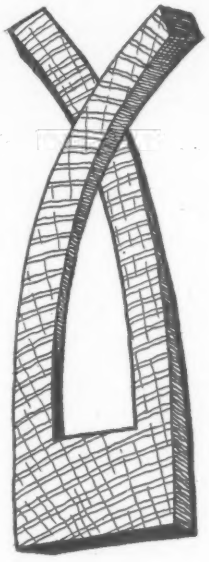
Roof Insulation: When attention is being given to roof troubles insulation should not be overlooked. This is no new twentieth century theory, for several hundred years ago roof tiling was laid at times over a thickness of hay, straw or reeds between rafters and tiling battens. When roofs were also habitable spaces, the reeds were plastered between rafters to provide a ceiling. Current practice is to lay quilting over the ceiling joists in such a way that pipes and cisterns may also be protected.

Upper Floor and roof access: Many old staircases lack headroom or are so narrow that double beds and large furniture cannot reach upper floors; where practicable trap-doors should be unobtrusively inserted in floors. Similar access to roof spaces should also be provided for periodic roof inspection even when no services pass through the roof.

Frost protection: This country has a world-wide reputation for its abominable domestic plumbing practice—one serious frost and a plumber is as rare as a golden sovereign. Immense damage is sustained each winter because architects fail to provide adequate instructions or because builders' consciences are eclipsed by other considerations. With so many older buildings to be returned to circulation, there is an opportunity to reduce this type of unnecessary maintenance and repair—notes on this subject will be found in a later article.

Subsidence: Owners and occupants of houses in mining areas are aware of the widespread damage and loss of houses through subsidence. Owing to the extremely unsatisfactory machinery for compensating some owners, but by no means all, this topic is reviewed in a later article. For further reference some general background information can be found in The National Building Studies Special Report No. 12.

Generally: In addition to the foregoing series of reminders, a host of others could be added—repairs to plaster and joinery, overhauling ironmongery and rehanging doors, the replacement of old fireplaces or firebrick backs, the improvement of natural ventilation of rooms, internal and external redecoration, the testing and overhaul of services and drainage systems, attention to external pavings and steps, party wall fences and other outside work. This is an arbitrary list but at least it confirms the need for most detailed inspections accompanied by some comprehensive schedule so that nothing may be overlooked.



TECHNICAL SECTION

This week we continue the series of articles on the design and practice of joinery by John Eastwick-Field and John Stillman with an examination of the subject of movement in timber.
Whilst aspects of this question have been dealt with haphazardly in books on joinery and scientifically in isolated papers, there has as yet been no consolidated and up-to-date exposition of the principle written specially for architects. In this, their second article, the authors have had the advantage of the results of recent research made available to them by the F.P.R.L. With the help of Robert Maguire they have prepared new tables and graphs and have made proposals for the practical application of this data. The series is numbered for purposes of classification 13. Materials : Timber.

THE DESIGN AND PRACTICE OF JOINERY

by John Eastwick-Field and John Stillman

2. MOVEMENT IN TIMBER

All building materials expand and contract slightly with changes in humidity and temperature. In certain materials such as steel and concrete the amount of movement can be calculated accurately, and allowed for in design. Timber, however, is subject to a greater degree of movement than most other materials, and whilst it is common practice to make some allowance for this movement in specification and design, the ways in which it moves are complicated and not always fully understood. It is probably true to say that more trouble arises in joinery from movement, than from any other cause.

Unlike other building materials, wood is a natural organic substance and has a complex cellular structure. For its growth a tree requires water far in excess of the amount which is desirable in timber prepared for joinery. The extraction of the surplus moisture causes the timber to shrink, but the degree and manner in which it shrinks is influenced by the way it is cut out of the log in the process known as "conversion"; and to understand the different methods of conversion and why one piece shrinks more or less than another, it is necessary to know, in an elementary way, how the wood in the tree is formed.

THE GROWTH OF TIMBER

In a sapling *all* the wood carries the food and water necessary for the tree's growth, and this wood is known as *sapwood*. As the tree grows in height and girth, a new layer of sapwood is formed each season underneath the bark. The progressive layers of growth can often be seen as alternate dark and light concentric rings when the tree is cut across, and are sometimes referred to as "annual rings," a misleading term since in some tropical countries there may be two seasons of growth each year. In trees grown in temperate climates, the light rings are the fast spring growth and the dark rings are the slower summer growth. When the tree grows older, the inner layers of growth cease to convey the sap, and the cells, of which the wood substance is composed, die. The sap is then carried only by the outer and relatively new growth layers, whose total width may be only ¼ in. and is unlikely to exceed a few inches.

At the centre of the tree is a substance known as pith, and although it can hardly be detected, it may be up to ¼ in. in diameter.

The major part of the trunk of an old tree

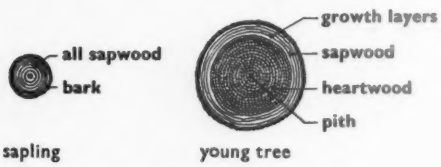


Fig. 1. The growth of timber.

will consist of the dead cells which comprise what is known as the *heartwood*. From the joiner's point of view this is the most useful wood, because the sapwood is often, and especially in hardwoods, of a lighter colour than the remaining wood—which may not be desirable in the finished piece of joinery—and also because it is more liable to attack by insects and fungus. It is not, however, otherwise inferior.

It must not be supposed, because the cells in the heartwood are dead that the wood has less strength: it is, in fact, this wood which gives rigidity to the tree.

In large trees a series of splits, radiating from the heart, often develop after felling. This is due to uneven drying out, the consequent shrinkage causing the fibres to rupture. The splits are known as heart-shakes, and whilst they have to be taken into consideration in avoiding waste during conversion, they do not adversely affect the surrounding wood.

CONVERSION

The important thing to know about conversion is, as has already been suggested, that the sections or planks into which trees are converted will behave differently and have a different appearance, depending on which way they are cut out of the trunk.

The simplest way of converting a log is to cut it through-and-through, but this results in about half the planks being cut tangentially to the growth layers. These planks, which are known as *flat-sawn* boards, are liable to warp when they are dried, and to shrink considerably across their width, as explained later.

Planks which are sawn radially (and known as *quarter-* or *rift-sawn*) are on the other hand less liable to warping during seasoning and have less shrinkage; conversion which produces as many planks as possible cut radially is therefore likely to produce the most stable timber, but because of the additional trouble and waste is up to 25 per cent more expensive than through-and-through conversion. If a decorative "figure" or pattern of grain is wanted, this may determine the way in which the wood is converted, and may overrule considerations of stability, so that a flat-sawn board might then be preferable to a quarter-sawn board. For instance, in oak the figure depends on rays which are exposed only in quarter-sawn boards, whereas in Douglas fir, the characteristic figure, which depends on the exposure of the growth layers at an oblique angle, is displayed only in flat-sawn boards.

The method of conversion may also influence the degree of movement and distortion that is likely to occur in the converted section from such other factors as sloping grain, the position of the heart, and of the knots. It will be appreciated for instance that since trunks of trees taper and the growth layers are in the form of cones parallel to the outside of the tree, planks which are cut parallel to the axis, which is the common practice, will have sloping grain—a factor which, in excess, will encourage warping. When absolutely straight grain is required for such objects as wall-bars in gym equipment the timber should be cut parallel to the *outside* of the log. Also, it is better to arrange the conversion so that the pith comes in the centre of a section rather than on the edge; otherwise there will again be a likelihood of warping. This is called "boxing the heart." In large hardwood trees the pith and the wood immediately adjacent to it is often cut out and discarded even if there is not already a hollow formed by decay.

From what has already been said it will be apparent that when moisture is extracted from timber to make it usable as joinery it will shrink, either with or without distortion. Distortion, however, does not, for all practical purposes, occur except when the wood becomes either wetter or drier, and can be simply explained in terms of the general behaviour of wood when subjected to changes in moisture content.

MOISTURE MOVEMENT

Most people will have noticed that the wood from a newly felled tree is saturated with water. In fact, the amount of water may weigh considerably more than the weight of the actual wood substance. It is contained both in the cell cavities and also in the fibrous structure of the cell walls, and when the tree is dried the water held freely in the cavities is the first to be expelled. Up to the point where the water in the cell walls begins to be given up, there is no shrinkage, and the amount of moisture then in the timber is about 27 per cent. to 30 per cent. by weight of the amount of the wood substance.

Further drying causes the water in the cell

Below, cross section of a log of elm, showing the sapwood*—the younger growth layers toward the outside of the tree—which is lighter in colour than the older timber, or heartwood. Small heart shakes are beginning to form at the centre of the log. Below right, the end of a typical hardwood log which has developed large heart shakes.*

CONVERTING ON THE BAND-RACK SAW: The log is mounted on a carriage which runs on rails past the saw. After each cut the log is moved sideways by power ready for the next cut. The process is very rapid (and therefore economical) if the log is not turned on the carriage, i.e., if the log is converted by sawing "through-and-through."

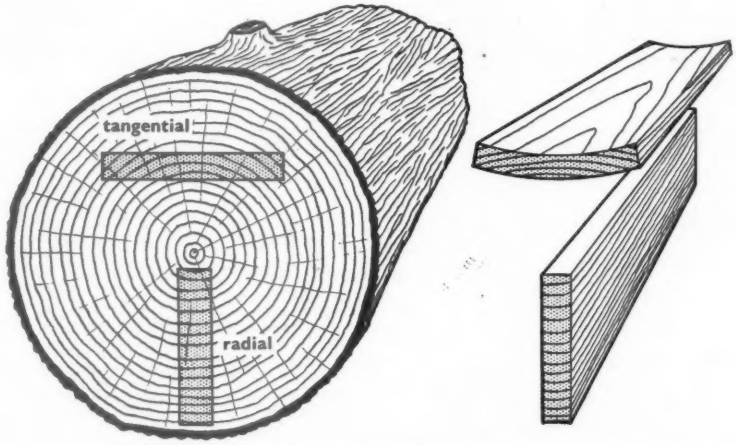


Fig. 2. A "flat sawn" board is one which is sawn from the log so that its plane is tangential to the growth layers. "Quarter-sawn" boards are cut radially from the log. Since shrinkage in timber is greater tangentially than radially, a flat-sawn board will tend to "warp," while the quarter-sawn board will remain flat.

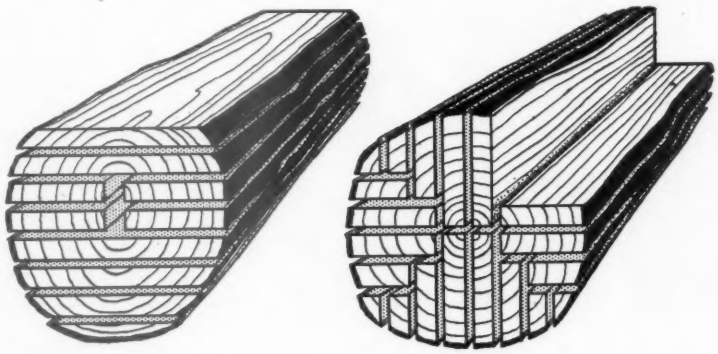


Fig. 3. Two methods of converting logs. "Through-and-through" is most common, and the cheapest. It produces about two-thirds flat-sawn stock and one-third quarter-sawn. "Quartering" is more expensive as the log has to be turned many times during sawing. It produces no flat-sawn stock, all the boards being quarter-sawn or approximately so.

walls to be given up, and the wood begins to shrink proportionately to the amount of water extracted.

If wood is dried in the open air it will continue to lose moisture as long as the air is dry enough to absorb moisture from it, that is until a state of equilibrium is reached. The amount of water in the wood at the time when equilibrium is reached will depend upon the relative humidity* of the air, and upon the species of timber; some species giving up their moisture more readily than others. In the open air equilibrium is reached when the timber has a moisture content somewhere in the region of 20 per cent. Inside most buildings, and particularly in those having central heating, the air has a lower relative humidity than the outside atmosphere, and consequently air dried timber used in them would lose considerably more moisture, with consequent shrinkage, until it reached equilibrium at a moisture content which might be as low as 8 per cent. In order to avoid such shrinkage, the timber has to be dried in kilns until it has a moisture content which is known to be appropriate to the anticipated humidity of the air in which it will ultimately be placed.

If timber remained stable once it had been sufficienty dried, the problem would be relatively simple, but in fact it continues indefinitely to absorb or dispel water according to the humidity of the surrounding air; and to shrink or expand accordingly.

Unfortunately, even the atmosphere in which the timber is to be used is unlikely to have a *constant* relative humidity, and an average value has to be assumed in practice. Only in exceptional circumstances will conditions be such as to produce no movement.

So much for the variations in the atmosphere: there are also as serious variations in the timbers themselves.

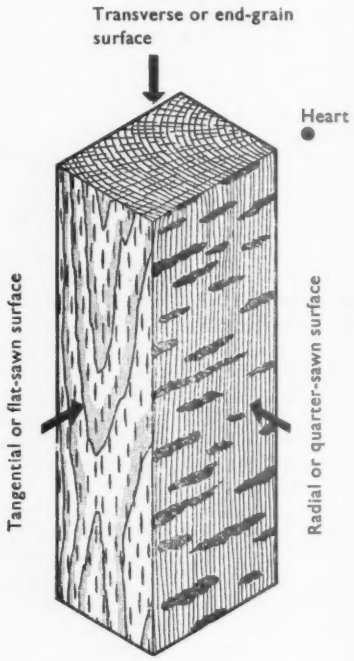
In the first place, the amount of movement resulting from changes in moisture content differs for each species; it is not the same in the radial and tangential directions for any one species, the tangential always being greater than the radial; and there is no fixed relationship between the radial and tangential movements for every species. Fortunately, movement along the grain is so little in all timbers as to be of no practical importance.

In the second place, each species of timber reaches equilibrium with given humidities at different moisture contents: for example, teak in air at 8 per cent. relative humidity and 77 deg. F. has an "equilibrium m.c." of 12·5 per cent. whereas the corresponding m.c. for oak is 16 per cent. and that of sycamore 18·5 per cent.

The equilibrium moisture content varies also with temperature, but the variation within the range encountered for joinery is not great, and for practical purposes we consider that it may be ignored.

When the time comes to decide what kind of timber to use in any particular design

* The Relative Humidity of the air at any given temperature is the amount of water-vapour present, expressed as a percentage of the maximum amount possible in air at that temperature. The Moisture Content of wood is the amount of moisture it contains, expressed as a percentage of the weight of the wood substance itself when dry.



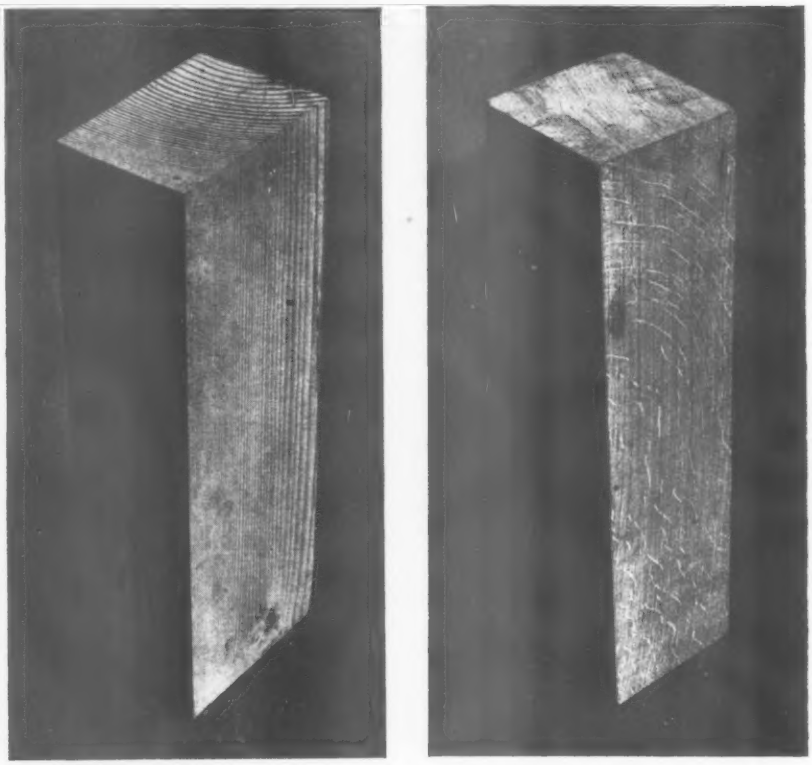


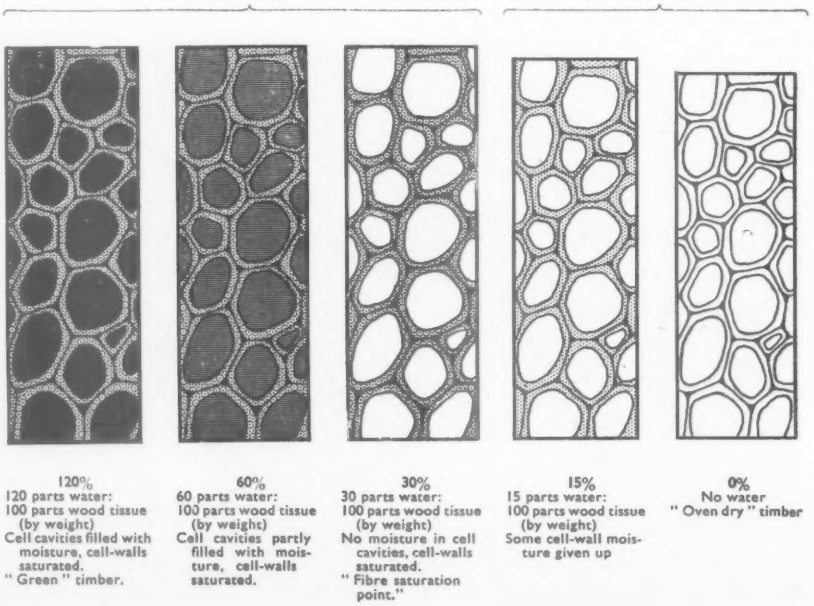
Fig. 4. THE STRUCTURE OF WOOD AND ITS EFFECT ON APPEARANCE: The majority of the cells run longitudinally in the log, arranged in growth layers *concentric about the heart. A flat-sawn face shows the contours of the growth layers as they undulate in and out of the surface; this is particularly noticeable in softwoods, where there is a strong difference in colour between the early and late growth in each layer. Smaller groups of cells known as* rays *run radially from the heart and these are exposed on a quarter-sawn face, showing as flecks or " silver figure " in some hardwoods. Softwoods have a poorly developed ray structure and do not show this effect. Above, left, a piece of Douglas fir, showing the characteristic figure on the flat sawn face. Above, right, English oak, a hardwood which shows " silver figure " on the quarter-sawn face.*

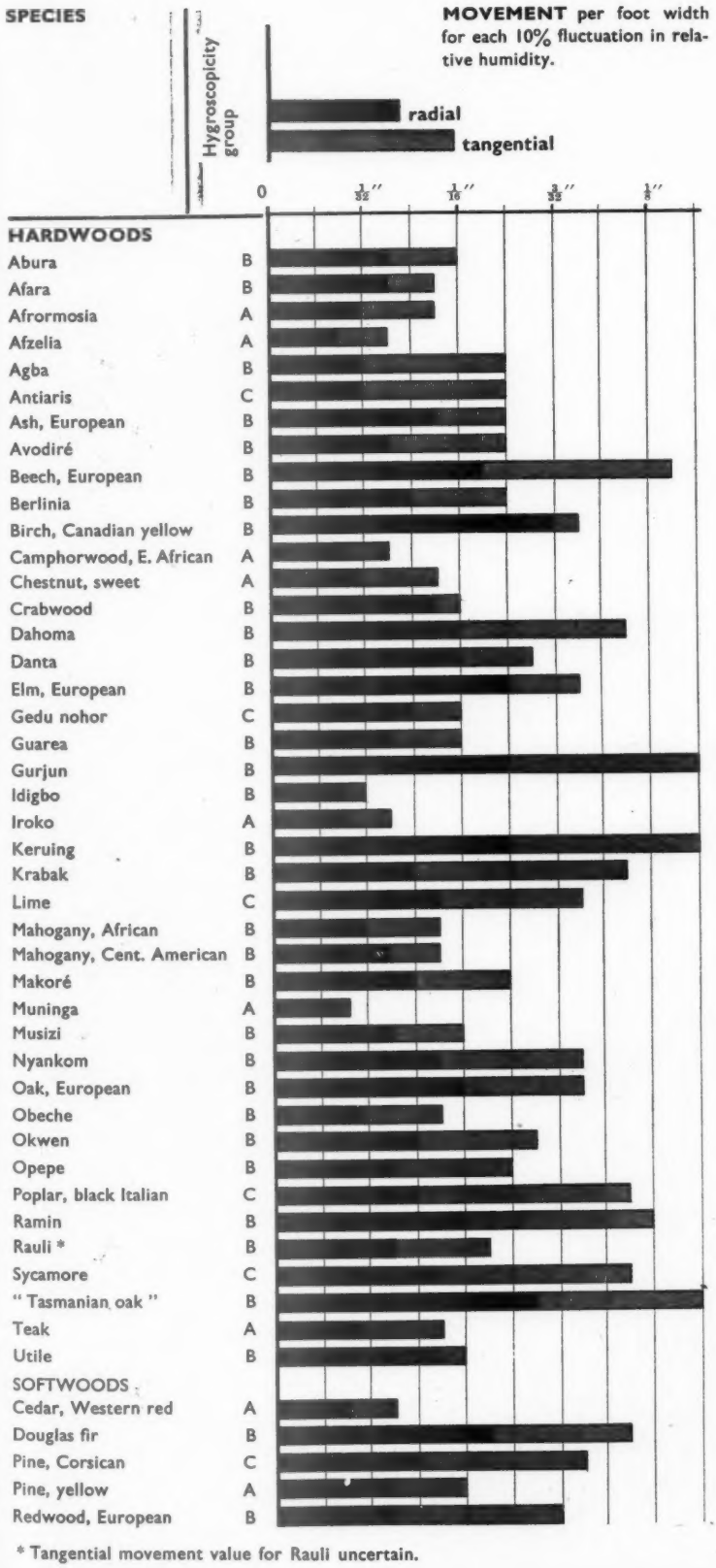
it is important to choose a species which will not move so much in the range of humidities in which it is likely to be placed as to give trouble or spoil appearance. For instance, if flat-sawn beech were chosen for a window board 9 in. wide, and subjected to a range of humidities between 35 per cent. and 65 per cent. relative humidity, it would move more than ¼ in.—which would obviously be undesirable. Figures showing the movement of different species have been ascertained by experiments by the FPRL, and those for a selected list of joinery woods are set out in the accompanying table.

Having chosen the timber, the appropriate moisture content must be decided upon, taking into account the levels at which the particular timber reaches equilibrium for various humidities. For simplicity we have grouped timbers into three classes: A those with low, B those with medium, and C those with high levels of equilibrium, and have produced a graph, showing the levels of equilibrium of the three classes for all humidities. The graph also indicates the average range of humidities for heated interiors and external air. A table has been compiled from the graph giving the moisture contents which we recommend to be specified for the three groups of timbers when used in joinery for specific purposes.

Prior to the publication of these tables and graph the only information on the subject generally available has been the table issued by the FPRL and used widely by members of the Kiln Owners' Association, and the table in BS 1186, Pt. 1: *Quality of Timber and Workmanship in Joinery.* Neither of these tables takes into account the different moisture contents at which

Fig. 5. MOISTURE CONTENT: cross-section of a piece of timber magnified 800 times.





* Tangential movement value for Rauli uncertain.

Fig. 6. COMPARATIVE MOISTURE MOVEMENT VALUES FOR JOINERY TIMBERS: The liability to distortion can also be gauged by the difference between the radial and tangential values, i.e., by the length of the shaded portion.

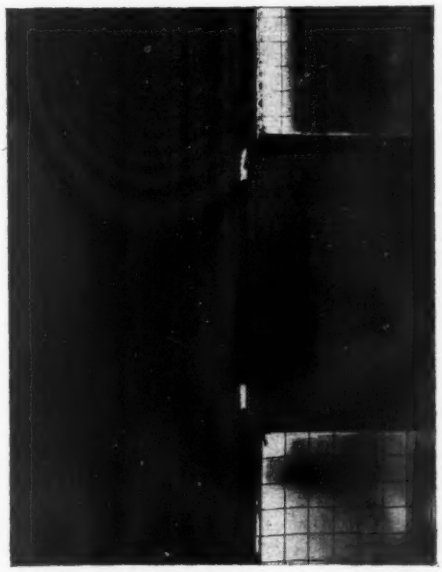
various species of timber reach equilibrium for given humidities—a factor which can be of some importance.

SUGGESTED MOISTURE CONTENT VALUES FOR SPECIFIC PURPOSES.

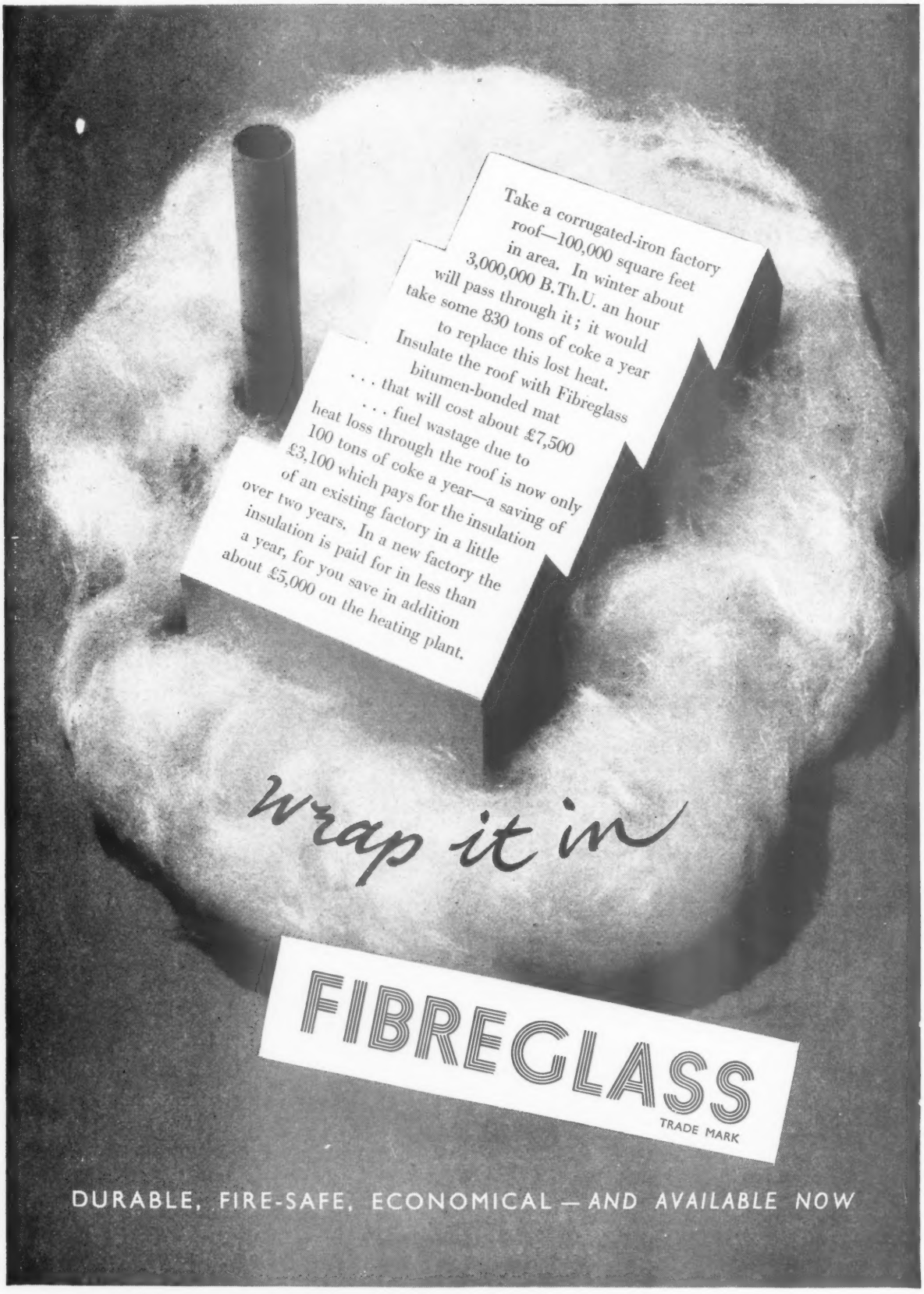
	Hygroscopicity Group		
	A	B	C
External joinery, except doors	13%	17%	19%
External doors	12%	15%	16%
Internal joinery in intermittently or moderately heated positions, except doors	11%	14%	15%
Internal doors in intermittently or moderately heated positions	10%	12%	13%
All internal joinery in continuously heated positions	9%	10%	11%
Joinery in close proximity with sources of heat ..	8%	9%	10%

DISTORTION

So far we have considered movement which occurs uniformly, but the same process of wetting and drying may also cause distortion in certain circumstances, some of which have already been mentioned when discussing conversion. This distortion is almost always caused by the difference between radial and tangential shrinkage and this explains why flat sawn boards are liable to cupping and why boards with sloping, twisted and interlocking grain are subject to distortion of one kind or another. Whereas one timber may shrink or expand more than another, it is quite possible that that with the lower movement may be the more liable to *distortion,* and whilst some indication may be provided by the straightness of grain, there are not at present any lists



A joint between the stile and rail of a glazed door, which has opened up through moisture movement. The door was fixed some time before the heating in the building was turned on, and the shrinkage was accentuated by the fact that the stile was a very wide one.



Fibreglass Limited, Ravenhead, St. Helens, Lancs. (St. Helens 4224)

Moisture content of timber (per cent.)

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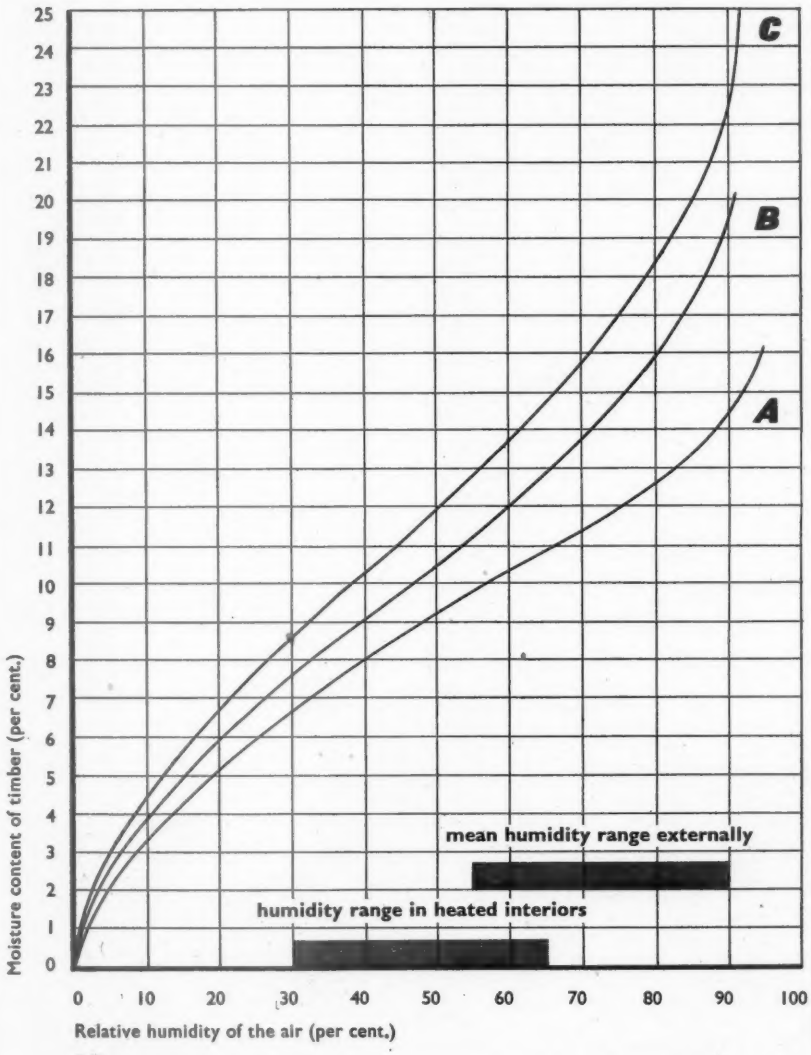

Fig. 7. EQUILIBRIUM MOISTURE CONTENTS FOR DIFFERENT RELATIVE HUMIDITIES: The three curves represent the average values of hygroscopicity of three groups of timbers.

USE OF FIGS. 6 AND 7: The group to which a timber belongs is shown in Fig. 6. By referring to the appropriate curve in Fig. 7, the moisture content of the timber can be related directly to the humidity of the air. Given a range of humidity for the air surrounding any piece of timber, (1) the fluctuation in moisture content can be determined from Fig. 7, and (2) the amount of movement can be calculated from Fig. 6. For example, if a 9-in. wide flat-sawn board of ramin at 12% moisture content were to be used in a position where the average humidity of the air was as low as 30% (e.g., a radiator casing), its moisture content would drop to 7½% (Curve B). The drop in moisture content from 12% to 7½% corresponds to a humidity drop from 60% to 30%, i.e., a fluctuation of 30%. Referring to Fig. 6, the movement of flat-sawn (tangential) ramin is ⅛ in. per foot width for each 10% fluctuation in humidity. The shrinkage of the board would therefore be

$$\frac{1}{8} \times \frac{30}{10} \times \frac{9}{12} = \frac{9}{32} \text{ in.}$$

of those timbers which are specially liable to distortion. It has, however, been noted, as might be expected, that timbers in which the excess of tangential over radial movement is not great are least likely to distort, irrespective of the amount of total movement to which they are liable. Muninga, for example, has a low total movement whereas Canadian yellow birch has a high total movement, but both timbers are known to distort little, as in each the difference between the radial and tangential movements is small.

SEASONING

The process of drying timber for its various uses is known as *seasoning*, and until shortly after the First World War it was nearly always done in the open air without any artificial aid.

Timber was before then comparatively cheap, and it was still an economic proposition to keep it stored in yards for the long period of time that air seasoning requires.

The increase in cost of the raw material and the depletion of the stocks during both the wars of 1914-1918 and 1939-1945, however, have encouraged kilning as a method of drying because of the far quicker rate at which it achieves the required result.

One other major factor has furthered an interest in kilning and has, in fact, made it essential in modern joinery, and that is the increase of central heating in buildings.

Although only a small part of the total output of timber for joinery is kiln dried even now, it is none the less of the utmost importance that *all* joinery used in heated buildings where the humidity is low, should be kilned; this is for the good reason that air seasoning will not reduce the moisture content to a figure below 17 per cent. even in the most favourable weather, yet figures of 8 per cent. to 10 per cent. are often needed.

Much softwood joinery is nowadays built into the work as it proceeds and is consequently exposed to the atmosphere for a considerable time, so that to kiln such timber would be a waste of time. Ideally, all timber should be kilned to a specified moisture content and brought into the building only when it has dried out and normal heating is operating. This is obviously impracticable for all but the most expensive joinery—though nevertheless *essential* for floors laid over heating panels. It is so important, that such floor blocks are sometimes wrapped in waterproof paper to prevent the wood absorbing moisture on the way from the factory to the building.

The whole problem of preserving the correct m.c. until the final conditions are reached requires attention, and will be dealt with in detail in a later article. In the meanwhile it is perhaps worth pointing out that it is very little use specifying a low moisture content if the timber is subsequently exposed to the wrong atmospheric conditions. Whilst a shower may not do much harm to normal joinery, exposure to a week of moisture-laden atmosphere would destroy the advantages of kilning, even though the timber might be painted with a traditional primer. It is sometimes thought that ordinary priming seals the wood but this is not so. Some notes on the efficiency of various primings and other finishes are given in the BRS digest *Questions and Answers*, 4th Series, No. 13, 1939, from which the following examples are quoted:

	Percentage efficiency in preventing moisture absorption	
	At 7 days	At 28 days
Bituminous paint, 2 coats	90	69
First quality oil paint, 3 coats (red and white lead primer, undercoat, and finishing coat)	83	56
Lead paint, 3 coats (red and white lead primer, undercoat, and finishing coat)	76	45
Aluminium paint, 2 coats (aluminium paste in bronzing liquid)	70	35
Shellac, 2 coats	68	31
Copal varnish, 2 coats	58	20
Aluminium paint, 2 coats (paste in boiled oil)	47	12
Red and white lead primer, 1 thin coat	38	14
Beeswax and turpentine, 2 coats over cellulose sealer	10	3
Boiled oil and turpentine, 2 coats brushed	2	0
Raw linseed oil, 1 coat rubbed	0	0

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METHODS OF SEASONING: Left, air drying of softwood. The timber has been "self-piled," i.e. not spaced apart by sticks. Although this method of piling does not permit very free circulation of air, it is often adequate for drying softwood. By far the greater part of our joinery timber, both hardwood and softwood, is air-seasoned. Above, a control chamber at the rear of timber kilns. The process can be carefully controlled, and continuous records are automatically plotted.

In practice much standard softwood joinery is made from air-seasoned timber. Usually this is adequate because a great part of it will be used in windows and door frames which are either exposed externally where a low moisture content is not required or are of such construction that even fairly large movement can be tolerated. Such items as standard cupboards and doors, which, because they are used inside require a lower m.c., will often be made by specialist firms which have now become virtually separate branches of the joinery industry and in whose works kilned timber would normally be used. It would nevertheless be of great value if softwood flooring—which is now being increasingly specified—were always kilned and laid at a late stage in the course of building. It is fortunate that the moisture content of 20 per cent., which can be achieved by air drying, is low enough to stop active fungal growth and to prevent new attacks of fungus and of several insect pests.

In practice it is mainly hardwoods which are kilned: and the reasons are, first, that on the whole, hardwoods are more frequently used in the kind of situations where low moisture contents are required; and second that softwood is imported in relatively small sections which by the time they are used have had an opportunity to dry out, whereas hardwood is often imported in log or in large sections: and third that in most cases a piece of hardwood of any particular size would take longer to dry out than a piece of softwood of equivalent size, and it is therefore important to use the limited space available in the kilns for hardwoods in order to meet the demand within a reasonable time.

The length of time taken for seasoning will be governed by the amount of water in the green timber and the moisture content to which it has to be reduced. Also by the species of timber, and, of course, by the size of the section. As far as the latter is concerned, it has been found uneconomic to kiln hardwoods over 3 in. *thick*, but by the nature of the process the *width* of the boards makes little difference because the moisture is drawn mainly from the upper and lower surfaces of the piled timber.

In most kilns the drying is accomplished by introducing warm air into the kiln at controlled humidities, which passes over the upper and lower surfaces of the timber which is piled in stick. There are other forms of kilning using super-heated steam and radio frequency heating, and there are also methods in which chemicals are applied to the timber to assist the process. These are, however, the exception and are very rarely used commercially.

There is now a sufficient experience of kilning to ensure that if it is done properly and in accordance with authoritative schedules, the timber will be thoroughly well seasoned, and be at least as good in service as the best air dried timber. There is a prejudice still against kilning, and there are those who consider that timber dried in the open and subsequently prepared and jointed up loosely and left in a warmed workshop for a long period prior to final glueing will be superior to kilned timber: but objective analysis of the results does not bear this out: on the contrary it shows that, owing to the control of heat and of humidity which kilning offers, the method has positive advantages in avoiding some of the distortion which may occur in seasoning.

With this fact in mind it may be of interest to compare very approximately the actual times which air drying and kilning are likely to take respectively, and a convenient rule of thumb guide for hardwoods is:

Air drying: 1 year per inch thickness

Kiln drying: 1-3 weeks per inch thickness

It must be admitted that kilning in the early days was not always done well, and there was little control over certain defects which are associated with the process. These defects can still occur, but the means of avoiding them are known, and with the knowledgeable operators and the closely kept records which are common they are far less likely to occur than previously and if they do, can be checked and the affected timber discarded. The most common of the defects are: *case hardening*, that is the drying out of the

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SPHERE WORKS, ST. ALBANS, HERTS.

fibres on the outside of the piece of wood prior to those on the inside, causing uneven tensions which make the wood distort when for instance the section is machined or re-sawn. This can be overcome by introducing steam which prevents the outside drying out too quickly, but if overdone the remedy can be the cause of another defect called *honeycombing*.

When this happens the inside dries out too quickly and whilst the outside shows no failure, the inside of the piece of wood is full of small checks or splits longitudinally with the grain.

Case hardening can be detected by observing the behaviour of a typical cross-section taken from a piece of timber in the kiln and from which the inside is cut, forming a prong. If the timber is not evenly dried the prongs will distort: the appearance of a prong taken from a piece of timber at a late stage of case hardening can be seen at the head of this article. Honeycombing can be seen by cutting a representative sample in cross section. The other faults which may occur, such as warping, twisting and bowing, can be minimized by careful stacking and even kilning. A special fault, known as *collapse*, to which some timbers are liable in seasoning, *e.g.*, Tasmanian oak, western red cedar, cypress, and hemlock, results in severe shrinkage and in the production of a corrugated surface on the quarter sawn surfaces called "washboarding." It has been found that this defect can be remedied with complete success in kilns, by a process called reconditioning.

The schedules to which the kiln operator will work make it necessary for daily samples to be taken, and weighed so that continuous records of the moisture contents can be kept. The only really accurate means of ascertaining the moisture content is to weigh the sample wet and then oven dry it and weigh it again. Electric moisture meters are available, and they work by recording the resistance between the needle points of electrodes about 1 in. apart. The needles are about ¼ in. long and because in some really hard woods can be driven in only about $\frac{1}{16}$ in., they do not give more than an approximate guide to the condition of the timber throughout its full thickness. In addition, they have to be adjusted for different species and for temperature and should therefore only be used in the hands of an expert. Their chief merit is that they give a quick reading which is useful as a check, particularly for mass-produced articles.

If timber does not have to be dried below about 20 per cent., air seasoning is no doubt still the most economical method. The cost of kilning is approximately a tenth of the cost of the wood and must be reckoned as an additional item if low moisture contents are required.

Before leaving the subject of seasoning, mention should be made of the expression "water seasoning." This is a misnomer. Certain timbers by tradition were and sometimes still are *stored* in the log in "timber ponds." This is done mainly to prevent the wood from checking badly and the ends of the log opening, which happens if they are exposed to the sun and drying winds. It also prevents the attack of certain insect pests and has been found to be a convenient form of storage facilitating handling especially for large and heavy logs. Amongst those species which were traditionally so stored were teak, rock elm, various species of mahogany, pitch pine and douglas fir.

We have explained that it is necessary to choose a species of timber suitable for the joinery that is being designed and to specify the appropriate moisture content. In spite of this, slight movement will almost certainly occur and this movement has to be allowed for in the design of sections and joints, a matter which will be discussed in future articles.

THE TIMBER YARD

We have received the following comments on the first article in this series from the Timber Development Association

1. *Softwood grading.* The authors describe "unsorted" quality as "wood of all grades except 1st and those lower than 5th" (p. 414). However, "unsorted" from Finland and Sweden consists of 1st, 2nd, 3rd and 4th qualities; from Russia consists of 1st, 2nd and 3rd qualities—a 4th quality is sold separately. The actual quality of "unsorted" varies widely according to the place of origin and the shipper. Some timber marks, therefore, have a much higher reputation than others. The term "unsorted" does not imply that the timber has not been sorted; it means that a number of grades are included in the same parcel.

2. *Hardwood areas.* The authors state "the hardwood areas are nearly all in tropical and semi-tropical countries (p. 415). Although most of our hardwood does at the moment come from tropical and semi-tropical countries, North America and Europe are both important hardwood-producing areas. No doubt these areas would assume greater importance for us if and when trade restrictions are removed.

3. *Hardwood grading* (p. 415). This varies in different countries and some countries have grading rules which are most exacting. For instance, West African sawn timber is graded according to the rules of the National Hardwood Lumber Association of America, while Malaya has its own excellent grading rules.

4. *Impregnated timber* (p. 417). This is not only distributed by stockists; many timber merchants have their own plants and market it in the usual way.

Acknowledgments for Article No. 1
To John Sadd & Sons Ltd. for permission to publish the photographs on pp. 411 and 414; and to W. W. Howard Bros. & Co. Ltd., Rippers Ltd., and William Mallinson & Sons Ltd. for their assistance.

Acknowledgments for Article No. 2
To John Sadd & Sons Ltd. for permission to publish the photographs on p. 661; and to Horsley, Smith & Co., Forest Products Research Laboratory, and the Timber Development Association for their assistance.

INFORMATION CENTRE

A digest of current information prepared by independent specialists; printed so that readers may cut out items for filing and paste them up in classified order.

11.38 materials: general
BRITISH STANDARDS

British Standards Year Book, 1954. British Standards Institution, 12s. 6d.

Complete list of British Standards to 31st March, 1954, with very brief description of each. Also membership of Councils and Committees.

15.123 materials: applied finishes, treatments
OIL PAINTS

Ready Mixed Oil-based Priming Paints. BS 2521-4:1954. (British Standards Institution. 3s. 0d.)

Ready Mixed Oil-based Undercoating and Finishing Paints (Exterior Quality). BS 2525-32:1954. (British Standards Institution. 3s. 0d.)

These two publications comprise twelve new standards and old standards 261, 262, 293, 294, 295, 371, 929 and 1011 are therefore withdrawn.

Of the existing standards, BS 929 was first introduced as a war emergency specification covering paints of a generally lower composition and performance standard that were necessary as a war-time measure to conserve scarce raw materials for paints. In framing the new specifications, reversion to a normal standard has been effected.

The new standards, BS 2521-5, for priming paints, include one lead-base primer for woodwork, one leadless grey primer for interior use, three lead-base primers for iron and steel, and one red oxide primer for iron and steel. These priming paints are designed for use under undercoating and finishing paints complying with BS 2525-32, but can also be used under conventional hard gloss paints provided appropriate drying times are allowed before the application of the undercoatings.

BS 2525-32 covers undercoating and finishing paints of the types known as "straight linseed oil paints." These British Standards do not apply to those types of paint known under such titles as hard gloss paint, enamel paint, etc., and the paints manufactured to these standards will not have the brushing properties or the finish and gloss of such types of paint. The paints are designed for the protection of exterior surfaces, and are not recommended for interior decoration.

BS 2525 gives two basic compositions which between them cover twelve colours of undercoating paints. A table is included indicating which of these undercoats is appropriate for each of 91 colours given in BS 281C to which the finishing coats in BS 2526-32 may be made.

Requirements are stated, as appropriate for composition, consistency, drying time, water content and keeping properties, and for colour, finish and opacity. Appendices describe sampling technique and give methods of test.

Readers requiring up-to-date information on building products and services may complete and post this form to the Architects' Journal, 9, 11 and 13, Queen Anne's Gate, S.W.1

ENQUIRY FORM

I am interested in the following advertisements appearing in this issue of "The Architects' Journal." (BLOCK LETTERS, and list in alphabetical order of manufacturers names please.)

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Please ask manufacturers to send further particulars to :—

NAME .....

PROFESSION or TRADE

.....

ADDRESS .....

.....

25.11 54

THE LIBRARY OF INFORMATION SHEETS

REFERENCE BACK

20.D1, 32.B1, 37.D1

Readers are asked to note the following amendments and to correct their copies of the Information Sheet in question:

20.D1 *Face of Sheet—the design of the soil vent block has been changed: the hole for the vent pipe has been enlarged and moved from the centre, so that one side is now open, to be closed by the adjacent block. The overall dimensions of the block remain unchanged.*

32.B1 *Reverse of Sheet—The figures in the table for the last three models should read as follows:—*

55 M	51,000	102	51	65-70	22,440	153
65 M	55,000	110	55	75-85	24,200	165
80 M	65,000	130	65	90-100	28,600	195

37.D1 *Reverse of Sheet—Under heading "British Standards for Service Pipes and Fittings" add* BS.1740 : 1951 *"Wrought pipe fittings, iron and steel, screwed B.S.P. thread" and amend the date of* BS.143 *to* 1952. *Delete* BS.—*"Steel fittings" and* BS.—*"Wrought iron fittings" and also (Class A or B) after the title to* BS.534 : 1934.

Obituary

Lord Courtauld-Thomson, K.B.E., C.B., died on November 1 at King Edward VII Sanatorium, Midhurst, Sussex, at the age of 89. Lord Courtauld-Thomson was elected to the Board of the Limmer & Trinidad Lake Asphalt Co. Ltd., in 1905 and was appointed Chairman in 1923, which position he held at the time of his death.

Announcements

PROFESSIONAL

W. Dobson Chapman & Partners of Macclesfield have now taken over the practice carried on until his recent retirement by Arthur Clayton, F.R.I.B.A., at 6, Chestergate, Macclesfield, and 4, Clarence Street, Manchester 2. The Macclesfield office will be transferred to Messrs. W. Dobson Chapman & Partners' present address at Jordongate House, Macclesfield (Macclesfield 2278/9). The Manchester office will continue to be carried on temporarily at 4, Clarence Street, Manchester 2, until December 1 when it will be transferred to more commodious offices at 3, St. James's Square, Manchester 2. The telephone number of this office will be unchanged (Blackfriars 9904).

Mr. R. G. Sperry, A.R.I.B.A., Chartered Architect, has commenced practice at 169, High Street, Epping, Essex, and would be pleased to receive trade catalogues and literature.

TRADE

J. Burley & Sons Ltd., have moved into new office buildings at Burley's Corner, Brooklands Road, Weybridge, Surrey. Telephone and telegrams: Byfleet 2771 (6 lines).

Mr. Donald Ross has been appointed General Sales Manager of Semtex Ltd. Responsible direct to Mr. Ross, Mr. W. W. Weston has been appointed Sales Development Officer for Semtex.

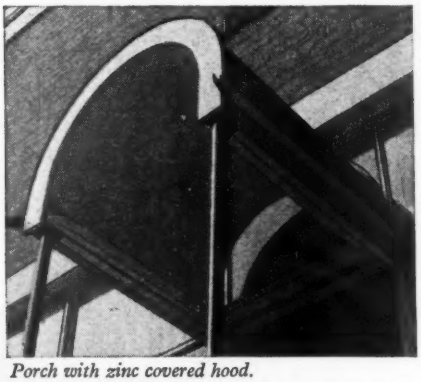
ZINC WEATHERINGS

House at Kensington. Architects: Leonard Manasseh & Partners.

In this house, contemporary design fits snugly into a Kensington background. It also illustrates some interesting uses of zinc—to cover the neat porch hood, and as weatherings for window sills and roof verge. For weatherings, zinc is easy to fix and rigid, and prevents staining of wall surfaces.

From roof to foundation, zinc has vitally important uses in contemporary building—for gutters, pipes, weatherings, flashings and hoods. And there are now no restrictions on its use. Supplies are plentiful, and likely to remain so. The price of zinc has dropped considerably, and it is now one of the cheapest permanent materials.

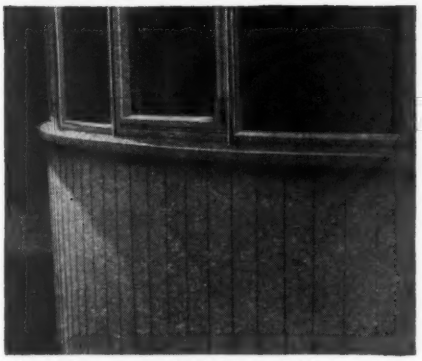
The Zinc Development Association is a non-trading body which is always prepared to give technical help to potential users. Publications, together with lists of stockists of all zinc building materials and of firms specialising in zinc work, are freely available.



Porch with zinc covered hood.

Detail of porch hood, showing gutter.

Zinc weathering on window sill.



Weathering to curved sill of bay window.

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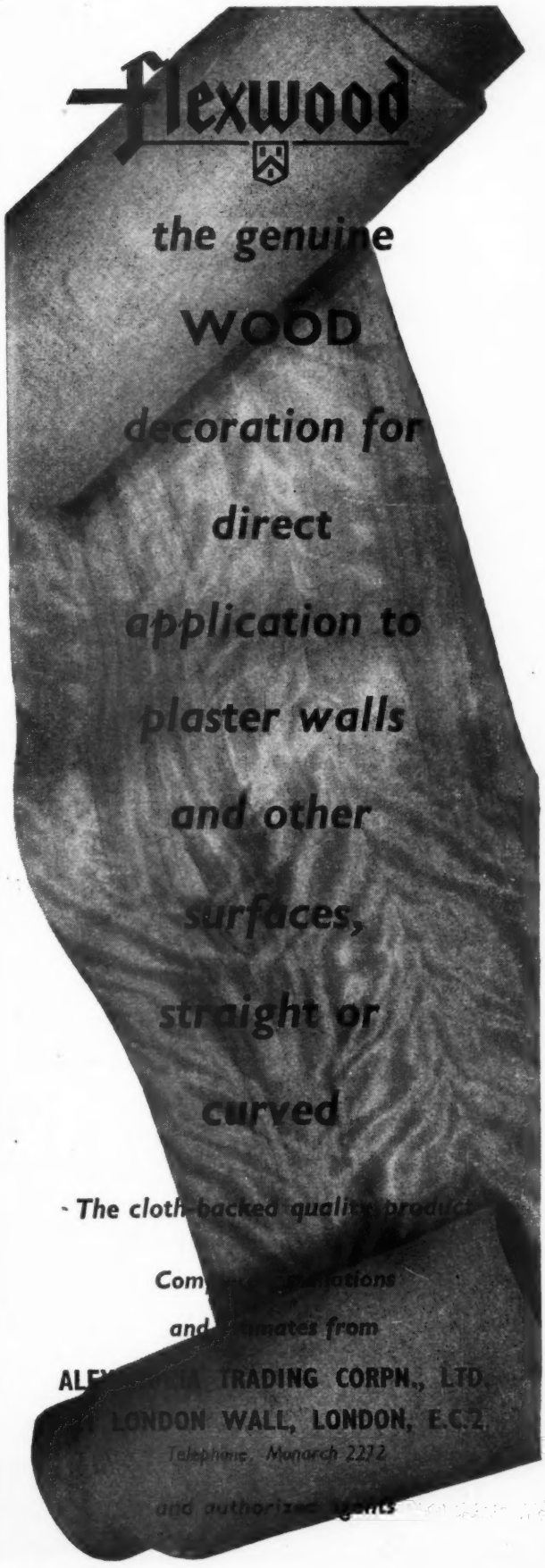
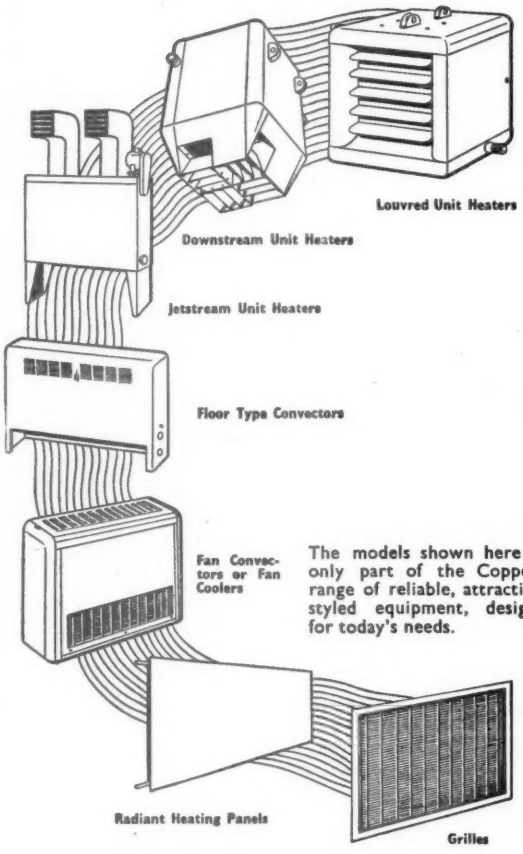
ZINC DEVELOPMENT ASSOCIATION • LINCOLN HOUSE • TURL STREET • OXFORD • TELEPHONE: 48088





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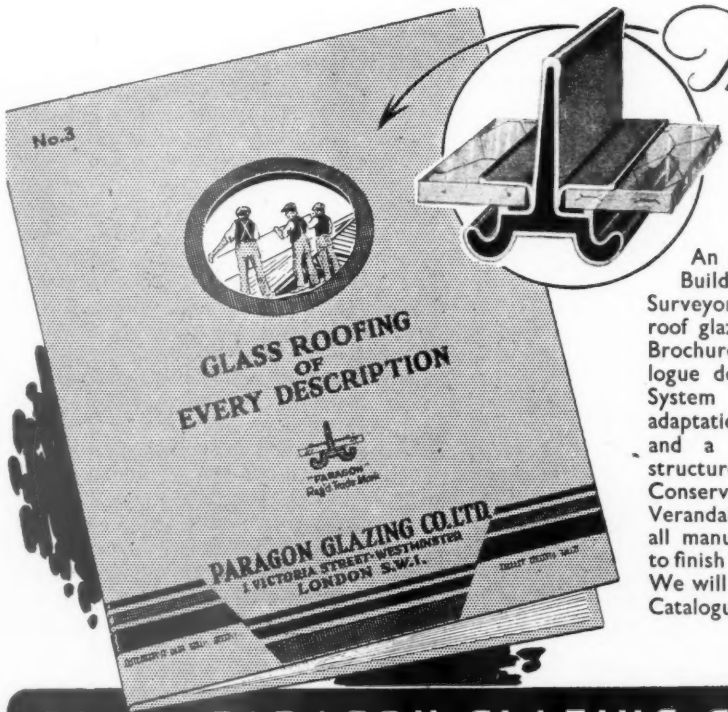

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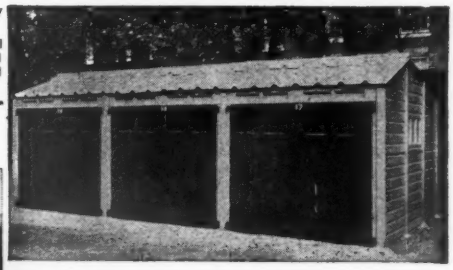

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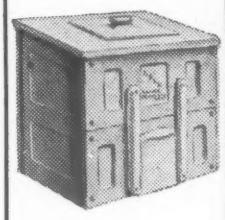

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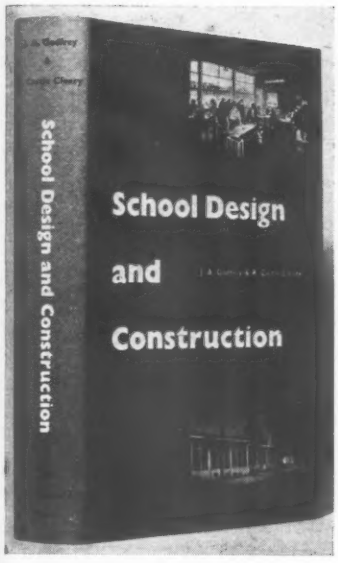

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Cleary, AA.R.I.B.A

376 pages, over

60 plans, 40 pages

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THE PURPOSE OF this book is to provide architects and educational authorities with a comprehensive and up-to-date textbook on school design, construction and equipment. It consists essentially of three main sections dealing with schools built during recent years, namely, the planning of their accommodation; the basic design requirements which directly affect the physical well-being of the children and staff; and the construction of the building itself and the equipment of its interior. Reference is frequently made to the 1951 Regulations of the Ministry of Education, and close attention has been given to the work of the Building Research Station. Size 8½in. by 5⅝in. 36s. postage 1s. inland.

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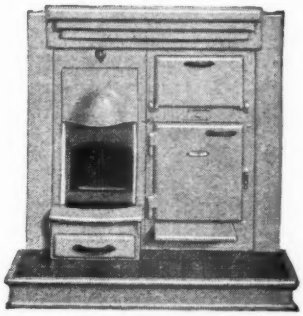

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CLASSIFIED ADVERTISEMENTS

Advertisements should be addressed to the Advt. Manager, "The Architects' Journal," 9, 11 and 13, Queen Anne's Gate, Westminster, S.W.1, and should reach there by first post on Friday morning for inclusion in the following Thursday's paper.

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

Public and Official Announcements

25s. per inch; each additional line, 2s.

The engagement of persons answering these advertisements must be made through a Local Office of the Ministry of Labour or a Scheduled Employment Agency if the applicant is a man aged 18-64 inclusive or a woman aged 18-59 inclusive unless he or she or the employment is excepted from the provisions of the Notification of Vacancies Order, 1952.

BOROUGH OF SOLIHULL.

ASSISTANT ARCHITECT. Grade A.P.T. VA, £650—£710 (from January 1955, new Grade A.P.T. III, £675 × £25—£725).

Applications are invited for the above appointment in the Borough Engineer & Surveyor's Department, 90, Station Road, Solihull.

The appointment will be subject to the provisions of the Local Government Superannuation Acts, to the terms of the National Scheme of Conditions of Service and to one month's notice on either side. Housing accommodation will be made available as soon as possible.

Applications giving full details as to age, present position and salary, qualifications and experience, together with the names and addresses of two referees, should be delivered to the Borough Engineer & Surveyor at the above address not later than Tuesday, November 30th.

W. MAURICE MELL, *Town Clerk.*
4690

MINISTRY OF WORKS.

LEADING ARCHITECTURAL ASSISTANTS required for drawing offices in the Chief Architect's Division in London, Edinburgh and various provincial offices.

Candidates must have had at least three years architectural training, good experience in an architect's office, and be of Intermediate R.I.B.A. standard. London salary £710—£834 per annum. Rates elsewhere slightly less. Starting pay according to experience. Prospects of promotion and establishment.

State age, full details of training and experience, and office desired, to E. Bedford, Esq., C.V.O., A.R.I.B.A., Chief Architect, Ministry of Works, W.G.10/C.A.10(F), Abell House, John Islip Street, London, S.W.1.
4732

CITY AND COUNTY OF NEWCASTLE-UPON-TYNE.
CITY ARCHITECT'S DEPARTMENT.
PROPOSED NEW TOWN HALL.
APPOINTMENT OF ARCHITECTURAL STAFF.

Applications are invited from Associate Members of the R.I.B.A. for the undermentioned special appointments in the City Architect's Department. These appointments are additional to the present Establishment of the Department, and the successful candidates will be engaged solely upon duties in connection with the New Town Hall Scheme, the estimated total cost of which is in the region of £2 million. The present position is that the Minister of Housing and Local Government has approved in principle the building of Stage I of the Scheme, which is estimated to cost some £600,000. It is hoped to commence building work early in 1956.

(A) PRINCIPAL ASSISTANT ARCHITECT, A.P.T. Division. Grade X (£920—£1,050), as from 1st January, 1955, amended A.P.T. VIII (£980—£1,100).

(B) SENIOR ASSISTANT ARCHITECT, A.P.T. Division. Grade VIII (£785—£860), as from 1st January, 1955, amended A.P.T. V (£840—£900).

(C) ASSISTANT ARCHITECT, A.P.T. Division, Grade VI (£695—£760), as from 1st January, 1955, amended A.P.T. IV (£705—£825).

Candidates for each of the above appointments must have received a sound architectural training, preferably at a recognised School of Architecture, and experience in Architectural work of exceptional quality will be an advantage.

Applicants for appointment (A) should have wide experience, and should be capable of taking responsibility for the day-to-day administration of a large building contract of this nature.

The appointments are intended to be for the duration of the Scheme, subject to satisfactory service, and will be subject to the National Conditions of Service as adopted by the City Council; to the provisions of the Local Government Superannuation Act, 1953, and to one month's notice on either side. The successful candidates will be required to pass a medical examination.

Applications stating age, particulars of training, qualifications, experience, present and past appointments and salaries attaching thereto, together with copies of two recent testimonials, or 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 Thursday, 2nd December, 1954.

JOHN ATKINSON, *Town Clerk.*
Town Hall, Newcastle-upon-Tyne, 1. 4713

CITY OF OXFORD.
CITY ARCHITECT AND PLANNING OFFICER'S DEPARTMENT.

Vacancy for PLANNING ASSISTANT within the range £675—£825 (New Grade IV from 1st January, 1955), according to experience. Grading may also be the subject of further review in light of National Council decision. Permanent pensionable post; medical examination. Candidates must be qualified members of the Town Planning Institute and have had experience in the planning work of a Local Authority. Additional qualifications will be an advantage. Successful applicant will be required to undertake varied duties in Planning Section of Department.

Housing Accommodation, if required, will be provided by the Council.

Forms of application and conditions of appointment may be obtained from the City Architect and Planning Officer, Town Hall, Oxford, to whom completed forms must be returned by 11th December, 1954.

HARRY PLOWMAN,
Town Clerk.
Town Hall, Oxford. 4736

LONDON ELECTRICITY BOARD.
JUNIOR QUANTITY SURVEYOR.

Applications are invited for the above position in the Chief Engineer's Department in Central London.

Applicants should have had experience in working-up in all trades, and the successful candidate will work under the direction of a Chartered Quantity Surveyor.

The post is graded under Schedule "C" of the National Joint Board agreement as Grade 9—£415 per annum rising to £600 12s. 0d. per annum, inclusive of London Allowance.

Application forms obtainable from Personnel Officer, 46, New Broad Street, E.C.2, to be returned completed by 30th November, 1954. Please enclose addressed envelope and quote ref.: V/1845/A on envelope and all correspondence.
4680

MINISTRY OF WORKS.

ARCHITECTURAL ASSISTANTS required for drawing offices in London, Edinburgh and various provincial offices, including Aldermaston, Berks; Harwell, Berks; Nancekuke, Cornwall; Ranskill, Notts; and Bishopton, Renfrew.

Candidates must have had at least three years architectural training, some experience in an architect's office, and be of Intermediate R.I.B.A. standard.

London salary £442—£695 per annum. Rates elsewhere slightly less. Starting pay according to age and experience. Prospects of promotion and establishment.

State age, full details of training and experience and office desired, to E. Bedford, Esq., C.V.O., A.R.I.B.A., Chief Architect, Ministry of Works, W.G.10/C.A.10(F), Abell House, John Islip Street, London, S.W.1.
4731

COUNTY BOROUGH OF GREAT YARMOUTH EDUCATION COMMITTEE.
SCHOOLS ARCHITECT'S DEPARTMENT.

Applications are invited from Associate Members of the Royal Institute of British Architects for the appointment of SENIOR ASSISTANT ARCHITECT on the permanent staff, salary Grade VII (£735—£810).

Candidates should have a knowledge of modern school design and construction.

The Council is unable to assist with housing accommodation. An allowance of 25s. per week will be paid for a period not exceeding six months, in the event of a married man being appointed who is unable to find accommodation.

Further particulars and forms are to be obtained from The Schools Architect, 22, Euston Road, Great Yarmouth, to whom they should be returned by the 3rd December, 1954.

D. G. FARROW,
Chief Education Officer.
4730

ARCHITECTURAL ASSISTANTS required by the GOVERNMENT OF KENYA P.W.D. for one tour of 40/48 months in the first instance. Salary scale (including present temporary allowance of 35 per cent. of salary), £904, rising to £1,134 a year. Commencing salary according to war service and experience. Gratuity of 13⅓ per cent. of total basic salary drawn during contract. Outfit allowance £30. Liberal leave on full salary. Free passages. Candidates over 24 years of age must be capable of working up sketch designs and preparing full working drawings for various types of Government buildings. They must have had at least four years actual experience in an Architect's office and have a sound knowledge of building construction.

Write to the Crown Agents, 4, Millbank, London, S.W.1. State age, name in block letters, full qualifications and experience and quote M2B/40529/AG.
4750

WEST SUFFOLK COUNTY COUNCIL.
COUNTY PLANNING DEPARTMENT.

AREA PLANNING OFFICER. Salary within A.P.T. Grade IV (£675 × £30—£825), according to experience. Applicants must be Corporate Members of the Town Planning Institute, preferably with Committee experience. N.J.C. service conditions; post pensionable; medical examination. Application forms obtainable from J. M. Gorst, A.M.I.Mun.E., A.M.T.P.I., County Planning Officer, Shire Hall, Bury St. Edmunds, to be returned by 18th December, 1954.

ALAN F. SKINNER,
Clerk of the County Council.
4760

CITY OF LEICESTER.
CITY ARCHITECT'S DEPARTMENT.

Applications are invited for the following posts:—

(*a*) SENIOR ASSISTANT ARCHITECT (Housing). Salary Grade A.P.T. IX, £840—£960 p.a.

(*b*) ASSISTANT ARCHITECT (Education). Salary Grade A.P.T. VIII, £785—£860 p.a.

(*c*) ASSISTANT ARCHITECT (Education). Salary Grade A.P.T. V, £620—£670 p.a.

(*d*) SENIOR ASSISTANT QUANTITY SURVEYOR (Housing). Salary Grade A.P.T. IX, £840—£960 p.a.

(*e*) SENIOR ASSISTANT QUANTITY SURVEYOR (General). Salary Grade A.P.T. IX £840—£960 p.a.

(*f*) QUANTITY SURVEYING ASSISTANT (Housing). Salary Grade A.P.T. IV—V, £580—£670 p.a. (New salary scales will be operative as from 1st January, 1955.)

Applicants for (*a*), (*b*) and (*c*), must be Registered Architects and hold a recognised architectural qualification: (*a*) Housing experience is essential and preference will be given to those having experience in central redevelopment schemes. (*b*) Experience is desirable in the design and erection of educational buildings.

Applicants for (*d*) and (*e*) must be Chartered Quantity Surveyors with experience of preparation of Bills of Quantities and settlement of large building contracts.

Applicants for (*f*), Grade IV, must have passed the Intermediate Examination R.I.C.S., and those for Grade V, the Final Examination, R.I.C.S.

The appointments will be subject to the National Scheme of Conditions of Service, passing a medical examination, and one month's notice on either side.

Applications, with full particulars together with copies of two recent testimonials, should be sent to the undersigned not later than Tuesday, 7th December, 1954.

J. H. LLOYD OWEN,
City Architect.
10, Loseby Lane, Leicester. 4785

BRITISH ELECTRICITY AUTHORITY.
MIDLANDS DIVISION.

Applications are invited for the following appointments in the Generation (Construction) Department at Wolverhampton. N.J.B. service conditions, superannuable appointments, salaries within Schedule "D" of the Agreement:—

(*a*) One ENGINEERING DRAUGHTSMAN (Mechanical), Grade 6. (Vacancy No. 816MD.)

(*b*) One SENIOR DRAUGHTSMAN (Structural Steelwork), Grade 4. (Vacancy No. 817MD).

(*c*) One SENIOR DRAUGHTSMAN (Architectural) Grade 4. (Vacancy No. 818MD.)

(*d*) One SENIOR DRAUGHTSMAN (Civil) Grade 5. (Vacancy No. 819MD.)

(*e*) One ENGINEERING DRAUGHTSMAN (Civil) Grade 6. (Vacancy No. 820MD.)

Applicants for these positions should have received a sound technical training and practical experience, in particular for:—

(*a*) In the layout of plant for new generating stations including turbines, boiler or similar plant;

(*b*) in the design of heavy steel structures, preferably with works training in steel fabrication;

(*c*) in the layout and design of main and auxiliary buildings associated with power stations;

(*d*) and (*e*) general civil engineering, preferably associated with power stations.

Appropriate technical qualifications will be an advantage; opportunities for advancement and for broadening experience; good conditions of employment and holidays. Salary ranges are at present, Grade 4, £671 to £780; Grade 5, £567 to £671; and Grade 6, £433 to £567. Previous applicants for these positions, unless otherwise notified, will be re-considered.

Apply, quoting the vacancy number, on form AE6, available from the Establishments Officer, 53, Wake Green Road, Moseley, Birmingham, 13, by 4th December, 1954.
4762

THURROCK URBAN DISTRICT COUNCIL.
ARCHITECTURAL ASSISTANT.

Applications are invited for the appointment of an ARCHITECTURAL ASSISTANT at a salary in accordance with Grade II of the A.P.T. Division of the National Scale of Salaries (applicable from 1st January, 1955), i.e., £560, rising to £640 per annum.

General architectural experience is necessary and applicants must be capable of preparing detailed plans and specifications and supervising housing schemes. Candidates should have passed the Intermediate Examination of the Royal Institute of British Architects.

Housing accommodation, if necessary, may be provided for the successful applicant if he lives more than 20 miles from the Thurrock Urban District.

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

Applications endorsed "Architectural Assistant II" stating age, qualifications and experience with copies of three recent testimonials should reach the undersigned not later than Monday the 6th December, 1954.

Canvassing will disqualify and applicants must disclose in writing any relationship to any member or senior officer of the Council.

A. E. POOLE,
Clerk of the Council.
Council Offices, Whitehall Lane, Grays, Essex. 4828

BOROUGH OF DEAL.

Applications are invited from Registered Architects for the position of CHIEF ARCHITECTURAL ASSISTANT in the Borough Engineer's Department.

Candidates must have extensive experience of municipal works, including housing estate schemes.

Salary will be in accordance with the present A.P.T. Grade VI £695—£760 (the new scales are under consideration) and the N.J.C. Conditions of Service will apply. The appointment will be subject to one month's notice on either side and to the provisions of the Local Government Superannuation Acts and the successful applicant will be required to pass a medical examination.

The Council will be prepared to assist with housing accommodation if required.

Applications stating age, qualifications, experience, etc., together with the names of three referees, should be forwarded to the undersigned not later than 3rd December, 1954.

E. S. DIXON,
Town Clerk.

Municipal Offices,
Queen Street,
Deal, Kent.
13th November, 1954. 4757

LONDON COUNTY COUNCIL.

Grade III ENGINEERS (salary up to £892 10s.) and SURVEYING ASSISTANTS (up to £739 10s.) required in District Surveyor's Service. Qualifications A.R.I.B.A., A.M.I.Str.E., or A.R.I.C.S.; structural knowledge essential. Particulars and application forms from Architect (AR/EK/DS/2), County Hall, S.E.1. (1025). 3511

LONDON COUNTY COUNCIL.

Architects and surveyors required for safety regulations of theatres and special buildings, and for general building regulation work. Salaries up to £892 10s., according to experience. A.R.I.B.A. or A.R.I.C.S. essential. Particulars and application form from Architect (AR/EK/TBR/3), The County Hall, S.E.1. (843) 3487

BOROUGH OF CHELMSFORD.
BOROUGH ENGINEER, SURVEYOR AND ARCHITECT'S DEPARTMENT.

CHIEF ASSISTANT ARCHITECT, Grade A.P.T. VI.

ENGINEERING ASSISTANT, Grade A.P.T. III.

ENGINEERING ASSISTANT, Grade A.P.T. I.

The Chelmsford Borough Council invite applications for the above appointments, further particulars of which can be obtained from the Borough Engineer, Surveyor and Architect's Department, Municipal Offices, Chelmsford. Closing date, Tuesday, 14th December, 1954.

B. A. FRANCIS,
Town Clerk.
4829

LONDON COUNTY COUNCIL.

TECHNICAL ASSISTANT required for the Lettering of Plaques erected by the Council on buildings of historic interest. A secondary duty will be to assist generally with the design of furniture, exhibitions and colour schemes. Salary up to £10 13s. 6d. a week. Application forms returnable by 8th December, from the Architect AR/EK/F & D/3, County Hall, S.E.1 (1476).

4759

LONDON COUNTY COUNCIL.
ARCHITECT'S DEPARTMENT.

ASSISTANT required for design of furniture, exhibitions and colour schemes. A.R.I.B.A., specialist qualifications, or experience. Salary up to £739 10s. Application forms returnable by 17th December, from the Architect (AR/EK/F&D/1), County Hall, S.E.1. (1514) 4801

CITY OF SHEFFIELD.
APPOINTMENT OF ASSISTANT ARCHITECTS.

Applications are invited from suitably qualified ARCHITECTS for superannuable posts (at present A.P.T. Grade V, £620—£670) in the Education and General Section of the City Architect's Department which has an interesting and varied programme of Schools and other Public Buildings.

Applications, stating age, education and training, qualifications, present and past appointments (with dates and salaries), experience and the names of two referees should reach me by 6th December, 1954.

JOHN HEYS,
Town Clerk.

Town Hall,
Sheffield, 1. 4810

ROXBURGH COUNTY COUNCIL.
COUNTY ARCHITECT'S DEPARTMENT.

Applications are invited for the appointment of ASSISTANT ARCHITECT. Salary scale £630—£770 per annum (Grades V to VI), with placing within that scale according to qualifications and experience.

Candidates must be registered architects, and preferably Members of the Royal Institute of British Architects.

The appointment is subject to the Local Government Superannuation (Scotland) Act, 1937, and to satisfactory medical examination.

Applications, accompanied by one copy each of three recent testimonials, should be lodged with the undersigned not later than 30th November, 1954.

Canvassing, directly or indirectly, in connection with the appointment will disqualify.

JAMES R. HUME,
County Clerk.

County Offices,
Newtown St. Boswells.
6th November, 1954. 4761

METROPOLITAN BOROUGH OF HAMPSTEAD

Require ARCHITECTURAL ASSISTANT (temporary). Salary within the interim scale £600—£640, plus London weighting. Appropriate qualifications required. No Housing provided. Applications suitably endorsed, giving three referees, to the Town Clerk, Town Hall, Haverstock Hill, N.W.3, by 4th December, 1954. 4790

DENBIGHSHIRE COUNTY COUNCIL.
COUNTY ARCHITECT'S DEPARTMENT, WREXHAM.

Applications are invited for the appointment of ASSISTANT ARCHITECT, A.P.T. Grade V (Salary £620 to £670 per annum). Preference will be given to members of the R.I.B.A., who have had sound experience in arcnitectural design and in the preparation of working drawings with full understanding of modern school construction. Further details and application form may be obtained from the undersigned to whom the completed forms are to be returned by 11th December, 1954.

W. E. BUFTON,
Clerk of the County Council.

County Offices,
Ruthin. 4756

CITY OF MANCHESTER HOUSING COMMITTEE.

Applications are invited from suitably qualified persons for (1) ASSISTANT ARCHITECT, A.P.T. VI, £695—£760 (£705—£825 as from 1/1/55); and (2) ASSISTANT ARCHITECTS, A.P.T. V, £620—£670. (Applicants must be Registered Architects and preference will be given to an Associate of the R.I.B.A.) Candidates should forward particulars of age, education, quanifications and experience to the Director of Housing, Town Hall, Manchester, 2, to be received not later than 30th November, 1954. 4755

CHURCH COMMISSIONERS.

Applications are invited for the appointment of an ARCHITECTURAL ASSISTANT at a salary according to age and experience, within the scale of £750 × £35—£1,100, together with non-contributory superannuation benefits.

Appointment will be subject to a probationary period of at least six months, and a satisfactory medical examination.

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

Applications in writing, stating age, education, qualifications and previous experience should be sent to Establishment Officer, Church Commissioners, 1, Millbank, Westminster, S.W.1. 4754

CHURCH COMMISSIONERS.

Applications are invited for the appointment of a QUANTITY SURVEYOR at a salary according to age and experience, within the scale of £1,000 × £50—£1,500, together with non-contributory superannuation benefits.

Appointment will be subject to a probationary period of at least six months, and a satisfactory medical examination.

Applicants must be Fellows or Associates of the Royal Institute of Chartered Surveyors or the Institute of Quantity Surveyors.

Applications in writing stating age, education, qualifications and previous experience should be sent to Establishment Officer, Church Commissioners, 1, Millbank, Westminster, S.W.1. 4753

STEVENAGE DEVELOPMENT CORPORATION.
CHIEF ARCHITECT'S DEPARTMENT.

Applications are invited for posts as JUNIOR ARCHITECTS, on salary grades in accordance with the N.J.C. Salary Scales A.P.T. V (£620—£670); A.P.T. Va (£650—£710); or A.P.T. VI (£695—£760) per annum, according to qualifications and experience. Housing accommodation will be available in due course in appropriate cases.

Applications, giving details of experience and names of two referees should be sent to the Chief Administrative Officer, Aston House, Near Stevenage, Herts., not later than Tuesday, 30th November, 1954. 4786

Applications are invited for the post of ARCHITECTURAL ASSISTANT Grade 1, Divisicnal Architect's Department, National Coal Board, Northern (N. & C.) Division, Gosforth, Newcastle-upon-Tyne, to work on large scale reconstruction Schemes of considerable interest. Applicants should have passed at least Intermediate R.I.B.A. examinations and should have had experience in the preparation under supervision of working drawings for large scale building schemes. Salary within the scale of £525 × £25—£650 p.a., according to experience.

Applications giving date of birth and full details of education, qualifications and experience, to:—Divisional Establishment Officer, National Coal Board, Northern (N. & C.) Division, Ellison Buildings, Ellison Place, Newcastle-upon-Tyne, 1, not later than 1st December, 1954. 4787

Applications are invited for the post of ARCHITECT Grade I to take charge of a Group in the Divisional Architect's Office, National Coal Board, Northern (N. & C.) Division, Gosforth, Newcastle-upon-Tyne, 3.

Applicants must be Associates of the R.I.B.A., with at least five years' office experience, after qualification, in the design and administration of large building schemes. Salary within the scale of £900 × £35—£1,200.

Applications, stating age, training, and giving full details, including salaries, of past and present appointments should be submitted not later than 11th December, 1954, to:—

Divisional Establishment Officer, National Coal Board, Northern (N. & C.) Division, Ellison Buildings, Ellison Place, Newcastle-upon-Tyne, 1. 4804

URBAN DISTRICT COUNCIL OF CORBY.
ENGINEER AND SURVEYOR'S DEPARTMENT.

Applications are invited for the undermentioned appointments in the department of the Engineer and Surveyor.

(1) SENIOR ARCHITECTURAL ASSISTANT. Salary in accordance with new Grade A.P.T. IV (£675—£825), commencing at £675 per annum.

Applicants must be Registered Architects and should have considerable experience in design, construction and contract administration.

(2) SENIOR QUANTITY SURVEYOR. Salary in accordance with new Grade A.P.T. IV (£675—£825), commencing at £675 per annum.

Applicants must have passed final R.I.C.S. (Quantities Section) and be thoroughly experienced in the preparation of Bills of Quantities, adjustment of variations and settlement of final accounts. Previous experience of substantial contracts for local authority housing is desirable.

(3) JUNIOR ASSISTANT QUANTITY SURVEYOR. Salary in accordance with Miscellaneous Division III (£395—£460), commencing at £395 per annum.

Applicants must be 22 years of age, or over, and have completed their National Service. The post offers scope and facilities for the successful candidate to qualify as a Chartered Surveyor. Previous suitable experience associated with works of building erection is essential.

The provisions of the Local Government Superannuation Acts, 1937—1953, will apply in respect of each appointment. Housing accommodation will be made available to successful candidates, if married.

Forms of application may be obtained from the undersigned, and requests therefor should indicate the position for which application is being made. Completed forms must be received not later than 9 a.m. on Saturday, the 11th December, 1954.

C. B. BLACKALL,
Clerk of the Council.

Council Offices,
Corby, Northants.
12th November, 1954. 4758

LONDON ELECTRICITY BOARD.
ARCHITECTURAL DRAUGHTSMEN.

Applications are invited for the above positions in the Architect's Section of the Chief Engineer's Department in Central London.

Applicants should be neat draughtsmen and preferably have had several years' experience in an Architect's Office.

The post is graded under Schedule "D" of the National Joint Board agreement as Grade 6—£458—£595 7s. per annum, inclusive of London Allowance.

Application forms obtainable from Personnel Officer, 46, New Broad Street, E.C.2, to be returned within fourteen days of the publication date of this advertisement. Please enclose addressed envelope and quote ref.: V/1785/A. on envelope and all correspondence. 4803

ISLE OF ELY COUNTY COUNCIL.
SENIOR QUANTITY SURVEYOR.

Applications are invited for the above appointment on the Staff of the County Architect within Grade A.P.T. V (New Scales) £750 × £30—£900, subject to the provisions of the National Scheme of Conditions of Service, the Local Government Superannuation Act, 1937, and to the passing of a medical examination.

Candidates should be Associate Members of the Chartered Surveyors Institute.

Forms of application may be obtained from the County Architect, County Hall, March, to whom they must be returned not later than 7th December, 1954.

R. F. G. THURLOW,
Clerk of the County Council.
4802

COUNTY COUNCIL OF ESSEX.
COUNTY LAND AGENT AND VALUER'S DEPARTMENT.

Applications are invited for the following appointments on the established staff:—

(*a*) ARCHITECTURAL ASSISTANT, A.P.T. V (£620 rising to £670 by three annual increments).

(*b*) JUNIOR ARCHITECTURAL ASSISTANT, A.P.T. I, £490 rising to £535 by three annual increments.

Candidates for appointment (*a*) should have been trained in an appropriate professional office, and have had practical experience in architectural design. They should also have a sound knowledge of building details and construction.

Candidates for appointment (*b*) should be capable draughtsmen and have had some previous experience.

Application forms from the County Land Agent and Valuer, 69, Duke Street, Chelmsford, to whom they should be returned not later than 3rd December, 1954.

Canvassing disqualifies. 4784

BOROUGH OF LUTON.
APPOINTMENT OF QUANTITY SURVEYING ASSISTANT.

Applications are invited for the appointment of a QUANTITY SURVEYING ASSISTANT (Salary APT VI—£695—£760). Candidates should be Qualified Quantity Surveyors with considerable experience. Housing accommodation may be considered.

Application forms from the Borough Engineer, Town Hall, Luton, to whom applications should be returned by 9th December, 1954.

A. D. HARVEY,
Town Clerk.
4833

BOROUGH OF DOVER.
SENIOR ARCHITECTURAL ASSISTANT.

Applications are invited for this appointment in the Borough Engineer's Department. Salary A.P.T. Grade V of the National Scales (£620/£670 per annum).

Applicants should hold a recognised architectural qualification, and have had practical experience with a local authority on housing work.

Applications, stating age, experience and qualifications, together with the names and addresses of three referees, must be delivered to the Borough Engineer, Brook House, Dover, not later than the 9th December, 1954.

Housing accommodation will be provided, if required.

JAMES A. JOHNSON,
Town Clerk.

New Bridge House, Dover.
19th November. 4548

SURREY COUNTY COUNCIL.

Applications invited for appointment of ASSISTANT ARCHITECT, GRADE III, Salary £600 × £25 to £725 p.a. plus London Allowance. Preference given to applicants who are Associate Members of R.I.B.A. Must have had good training and adequate experience in design and construction of modern buildings.

Applications giving full details of present and previous appointments and salary attaching thereto, accompanied by copies of 3 recent testimonials, to County Architect, County Hall, Kingston, by 4th December, 1954. 4836

BOROUGH OF FOLKESTONE.
ARCHITECTURAL ASSISTANT.
Grade VI, £695—£760.

Applications are invited from qualified Architects for the above appointment.

Candidates must have had good experience in design, detailing, specification writing, etc.

The work will consist of schemes for cafes, flats, housing and general work of a Local Authority.

Application forms and details obtainable from Mr. E. L. Allman, A.M.I.C.E., Borough Engineer, Municipal Offices, Folkestone.

N. C. SCRAGG,
Town Clerk.

Town Clerk's Office,
West Terrace,
Folkestone.
12th November, 1954. 4783

BOROUGH OF FOLKESTONE.
CHIEF ARCHITECTURAL ASSISTANT.
Grade VII, £735—£810.

Applications are invited from qualified and experienced Architects for this appointment, the starting point in the Grade being determined by the qualifications and experience of the selected candidate.

Candidates must have good general architectural experience as required by a Local Authority and be able to supervise staff and deal with administration.

Application forms and details from Mr. E. L. Allman, A.M.I.C.E., Borough Engineer, Municipal Offices, Folkestone.

N. C. SCRAGG,
Town Clerk.

Town Clerk's Office,
West Terrace,
Folkestone.
11th November, 1954 4782

GLOUCESTERSHIRE COUNTY COUNCIL.
COUNTY PLANNING DEPARTMENT.

Applications are invited for the following appointments :—

(*a*) ARCHITECTURAL ASSISTANT, A.P.T. Grade VI (£695—£760). Amended grade A.P.T. IV (£675 × £30—£825) from 1st January, 1955.

(*b*) TECHNICAL ASSISTANT, A.P.T. Grade II (£520—£565).

Applicants for (*a*) must be qualified architects with experience in Civil Design and large housing layouts. Applicants for (*b*) must have passed the intermediate examination of the Town Planning Institute or equivalent and should have an architectural inclination.

The posts are superannuable, subject to medical examination. The National Joint Council's Scheme of Conditions of Service will apply.

Applications stating age, qualifications and experience, together with copies of three testimonials, or names of referees, to reach the County Planning Officer, Upton Lane, Barnwood, Gloucester, not later than 30th November, 1954.

GUY H. DAVIS,
Clerk of the County Council.
4781

COUNTY OF ESSEX.
LEYTON COMMITTEE FOR EDUCATION.
APPOINTMENT OF TEMPORARY ASSISTANT ARCHITECT.

Applications invited for appointment as TEMPORARY SENIOR ASSISTANT ARCHITECT in the School Architect's Section of the Borough Engineer and Surveyor's Department.

Applicants should be registered Architects with experience in planning, construction and supervision of school buildings.

Salary will be Grade A.P.T. VII at present £765—£840 including London Weighting, which is reduced according to scale where the age of the successful applicant is less than 26 years.

Full details and form of application from Borough Education Officer, Kirkdale Road, Leytonstone, E.11, to whom they should be returned by Monday 13th December, 1954.

D. J. OSBORNE.
Town Clerk.

Town Hall.
Leyton, E.10. 4834

COUNTY BOROUGH OF NEWPORT, MON.

Applications are invited for the following appointments :—

(*a*) TWO ASSISTANT ARCHITECTS—Grade 7 (£735—£810; max. £825 after 1st January, 1955). Candidates must be Associate Members of the Royal Institute of British Architects.

(*b*) TWO ASSISTANT QUANTITY SURVEYORS—Grade 8 (£785—£860; max. £900 after 1st January, 1955). Candidates must be Associate Members of the Royal Institution of Chartered Surveyors or of the Institute of Quantity Surveyors.

Conditions of appointment and service and forms of application obtainable from Mr. Johnson Blackett, F.R.I.B.A., Borough Architect, Civic Centre, Newport, Mon., to whom they should be returned *not later than 6th December*, 1954. 4780

COUNTY BOROUGH OF MERTHYR TYDFIL.
BOROUGH ENGINEER & SURVEYOR'S DEPARTMENT.

Applications are invited for the following appointments :—

1. SENIOR ARCHITECTURAL ASSISTANT
2. ARCHITECTURAL ASSISTANT

at a salary in accordance with Grade A.P.T. VI and Grade A.P.T. V of the National Scheme of Conditions of Service, respectively.

Housing accommodation will be provided if required.

Applicants should have had experience in the preparation of plans, specifications, etc., for architectural work (including schools) usually undertaken by a local authority.

The appointments will be subject to the Local Government Superannuation Acts and the successful candidates will be required to pass a medical examination.

Applications, stating age, training, qualifications, experience, past and present appointments together with copies of three recent testimonials and a copy of the applicant's birth certificate must be delivered to the undersigned not later than Saturday, 4th December, 1954.

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

T. S. EVANS,
Town Clerk.

Town Hall,
Merthyr Tydfil.
15th November, 1954. 4779

PENGE URBAN DISTRICT COUNCIL.
ARCHITECTURAL ASSISTANT A.P.T. II
(Amended £560—£640).

Applications are invited for the above appointment in the Department of the Engineer and Surveyor. The post is established on the amended grade A.P.T. II, with point of entry according to stage of training and experience.

Applicants must have had considerable experience of the design and site supervision of housing construction and conversion works.

London Weighting Allowance is payable in addition (Age 21 to 25—£20; and Age 26 and over—£30).

Further particulars and form of application may be obtained from the undersigned for return by noon on the 11th December, 1954.

P. J. BUNTING
Clerk of the Council.

Town Hall,
Anerley Road,
London, S.E.20. 4816

BOROUGH OF HEMEL HEMPSTEAD.
ARCHITECTURAL ASSISTANT.
GRADE A.P.T. III/IV.

Applications are invited for the appointment of an ARCHITECTURAL ASSISTANT in the Borough and Water Engineer's Department at a salary within A.P.T. Grade III/IV (££550—£625). Housing accommodation will be available if required.

Candidates should have passed the Intermediate Examination of the R.I.B.A. or other approved examining body and should have had experience in the design of dwellings and public buildings for Local Authorities.

The appointment will be subject to the Local Government Superannuation Acts, to the National Conditions of Service from time to time in force and to the passing of a medical examination and will be terminable by one month's notice in writing on either side.

Applications stating age, education, qualifications, present and previous appointments and details of experience, together with the names of two persons to whom reference may be made should be sent to A. H. Turner, A.M.I.C.E., Borough Engineer, Market Square, Hemel Hempstead, Herts., not later than Saturday, 11th December, 1954.

Canvassing will disqualify and applicants must state whether, to their knowledge, they are related to any member of the Council or to any senior officer of the Corporation.

C. W. G. T. KIRK,
Town Clerk.

Town Hall,
Hemel Hempstead, Herts.
18th November, 1954. 4842

PEAK PARK PLANNING BOARD.

Applications are invited for the appointment under N.J.C. service conditions of a JUNIOR PLANNING ASSISTANT; salary present A.P.T. Grade II £520—£565; previous experience in the preparation of development plan maps is essential. Apply on forms obtainable from the undersigned, to be returned by 13th December, 1954. Canvassing disqualifies.

JOHN FOSTER,
Planning Officer.

Aldern House,
Bakewell, Derbyshire. 4845

Architectural Appointments Vacant

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

The engagement of persons answering these advertisements must be made through a Local Office of the Ministry of Labour or a Scheduled Employment Agency if the applicant is a man aged 18-64 inclusive or a woman aged 18-59 inclusive unless he or she or the employment is excepted from the provisions of the Notification of Vacancies Order, 1952.

REQUIRED for Architects' office, Central London area, young qualified ASSISTANTS interested in design and construction. Write, stating experience and salary required. Box 2325

BUILDING SURVEYING ASSISTANT (about R.I.C.S. Final Standard) with at least two years' practical experience required by City firm of Chartered Surveyors & Architects. 3925

ASSISTANT ARCHITECTS required. Inter. R.I.B.A. or equivalent qualifications; salaries ranging to £745 per annum. Practical experience of work on commercial and industrial buildings essential. Applications stating age, experience, qualifications and salary required to:—W. J. Reed, F.R.I.B.A., Chief Architect, Co-operative Wholesale Society Ltd., 99, Leman Street, London, E.1. 4559

JUNIOR ARCHITECTURAL DRAUGHTSMAN required by London firm of Architects and Surveyors. Good prospects. Study time allowed for man taking professional examinations. Apply stating age and experience. Box 4558.

SENIOR ARCHITECTURAL ASSISTANT urgently required by London firm of Architects and Surveyors for new buildings and conversions. Salary £600—800. Apply stating age, qualifications and experience. Box 4557.

JUNIOR ASSISTANT (Intermediate standard) required for Central London practice. Some previous experience preferred. Apply stating age, experience and salary required to Box 4631.

ASSISTANTS required for firm of contemporary Architects, the following qualifications being essential :—

(*a*) Should have reached Intermediate standard.
(*b*) Excellent drafting ability.
(*c*) Several years' office experience.
(*d*) Sound knowledge of construction.
(*e*) Keen interest in modern architecture.

Boissevain & Osmond, W.1. LAN. 7406. 4646

ARCHITECTURAL ASSISTANT or building draughtsman, age up to 35, required for work on industrial buildings. Preference given to candidates with Inter. R.I.B.A. but this not essential although O.N.C. in building is the minimum acceptable qualification. Applicants should have experience in foundation work, drainage and factory buildings. Permanent position and attractive salary. Assistance with housing given if necessary. Write in confidence to Personnel Manager, Michelin Tyre Co., Ltd., Stoke-on-Trent, Staffs., giving all relevant information. 4643

ARCHITECTURAL ASSISTANTS with experience, required for general practice. Reply, stating age, experience and salary required, to Thomas Worthington & Sons, 178, Oxford Road, Manchester, 13. 4576

EXPERIENCED ASSISTANT ARCHITECT required. Only first-class man will be considered. Applicants should write in the first instance giving full details of their age, training, experience, present salary and salary required. Write to Messrs. David Carr & Stuart Matthew, Architects, 14, Lynedoch Place, Edinburgh. 4595

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ARCHITECTURAL DRAUGHTSMAN. Applications are invited by a Leeds Company with a substantial business in prefabricated housing and schools for home and overseas markets. Accurate and neat draughtsmanship will be required of applicants, who should be preferably of Intermediate standard. The work is interesting, varied, and demands imagination, initiative and a contemporary approach to building problems. A man with these qualities, who is prepared to devote some effort to learning the technique of prefabrication, will find ample and progressive scope for their deployment. A pension scheme is in operation. Reply, stating age, experience and present salary to: Messrs. Cawood Wharton & Co., Ltd., 1a, Cavendish Road, Leeds, 1. 4590

THE Milk Marketing Board requires a JUNIOR DRAUGHTSMAN and TRACER in their Architect's Department. Salary according to experience. Applications in writing to The Staff Officer, Milk Marketing Board, Thames Ditton, Surrey. 4700

ARCHITECTURAL ASSISTANT, Intermediate standard R.I.B.A., with some previous experience in an Architect's office, required in the Lake District. Salary according to experience. Write, stating age, experience, to Jennings & Gill, L./A.R.I.B.A., Market Place, Ambleside. 4701

ARCHITECT'S ASSISTANTS required by a large Chain Store organisation. Commencing salary £600—£750 per annum, according to experience. Subsidised Staff Canteen. Staff Pension and Life Assurance Scheme. Write, giving details of past experience, age, etc., to Box AJ803, LPE, 55, St. Martin's Lane, W.C.2. 4728

ARCHITECTURAL ASSISTANT (Intermediate standard), required in West End office. Box 4726.

JUNIOR ARCHITECTURAL ASSISTANT, Intermediate Standard, for General Practice in Lincolnshire. Starting salary £300—£400, according to experience. Apply in writing giving full details and date available. Box 4725.

ARCHITECTURAL ASSISTANTS required. Intermediate standard. Contemporary work, schools, factories, houses, etc. Profit sharing scheme. Write or telephone: Hugh Macintosh & Partners, 33, High Street, Croydon. CROydon 1890. 4719

ARCHITECTURAL ASSISTANTS required Intermediate and Final Standard. Opportunity to gain experience. House available for senior. Pension scheme. State age and salary required. Apply Chief Architect, Friary Brewery, Guildford, Surrey. 4666

ARCHITECTURAL ASSISTANTS urgently required for busy, varied and progressive country practice. Write, giving details age, experience, salary required. Geoffrey Bazeley & Barbary, 15/16 Averton, Penzance, Cornwall. 4664

ARCHITECTURAL ASSISTANT required in small busy office in Hertfordshire. Interesting work. Applicant must be qualified and have had good office experience. Reply stating age, experience, qualifications and salary required to Box 4666.

ARCHITECTURAL ASSISTANTS urgently required for school development projects based upon prefabricated construction. Birmingham office. Good prospects for right men. Reply, giving particulars of age, qualifications, present Salary, to Box 4654.

QUALIFIED STRUCTURAL ENGINEER, preferably with established connections in the architectural profession and building trade, required as Chief Technical Representative with important Company. The position, which is pensionable, offers far-reaching opportunities for a technical man with sound commercial background. Write, giving full particulars, to Box 4789.

JUNIOR ARCHITECTURAL ASSISTANT required for private practice near Sleaford, Lincs. Write stating experience and salary required. Box 4791.

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LONDON architect with large programme of work abroad, including multi-storey hospitals, requires keen and experienced ASSISTANTS. Good prospects for the right type of applicant and probable opportunity for travelling abroad later. Reply giving full details of training and experience, and state salary required. Box 4792.

LONDON Architects require ASSISTANT, Final Standard. Good practical experience essential. Salary £650—£750. Box 4795.

2 INTERMEDIATE/FINAL R.I.B.A. Standard ASSISTANTS required. Applicants to have knowledge of commercial work including offices and stores, etc., and London experience is essential. Apply Lewis Solomon, Son & Joseph, 21, Bloomsbury Way, W.C.1. 4799

ARCHITECTURAL ASSISTANT urgently required, experienced in preparation of working Drawings, Details, Specifications and supervision, for South-West London office. Apply in writing giving full particulars of experience, age and salary required to Box 4797.

ARCHITECTURAL ASSISTANTS required immediately. Intermediate and Final Standard. State experience and Salary required. Permanent posts. Bertram Butler & Company, Chartered Architects, 6, Tettenhall Road, Wolverhampton. 4798

SENIOR ASSISTANT required in busy practice in West End. Age about 30 years, qualified with several years' experience and capable of running contracts. JUNIOR ASSISTANT also required. In early twenties, Intermediate R.I.B.A., with at least two years' experience. Box 4741.

ARCHITECTURAL ASSISTANT of at least Intermediate Standard required by South London Architect for domestic and factory work. Reply stating salary and full particulars to Box 4806.

APPLICATIONS are invited for a CLERK OF WORKS (temporary) Grade A.P.T. V. Full details of experience in multi-storey flats, shops and maisonettes, to be submitted in writing to Box 4805.

WORKS ARCHITECT, qualified man required by Large Engineering Company. Applicant should have had extensive experience of Factory and Office Buildings. Apply giving full details of age, experience and salary required to Personnel Manager, Box 4809.

ARCHITECTURAL ASSISTANT required for Head Office of Multiple Firm in West of Scotland for work on shops and commercial buildings. Applicants should be of R.I.B.A. Intermediate standard with office experience, preference being given to applicants with shopfitting experience and who have completed National Service. Apply in writing giving full details of salary required, training, etc., to Box 4817.

ARCHITECT, qualified, required in general country practice. Apply:—Watkins, Coombes, Partners, F./A.R.I.B.A., Heslam Chambers, 191, High Street, Lincoln. 4800

SENIOR ASSISTANT ARCHITECT required by prominent Building and Civil Engineering Contractors at Head Office in London. Must be fully experienced and capable of producing own designs and details for varied work, including low-cost housing, with minimum supervision. Salary £600—£900, according to qualifications. Write with full particulars to Box 4813.

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REQUIRED immediately in Chelmsford, keen ARCHITECT'S ASSISTANT with initiative and ability to prepare working drawings, details, surveys, etc. State age and salary required to Box 4812.

VACANT DRAWING BOARD and desk awaits a JUNIOR ASSISTANT interested in the repair of ancient buildings, Churches, Manor Houses as well as contemporary design in all branches. Pleasant office in Worcester. Apply with full details of training, experience and salary required. Box 4755.

JUNIOR ASSISTANTS required at Welwyn Garden City. Write stating experience, salary required, to Louis de Soissons, Peacock, Hodges & Robertson, Midland Bank Chambers, Welwyn Garden City. 4740

LONDON ARCHITECTS require ASSISTANT of Intermediate Standard for varied private practice. Reply with particulars of salary required to Box 4765.

MULTIPLE company in the Midlands require qualified ARCHITECT to be responsible to principal for designs, working drawings, Contracts, control of Drawing Office and other Staff. To a capable man proving his suitability the post offers an exceptional opportunity to succeed present Chief Architect who is approaching retiring age. Five-day week and Superannuation Scheme in operation. Applications giving details of age, qualifications, training, experience and salary required should be sent to Box 4743.

LARGE firm of Building & Civil Engineering Contractors require a young ARCHITECTURAL ASSISTANT, Inter. Standard, for their Architect's Department. Office experience essential. Apply, giving full details of education, experience and salary required, to Box 4748.

ARCHITECTURAL ASSISTANT required, considerable experience in private practice essential, particularly private housing. John C. Clague, L./R.I.B.A., 68a, Burgate, Canterbury. 4747

ARCHITECTURAL ASSISTANT of some years' good office experience and accustomed to site control and responsibility, required for Manchester Office. R.I.B.A. qualification desirable. Interesting post with wide range of work for man of initiative and capacity. Please give details of education, experience and salary required to: Harry S. Fairhurst & Son, Chancery Chambers, 55, Brown Street, Manchester 2. 4746

E. BRIAN TYLER, F.R.I.B.A., Prior House, Westgate, Chichester, would be glad to appoint a capable ASSISTANT interested in general practice particularly domestic work. At least two years' office experience. Please give details and quote salary required. 4745

THE BRITISH THOMSON-HOUSTON CO., LTD., Rugby, have immediate vacancies for the following staff:—ASSISTANT ARCHITECT, Senior Grade, to take charge of section of office. Experience of industrial work essential and fully familiar with all activities of the profession. ARCHITECTURAL DRAUGHTSMAN fully experienced in the preparation of all drawings, detailing etc. STRUCTURAL ENGINEER, Senior Grade, required to design and negotiate all steelwork and reinforced concrete structures, to be responsible for a variety of work in the architect's section. QUANTITY SURVEYOR, Senior Grade, to take control of quantity surveying practice in the architect's section. CLERK OF WORKS to supervise the erection of building contracts at Rugby and Midlands Area. Applications should be addressed to the Head of Personnel Department stating full details of experience, past and present employers, salary required. Copies of references should be provided. 4751

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SENIOR ARCHITECTURAL ASSISTANT required with good practical experience for general practice. Reply in writing giving details of experience and salary required to Gerald Shenstone & Partners, 54 Bloomsbury Way, London, W.C.1. 4739

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QUALIFIED ARCHITECTURAL ASSISTANT required immediately for firm of Architects in North London. Reply stating age, qualifications and experience and salary required to Box 4769.

SENIOR ARCHITECTURAL ASSISTANT required for busy practice engaged upon schools, industrial buildings, offices, etc. Write giving full particulars of qualifications, experience and salary required to Joans & Slater, F/A.R.I.B.A., 32, Foundation Street, Ipswich. 4768

LONDON Architects require ASSISTANT—Intermediate Standard—apply giving full particulars to Box 4767.

ARCHITECTS. — SENIOR ASSISTANTS required by busy London Architects. Must be experienced and capable of carrying out commercial and industrial projects from sketch plans to completion of buildings. Salary about £900 according to ability and experience. Pension scheme available where applicable. Box 4766.

MARRIED ASSISTANT, preferably just qualified, wanted for country office in Chilterns; cottage available; apply with particulars to Lionel Brett, Watlington Park, Oxford. 4771

ARCHITECTURAL DRAUGHTSMEN required after Christmas in connection with the rebuilding and extension of a large city block. Sound knowledge of construction plus ability to survey and prepare detailed working drawings are essential. Applicants, having at least two years' experience, should write to Staff Architect, Schofields Department Store, The Headrow, Leeds 1, giving age, experience, qualifications. Salary by arrangement. 4772

ARCHITECTURAL ASSISTANT to Staff Architect required after Christmas in connection with the re-building and extension of a Department Store block. Capable of taking charge of draughtsmen at all stages of work and ability to prepare accurate working drawings up to quantity surveyor stage. Some knowledge of engineering services in modern building also an advantage. Applicants, having at least three years' experience, should write to Staff Architect, Schofields, The Headrow, Leeds, 1, giving age, experience, qualifications. Salary by arrangement. 4773

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ARCHITECTURAL ASSISTANT (Senior) fully qualified, required immediately in busy London Architect's office. Must be experienced in preparation of working drawings, details, supervision of commercial and other buildings in course of construction. Write giving details of experience, salary required, when free. Box 4778.

ARCHITECTURAL DRAUGHTSMEN required in London office, W.1. Good experience and first class draughtsmanship essential. Five-day week. Salary £650 upwards according to experience. Write Box 4777.

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ASSISTANT, Intermediate Standard, required for architects office, London. Five-day week. Full details to Box 4655.

ARCHITECTURAL ASSISTANT required with experience in design of industrial buildings, and capable of preparing surveys, working drawings and details. Applications, stating age, education, experience and salary required, should be addressed to E.M.A., Cadbury Brothers, Ltd., Bournville, Birmingham. 4737

ARCHITECTURAL ASSISTANT required in the Property Department of Brewery Company. Sound all-round training essential. Capable of surveys, working drawings, specifications and supervision. Able to drive car. Apply in writing to the Chief Architect, Vaux & Associated Breweries Ltd., Castle Street, Sunderland, giving details of age, experience and salary required. 4843

ARCHITECT or SURVEYOR required by Granada Theatres Ltd. to supervise building maintenance work and alterations. Ability to prepare drawings and/or specifications essential. Write giving age, education, qualifications, experience and salary required to Personnel Manager, 36, Golden Square, London, W.1. 4826

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ARCHITECTURAL ASSISTANTS, qualified, required for Contemporary work. Starting salary £600 p.a. Harvey & Scott, 2, Lynedoch Place, Glasgow. Telephone Douglas 8388. 4841

JUNIOR ASSISTANT, competent to make measured surveys and prepare working drawings, required by Wallis and Smith, Chartered Architects, Basingstoke. Salary £7 to £9 per week. 4821

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