FINE ARTS

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THE ARCHITECTS' JOURNAL

S

standard contents

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

No. 3364] [Vol. 130

THE ARCHITECTURAL PRESS

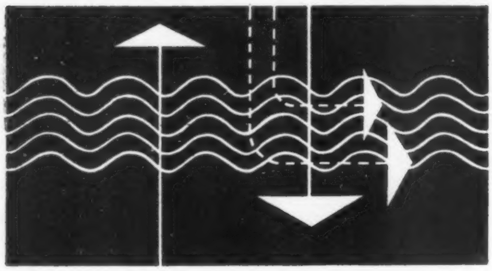
9, 11 *and* 13, *Queen Anne's Gate, Westminster, S.W.*1. *'Phone: Whitehall* 0611

Price 1s. 0d.

Registered as a Newspaper.

★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 Ii one week, Il to Z the next. In all cases where the town is not mentioned the word LONDON is implicit in the address.

ILA	Institute of Landscape Architects. 1, Park Crescent, Portland Place, W.1.	Museum 3473
I of Arb	Institute of Arbitrators. Hastings House, 10, Norfolk Street, Strand, W.C.2.	Temple Bar 4071
IOB	Institute of Builders. 48, Bedford Square, W.C.1.	Museum 7197
IQS	Institute of Quantity Surveyors. 98, Gloucester Place, W.1.	Welbeck 1859
IR	Institute of Refrigeration. Dalmeny House, Monument Street, E.C.3.	Avenue 6851
IRA	Institute of Registered Architects. 68, Gloucester Place, W.1.	Welbeck 9966
ISE	Institution of Structural Engineers. 11, Upper Belgrave Street, S.W.1.	Sloane 7128
JFRO	Joint Fire Research Organisation (DSIR & Fire Offices' Committee). Fire Research Station, Boreham Wood, Herts.	Elstree 1341/1797
LDA	Lead Development Association. 18, Adam Street, W.C.2.	Whitehall 4175
LMBA	London Master Builders' Association. 47, Bedford Square, W.C.1.	Museum 3891
MAFF	Ministry of Agriculture, Fisheries and Food. Whitehall Place, S.W.1.	Trafalgar 7711
MOE	Ministry of Education. Curzon Street House, Curzon Street, W.1.	Hyde Park 7070
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's Square, S.W.1.	Whitehall 6200
MOS	Ministry of Supply. Shell Mex House, W.C.2.	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. 2, Caxton St., 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
NEFMAI	National Employers Federation of the Mastic Asphalte Industry. 21, John Adam Street, Adelphi, W.C.2.	Trafalgar 3927
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. 12, Suffolk St., S.W.1.	Whitehall 1693
NHBRC	National House Builders Registration Council. 58, Portland Place, W.1.	Langham 0064/5
NPL	National Physical Laboratory. Head Office, Teddington.	Molesey 1380
NRDB	Natural Rubber Development Board. Market Buildings, Mark Lane, E.C.3.	Mansion House 9383
NSAS	National Smoke Abatement Society. Palace Chambers, Bridge Street, S.W.1.	Trafalgar 6838
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 5533
RICS	Royal Institution of Chartered Surveyors. 12, Great George Street, S.W.1	Whitehall 5322/9245
RFAC	Royal Fine Art Commission. 5, Old Palace Yard, 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
RSH	Royal Society of Health. 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
SE	Society of Engineers. 17, Victoria Street, Westminster, S.W.1.	Abbey 7244
SFMA	School Furniture Manufacturers' Association. 30, Cornhill, E.C.3.	Mansion House 3921
SIA	Society of Industrial Artists. 7, Woburn Square, W.C.1.	Langham 1984/5
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 5040
WDC	War Damage Commission. 6, Carlton House Terrace, S.W.1.	Whitehall 4341
ZDA	Zinc Development Association. 34, Berkeley Square, W.1.	Grosvenor 6636



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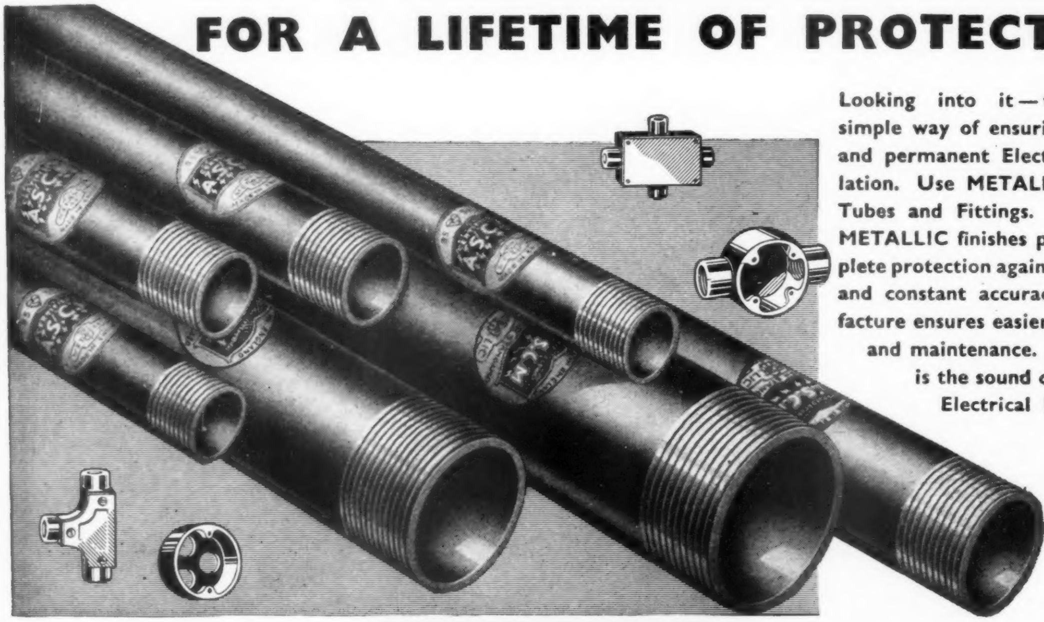

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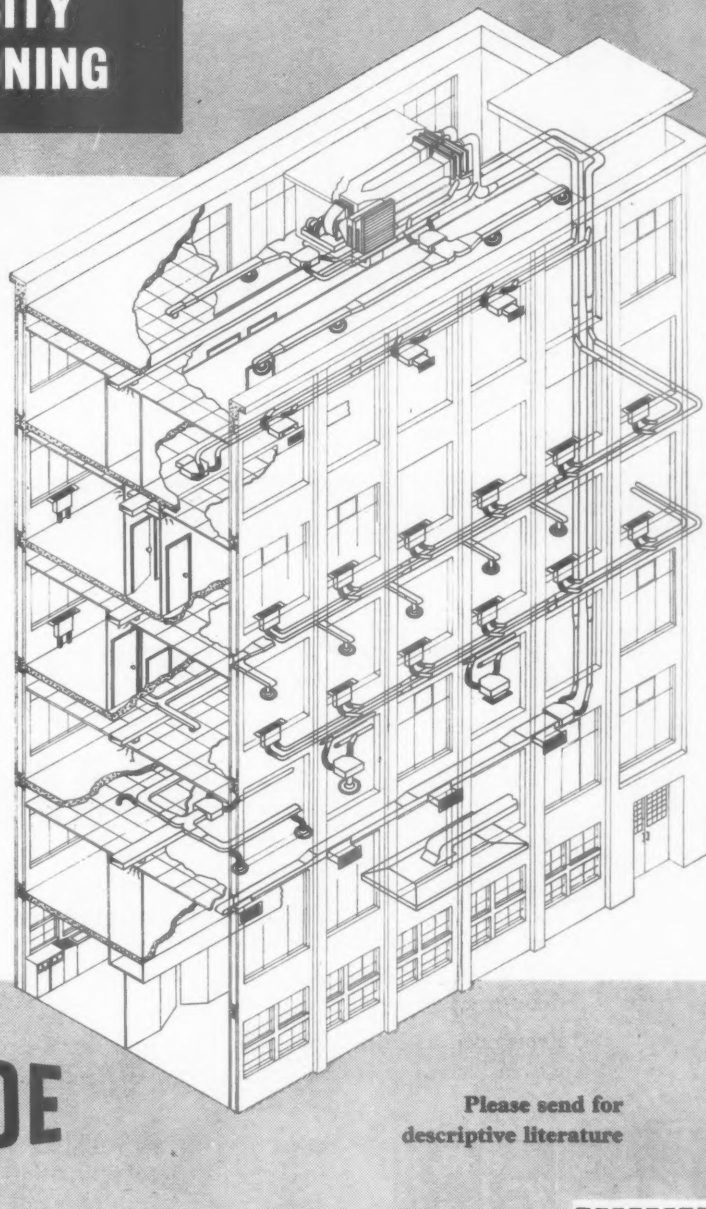

—a pioneer installation

Brightside have pioneered the Dual Duct High Velocity system in this country following research in America, and have installed the first of its type in Sheffield office premises.

merits of the system

BUILDING SPACE SAVED

—the smaller ducts cut down floor-to-floor heights, enabling more floors to be accommodated in a given height of building. Building costs are reduced in other ways.

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or folds...

or goes round the corner...

and it's a door—

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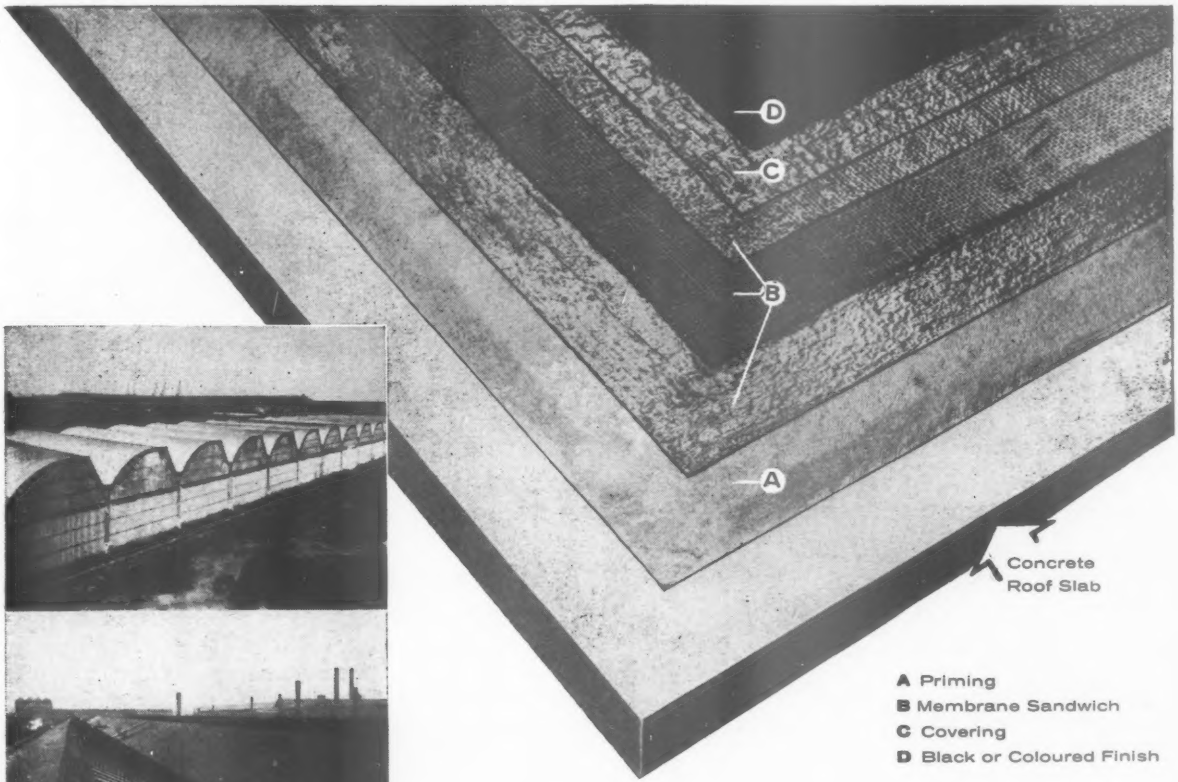

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H-W.138

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STEEL FURNITURE AND PARTITIONING

in this impressive new building was supplied by

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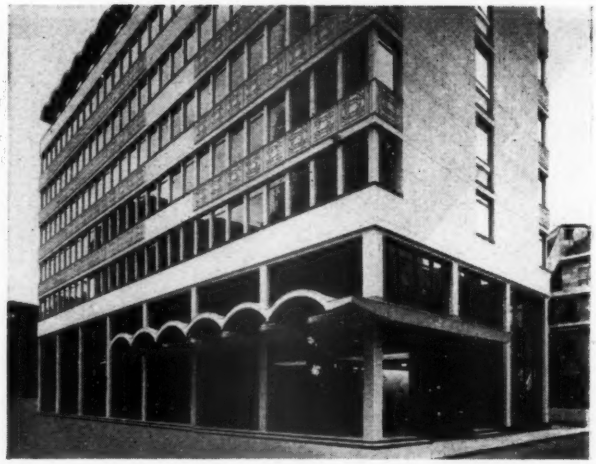

COTTS HOUSE

Camomile Street, London, E.C.3

Headquarters of the Mitchell Cotts Group of Companies

Architects: Sir Giles Scott, Son & Partners

THE MODERN LINES of Harvey Desks create an atmosphere of orderliness and efficiency. In open offices, as shown above, desks are arranged back-to-back, the tops being separated by shelf units which provide additional working area without encroaching on floor space.

TYPISTS' DESKS, illustrated above, are designed for maximum comfort and convenience. They provide all facilities for typing, yet occupy only 7 sq. ft. of floor space. The side pedestal incorporates a pull-out flap, 5 stationery drawers and a locking cupboard for personal belongings.

STEEL PARTITIONS in Cotts House are mostly of the Barrier type, with glass tops, as shown right. Full-height partitions, glazed, were also installed.

THE SUPERIOR APPEARANCE and versatility of Harvey Steel Furniture and Equipment is strikingly demonstrated in this important City building. Adequate provision is made for the individual working needs of all members of the staff, whilst maintaining a harmonious effect throughout.

The many units supplied by Harvey include single and double pedestal DESKS, CHAIRS of various types, FILING CABINETS, CUPBOARDS, LOCKERS and SHELVING.

Certain offices are furnished with the Harvey 'CONFERENCE' DESK—the desk with the big top—together with supplementary units from the '400 - Style' range — BOOKCASES, TELEPHONE STANDS, SLIDING-DOOR CUPBOARDS, etc.

Six extensive floors were converted into offices by means of HARVEY STEEL PARTITIONING.

Excellent use is made of COLOUR in providing ideal working conditions. The general scheme is Duotone Grey, with desk tops in Terra Cotta. The Grey enamelled chairs are upholstered in Black moquette.

Harvey Steel Equipment is adaptable to the most modern conceptions of office planning, and is built to a standard which ensures prolonged trouble-free service.

IF YOU ARE MOVING to new premises or wish to modernise your existing offices, ask for details of Harvey Steel Furniture and Partitions.

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SF/22

A SCIENTIFIC FACT

General Contractors: J. Jarvis & Sons Ltd.

Roderic Hill Building, Imperial College of Science and Technology.

Architects and Consulting Engineers: Norman & Dawbarn. Consultant Architect: Sir Hubert Worthington, R.A.

It's a scientific fact that the deliberate entrainment of microscopic bubbles of air in cement-sand mortar imparts the following properties — increased plasticity and workability, reduction in the w/c ratio, improved water retentivity, increased resistance to the passage of water and improved durability by the fact of increased resistance to repeated cycles of freezing and thawing. That's what Febmix Admix Mortar Plasticiser does and those are the advantages obtained from its use on bricklaying work, for which purpose Febmix Admix was used on this contract.

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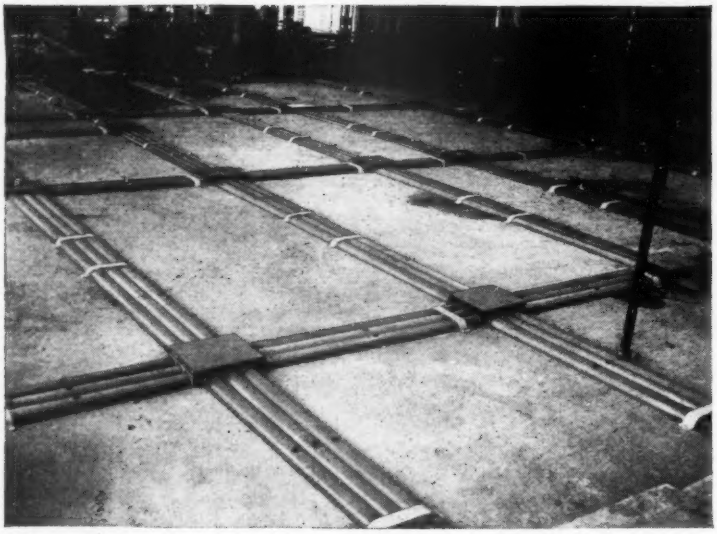
DHB/7184

13,600 feet

of new KEY triple unit fibre UNDERFLOOR DUCT for the new Daily Mirror building



SOLVES ALL PRESENT AND FUTURE ELECTRICAL DISTRIBUTION PROBLEMS

Now and for the future, this immense Key Underfloor Duct installation will solve electrical distribution problems in the 'Daily Mirror' building. The system provides unique flexibility because once the duct is laid, outlets for power and telephones can be added anywhere to suit individual needs. These outlets can later be increased and extended as needs in the building change, without disturbing floors or existing wiring.

LOW COST—EASY TO INSTALL

Here closed-bottomed 'dee'-shaped duct is used, but an open-based duct is also available. Both can be economically and speedily installed. The ducts are light in weight, and easy to cut and work with normal wood-working tools. They are cheaper than any other system.

For new or existing buildings

NEW SKIRTING DUCT can be used where the installation of underfloor ducting alone would be impracticable, extending still further its convenience and flexibility.

NEW DADO DUCT is similar to skirting duct and is designed for use at desk height. These two systems and underfloor ducting itself can be used alone or in conjunction with one another in both new and existing buildings.

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First and foremost in Underfloor Duct Systems

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- **EASY TO INSTALL**—fitted directly into the pipeline, it needs no support, and is connected to the normal electric supply.
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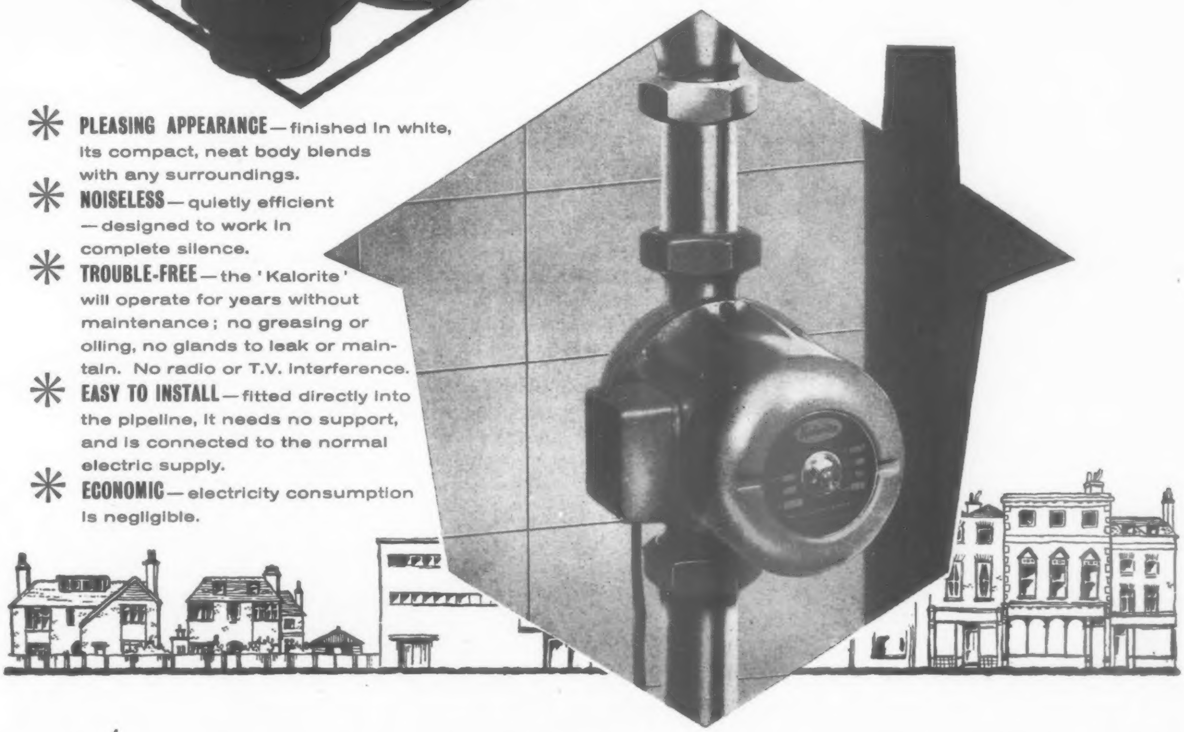

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P.2913

The General Electric Company and Thermal Insulation

At this manufacturing centre three new open roof bays were lined with ½ inch Insulating Gypsum Plasterboard, reducing the potential heat-loss, by comparison with uninsulated bays, by 14½%. This made possible a reduction in the capital cost of the heating installation, and over a heating season of 200 days allowed a saving of £456 in fuel bills.
The General Electric Company, Witton, Birmingham.

SAFE INSULATION

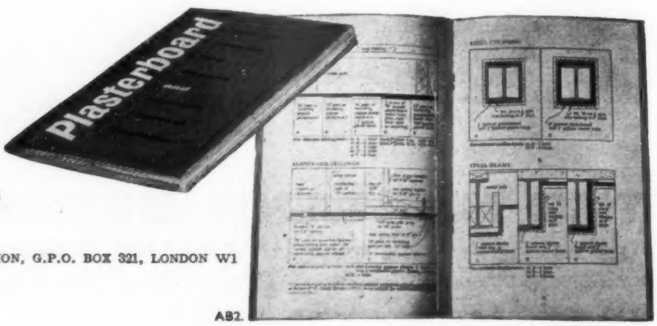
pays for itself

Insulating Gypsum Plasterboard conforms to Section II of B.S.476, having Class 1 surfaces of very low flame spread on both sides. It only costs about 5d. per square foot, and in addition very low fire insurance premiums can be obtained for building linings in this class. At the same time, Insulating Gypsum Plasterboard provides a high degree of thermal insulation. Alternatively, plain plasterboard, which has the same qualities of fire resistance, may be used at a cost of approximately 4d. per square foot.

Gypsum Plasterboard is a first-class building material, being easy to handle, erect and decorate.

IT'S THE CORE THAT COUNTS

All plasterboard has an incombustible core of Gypsum, which contains 20% combined water. During a fire this water is gradually released in the form of vapour, which provides an effective barrier to the fire's progress.



FACTS AND DIAGRAMS

concerning fire resistance and thermal insulation are contained in our free illustrated brochure.
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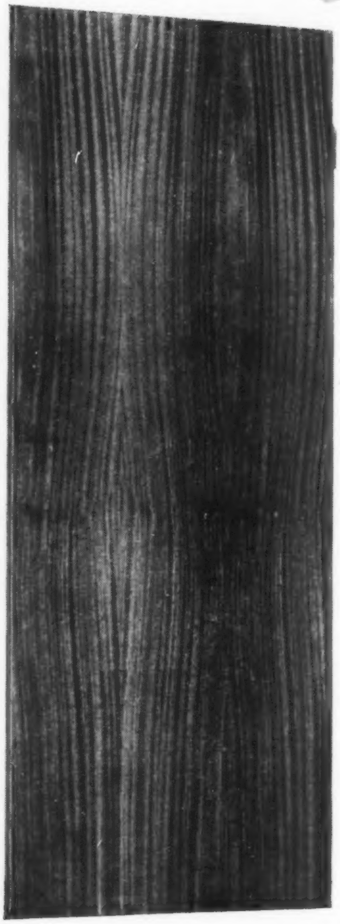
Whichever view you take of a LEADERFLUSH door the quality is unmistakable



Bird's eye, worm's eye, slant eye or even x-ray eye, whichever way you look at them the quality is there, unmistakable. It is the kind of quality which lasts year after year whatever the conditions. **Designed** construction, the finest seasoned timber obtainable, first class workmanship and finish. These give LEADERFLUSH Flush doors their quality.

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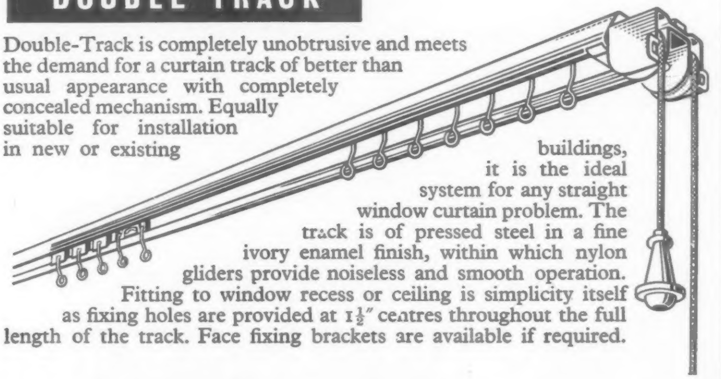
(Pat. & Regd.)

CURTAIN SUSPENSION SYSTEMS

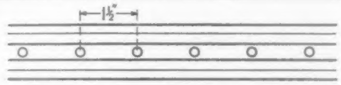
'Rufflette' Brand tracks have been installed by many local authorities and cubicle track has been fitted in many hospitals throughout this country and overseas. Double-Track — the latest Thomas French & Sons Ltd. curtain suspension system, is being extensively used by hotels, hospitals, schools and in large commercial buildings.
Fully illustrated literature on all the products shown on this page will be sent on request to the address below.

SEE OUR PERMANENT EXHIBITS AT THE BUILDING CENTRES AT LONDON, BRISTOL, GLASGOW & DUBLIN

DOUBLE TRACK



Double-Track is completely unobtrusive and meets the demand for a curtain track of better than usual appearance with completely concealed mechanism. Equally suitable for installation in new or existing buildings, it is the ideal system for any straight window curtain problem. The track is of pressed steel in a fine ivory enamel finish, within which nylon gliders provide noiseless and smooth operation. Fitting to window recess or ceiling is simplicity itself as fixing holes are provided at 1½" centres throughout the full length of the track. Face fixing brackets are available if required.



3/16" diam. fixing holes run the full length of the track section.

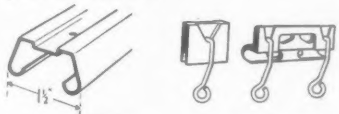
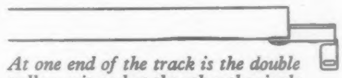
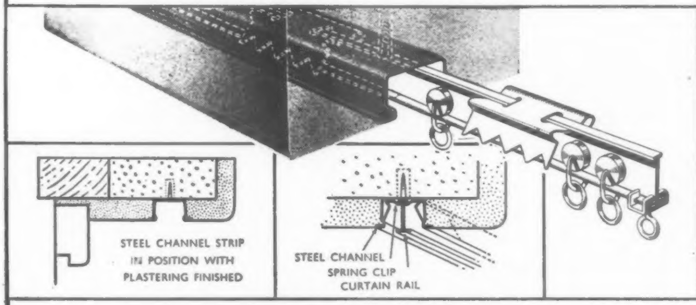


Diagram shows the robust track section and the free and master gliders which operate within the track.



At one end of the track is the double pulley unit and at the other the single pulley unit shown above.

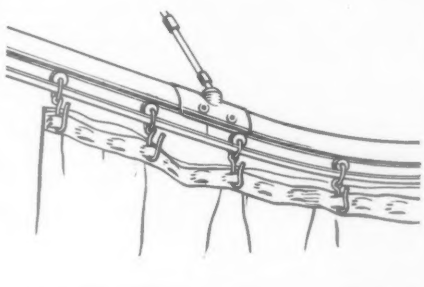


RECESSED CURTAIN TRACK

'Rufflette' brand recessed curtain track, as an integral part of the structure, is concealed, permanent and at the same time is inexpensive. It can be fitted into wood, or plaster lintels. This track meets the demand from architects, builders and contractors for a permanent built-in curtain suspension system to eliminate the risk of damage to ceiling and wall surfaces when tenants fit their own rails.

CUBICLE TRACK

The simplest and best method of partitioning space by curtains. Suspension is from ceiling or wall, floor being unobstructed. Silent runners make the operation of curtains almost inaudible. For hospitals, schools, hairdressing establishments, clinics and stores, 'Rufflette' Brand Cubicle Track provides a ready means of screening and partitioning.



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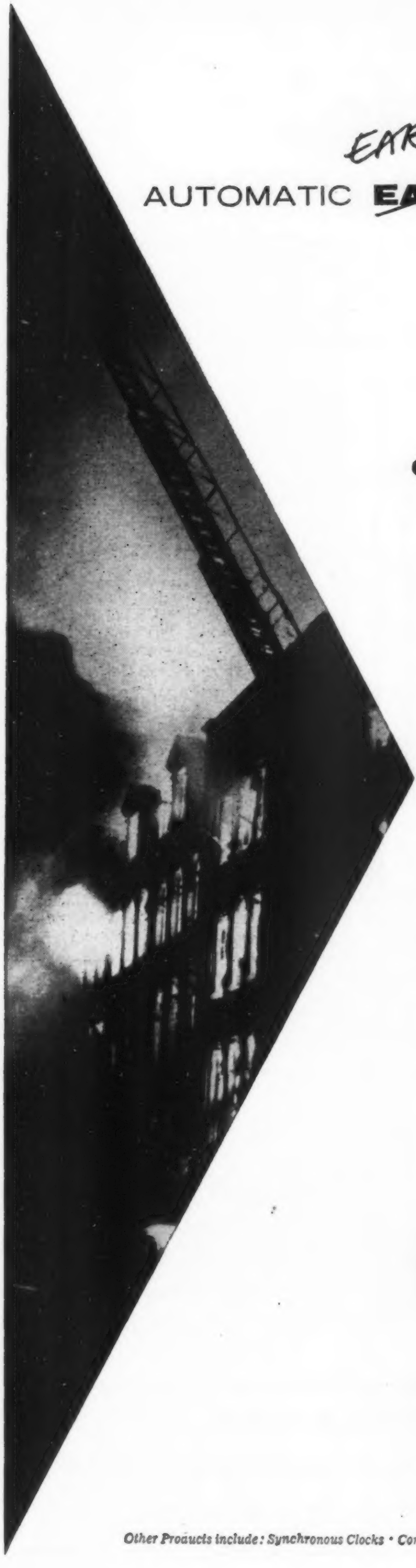

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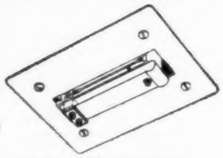
● Despite elaborate precautions fires still break out. Once started they must be tackled *quickly* if major damage is to be prevented.

Our Fire Brigades are the best in the world but the odds are heavily against them from the beginning if an outbreak goes undiscovered until it has gained a firm hold.

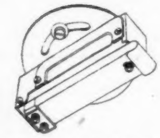
THIS CAN BE PREVENTED !

Fortunately there is an answer to this problem . . . An efficient, *super-sensitive* fire detector system that gives early warning of the start of a fire automatically, day or night.

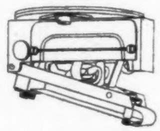
This equipment is approved by the Fire Offices' Committee and Technical Staff are available to advise on specific projects. We have had long experience of Fire Protection installations — may we send you our latest literature ?



The flush fixing Automatic Detector for use in Commercial and Business premises.



The surface fixing model for Industrial and general use.



Positive indication and operation are obtained from the Detectors under alarm conditions.

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Crittall window and panel units forming a Curtain Walling, sealed with SECOMASTIC, at Roman House, London Wall. Architect: R. N. Wakelin of Campbell-Jones & Sons.

Photograph by courtesy of the Crittall Manufacturing Co. Ltd

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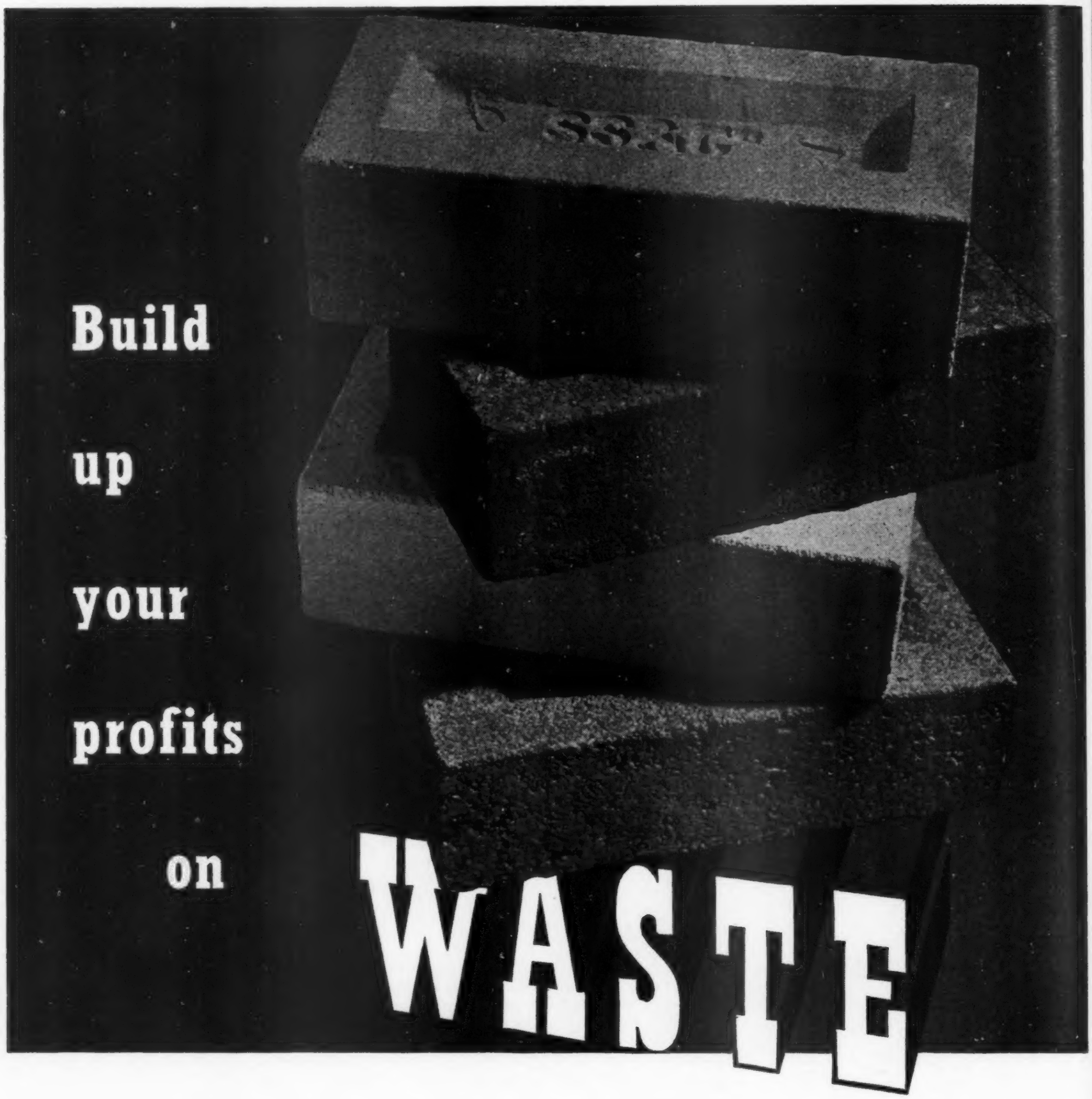

'Waste' materials, such as clinker and slag, can add a comfortable total to the profits. Sutcliffe, Speakman's EMPEROR Press turns these materials into good-quality bricks — consistent, well formed and readily marketable. The Press, exerting a pressure of 200 tons, produces up to 3,000 bricks per hour. Its other uses include coal Briquetting, pressing of fine pulverents into special shapes and forms, briquetting metal borings and turnings (iron, steel, brass, copper, aluminium, etc.).

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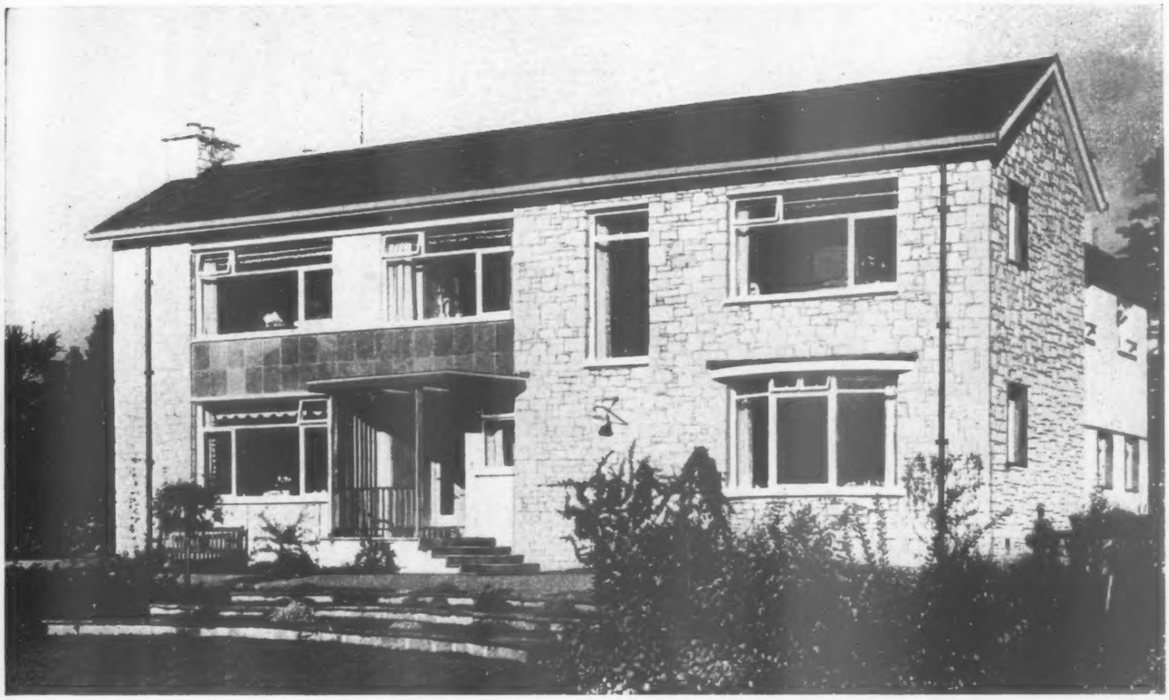


'Rose Hall', Dunbartonshire, is the home of Mr. W. B. Gardner Henderson. However severe the weather, 'Rose Hall' is always beautifully warm—oil fired heating was chosen to make sure of that. Fuel for the oil fired system is supplied by Scottish Oils and Shell-Mex Ltd., through their local Authorised Distributor. **ARCHITECT:** *Baron Bercott, B.Arch. Dip. C.D., A.R.I.B.A., A.M.T.P.I.*

Modern throughout—Rose Hall, Dunbartonshire has oil fired heating

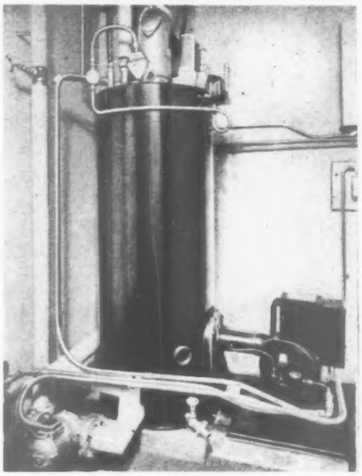
'ROSE HALL' gives its owner, Mr. W. B. Gardner Henderson, a glorious view of the Firth of Clyde. And plate glass windows have been fitted to ensure that there is no distortion of this magnificent view. The house owes its name to one of Mr. Gardner Henderson's main hobbies, the cultivation of roses. Modern in every possible way, 'Rose Hall' is kept warm and clean by the most modern of all heating systems. It has *oil fired* heating.

Oil firing in this house provides warmth efficiently and with no trouble at all. Room temperatures are controlled automatically. And the same boiler (see small illustration) supplies all the domestic hot water. During the summer the central heating can be turned off, still leaving the hot water supply in operation. With oil there is, of course, no stoking—instead the oil is gravity fed from storage tank to boiler.

Oil is a clean fuel. When it is supplied by a Shell-Mex and B.P. Authorised Distributor it is supplied promptly. Bought in bulk, oil is a surprisingly economical fuel. Running costs for oil fired automatic heating are normally very low in comparison with those of other fuels doing the same job.

Oil firing is suitable for nearly all homes, regardless of size or age. It is ideal for full central heating, partial central heating, or for hot water supply only. There are two grades of fuel oil for domestic heating, Shell Domestic Fuel Oil which is correct for the 'pressure-jet' type boilers and BP Domesticol for the 'vaporising' type units.

If you are interested in the construction, design or modification of any house or public building and would like to know more about the costs and practical application of fuel oil, please write to Shell-Mex and B.P. Ltd., Sales Promotion Dept. AJ.26, Shell-Mex House, Strand, London, W.C.2.



As well as supplying heat for the house's complete central heating system, this boiler provides ample domestic hot water all year round.

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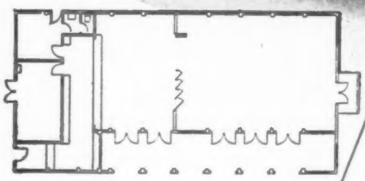
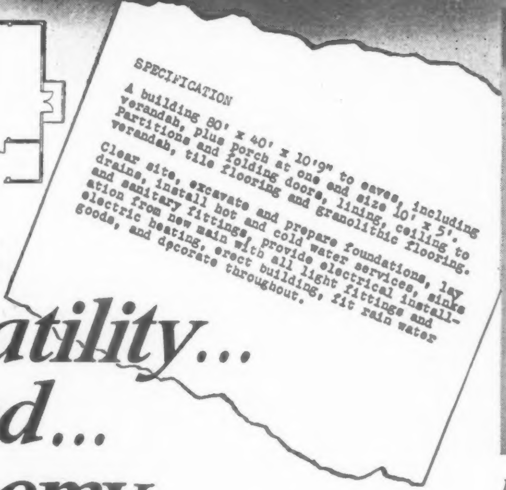
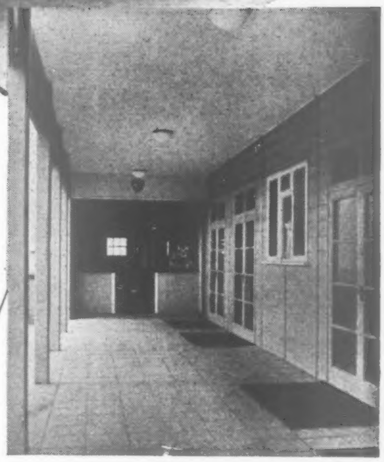




SPECIFICATION

A building 80' x 40' x 10'9" to eaves, including verandah, plus porch at one end size 10' x 5'. Partitions and folding doors, lining, ceiling to verandah, tile flooring and granolithic flooring.

Clear site, excavate and prepare foundations, lay drains, install hot and cold water services, sinks and sanitary fittings, provide electrical installation from new main with all light fittings and electric heating, erect building, fit rain water goods, and decorate throughout.



Photographs by courtesy of Hart's Holiday Club, Leysdown, Isle of Sheppey

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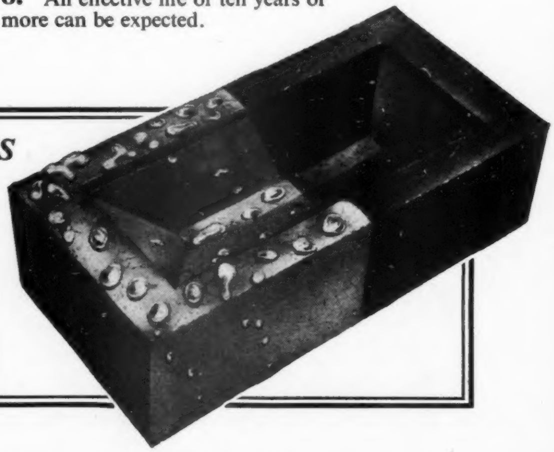

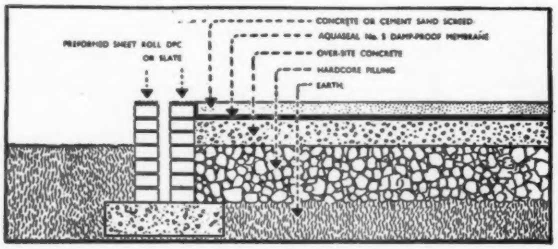

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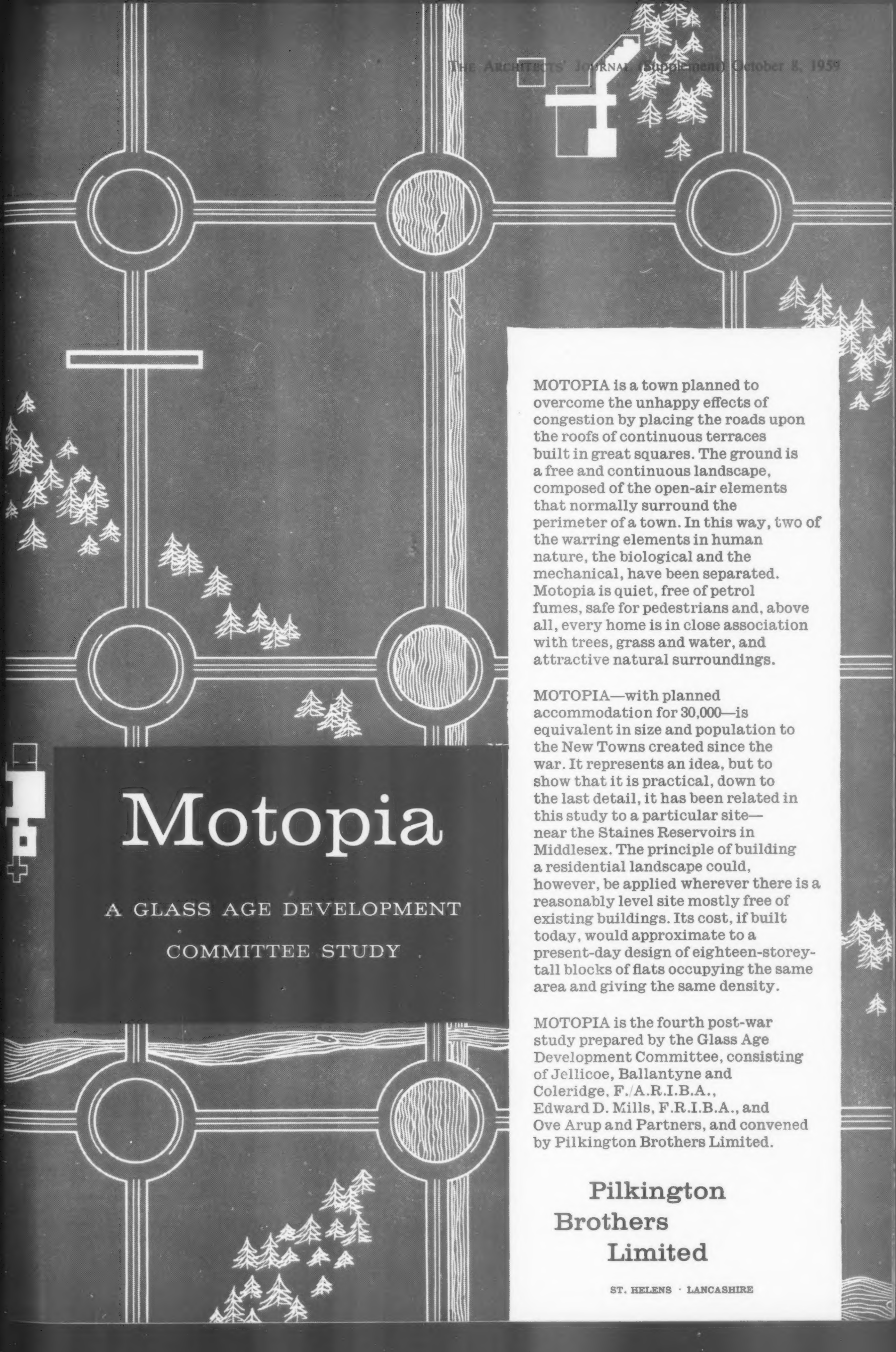
Motopia
A GLASS AGE DEVELOPMENT
COMMITTEE STUDY
MOTOPIA is a town planned to overcome the unhappy effects of congestion by placing the roads upon the roofs of continuous terraces built in great squares. The ground is a free and continuous landscape, composed of the open-air elements that normally surround the perimeter of a town. In this way, two of the warring elements in human nature, the biological and the mechanical, have been separated. Motopia is quiet, free of petrol fumes, safe for pedestrians and, above all, every home is in close association with trees, grass and water, and attractive natural surroundings.
MOTOPIA—with planned accommodation for 30,000—is equivalent in size and population to the New Towns created since the war. It represents an idea, but to show that it is practical, down to the last detail, it has been related in this study to a particular site—near the Staines Reservoirs in Middlesex. The principle of building a residential landscape could, however, be applied wherever there is a reasonably level site mostly free of existing buildings. Its cost, if built today, would approximate to a present-day design of eighteen-storey-tall blocks of flats occupying the same area and giving the same density.
MOTOPIA is the fourth post-war study prepared by the Glass Age Development Committee, consisting of Jellicoe, Ballantyne and Coleridge, F./A.R.I.B.A., Edward D. Mills, F.R.I.B.A., and Ove Arup and Partners, and convened by Pilkington Brothers Limited.
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Key to main features of MOTOPIA

1 THE ROADS—connected with the external road system by a flyover-pass along the roofs in double tracks, with ramps at each of the roundabouts leading to the access roads.

2 THE RESIDENTIAL TERRACES consist of ground floor (miscellaneous and covered way); 1st, 2nd and 3rd floors (flats and maisonettes); 4th floor (car park and access road); roof level (motorways). The terraces are broken occasionally by 15-storey flats.

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3 THE ROUNDABOUTS contain public houses, a few shops, clubrooms, nursery schools and the like; some with stops for the water-buses which provide internal transport; yacht moorings etc.

4 THE TOWN CENTRE allows for shopping and entertainment for a catchment area for 250,000 people, office accommodation for 3,000, and a few light and service industries. Covered parking for 3,000 cars on two levels and open roof for miscellaneous use, helicopters and cars (equivalent to 1500 car parking spaces).

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6 THE LANDSCAPE has utilised existing waste gravel pits to form stretches of water (linked to the Thames) for yachting; with the remainder of the area developed for churches, schools, playing fields, sports clubs, rural scenery including market gardens and allotments, and park and forest areas.

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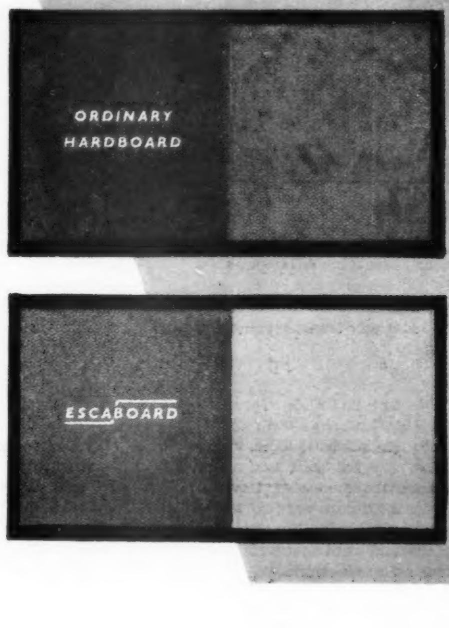

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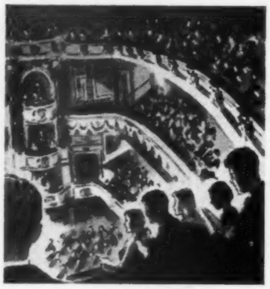
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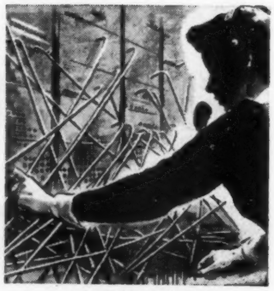
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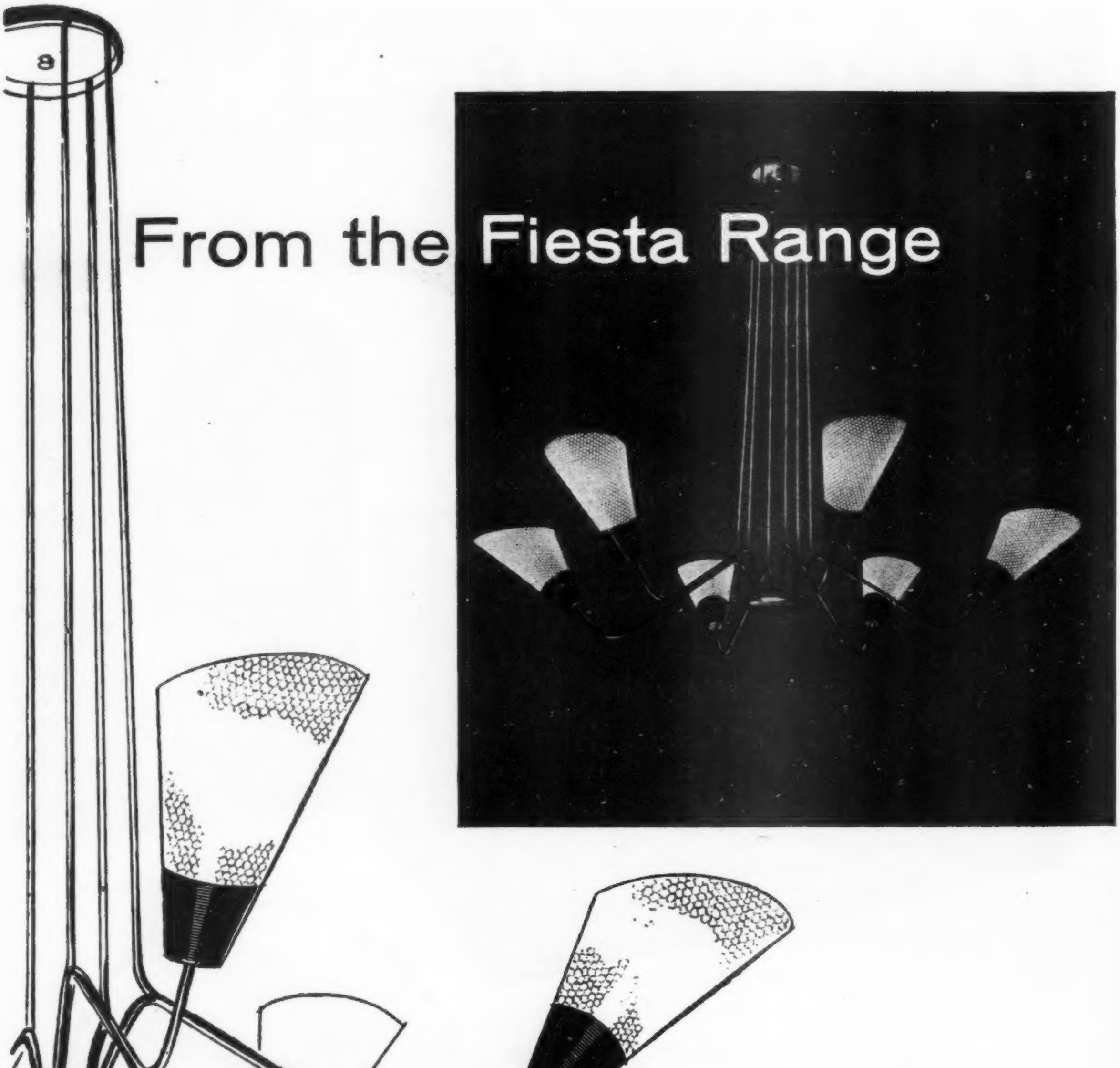

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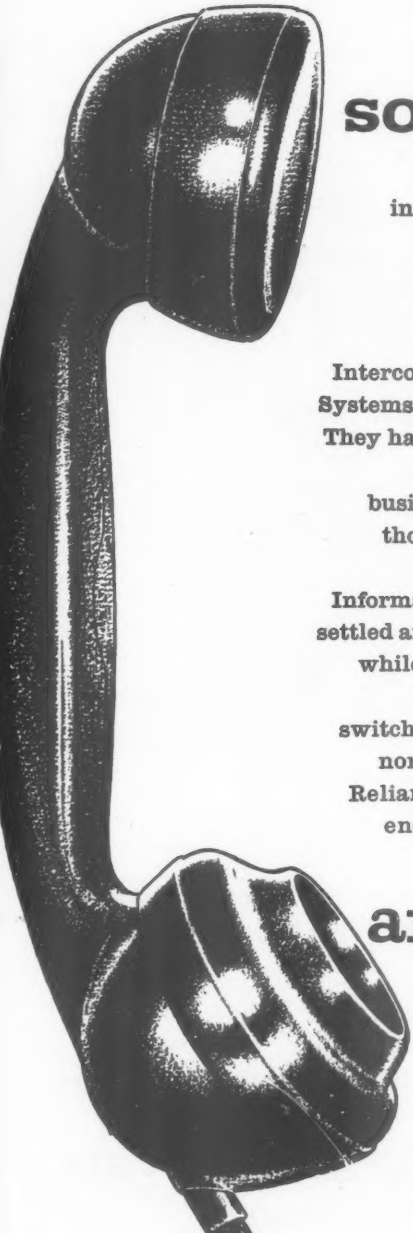

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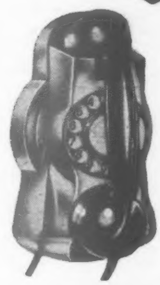

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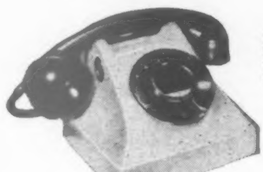

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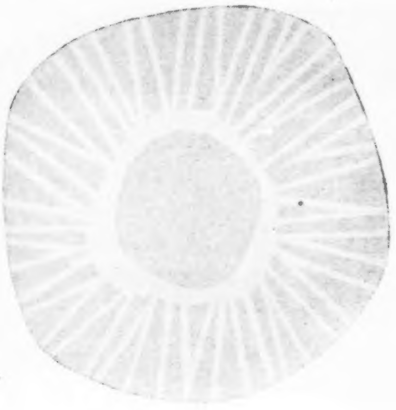

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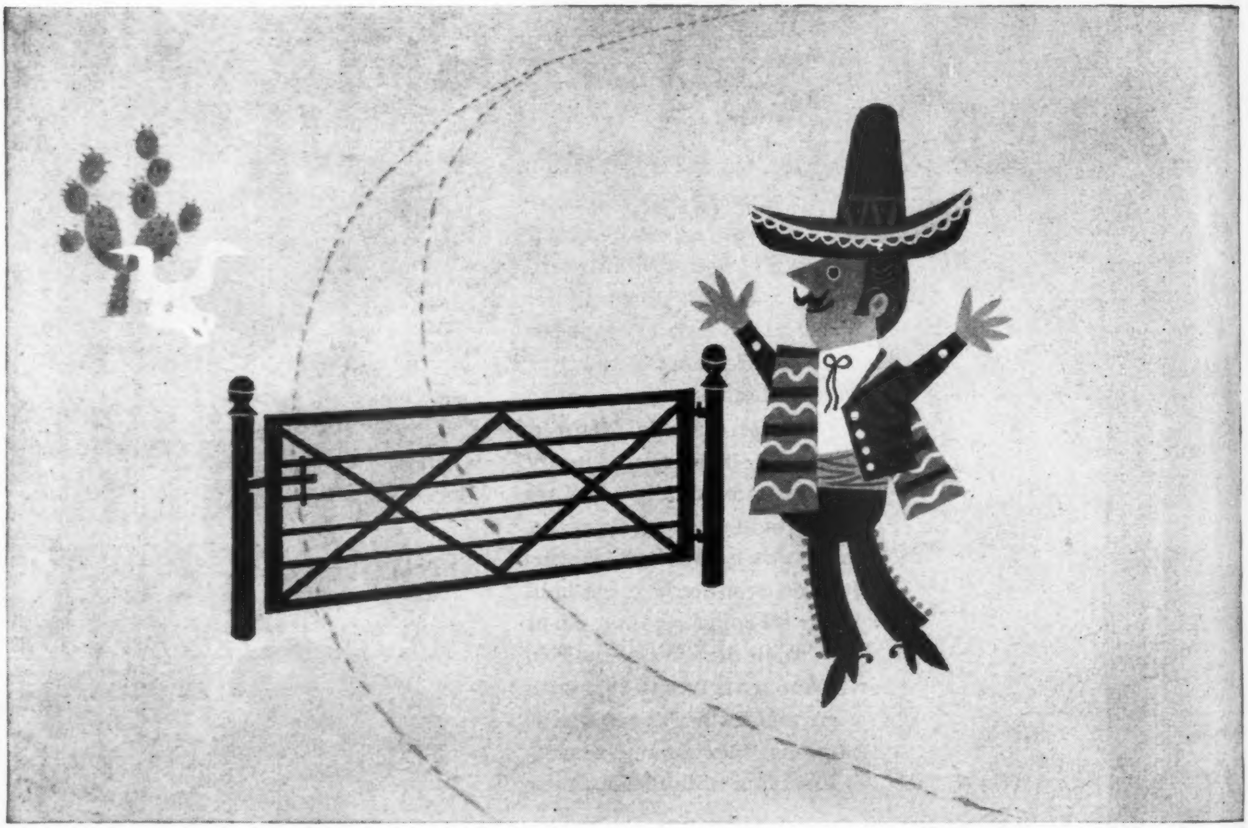

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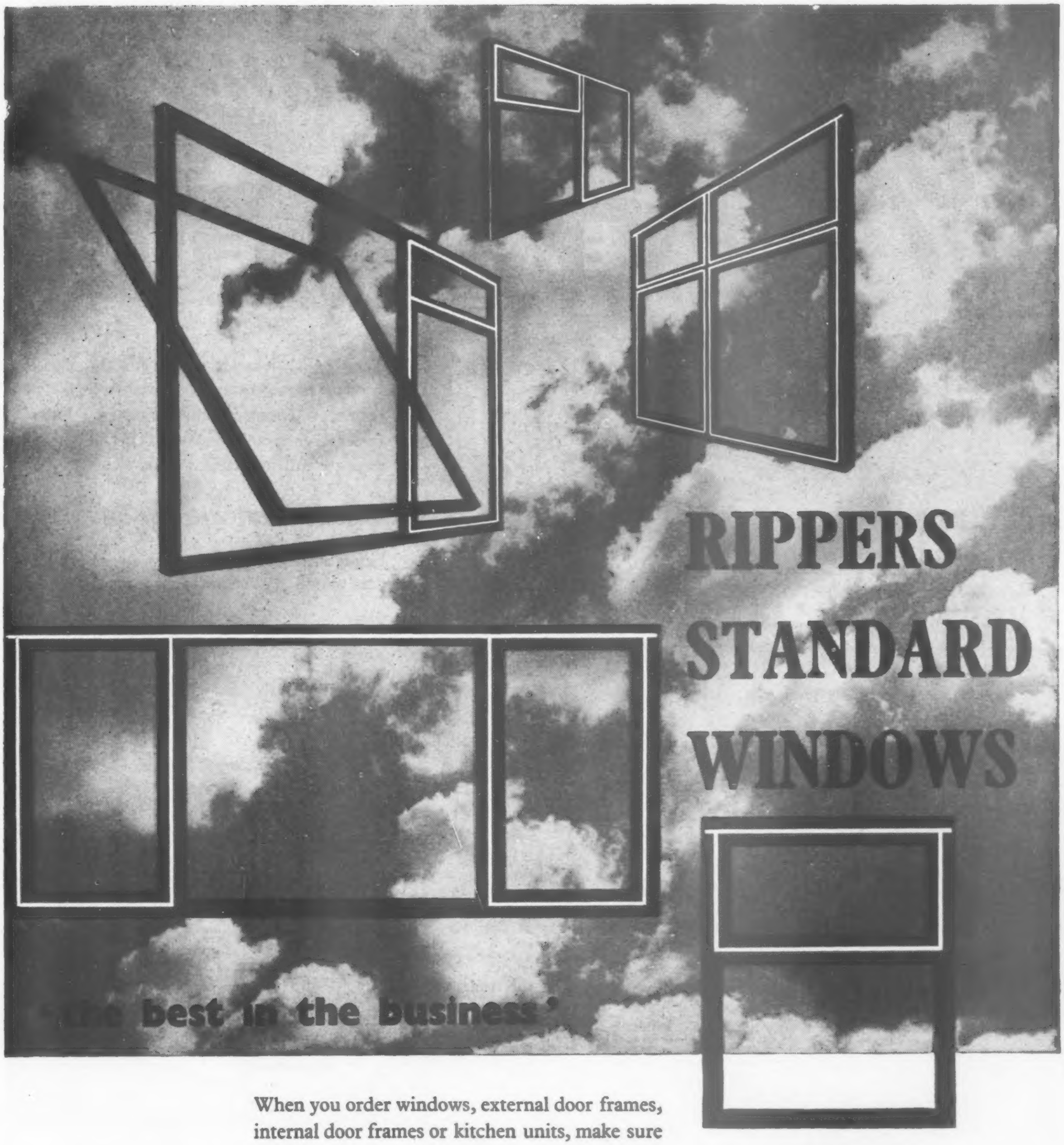

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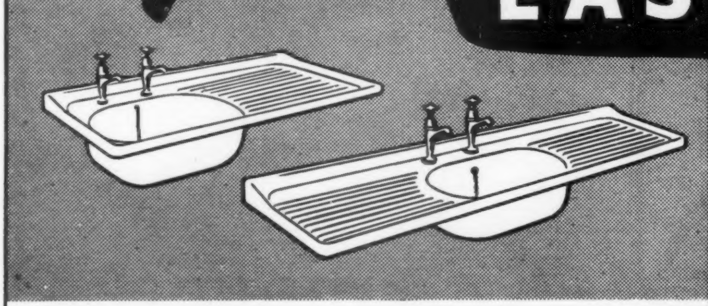

MODEL E42/21T (Vitreous Enamel) DIMENSIONS 42"X 21"

MODEL E63/21T (Vitreous Enamel) DIMENSIONS 63"X 21"

Lustrous porcelain-enamel on pressed steel with deep splash-back. Streamline fluted drainers. Large capacity bowl - single drainer right or left handed. Colour choice of white, cream, pale blue or eau-de-nil.

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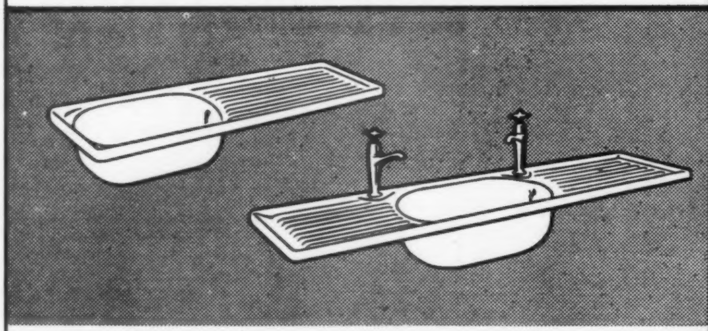
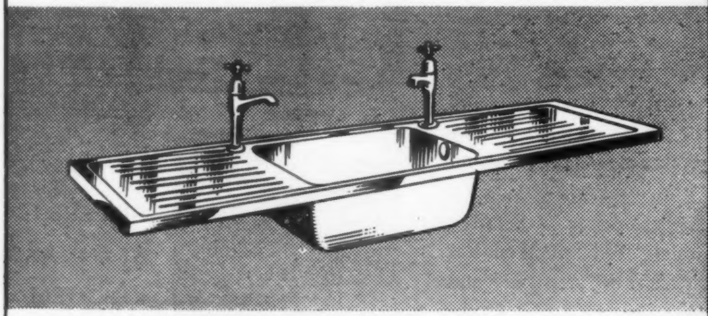


MODEL MP42/18 (Vitreous Enamel) DIMENSIONS 42"X 18"

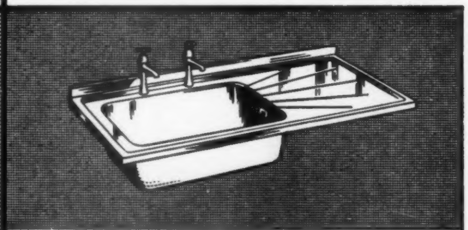
MODEL MP54/18T (Vitreous Enamel) DIMENSIONS 54"X 18"

Lustrous porcelain-enamel on pressed steel with bevelled anti-drip rim. Streamline fluted drainers. Large, almost oval bowl. Double drainer has off-set tap positions. Single drainer right or left handed. In white or cream.



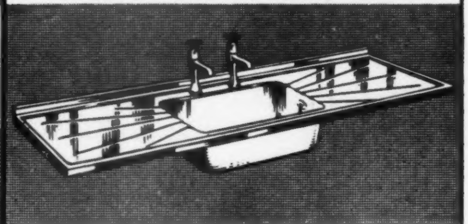
MODEL MPS 54/18 T (Stainless Steel) DIMENSIONS 54"X 18"

Gleaming stainless steel. High mounted tap positions. Ample bowl space.



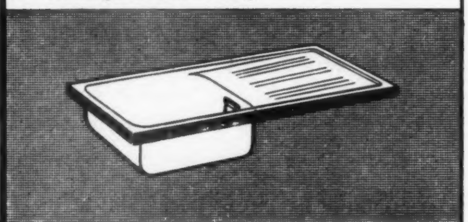
MODEL S 11 (Stainless Steel) DIMENSIONS 42"X 21"

Gleaming stainless steel with anti-drip rim and rear flange for wall bedding. Right or left handed.



MODEL S 17 (Stainless Steel) DIMENSIONS 63"X 21"

Gleaming stainless steel with anti-drip rim and rear flange for wall bedding.



MODEL ROL 36 (Vitreous Enamel) DIMENSIONS 36"X 18"

Lustrous porcelain-enamel on pressed steel with anti-drip rim. Single fluted drainer. Right or left handed. White or cream, with black edging.

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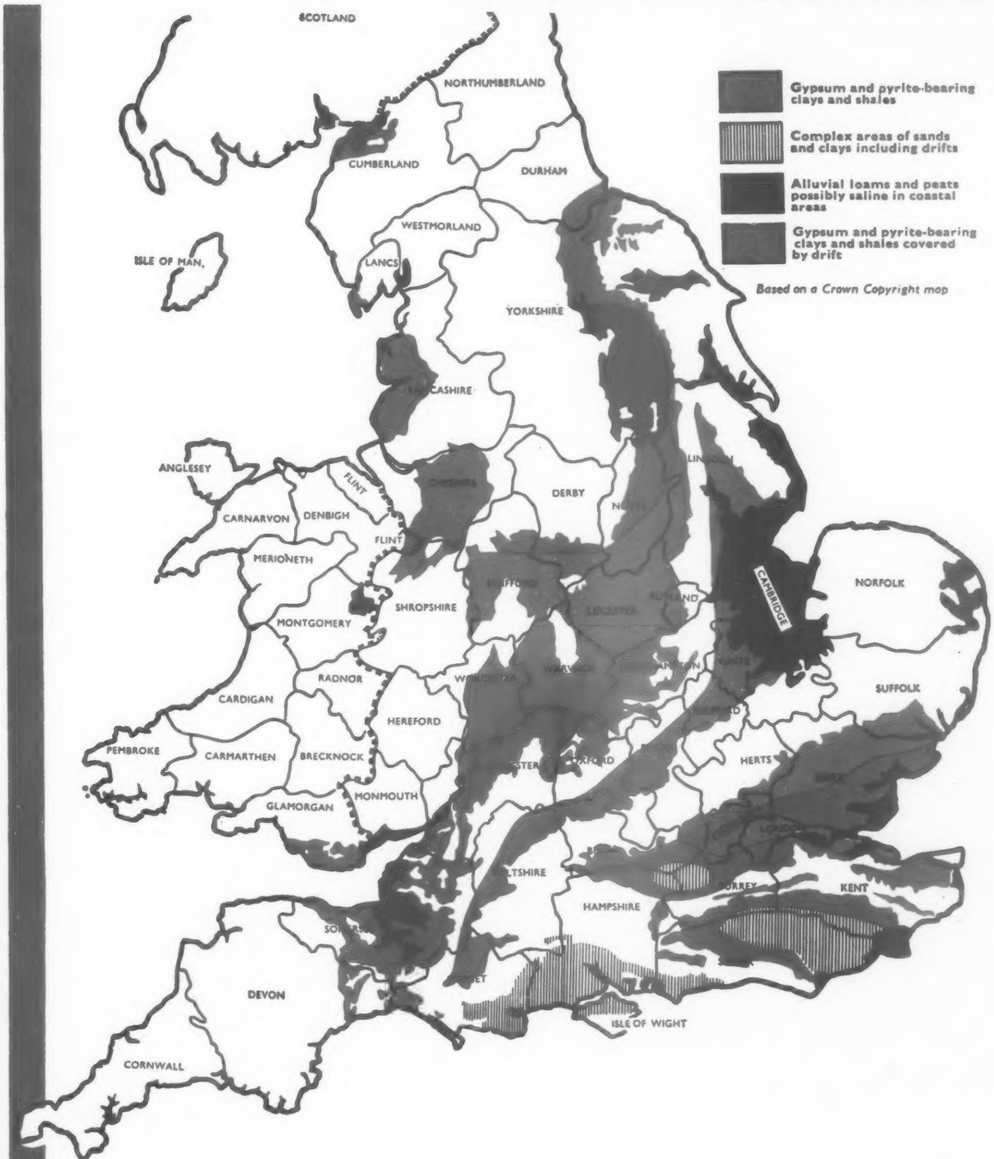

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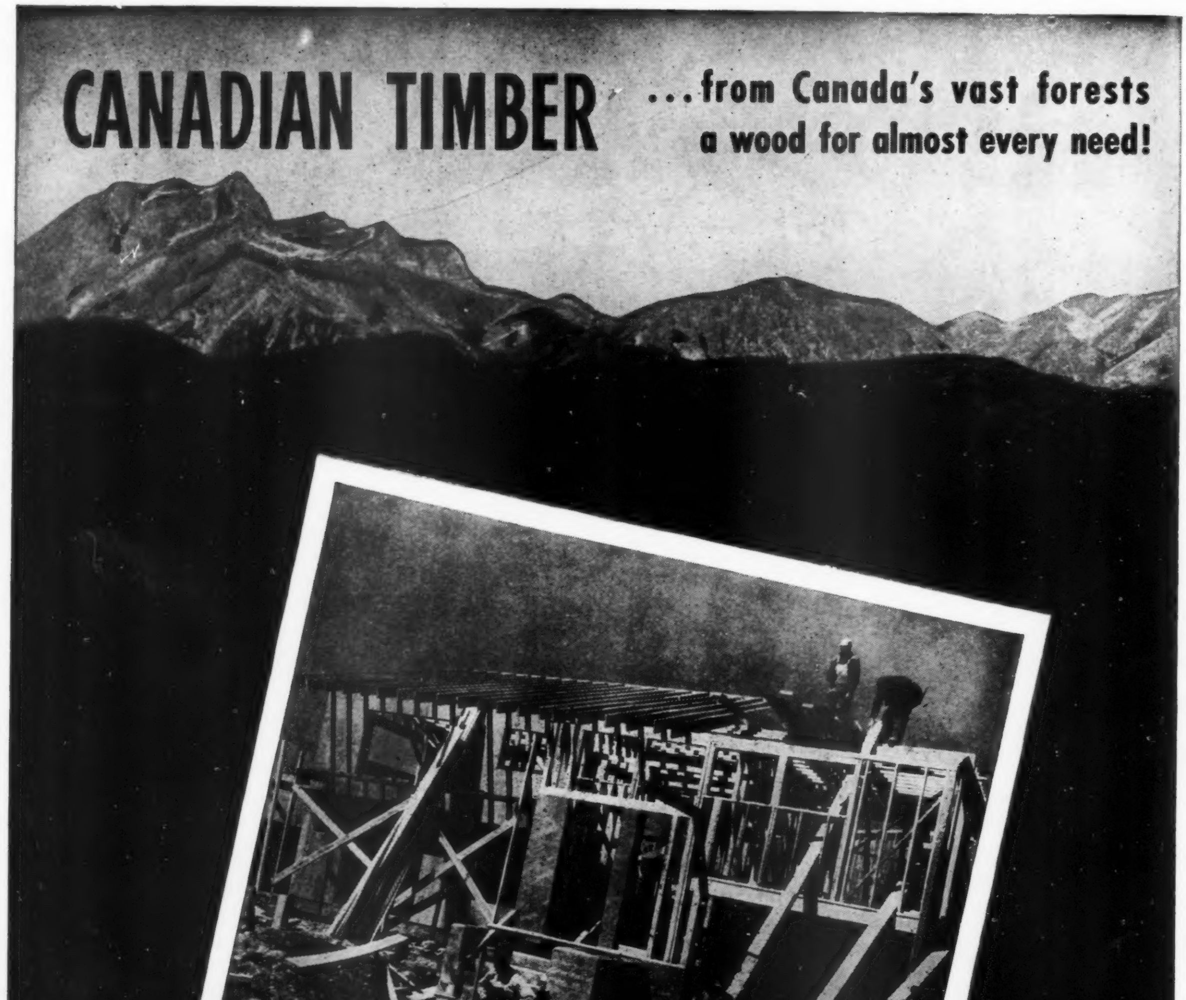
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½ lb.	—	1⅝" x 1⅝"
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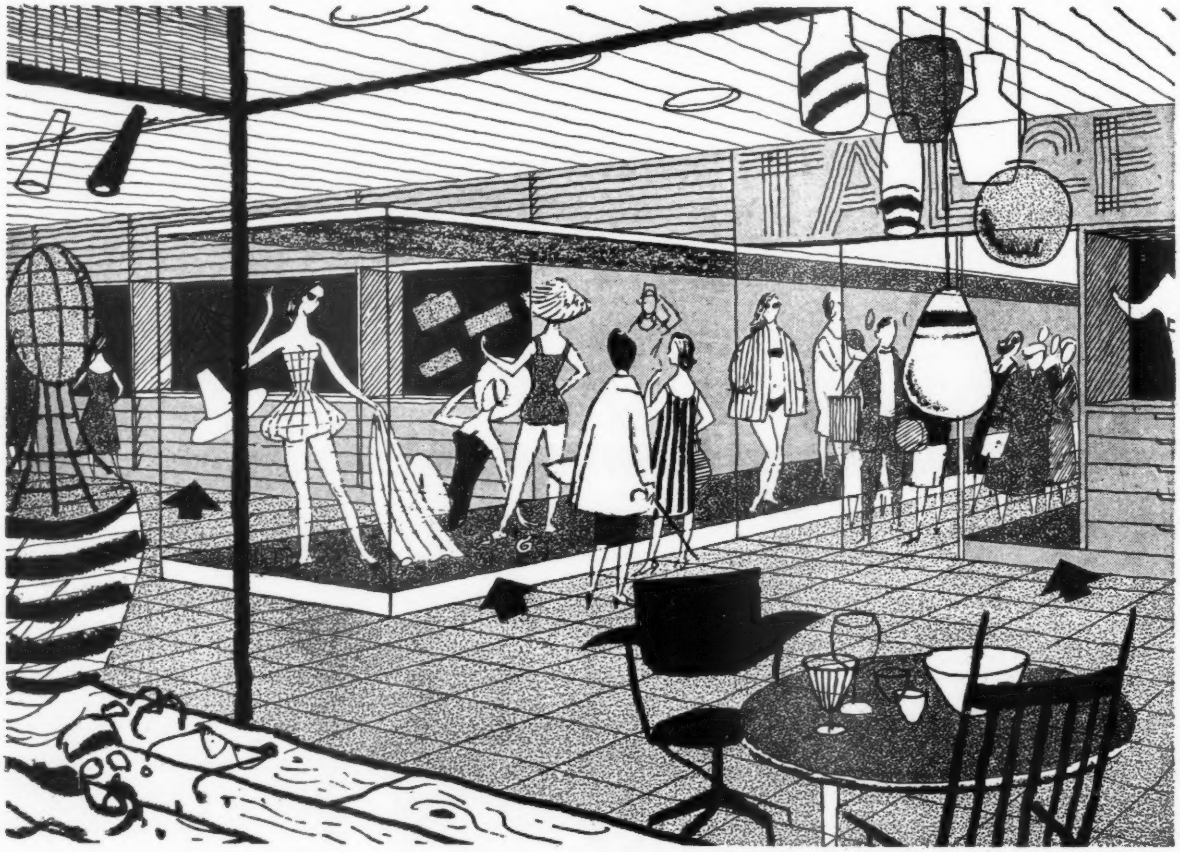

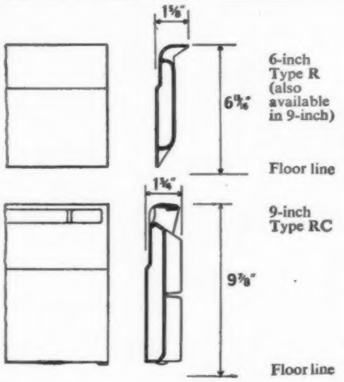

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27

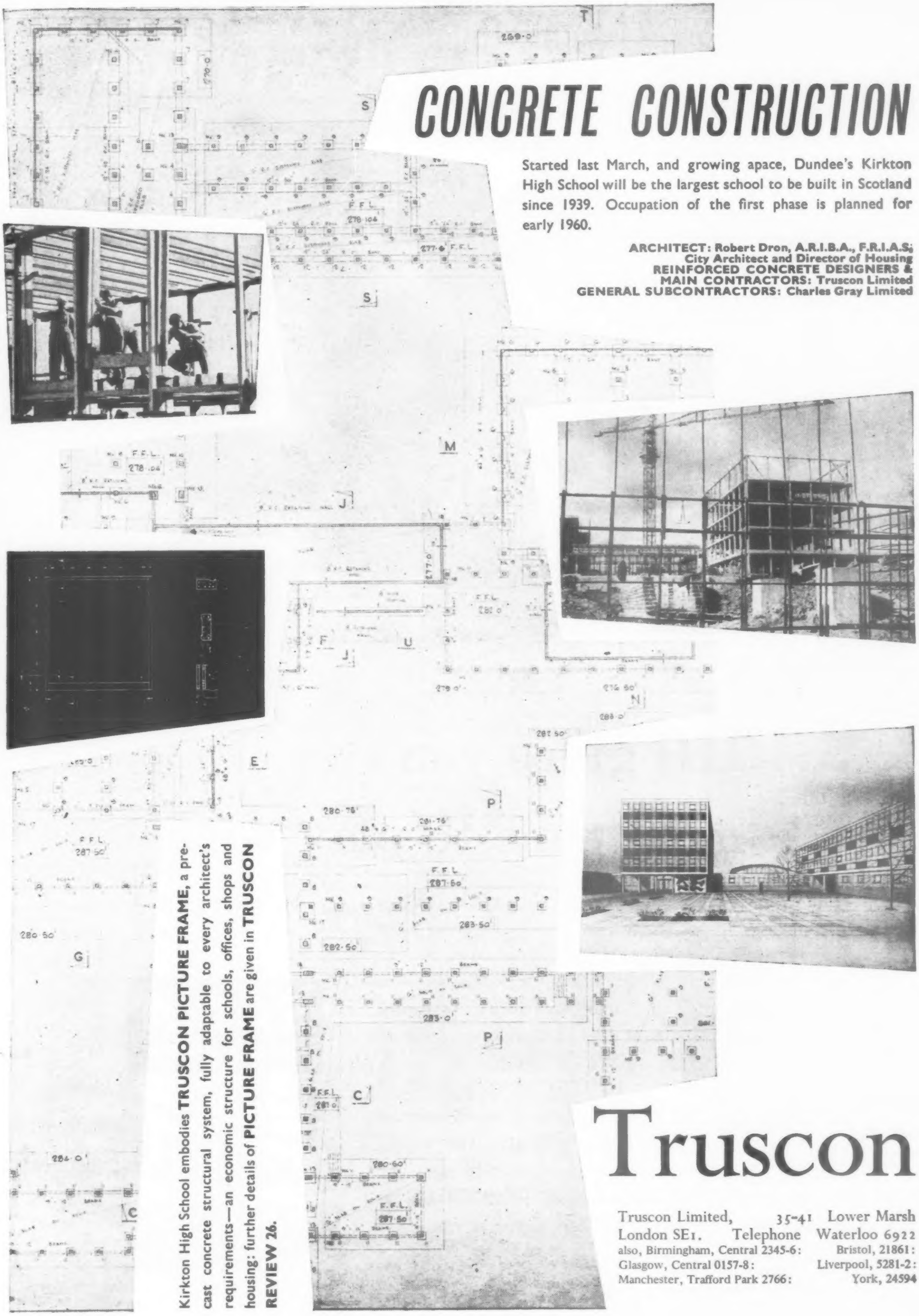
WHEREVER maximum space is a functional necessity—and there are many instances, such as shops, libraries and exhibition rooms—the problem arises of how to make provision for a heating system that gives the proper requirements of evenly distributed warmth, functions economically, and neither takes up useful wall space nor offends aesthetically by spoiling a clean-looking line.

There is one system which architects are now coming to look upon as the best answer to this problem. It has been evolved by Crane Ltd. (already well known for other types of heating equipment) and employs heating panels in place of the usual skirting boards. It is clear that this system gives the designers considerable flexibility of arrangement. The heating panels are quite unobtrusive and, being capable of encircling the entire room if necessary, eliminate 'hot spots' and distribute the warmth evenly where it is wanted. In the illustration the position of Skirting Heating panels is indicated by arrows. It will be readily appreciated how well this system answers the condensation problem here.

There are two types of panel. Type R—purely radiant—in 9-inch panels to match Type RC, and in 6-inch panels for use where less heat is required: and Type RC (radiant-convector) 9-inches high. The panels used in the example illustrated are 6-inch Type R. All panels are in 2-ft and 1-ft lengths and are made of cast iron, which gives them considerable resistance to accidental damage. The operations of calculating heat requirements and designing the pipework are in principle no different from those for conventional radiator heating systems.

Wherever the architect needs greater freedom of expression than conventional heating systems allow him, and at the same time has to pay due consideration to costs, the answer is, undoubtedly,

CRANE skirting heating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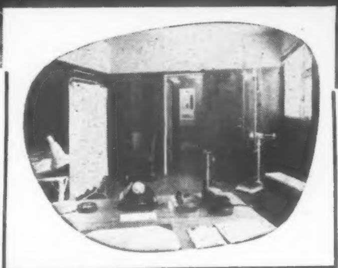

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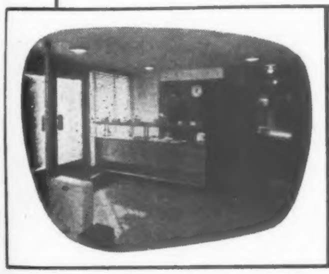

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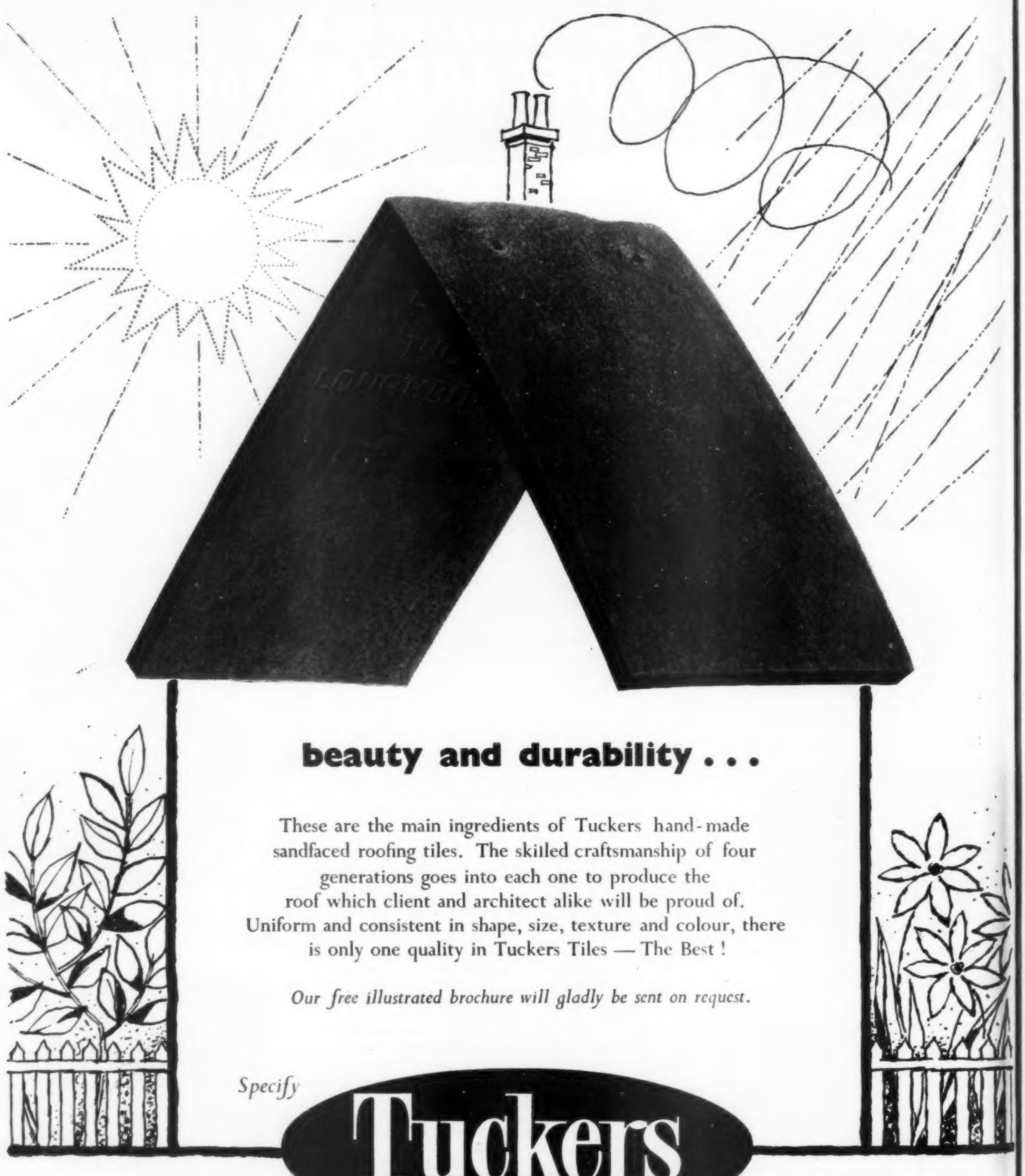

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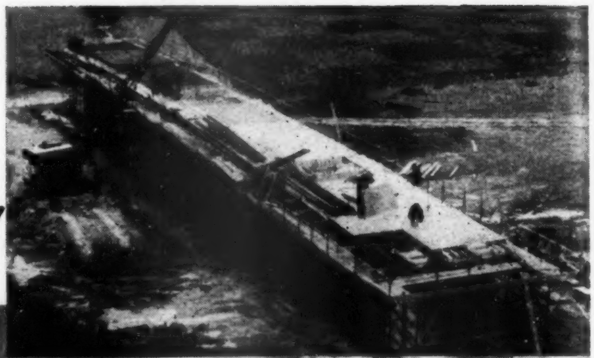

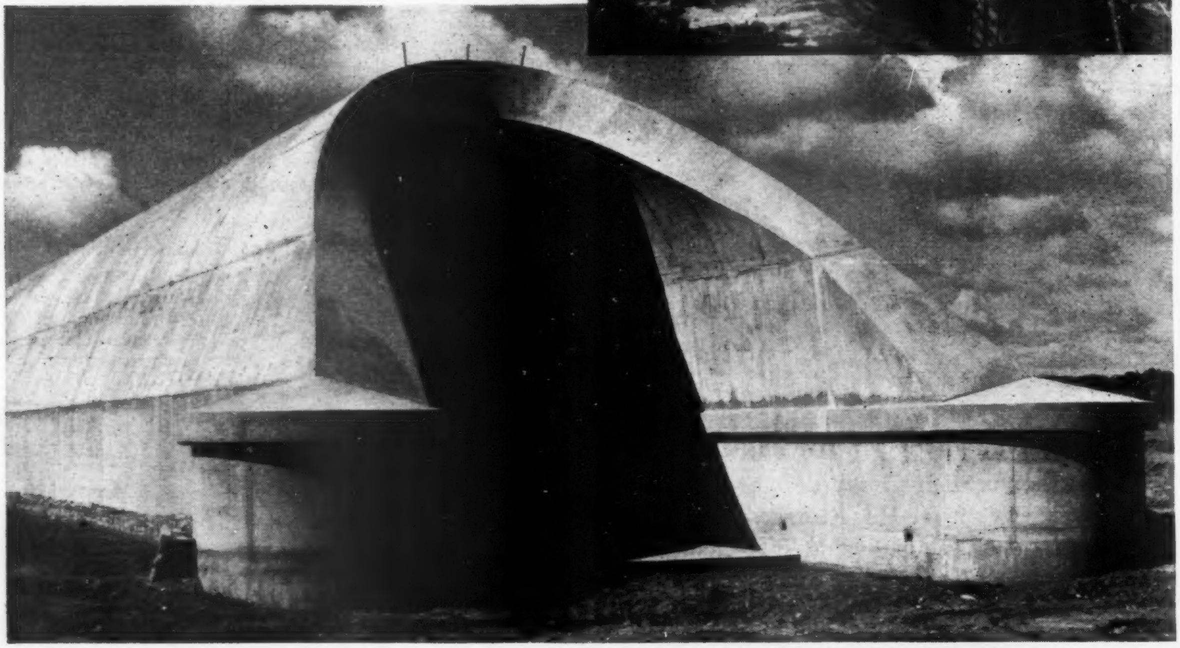

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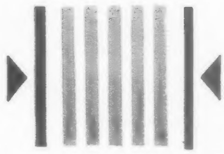

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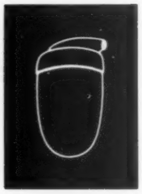

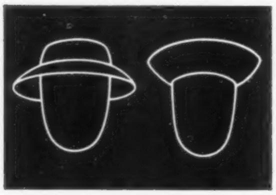

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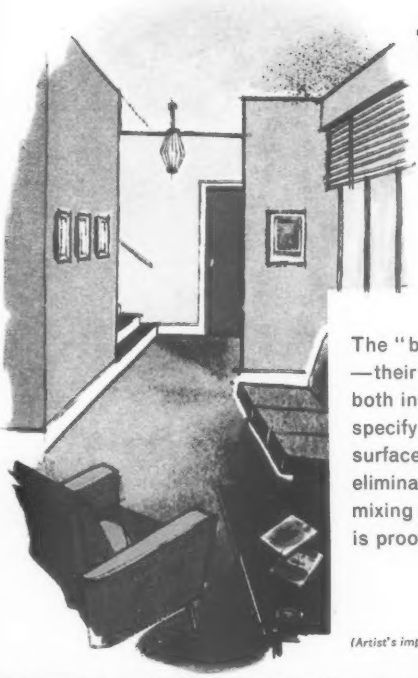

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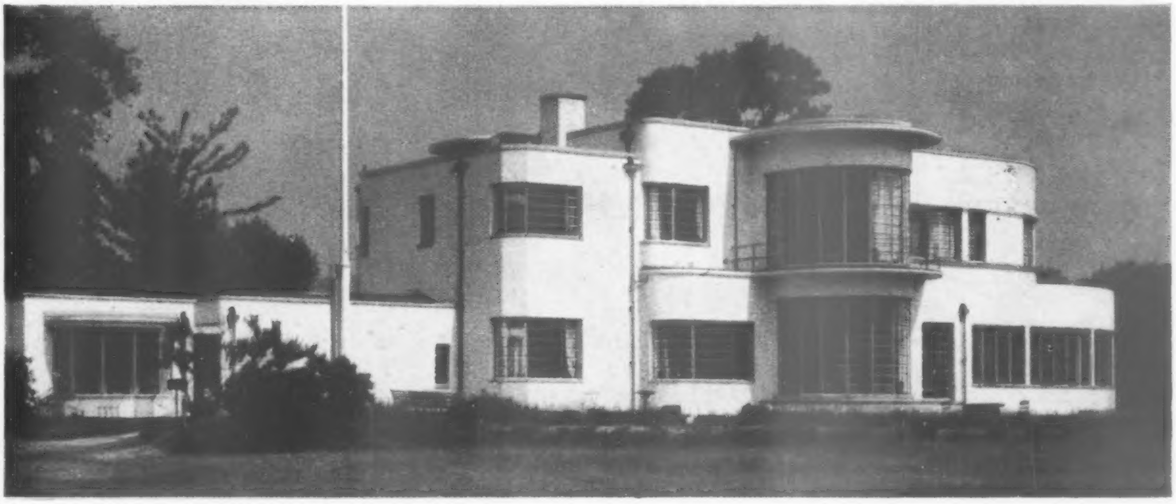

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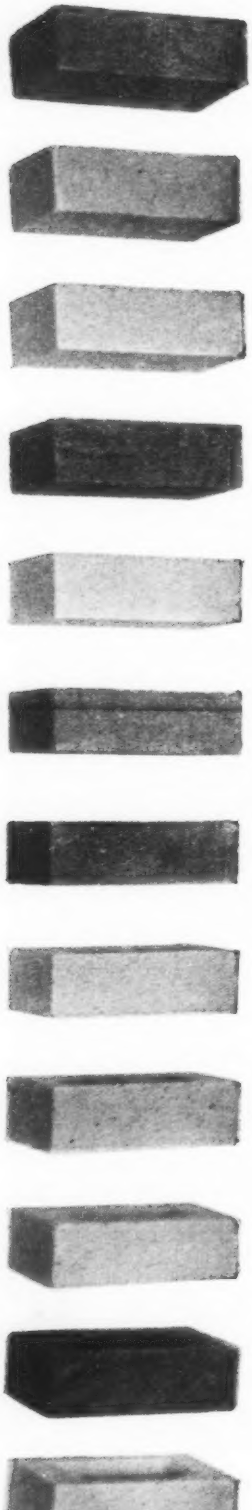

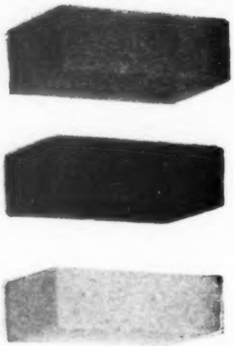

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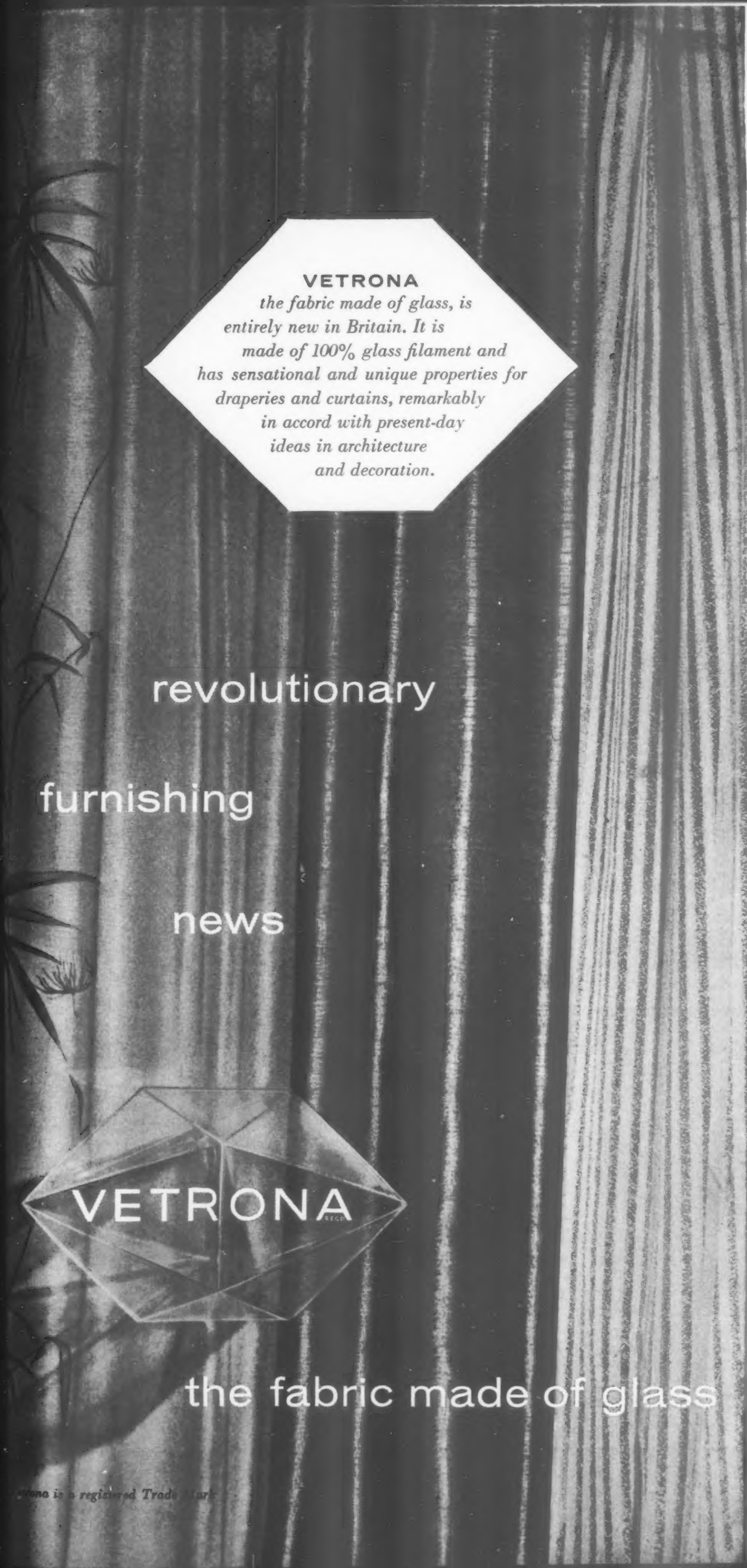

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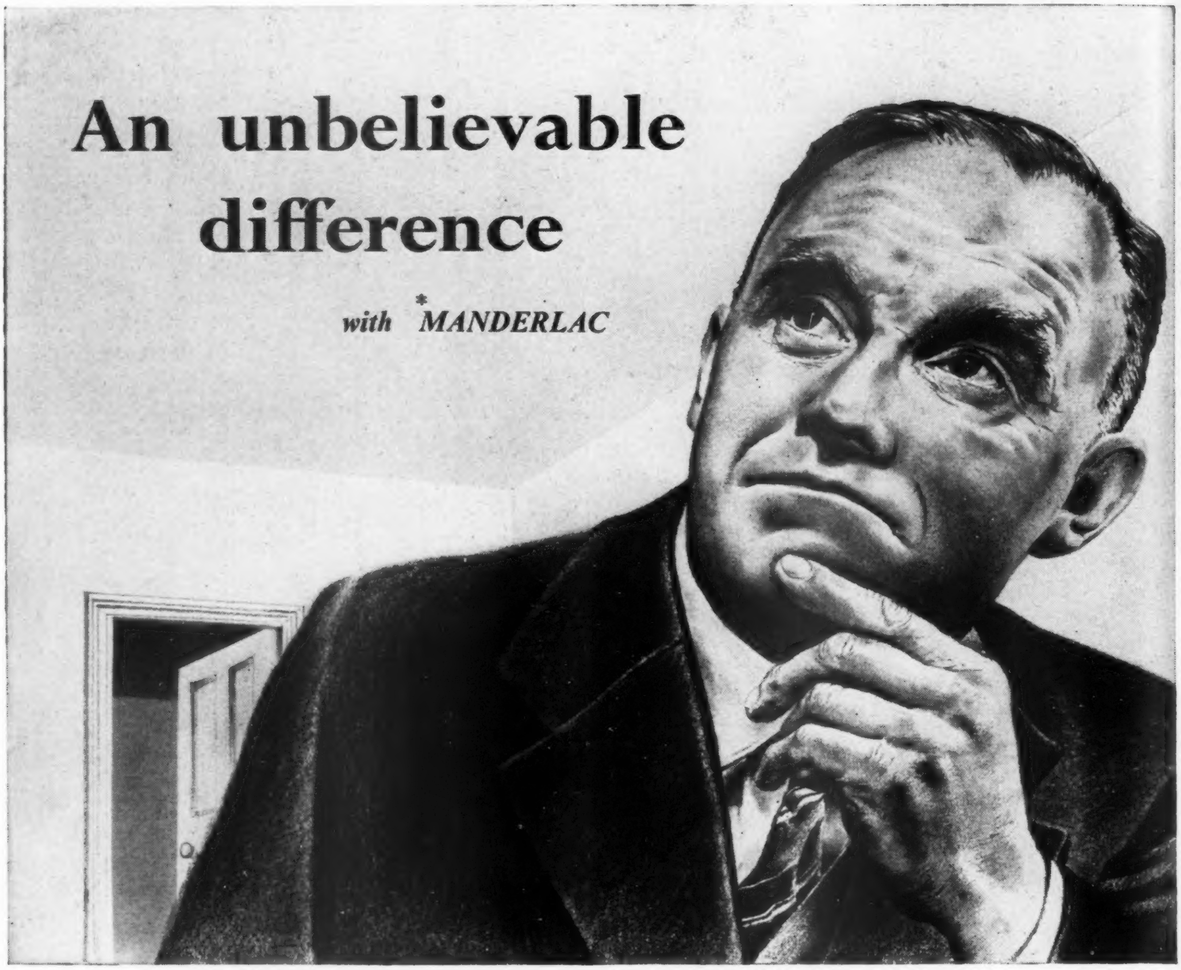

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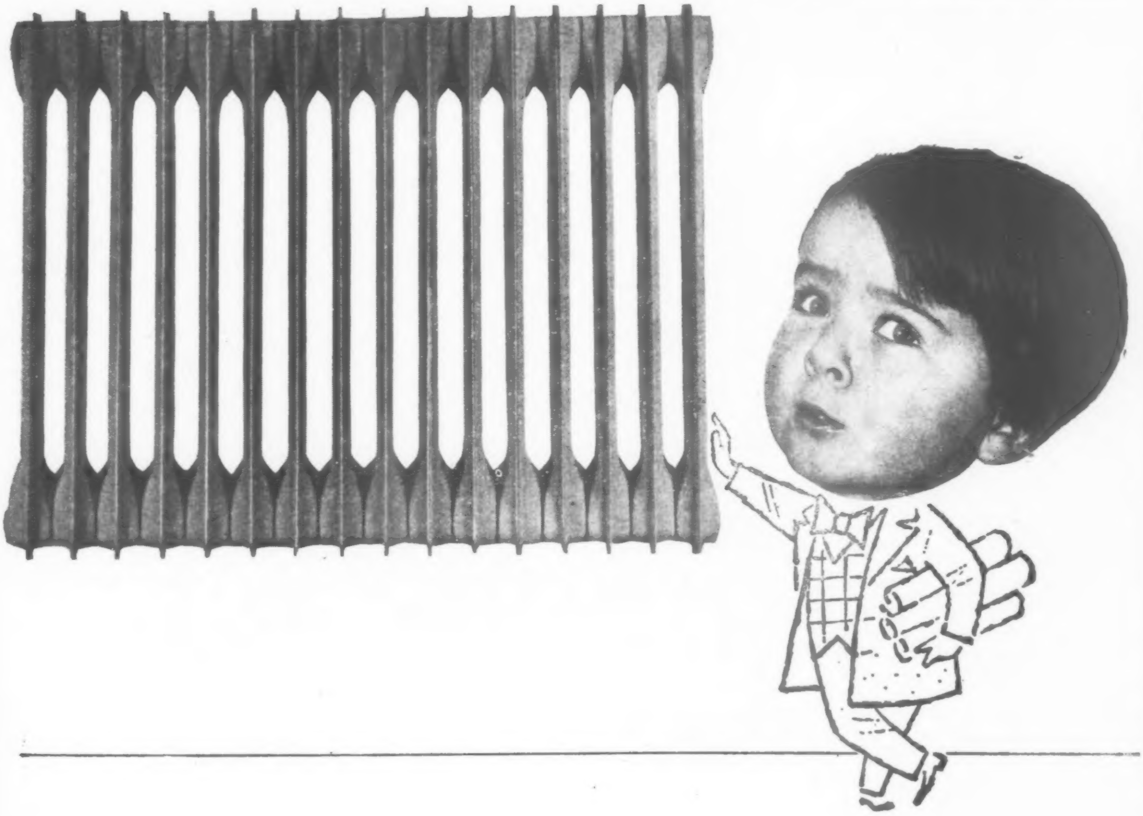

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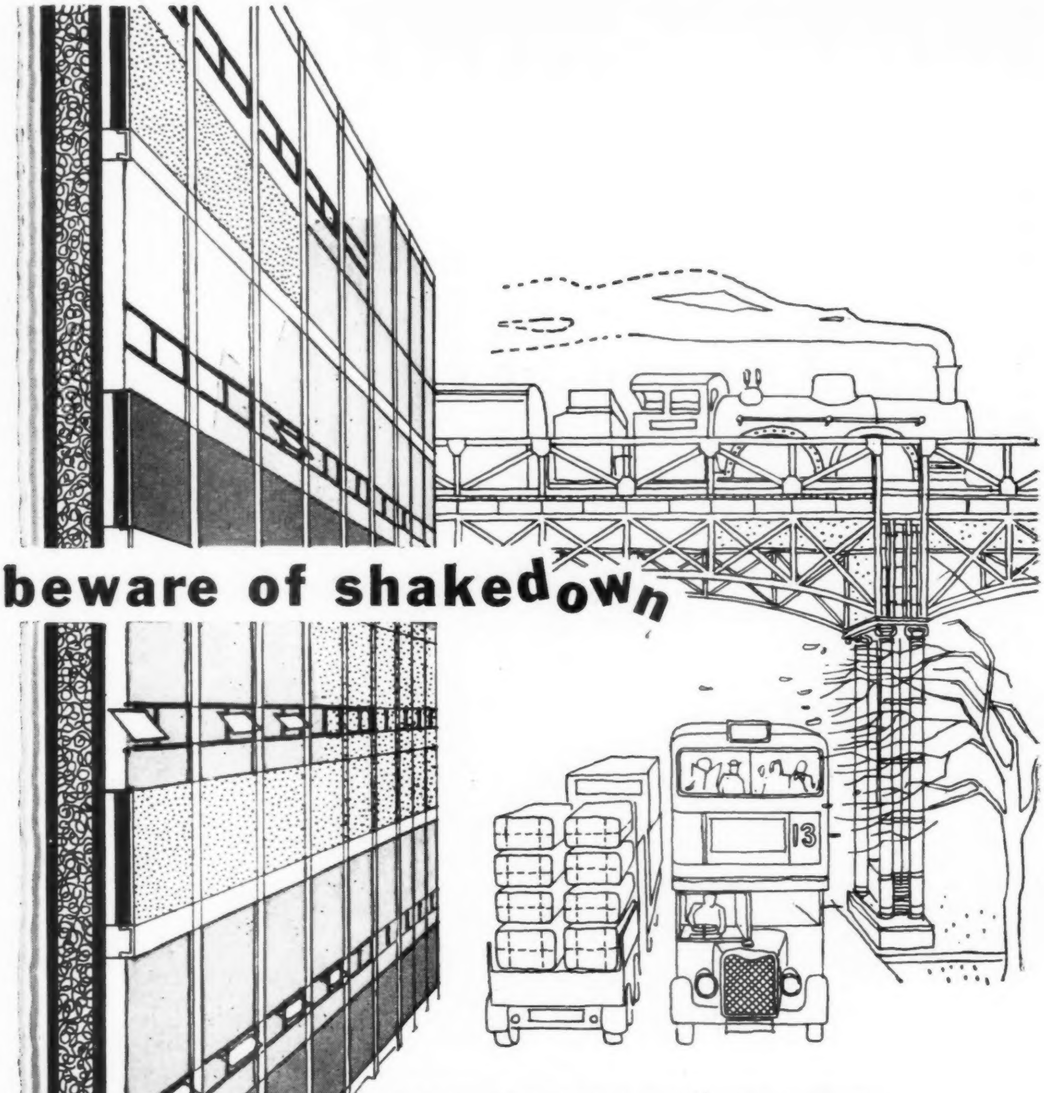

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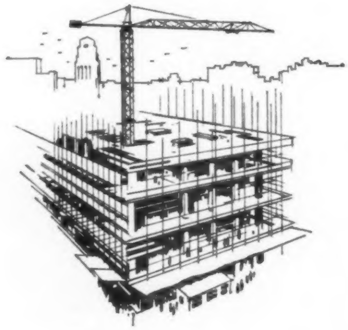

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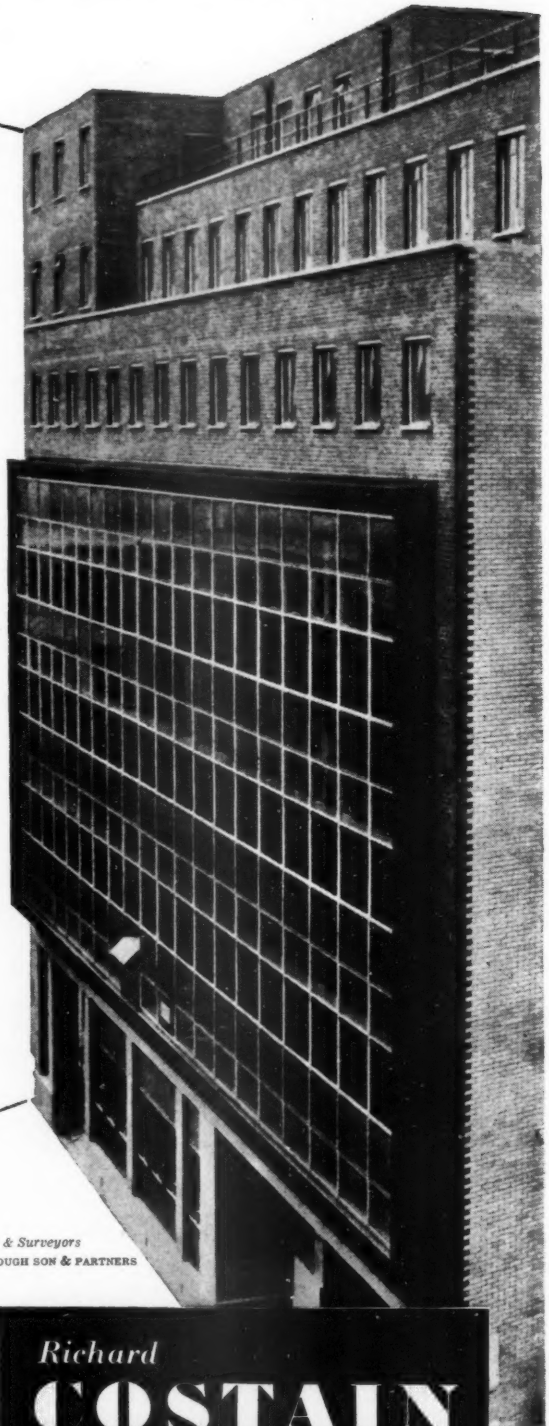

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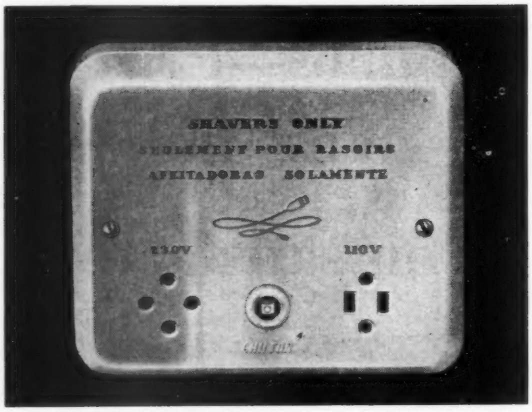

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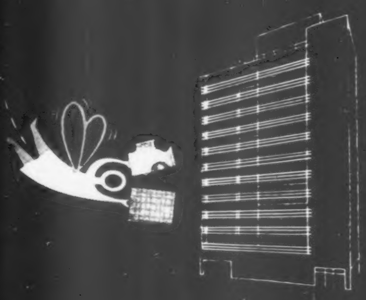

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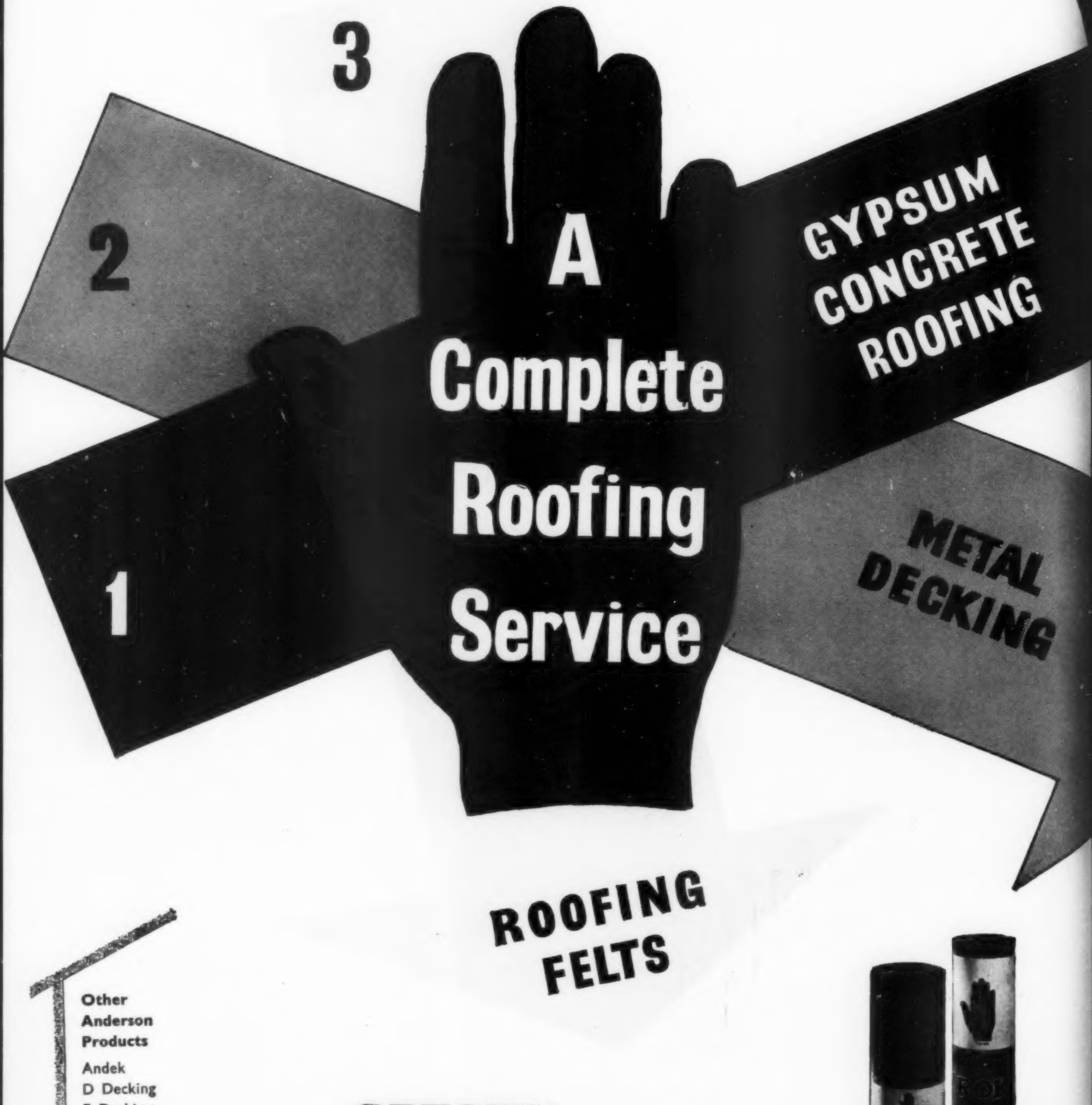

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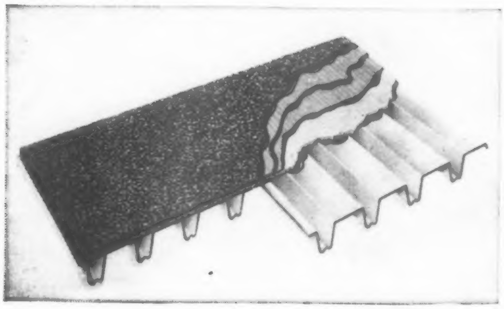

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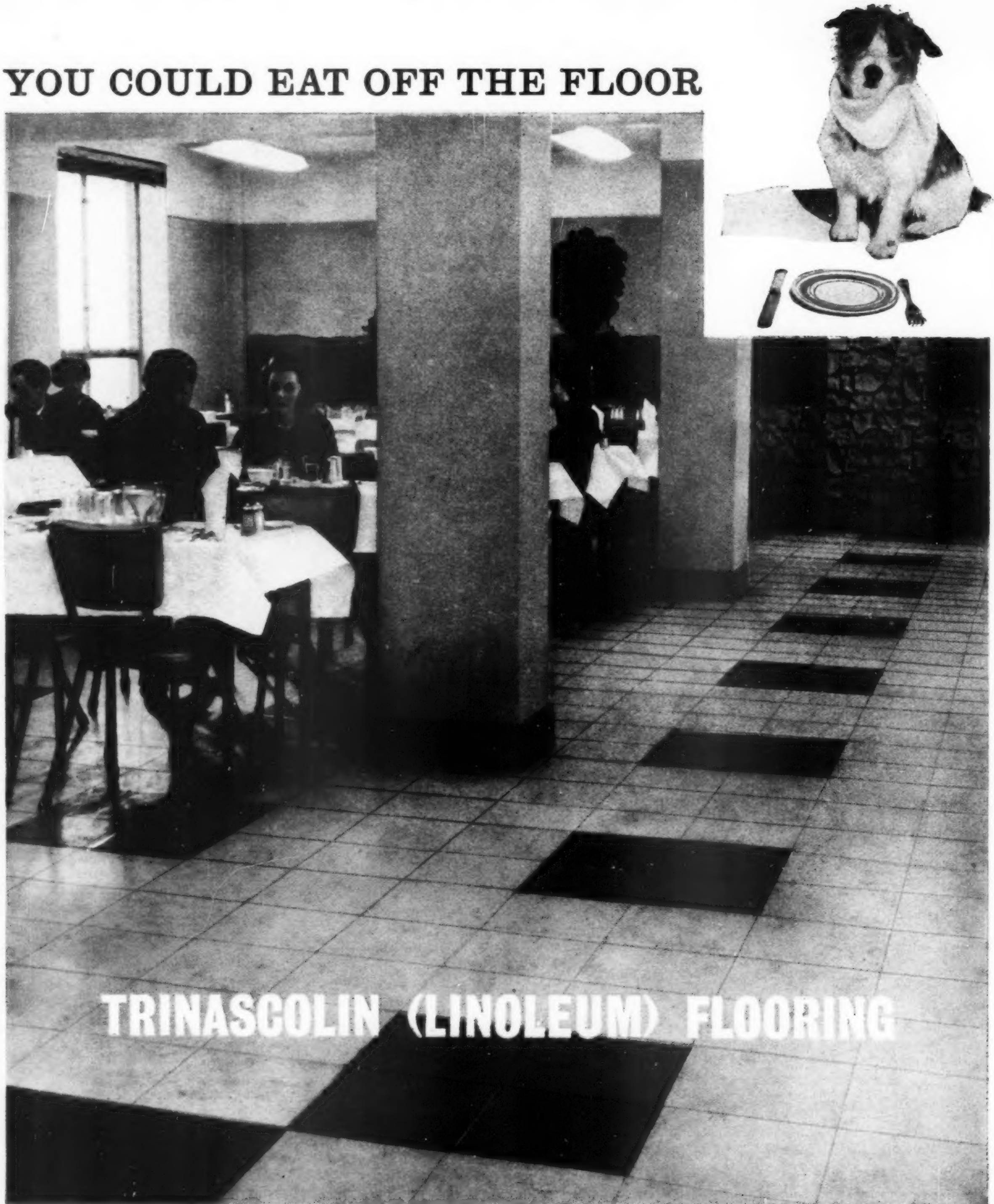

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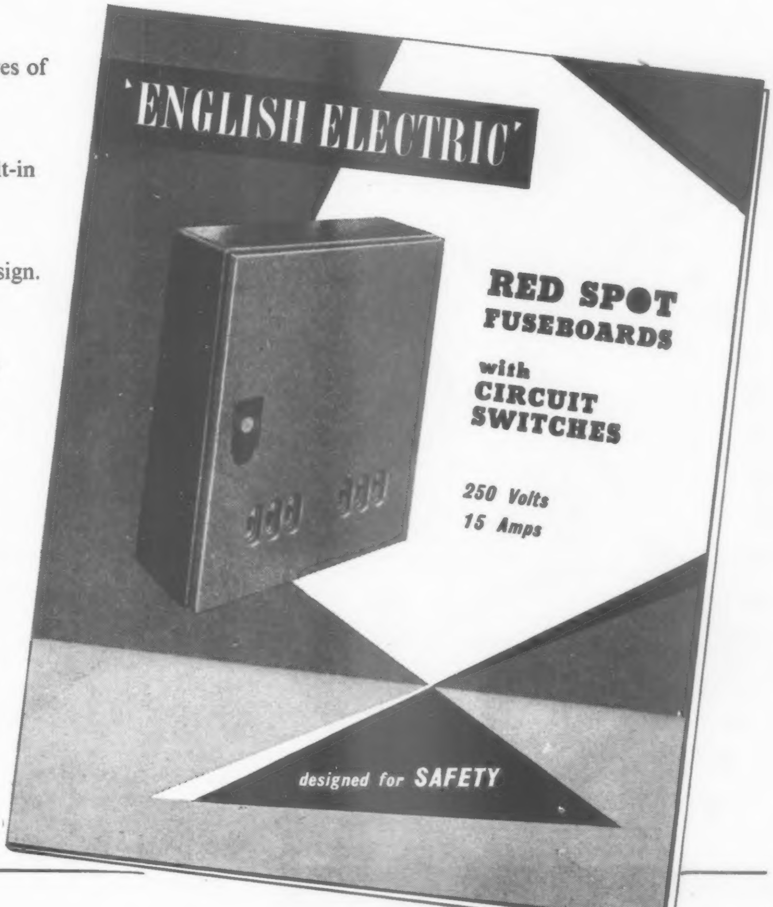

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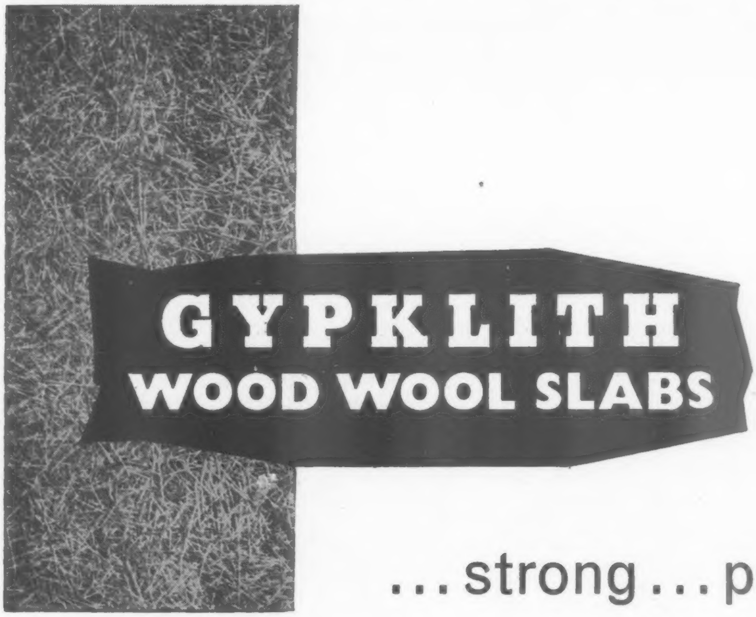

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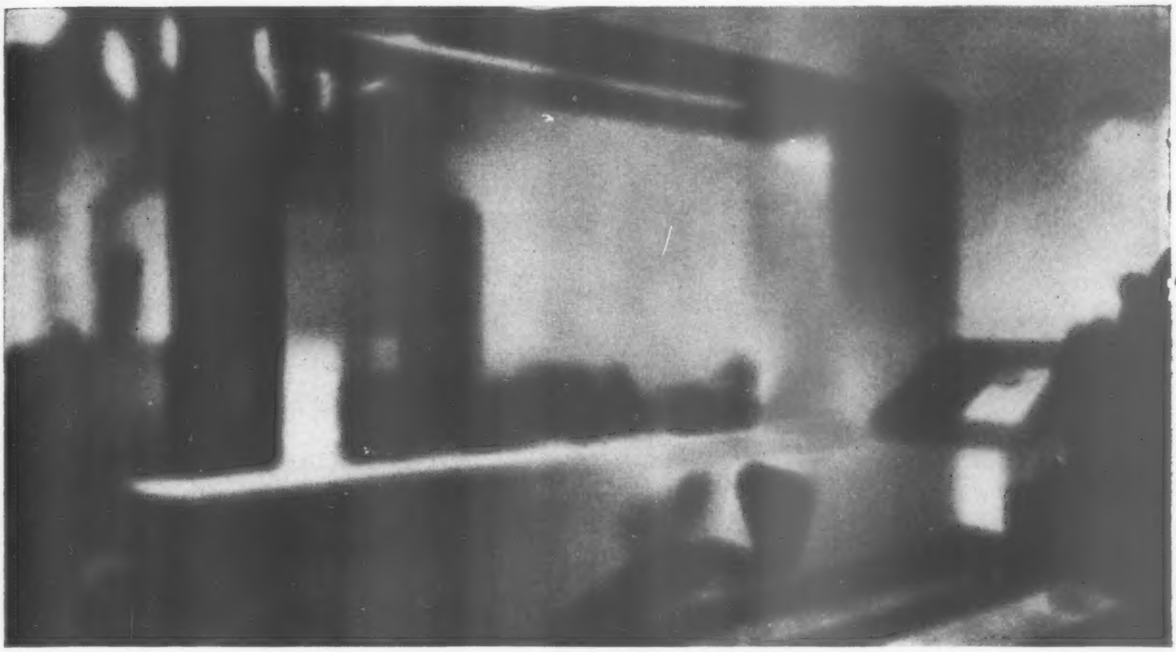

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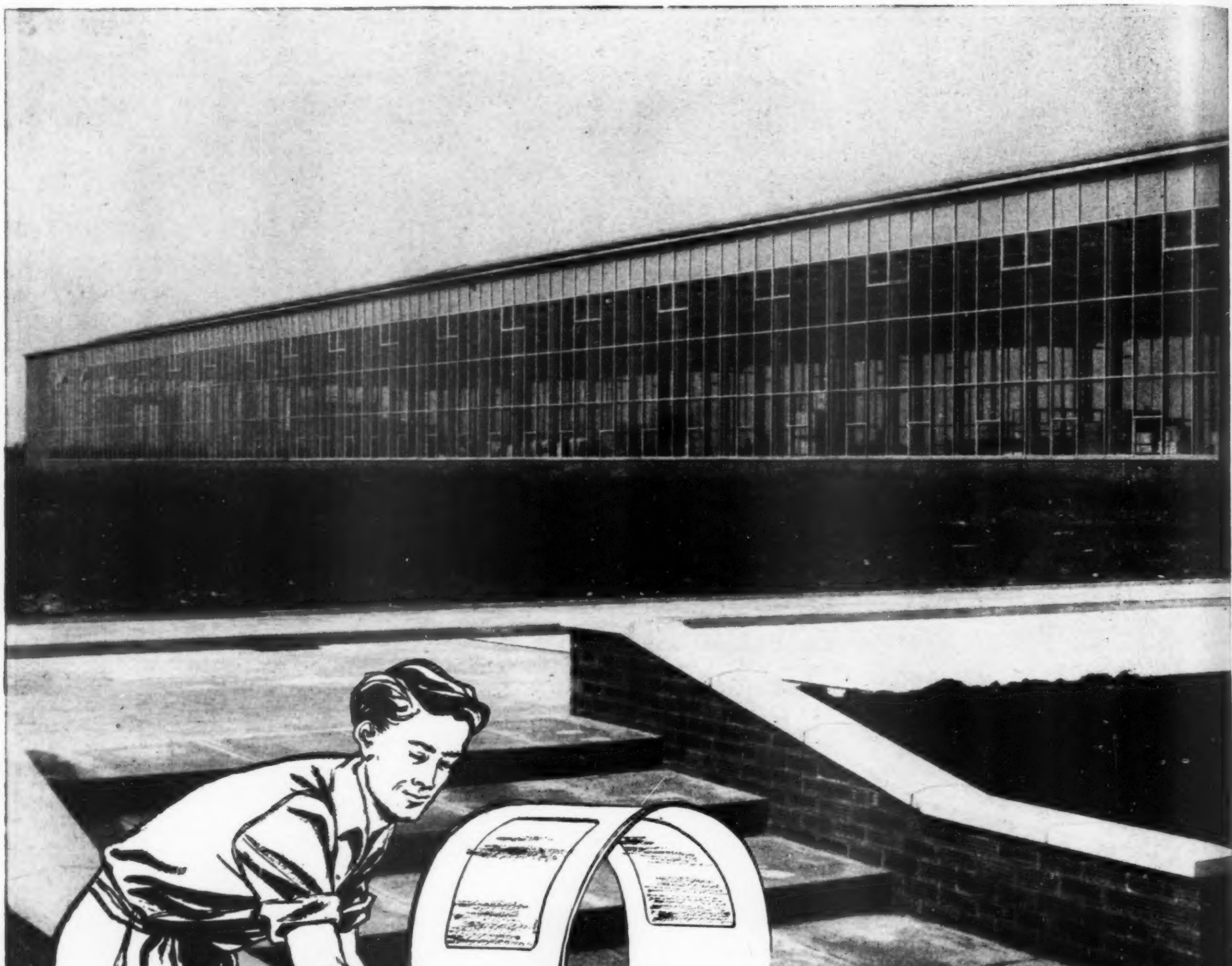

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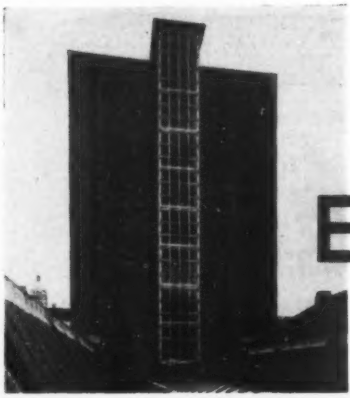

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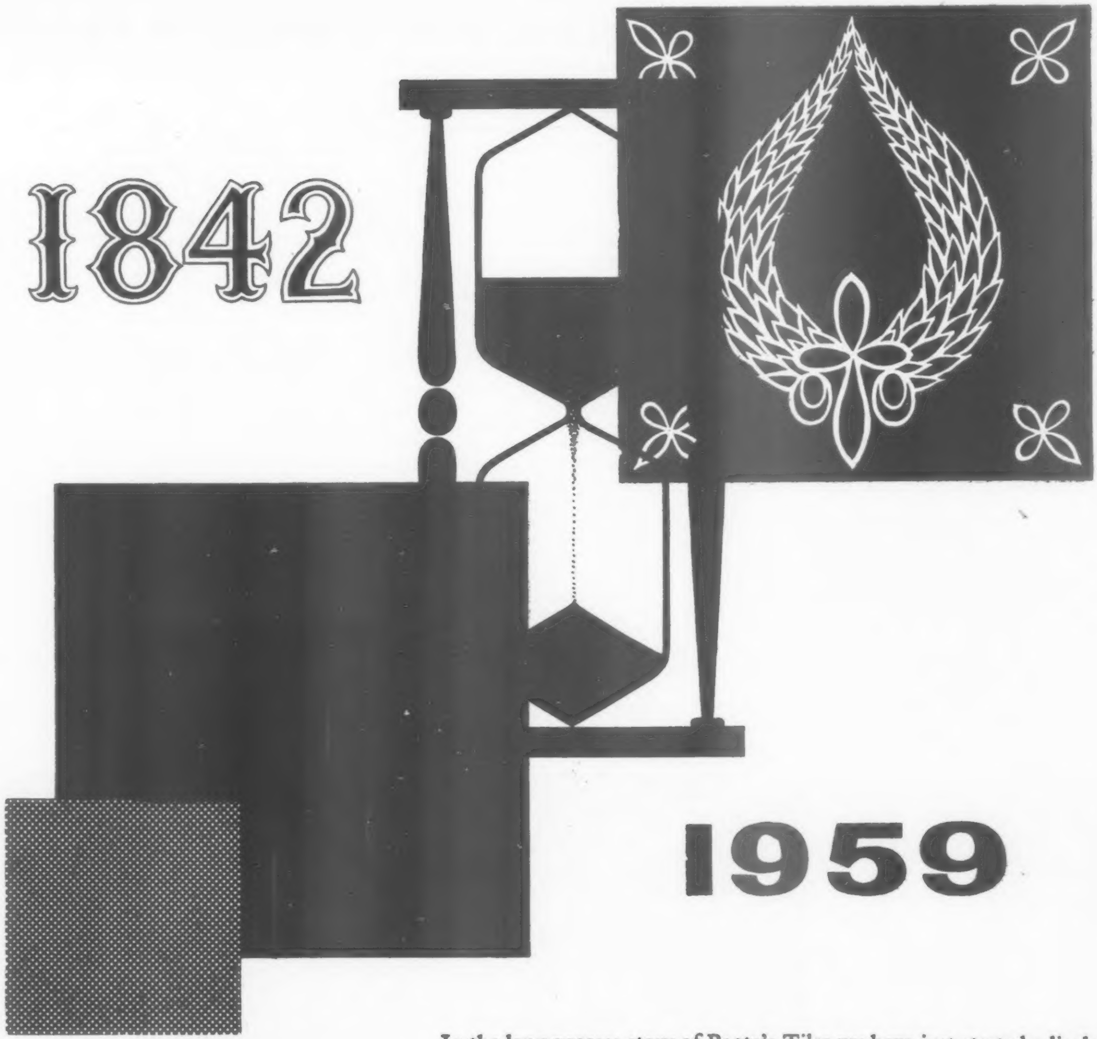

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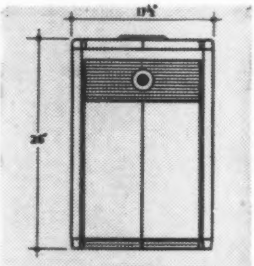

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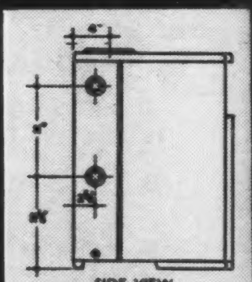

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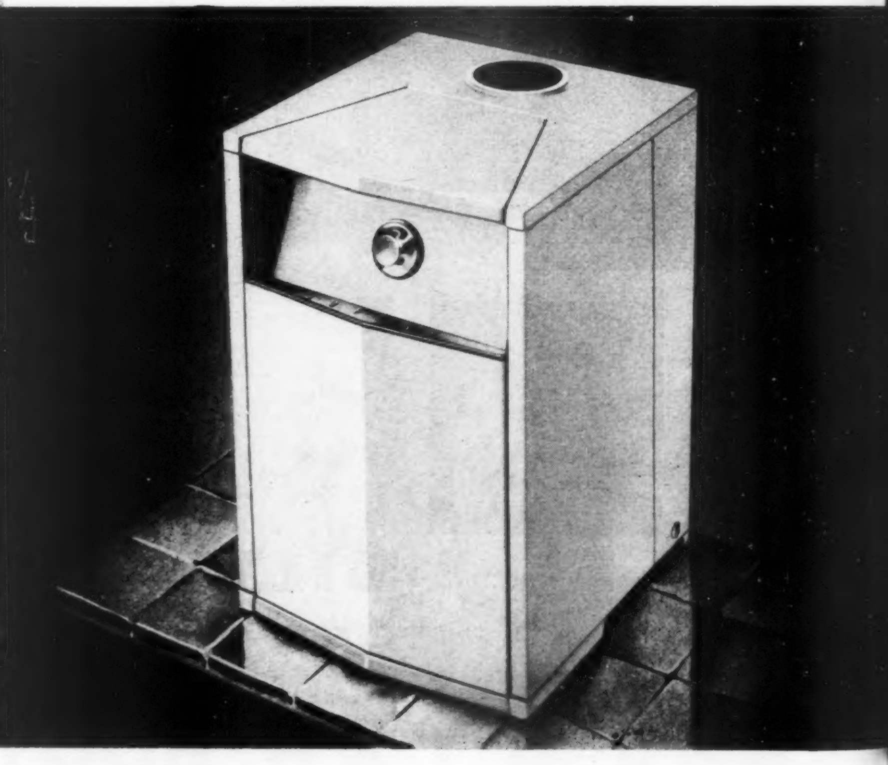

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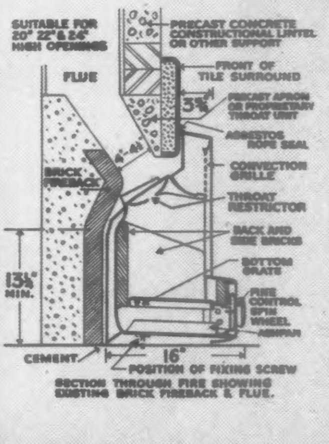

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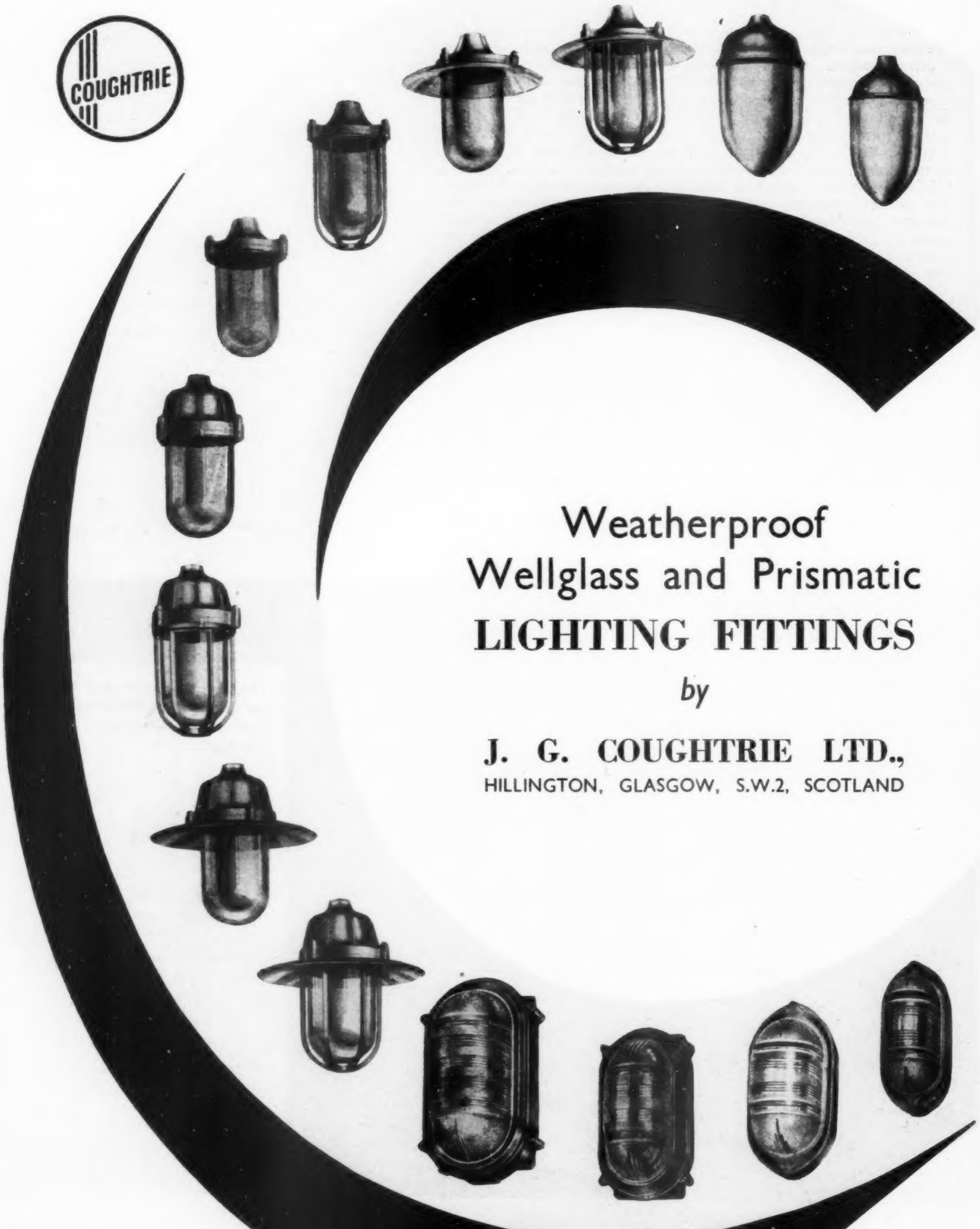
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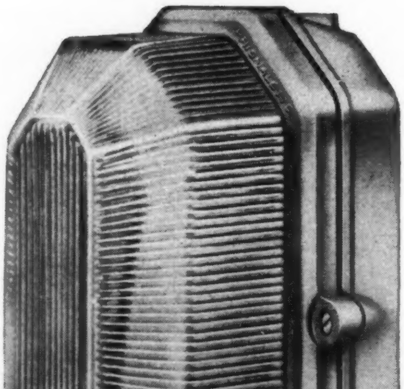

Weatherproof **High quality prismatic glass**
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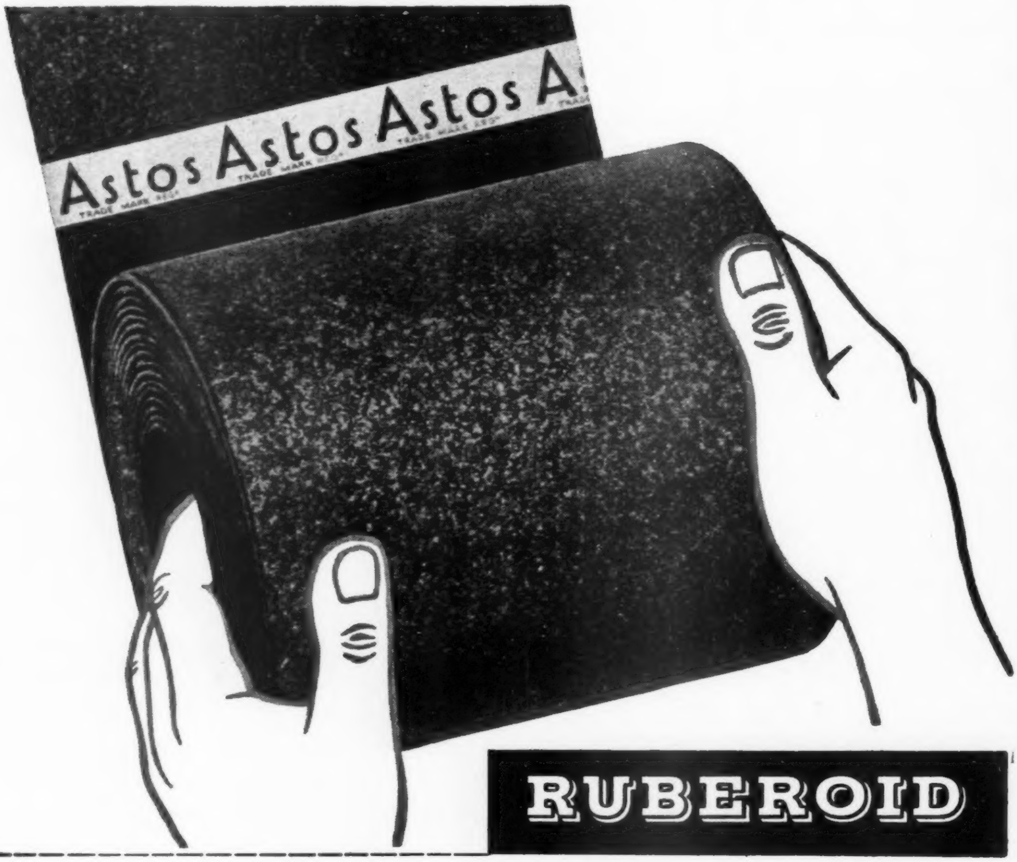

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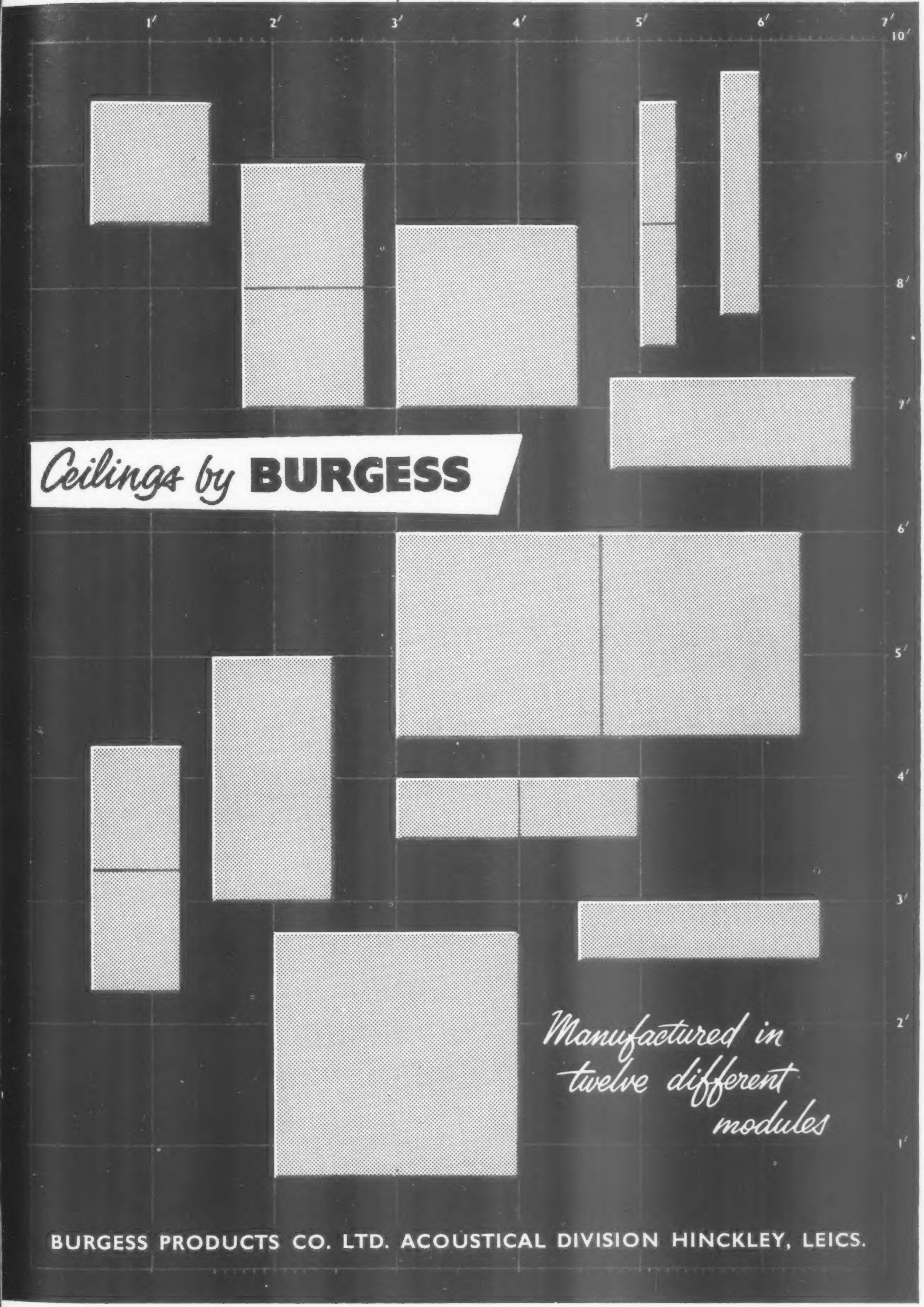
1' 2' 3' 4' 5' 6' 7'
10' 9' 8' 7' 6' 5' 4' 3' 2' 1'
Ceilings by BURGESS
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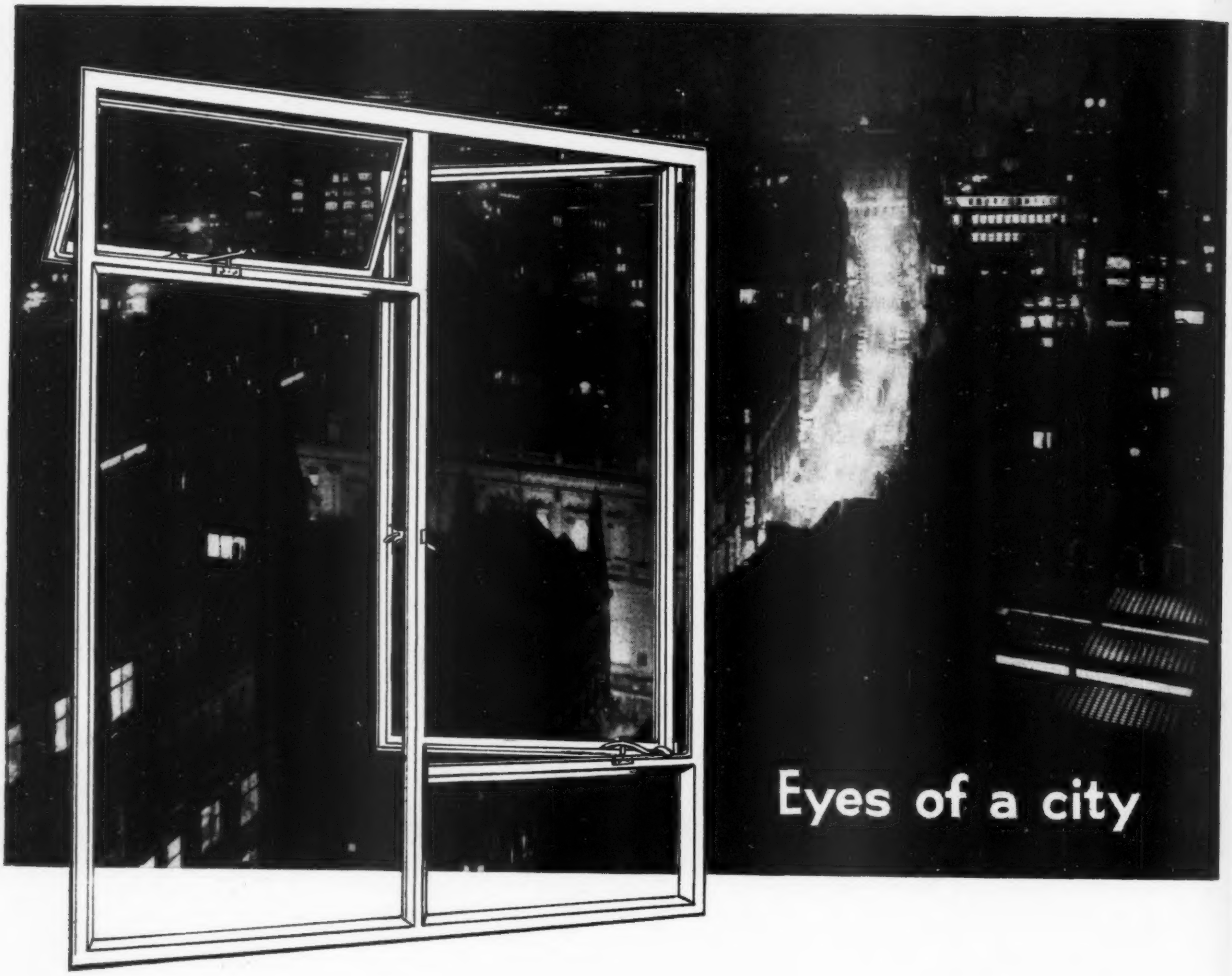


ANTICIPATING the practical needs of extensive multi-storey building developments in our Cities, the Beacon Inside-Glaze Window is a low-cost solution to the glazing problems of high buildings. All Beacon windows in the B.S.S. 990 range can be specified with inside glazing and yet maintain one-piece construction and identical overall sizes: coupling is not required.

BEACON STANDARD WINDOWS FOR **INSIDE GLAZING**

MEMBER OF THE METAL WINDOW ASSOCIATES

JOHN THOMPSON BEACON WINDOWS LTD · WOLVERHAMPTON

CUSTOM-BUILT CONTROL PANEL

FOR KINGS COLLEGE UNIVERSITY OF DURHAM

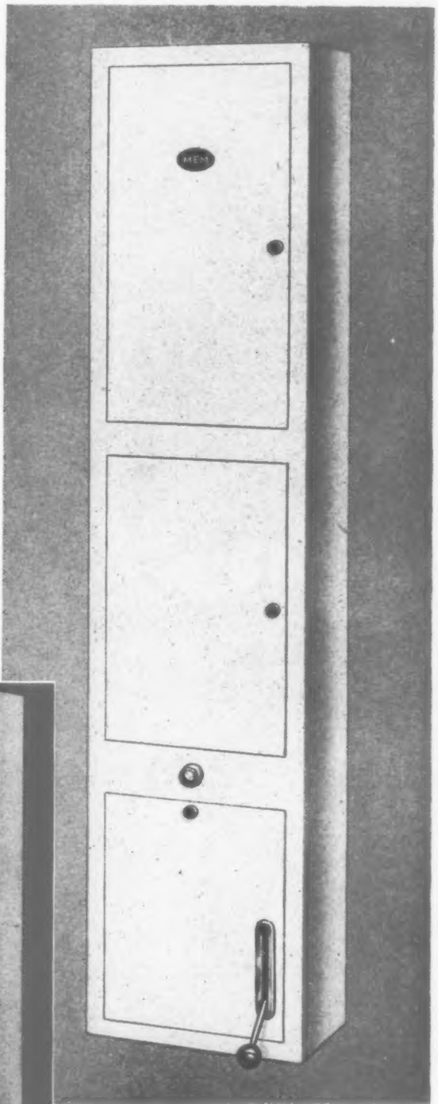
A typical custom-built control panel designed to the specification of R. W. Gregory & Partners, Consulting Engineers of Newcastle-on-Tyne, for the new Physics Teaching Block of Kings College, University of Durham.

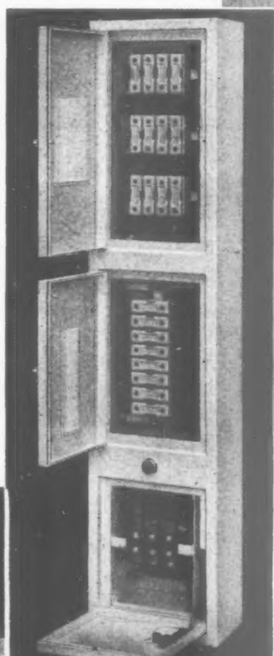
This is one of a number at present being made up in our Panels Department, which is fully equipped to manufacture custom-built switchboards, control units and motor control cubicles, etc.

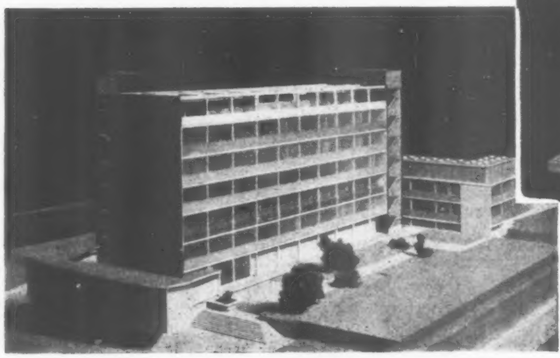
The unit illustrated incorporates the new "EXEL" distribution board interiors which are suitable for either rewirable or H.R.C. fusing, and in the case of H.R.C. types, the fuse carriers will accommodate H.R.C. cartridge fuses to B.S. 88, 1952, Clause J. dimensions.

The main fused isolator is of the well known "Glasgow-Rex" range modified for flush mounting and rated at 60 amps, 500 volts, T.P. & N. pattern.

Fusing of the distribution section is 30 amp throughout.







The cabinet is of dust proof construction. The covers, which are flush pattern, are mounted on concealed hinges and are fitted with gaskets of resilient foam rubber.

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MIDLAND ELECTRIC MANUFACTURING CO. LTD. REDDINGS LANE, TYSELEY, BIRMINGHAM, 11

Gentlemen, be seated...

is always a welcome invitation, particularly when sitting down into the luxury of the 'Steel Style' TT8—a comfortable and elegant armchair styled to harmonise with any decor.

Steel Style
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Tables and Chairs for every purpose

Strongly built, the 'Steel Style' TT8 Armchair has a tapered steel frame, bonderised and finished in two coats of best quality stove enamel. The deep latex foam contoured seat and back are upholstered in a wide variety of luxury coverings. It is easy to move and clean, and its adaptability enables it to be used as a twin-arm chair, a single-arm chair (right or left arm), and as a settee formed by two or more units.

The 'Steel Style' TT8 is ideal for executive and reception offices, board rooms, showrooms, airport and hotel lounges. We suggest you phone or write for a representative to call and show you this outstanding armchair.

ADVISORY SERVICE

New Equipment Ltd (manufacturers of 'Steel Style' furniture) will be pleased to advise on all furnishing problems, as a solution can probably be found in the comprehensive 'Steel Style' range.

'Steel Style' Furniture is used by many well-known organisations including: THE MARLEY TILE CO. LTD., REED PAPER GROUP LTD., SHELL-MEX & B.P. LTD., C. A. PARSONS LTD., BRINTONS CARPETS LTD., THE PLESSEY CO. LTD., GLAXO LABORATORIES LTD., BRITISH OXYGEN GASES LTD., Y.M.C.A., UNITED GLASS BOTTLE CO. LTD., RENOLD CHAINS LTD., INTERNATIONAL PAINTS LTD., HEAD WRIGHTSON & CO. LTD., LONDON COUNTY COUNCIL.

Manufactured by **NEW EQUIPMENT LTD., CROXDALE, COUNTY DURHAM. Tel: Spennymoor 2246/7**
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Solving Two Problems

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GLASS VENTILATORS

Patent No. 23858 *Registered design No. 888900*

This simple and highly efficient means of controlling ventilation will be appreciated in all buildings where fug, fumes, cooking smells, etc. are encountered.

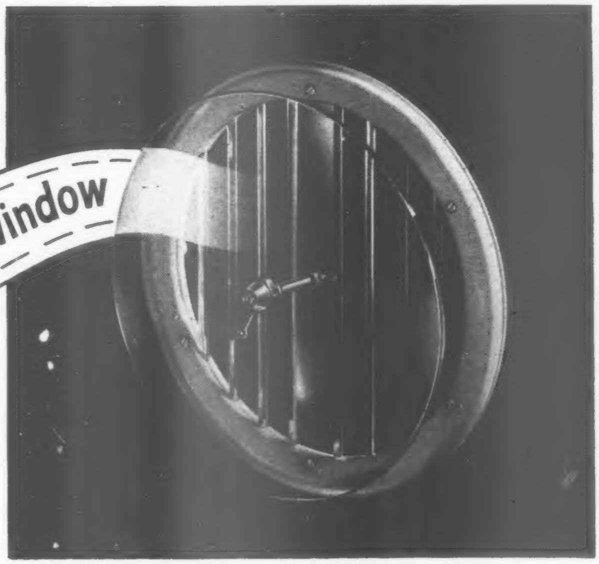
Smooth in operation, the 'Ventilex' Ventilator may be completely closed or opened to any degree, ensuring accurate control of the air-flow to meet changing conditions. The frame and opening mechanism are moulded in cream plastic. The movable disc is of toughened glass. Diameter of glass disc: 9½".

The 'Ventilex' is particularly suitable for kitchens, canteens, bars, bathrooms, offices, showrooms, etc. It can be fitted to existing windows.

'INTER'

Registered design No. 888909

The Glass 'Talk-through' Window



An hygienic and fool-proof means of two-way communication for cash desks, kiosks, theatre and railway booking offices, hospitals, banks, etc.

Attractively styled in ivory plastic and toughened glass, the 'Inter' Glass Talk-through Window provides facilities for easy conversation combined with hygienic protection, eliminates draughts and is a safeguard against theft.

When not in use, the toughened glass disc is simply moved to the closed position by means of the chromium plated mechanism.

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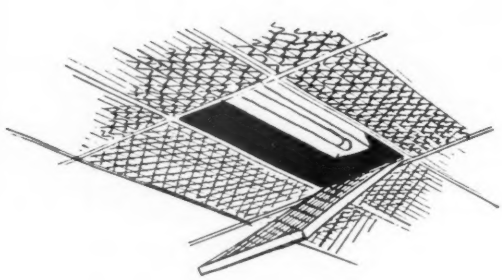

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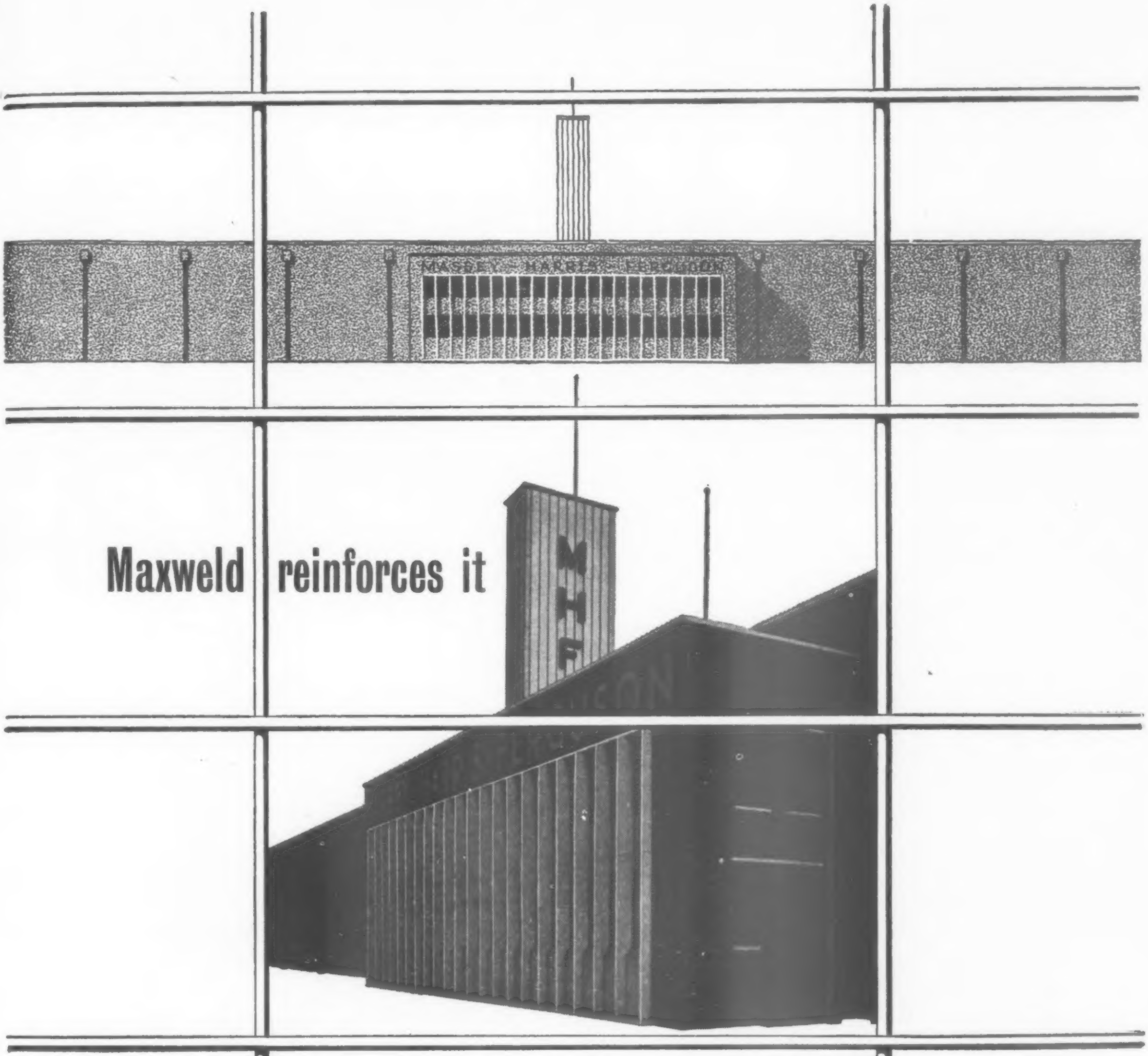

The reinforcement fabric used in the Massey-Harris Ferguson factory at Stretford was supplied by Richard Hill. Do you need reinforcements? Then call up the Maxweld man! He can give you all the facts on the type and quantity of fabric you'll need plus a rough idea of the cost. And he's backed by the

Richard Hill Design Service

who can then draw up more detailed plans and estimates. You can get him at Middlesbrough (2206), London (Mayfair 3538), Birmingham (Mid. 5625), Manchester (Central 1652), Leeds (2-7540), Bristol (24977), Glasgow (Central 2179), Nottingham (Bulwell 27-8383), Bournemouth (Westbourne 63491), Cardiff (46552), Belfast (29126).

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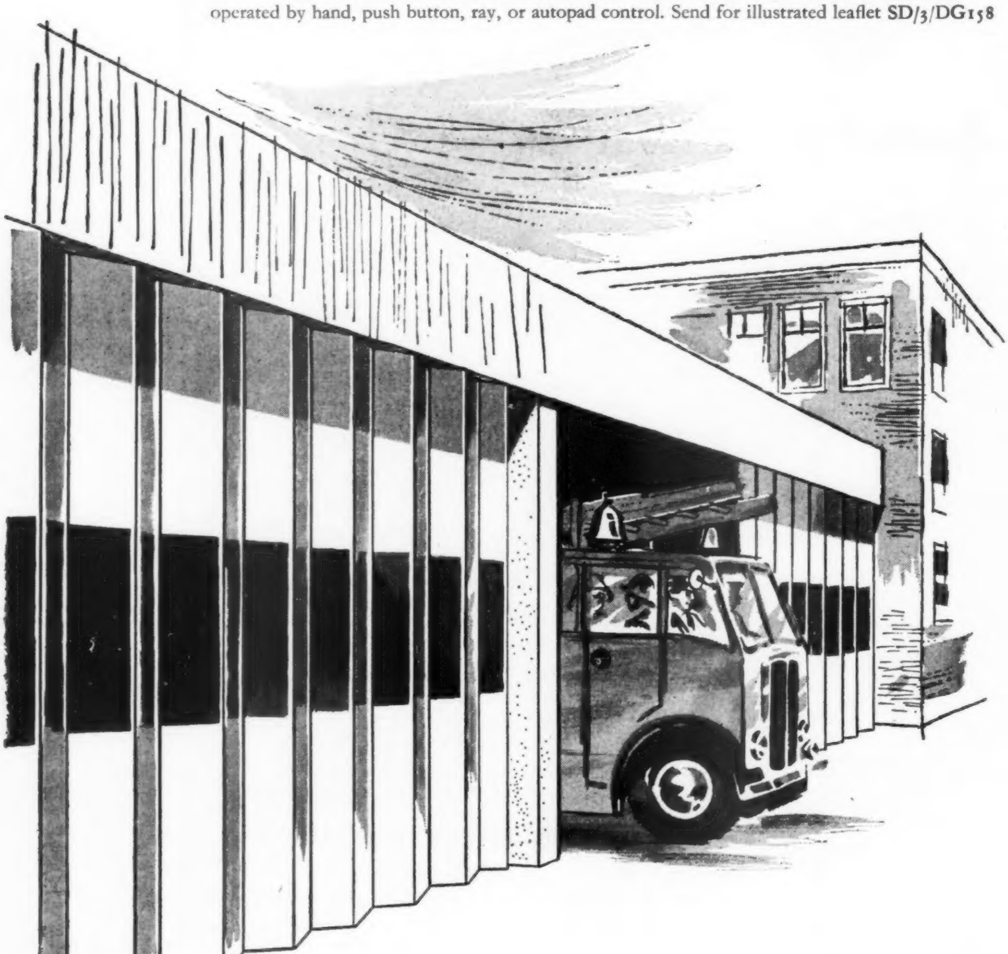

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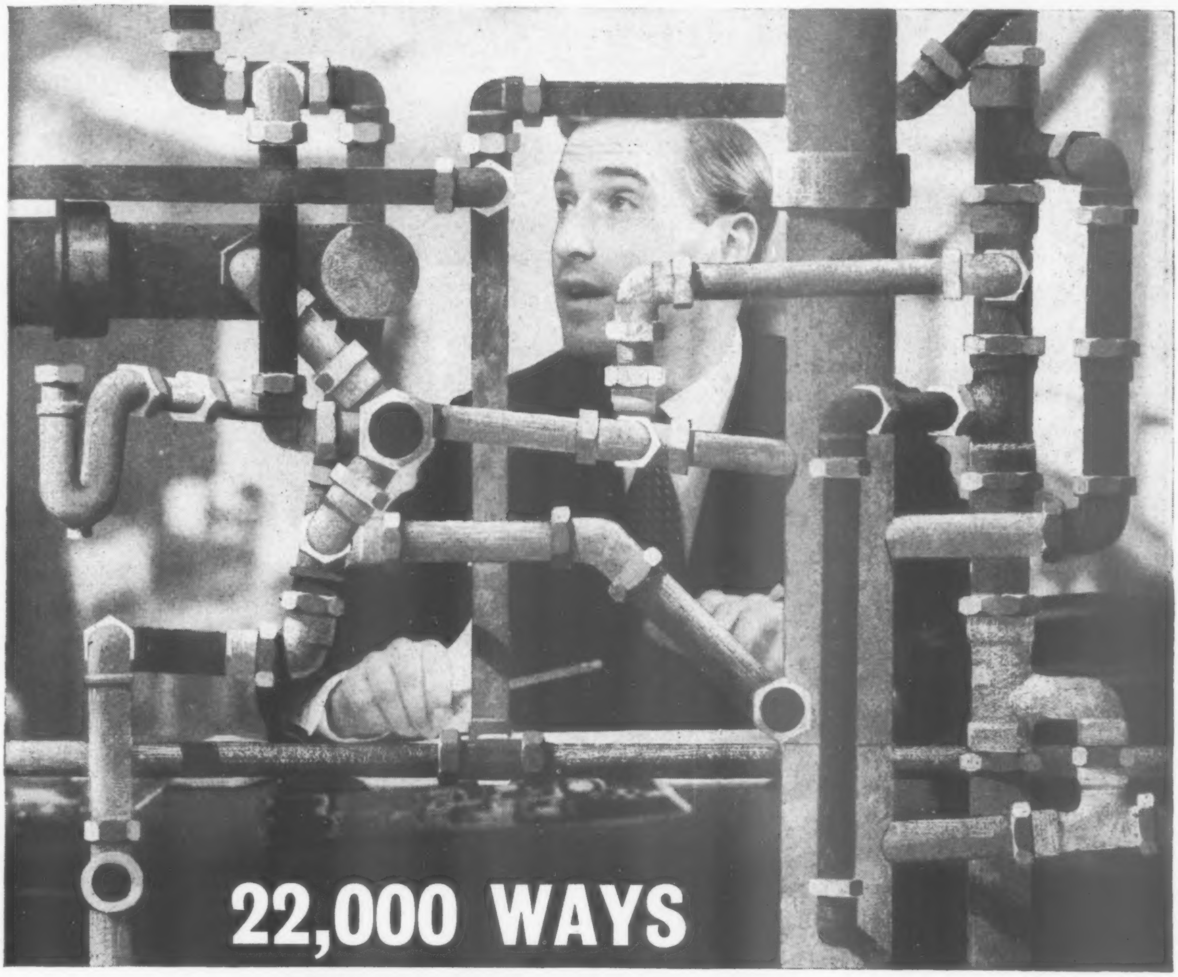

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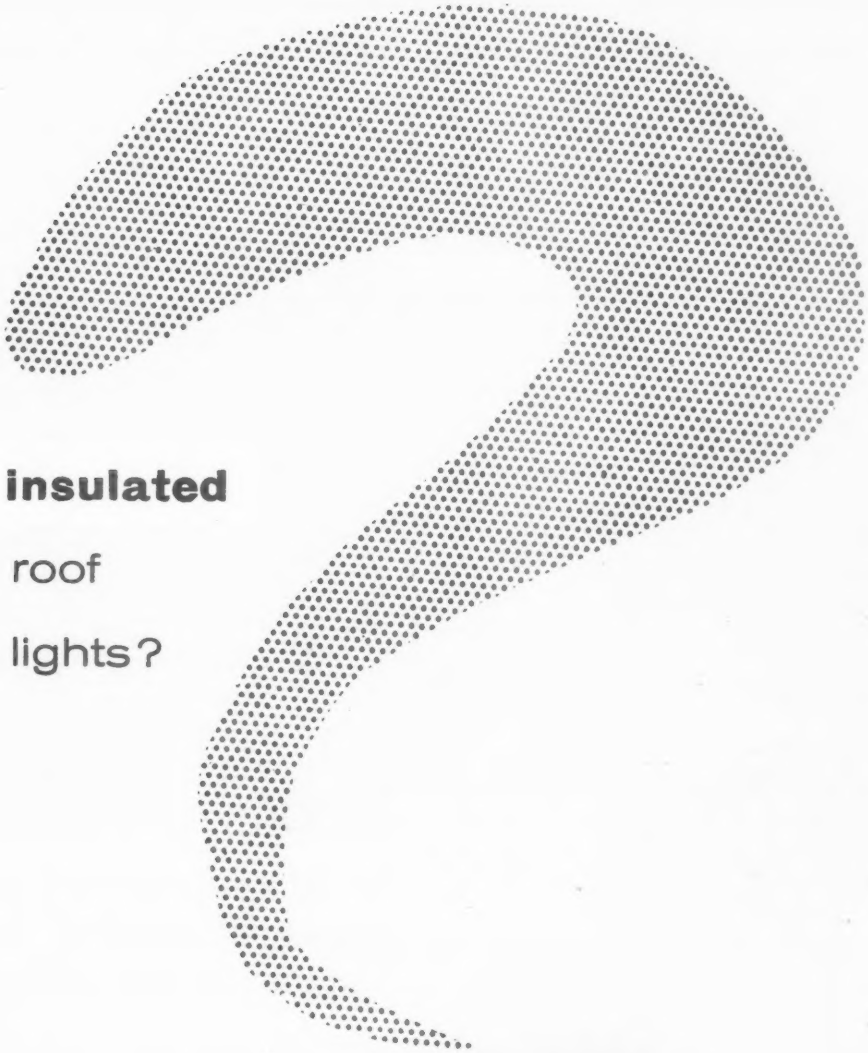

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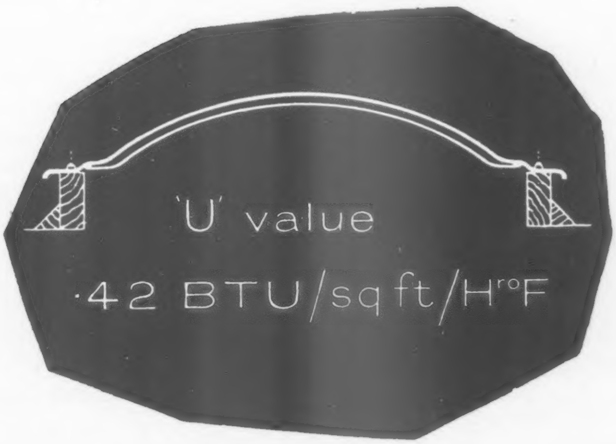

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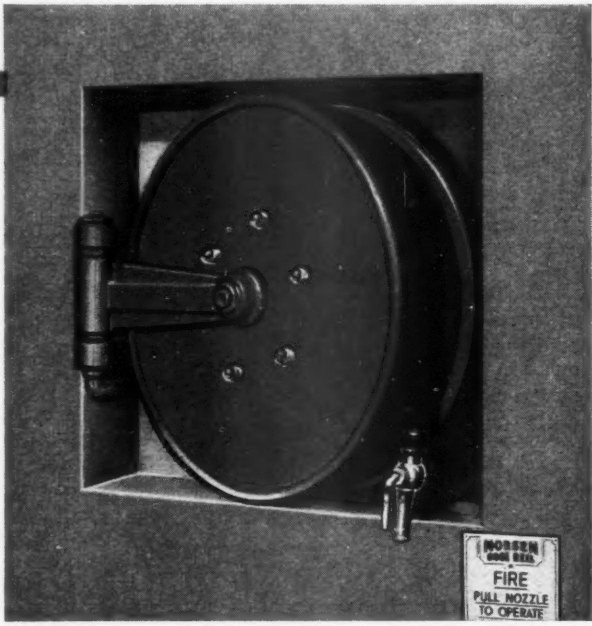
(Nicholson's Patents)

FIRE HOSE REELS



On right "The Architects' Dream"

THE NORSEN RECESS SWINGING AUTOMATIC HOSE REEL

This reel can be housed flush with the wall face and is capable of swinging through a full 180° (Nicholson Patent). It can be mounted to swing from either side of the recess—a great advantage when positioned at the ends of corridors or narrow passages.

When the reel is recessed, no obstruction is caused. If required, a door, decorated to conform with the general scheme can be fitted to conceal the reel.

ALL NORSEN REELS CAN BE FINISHED IN ANY CHOSEN COLOUR AS AN ALTERNATIVE TO THE STANDARD RED

THE NORSEN (WALL TYPE "B") AUTOMATIC HOSE REEL

The standard Norsen Reel for general purpose use. Water entry pipe from top, bottom or side as required. Specially-designed hose guide ensures instantaneous unreeling in any direction.

THE NORSEN SWINGING AUTOMATIC HOSE REEL

This reel is designed to swing through a full 180° and is thus ideal for siting at corridor junctions. The water supply from the inlet pipe is carried through the hollow arm of the reel.

THE NORSEN (WALL TYPE "A") AUTOMATIC HOSE REEL

Normally positioned at the ends of corridors, this Norsen Reel can be mounted either standing on its base or hanging from soffits. A reel carrying up to 120 feet of hose can be accommodated on a baseboard measuring only 27 inches wide.

No other equipment can provide Norsen's instant AUTOMATIC response to the challenge of fire

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Norsen Reels come into operation INSTANTLY. The unreeling of a pre-determined length of hose (usually about 10 feet, 6 inches) automatically operates the valve inside the reel and immediately, full water pressure is at the nozzle under the operator's control.

★ **IN CASES WHERE THERE IS INSUFFICIENT WATER PRESSURE OR ONLY A STATIC SUPPLY IS AVAILABLE, AN AUXILIARY PUMP CAN BE SUPPLIED. FULL DETAILS CAN BE OBTAINED ON APPLICATION.**

If you are engaged in the design of a building for which built-in fire protection is scheduled, send us a tracing of the general plan and, entirely without obligation, we will prepare a complete scheme and estimate based on the strategic siting of Norsen Reels to give you the maximum in protection at the minimum in cost.

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Industrial Engineering Ltd. is a subsidiary of Kelsey Industries Ltd., a public Company. Industrial Engineering concentrates wholly on roofing, and amongst its regular clients are The British Transport Commission, Government Departments, Nationalised Industries and large industrial undertakings.

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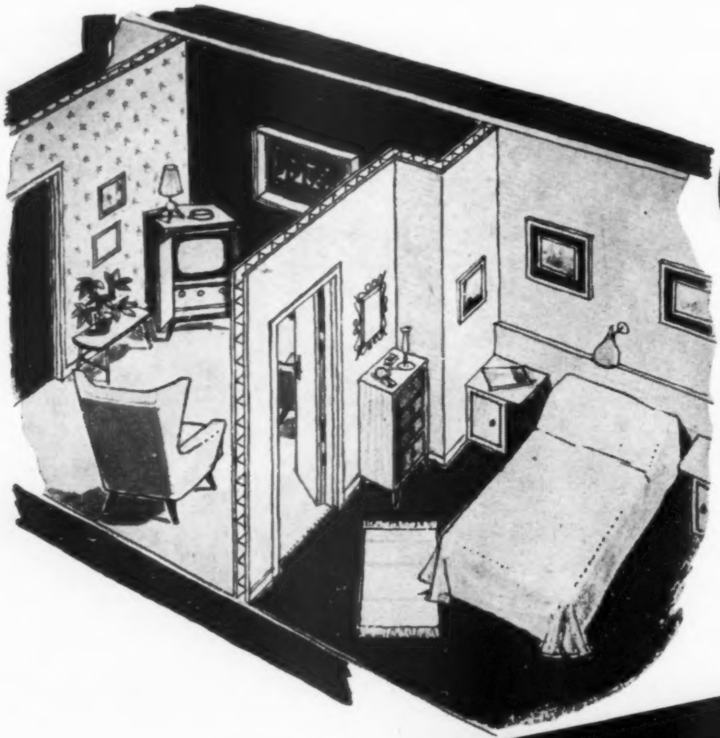
Branch Offices: *Belfast, Birmingham, Bristol, Dublin, Glasgow, Hemel Hempstead, Kettering, Leeds, Leytonstone, Manchester, Mitcham, Newcastle, Sheffield.*



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Construction and
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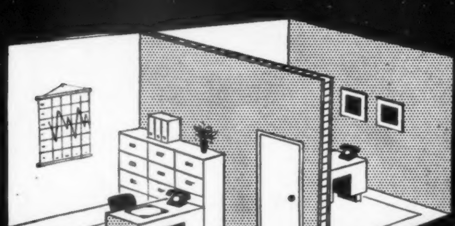
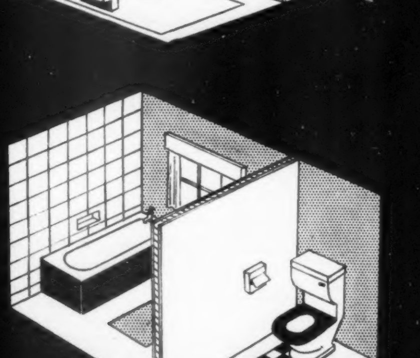
Paramount Dry Partition





Ideal for inner linings to external walls, internal walls and partitions, Paramount Dry Partition is strong, rigid, easy-to-cut and handle. Light in weight, highly fire-resistant it has good sound and thermal insulating properties. Being a 'dry' product, it is ready for immediate decoration and saves hours of on-site labour. The accompanying illustrations give an idea of the impressive range of uses for this outstanding wall unit. Off-cuts have the same strength as the original panel and can be used for constructing built-in wardrobes, airing and meter cupboards etc. For full details about all Blue Hawk DRY CONSTRUCTION materials apply to:

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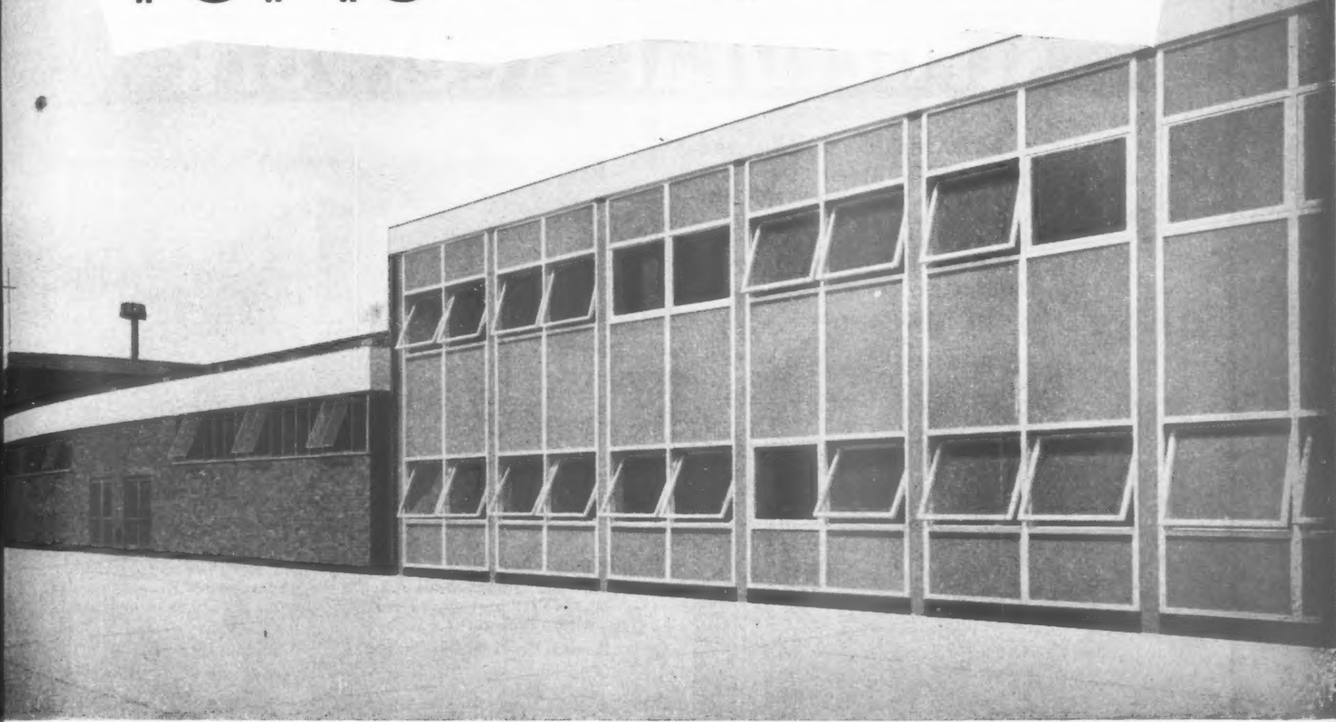
BLUE HAWK PRODUCTS

AP193

TOMO double-glazing at London Airport



Administrative and operations offices for aviation fuel supplies at London Airport, half of which are occupied by Shell-Mex & B.P. Ltd. and the other by Esso Petroleum Co. Ltd. Architect: Frederick Gibberd, C.B.E., F.R.I.B.A., M.T.P.I.

We think you'll agree that the appearance of these attractive offices at London Airport is enhanced by their TOMO double-glazed WINDOWS. But that's only a small part of the story. TOMO double-glazing also offers excellent thermal-efficiency values, remarkable sound-reduction properties, finely-controlled ventilation and total indoor window-cleaning.

On the subject of thermal efficiency, we should like to refer you to the report of a recent B.R.S. test quoted on the right. It speaks volumes.

When you work within whistling distance of aircraft, sound reduction becomes a matter of vital importance. Here TOMO WINDOWS score heavily. The total reduction in sound level depends finally, of course, on the thickness of glass employed and the space between panes. Using 32-ounce glass spaced at 1¾in., TOMO double-glazing gives a reduction of approximately 40 decibels and will, we hope, save Shell-Mex and Esso personnel not a few headaches in the future.

One last point, TOMO double-glazed WINDOWS are suitable for inward or outward opening and can be top-hung, bottom-hung, side-hung or pivot-hung. Any further information you may require will be gladly supplied.

BUILDING RESEARCH STATION TESTS

When a standard-production TOMO WINDOW Wall-Unit (8ft. by 8ft.) was tested at the Building Research Station, Garston, the mean thermal transmittance of the complete unit was found to be 0·31 B.Th.U./sq.ft./h./°F. This is equal to the thermal transmittance of a traditional 11in. cavity brick wall! This impressive result was further improved to 0·29 when the TOMO pleated blinds, fitted between the panes, were lowered.

The U-value of the window-area only was found to be 0·38 which, with TOMO pleated blinds down, became 0·35. At 0·38, TOMO double-glazed WINDOWS are substantially (29%) better than the U-value of 0·47 quoted for conventional double windows in the I.H.V.E. Guide to Current Practice, 1955.

FOR UTMOST EFFICIENCY IN THERMAL INSULATION AND SOUND REDUCTION— SPECIFY

TOMO

DOUBLE GLAZED WINDOWS

—purpose-made in finest timbers to Architect's size, style and finish

NEW!

A Stock-size TOMO double-glazed 'Picture' Window, horizontal-pivot hung, to the BS5644 overall size 5'11½" wide × 4'0½" high. Made from best quality softwood, ready-primed; £25 nett ex-works.

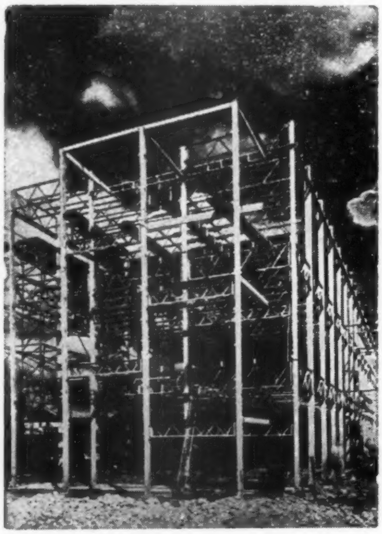
— NOW AVAILABLE FROM STOCK!

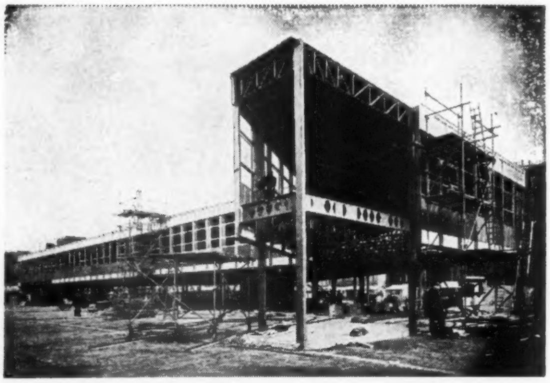
TOMO TRADING CO. LTD., COWLEY PEACHEY, UXBRIDGE, MIDDX.
Telephone: West Drayton 3751 (10 lines)

structural steelwork

THE BOWATER PAPER CORPORATION LIMITED. The Architects for the new Office Blocks at both Mersey and Northfleet designed for Lattice Steelwork on a modular grid which allowed service lines to be run between floor and ceiling and gave complete flexibility for internal arrangements.

Architects: Messrs. Farmer & Dark.



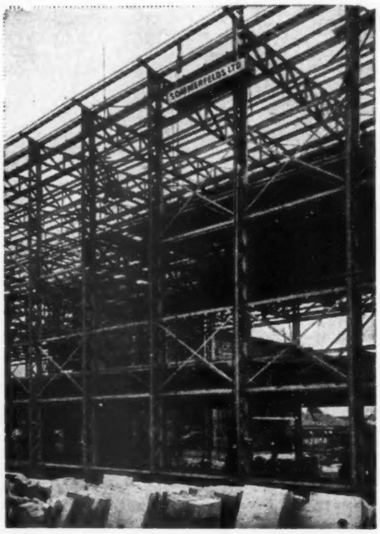


B.E.A. For this B.E.A. Building, speed was the essence of the Contract. Sommerfelds designed the Steelwork and from unloading the first lorry on site to the completion of a 250 ton steelwork erection took three weeks.

General Contractors: Messrs. Richard Costain Limited.

YORK. For the City of York a Grammar School. Sommerfelds designed the Steelwork on a 3ft. 4in. modular grid allowing complete freedom for the Architect to use curtain walling and internal arrangements.

Architect: E. Firth, F.R.I.B.A., A.M.T.P.I., City Architect.



I.C.I. For I.C.I. a Laboratory Block. A multi-storey building with a height to eaves of 44ft. and uninterrupted spans of 50ft. on each floor. Deep Lattice Beams and light stanchions were used with considerable saving in steel requirements.

Architects: Messrs. J. Douglass Matthews & Partners.

Sommerfelds LTD. WELLINGTON · SHROPSHIRE
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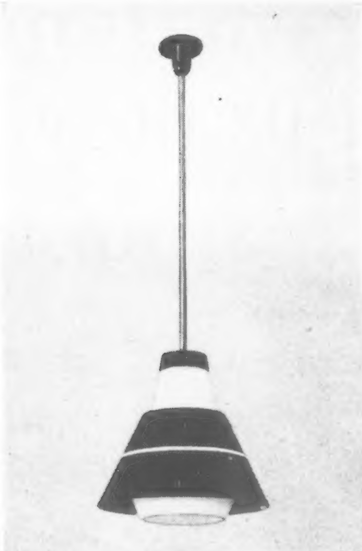

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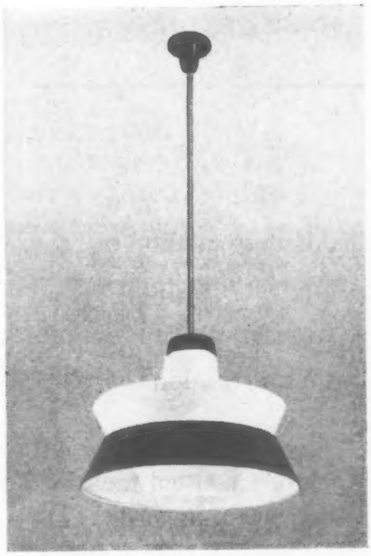

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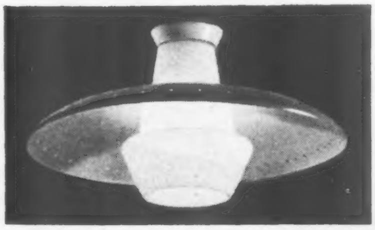

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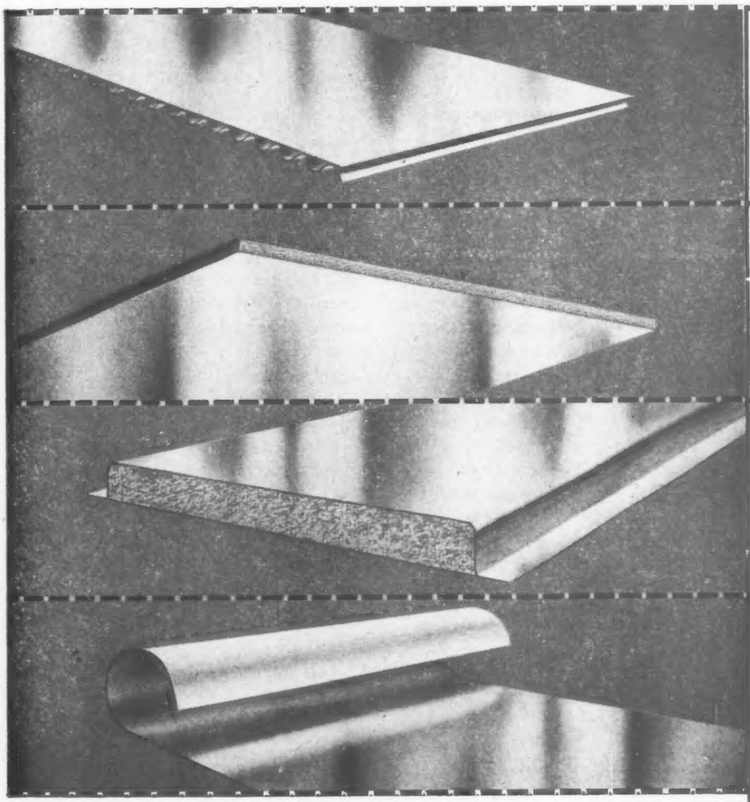

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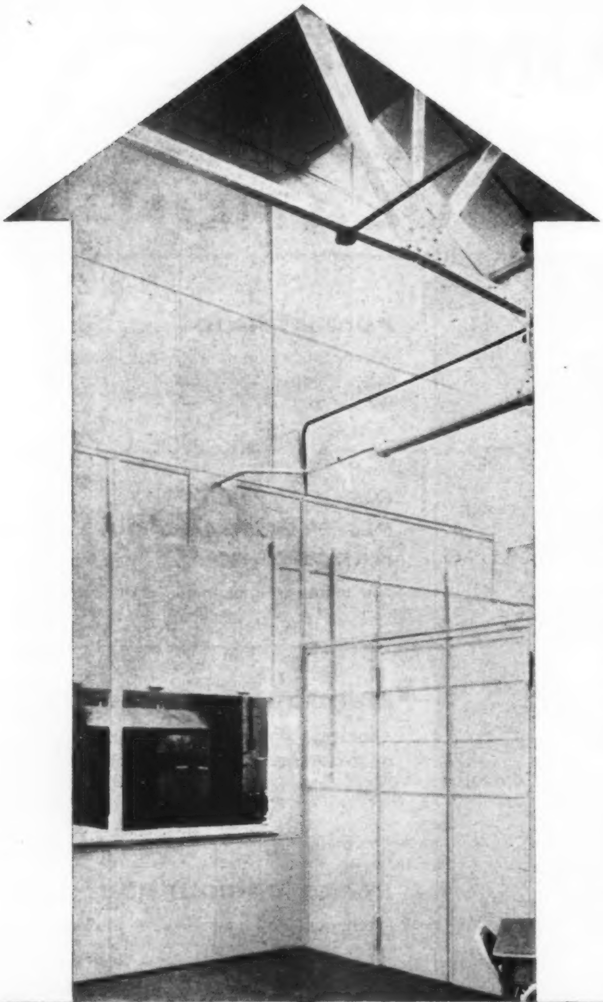

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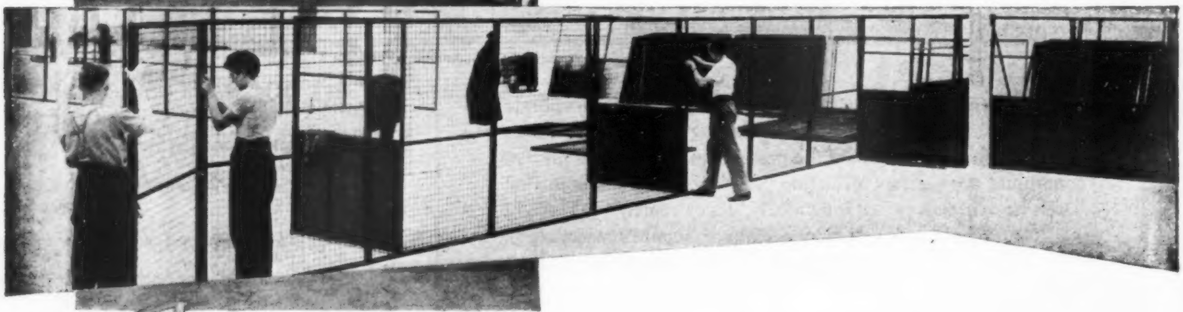

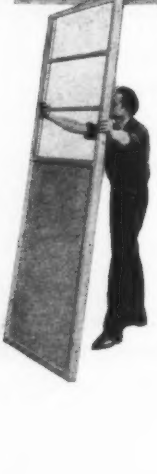

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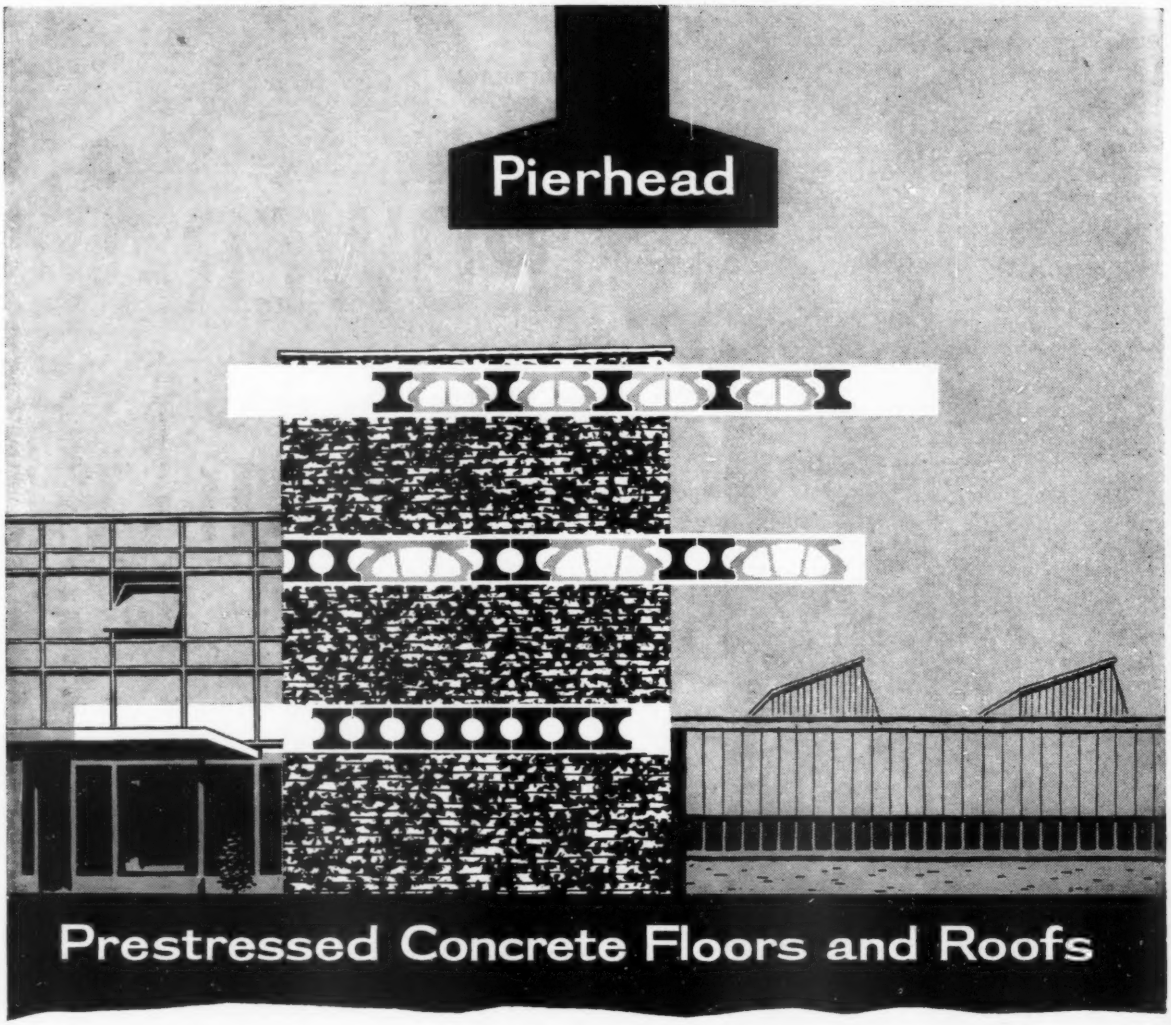

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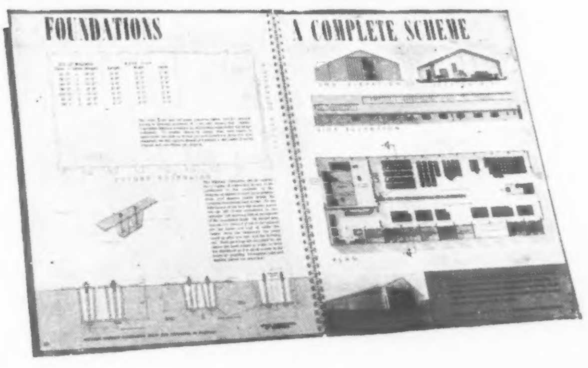

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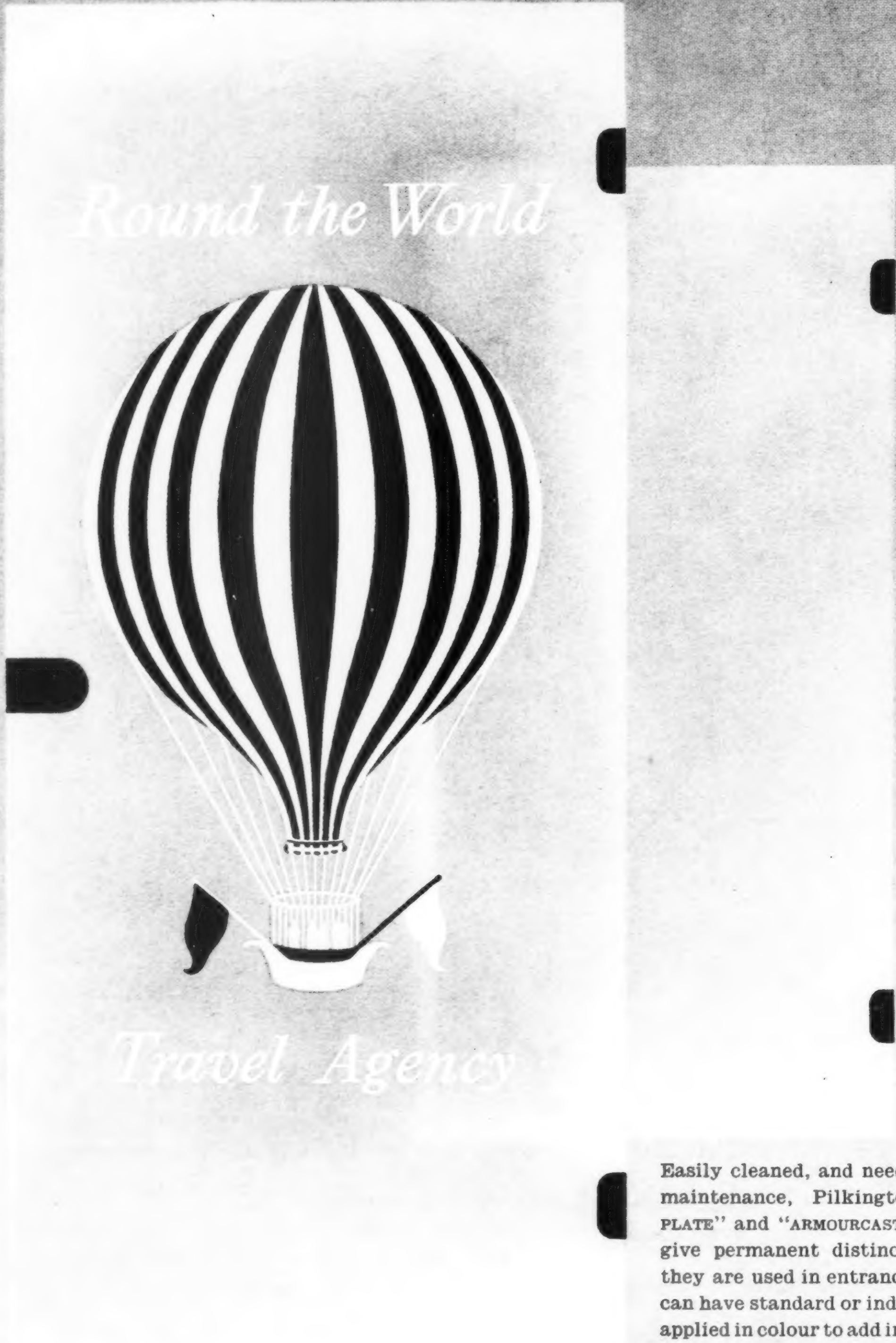

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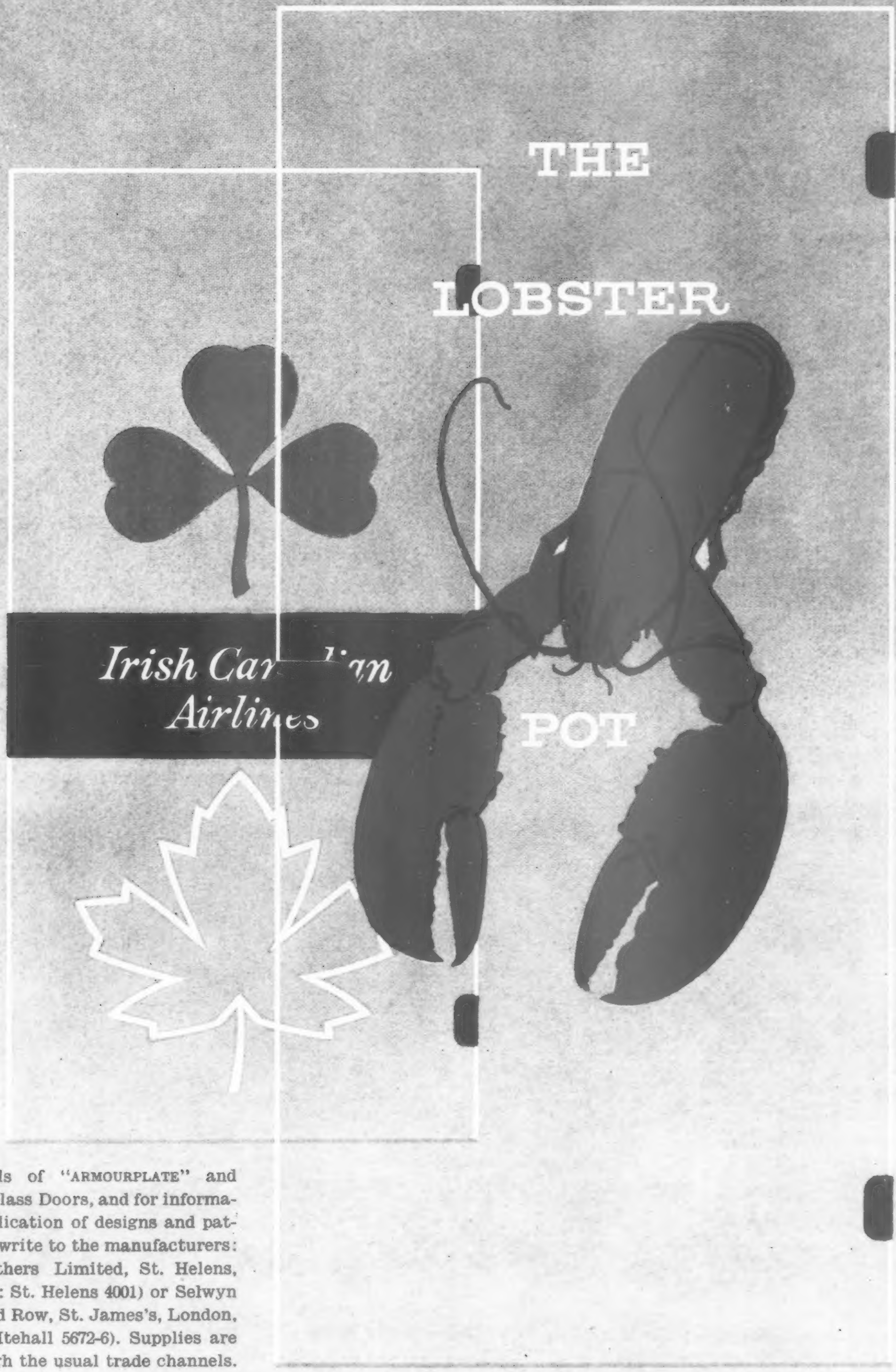

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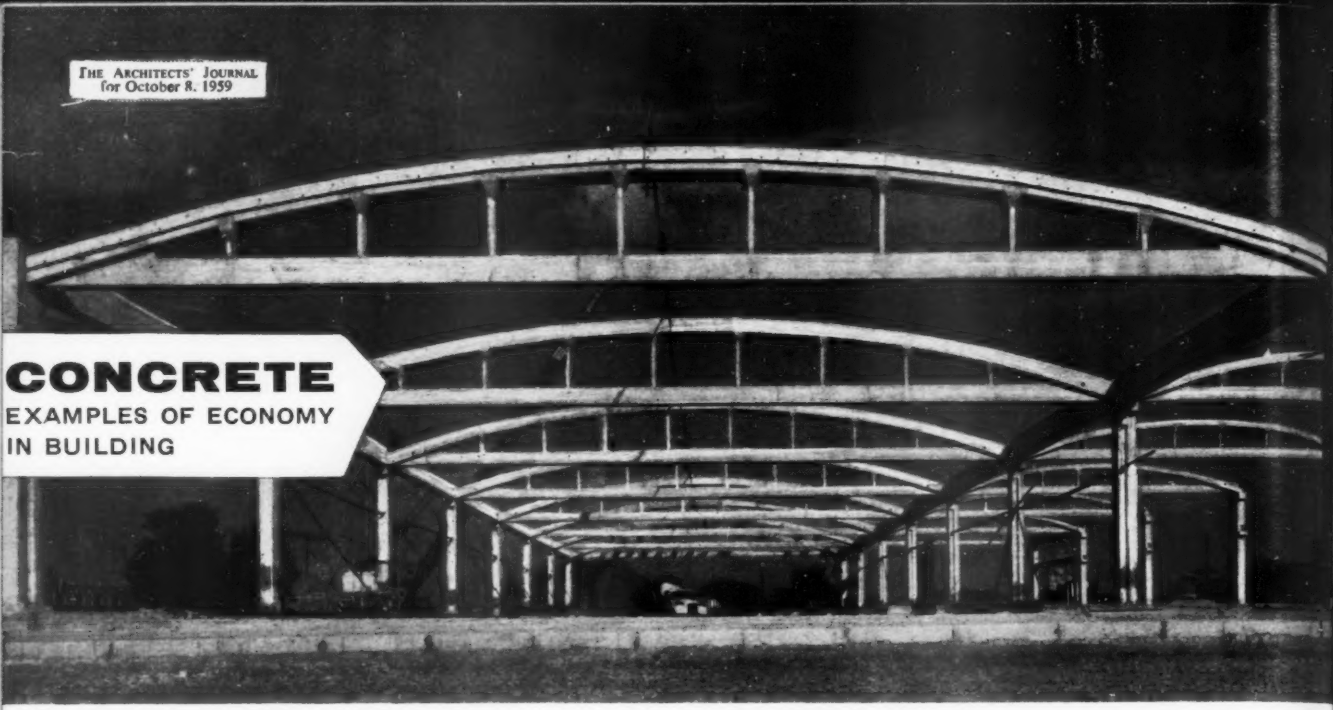

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The perimeter and spine beams are hollow precast reinforced concrete and house the gutter. Outlets for rainwater pipes can be seen in the lower photograph adjacent to columns. Rebates in the sides of the columns, visible in the upper photograph, are for housing brick panel walls.

All columns are precast, external ones being 12″ × 14″ and 15″ × 14″, internal ones being 15″ × 18″ and corner columns 24″ × 18″.

Architect: Matthew Maybury, A.R.I.B.A.
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The Architects' Journal

No. 3364 Vol. 130. October 8, 1959

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NOT QUITE ARCHITECTURE

Treble-one

Just a bit about Farnborough. Not the new aircraft, not even the astonishing Hovercraft trundling sedately up the runway like a cross between a combine harvester and a floor polishing machine, because the show is slowly dying—the new things that are being done can no longer be done at an exhibition—and at 29 I find it a bit unnerving that something I grew up with is already nearly dead.

*

Treble-one squadron: black Hawker Hunters performing miracles of formation acrobatics. Last year they were doing formation loops and rolls with up to 22 aircraft. This year they used 16 in two eights doing separate co-ordinated aerobatics so that the sky was never empty, something which is even more difficult to calculate and perform.

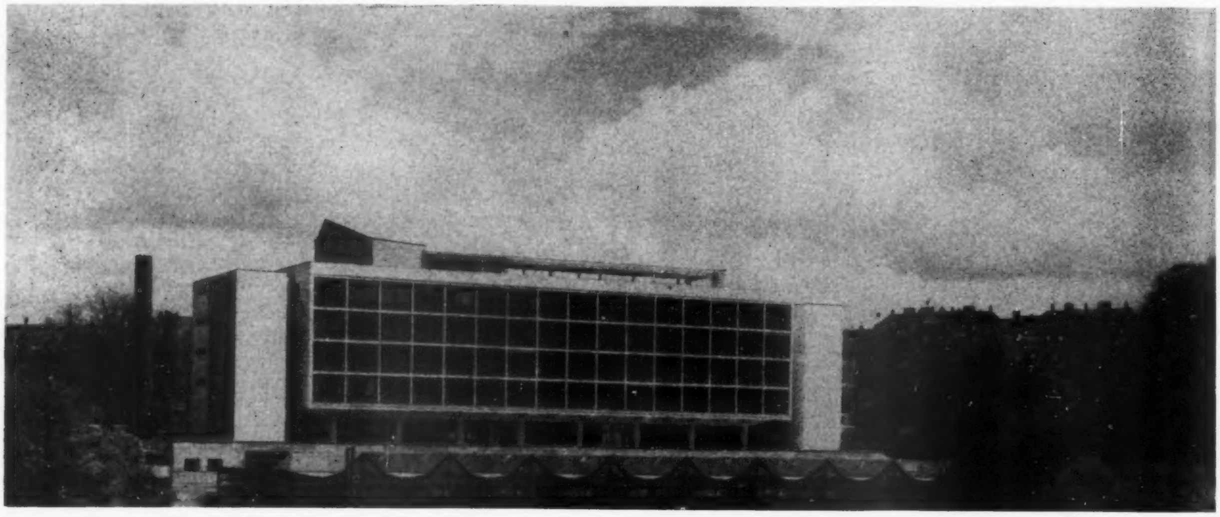
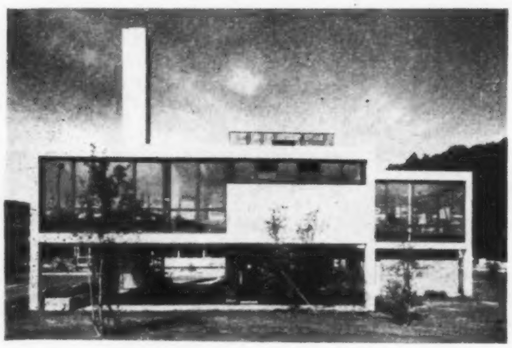
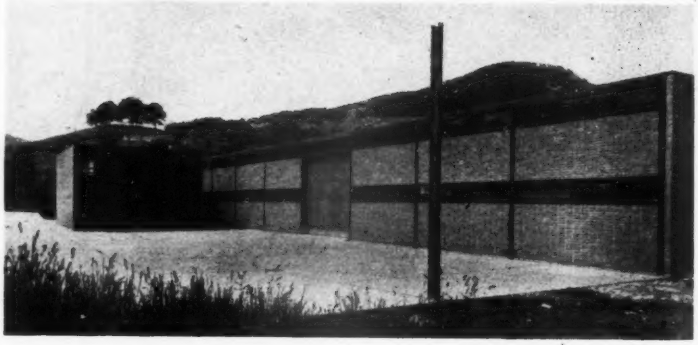
*

The difference between Treble-one and any other formation team I have ever seen is that in the whole display it is literally impossible to regard them as separate aircraft. They are a single black entity which can break up and reform without the units ever seeming to have had a separate existence. When this is elegantly augmented and underlined with smoke-trails which can be stopped and started at will, the result is one of the miracles of twentieth-century art. Here is our true equivalent—in some of the manœuvres almost a literal equivalent—to stiff leaf capitals: continuous arabesque, always changing yet always controlled. That the materials are "red-hot pursoot ships" instead of stone and chisel, that the controller is not God but a doubtless very human F/Lt. or S/Ldr. is interesting but irrelevant: we must take perfection where we find it.

*

Begging your pardon, this has all been said before, and Le Corbusier found his perfection in some very weird aeroplanes of the 1920's (French bombers of that date all look as though they had been designed by



Swiss Industrial Architecture

The pıogress in standards for factories can be assessed by the photographs, top of page. On the left is shown the Bally shoe factory, Shonenwerd, Switzerland, in 1882. In contrast is the ball-bearing factory at Bienne, designed by Charles Kleiber seventy years later. For those who are unduly confident about technical progress, it should be noted that in both illustrations workers have individual lamps, protective clothing, and window blinds controlling glare. The twentieth century is not so far ahead as we like to flatter ourselves. Centre, above, is the workshops and classroom block of the Berne Technical School, designed by Hans Brechbuhler in 1937; another example to remind British architects how slowly we progress, for such standards of design are barely being reached in this country twenty years later. Above, left, a canteen for Siemens Electrical Products, Ltd., in Weininger-Zurich, by Walter Niehaus, built this year, and right, a metal workshop in Solothurn by Franz Fuegg, built last year. These illustrations come from the RIBA's exhibition of Swiss Industrial Architecture, which opened at Portland Place last Tuesday and lasts until October 17.

Viollet-le-Duc's grandson). But—if Corb was sincere about any of *Vers une Architecture*—he was seeking perfection in the name of the machine, because machines were just the thing then, along with the Charleston, when he ought to have been seeking it for its own sake. I could find it easily, but quite differently, in a Giles cartoon, a good landing, a pint of Flower's Keg Bitter, or the Chamberlin, Powell & Bon warehouse at Witham. There's far more art going on than we realize, only it goes by other names.

*

Enough of that. What I do wonder is what it feels like to be one of the semi-robot artists of Treble-one. I have done enough formation flying (non-aerobatic) to sense what it feels like at its best—a complete surrender of individuality for a few minutes, the universe becoming purely a matter of the next wing tip, a few inches from your own. How much stronger must the effect be in an aerobatic sequence rehearsed day-in and day-out with formation leaders in whom one has complete trust?

*

At 21 I fought against this loss of self—if I was going to crash I would rather it were my own stupidity, not somebody else's, etc. Seven years later, I can see that it is an almost exact physical equivalent to the spiritual exercise, advocated by so many religions, of identification with the God-head (sorry, I can't make it sound any less pompous) which leads me to macabre thoughts—"Achieve your catharsis the aerobatic way, this year" or "Straighten your kinks with formation loops!" In view of coming events it would be very nice to get our political leaders to do half-an-hour's dual formation flying a day, as an aid to their spiritual development and political integrity. If you have any nominations for tail-end Charlie, who has to work the hardest, kindly do not send them to

IAN NAIRN

as he has the space already reserved.

DIARY

Building Matters. Cleeve Barr talks on New Towns and Stanley Boakes on Concrete. BBC Network 3. 7 p.m. OCTOBER 13

Exhibition of Modern Yugoslavian Architecture. At the BC, 26, Store Street, London, W.C.1. OCTOBER 14 TO NOVEMBER 6

Sound Proofing and Thermal Insulation. Papers by E. F. Stracey and J. Churton at the RSH, 90, Buckingham Palace Road, S.W.1. 2.30 p.m. OCTOBER 14

Landscape Architecture on Rocks and Sand. Talk by George Carpenter at the AA, 34/36, Bedford Square, W.C.1. 6.15 p.m. OCTOBER 14

The 50s—The Revolution in Architectural Thinking since 1950. Talk by Peter Smithson at the ICA, 17/18, Dover Street, W.1. 8.15 p.m. OCTOBER 15

The Editors

THE NEW BUILDING CLASSIFICATION

READERS will notice that with this issue we have commenced to print the symbols of the new classification put forward by Dargan Bullivant in the JOURNAL, September 24.

The International Council for Building Research Studies and Documentation (CIB) which has just held its first Congress, has accepted the recommendations of its Working Group for the institution of this new system of classification. The system, known as SfB, is based on the Swedish system which has been operating for some years now in that country. It has been modified and developed by the Working Group after considerable research and the examination of a number of alternative systems.

The CIB endorsement of the new system is a triumphant vindication of the work of the AJ Research Fellows, Dargan Bullivant and the late Michael Ventris. Bullivant was a member of the CIB Working Group and has been appointed secretary of a new sub-committee whose task will be to co-ordinate the work of member countries in implementing the system. As members of CIB, the RIBA and BRS, together with the Timber Development Association and Cement and Concrete Association will, no doubt, waste no time in adopting the system. It is to be hoped that all other research organisations and manufacturers disseminating technical and trade literature will follow suit. Dargan Bullivant is to be congratulated on his work.

The Editors, who are anxious to know the results of the new system at work, continue to invite readers who adopt the system to submit their comments after a period of trial, and have suggested to a number of schools that a meeting be held to discuss its introduction to students. Reports of progress will be published.

SIXTY YEARS RIPENING

The TCPA, which celebrates this year the sixtieth anniversary of its formation, has put on display at Burlington House an exhibition of the post-war New Towns. These are the slow ripening fruits of its vigorous, progressive endeavours, for which it deserves its share of the nation's thanks. No layman can wander through the exhibition without being impressed by the idyllic scenes presented by photographs of the fifteen new towns. The sun always shines on neat, fresh-painted houses with grass verges in front and trim gardens behind. The scintillating schools are thronged with smiling well-fed children and the shopping centres with cheerful, fecund wives whose husbands are happily at work (with the h.p. second-hand car parked in the road outside) in multi-shaped modern factories. Here is the beginning of the Jerusalem, as the TCPA imply in the opening screen to the exhibition, being built in England's green and pleasant, if shrinking, countryside. Here is the reward for the TCPA's long fight for garden cities. No one should decry their great endeavours or belittle our indebtedness to them. No discerning architect, on the other hand, can go through the exhibition without a sensation of despair—particularly if he visited the SPUR exhibition earlier this year. The New Towns represent an ideal of the last century. While deserving study and admiration from foreign visitors, they should now extract from the British architect only alarm at their inadequacies in terms of planning and design.

This is not to deny that there are good developments going on: there is very interesting housing at Peterlee and Basildon, for instance, but the only scene of real promise in town planning terms is Cumbernauld. Here is the first indication that the New Towns are being developed to assimilate easily tomorrow's conditions. Cumbernauld is one answer to the problem. It could be described as the first of a second phase of town building, in which lessons can be learnt from the New Towns of the first phase. The pity is that there was no policy of accelerating progress in just one of the New Towns immediately after the war so that some more amendments could have been incorporated in the remainder as experience grew and became available. Unfortunately there is no attempt in this exhibition to judge the achievements and failures of the New Towns. A mere record at this stage is just not good enough. We need more facts on which to base future developments.

While it is obvious that the very idea of building a new town is so novel that there was no need to add to difficulties by being too experimental in design and construction, it does seem odd that so few attempts were made by the Corporations to do development work on the lines of the LCC. Failing study on this and similar points by the TCPA, one turns elsewhere for key information. Perhaps the new Minister of Science—whichever party appoints him—will realize the need for scientific study of the New Towns and take over the work of the defaulting Ministry of Housing and Local Government and try and assess the efficiency of the New Towns in terms of social environment, traffic circulation, ccmmerce, industrial output and legislative procedure. Are we creating in New Towns the optimum conditions for living in the second half of the twentieth century?

We need more New Towns. The expanded towns programme is a failure. The difference between the latter and the New Towns is not one of degree—most of the New Towns are based on the nucleus of an old one—the difference is due to the failure to provide development corporations with the power, however impaired, to get things moving. But one asks for New Towns with a certain reluctance if the probability is that they will contain so much third-rate design. The best is hard to beat but the standards they set are not sufficiently copied. While the RIBA waits for the products of a two A level intake to leaven the mass, could it not hold really thorough criticisms on planning and design for the rank and file who, free from committee work and golf, actually get down to the drawing board and create the third-rate environment so prolifically displayed at Burlington House?

ASTRAGAL
NOTES & TOPICS

PRO AND CON

I don't know whether the advertisement has appeared yet, but the RIBA is looking for a chief information officer (though that's not the official title). The right man will get between £2,000 and £3,000 a year and will work immediately under Secretary Ricketts on a level with the Secretary to the Board of Architectural Education. He will be responsible for all publicity matters, both outside and inside the organization, including those relating to the allied societies, the *RIBA Journal*, exhibitions, press, TV and so on.

*

This is very good news. The Institute needs nothing more badly than a man who can give all his time to professional and public relations.

*

There is one danger. A friend of mine tells me that he finds the work of public and press relations so fascinating that he sometimes forgets he is not one hundred per cent in favour of the thing he is publicising. I can't help feeling that if the RIBA had the same sort of man it might soon be embarrassed. A hard working PRO would find all sorts of ways of telling the public that any architect was better than no architect. But it is no good saying that kind of thing to a public that has many funny stories about the negligence of qualified architects. Perhaps the first job of this publicity man is to publicize to every architect what an architect's responsibilities really are. There is real danger in employing a slick, professional PRO, and in oversetting the profession.

WOT, NO DREAMING SPIRE?

Arne Jacobsen, who has been in Oxford working with his chief assistant, Knud Holscher, on his design for St. Catherine's College, has now been commissioned to landscape the gardens and to design the furniture, fittings, cutlery and so on. I hope British designers won't be too upset: having asked Jacobsen to design the college the University has done the right thing to give him the chance to complete the job.

*

Mr. Jacobsen tells me that his building, which will be in the Oxford collegiate tradition, will be domestic in scale and will have a quadrangle—but not a spire or high tower—and that the materials will include bricks, glass and steel but not stone. These meagre details are tantalising. Until the design has been steered through all the committees that have to be consulted, I suppose we won't hear much more. With luck the design will be approved early in the new year and building will begin towards the end of it.

Arne Jacobsen (right) who has been visiting Oxford to discuss his design for St. Catherine's College is seen here on the site with Alan Bullock, the censor of the college.

NET WORK SMALL

The first item of the new BBC Network Three series, *Building Matters*, was about "Selling Houses by Design." It was given not by an architect, but by a Wolverhampton builder—Geoffrey Maclean. Selling houses, he said, meant solving three problems: appearance, how people wanted to live and price. The architect, he said, was the only man in the building industry with a trained æsthetic approach, but architects and builders made "strange bedfellows" for building remained "the one modern industry where design and construction were almost completely divorced." Mr. Maclean gave the impression it was no use relying on the architect for user research or ideas about economy. This was all the more disturbing since he got over some excellent points on the importance of street furniture and landscape, the importance of teamwork in the design-construction process and the need for "after sales service."

*

The programme as a whole crammed too much into too short a time. Nine minutes were far too little for John Weston (BRS) to say anything memorable about dry alternatives to plaster finishes. If the aim was simply to awaken interest, his conclusion that the new techniques were still no cheaper than the old was hardly the way to set about it.

*

Competing with these two main features were a discussion (*sic*) on the new Code of Practice for Selective Tendering (three minutes) (*sic again*); admonition to scaffold safety (two minutes); a lucid and, I fear, much-needed explanation of the difference between sound insulation and sound absorption (five minutes); and three minutes' exciting news about wage claims, insurance stamps and imported redwood. Total, 29 minutes (unofficial timing) plus half a minute at each end of inevitable tinkle-tinkle, pick-pick sound track to get the listeners in the mood. Nevertheless, a promising start.

PARTY POLYTECH

Should we be flattered by the Conservative Party's decision to cast an architect for the rôle of the typical young Englishman in an election telecast? It was nice to find someone who didn't think of us as long-haired intellectuals with artistic genius, tortured souls and a shocking indifference to costs. The architect was a good -looking young chap, too—not an AA type, but trained at the local tech., with a sensible sort of wife who obviously never wore jeans or untidy hair. But what an architect! We didn't see his work, but his dreams were illustrated by dreary-looking council semi-dets under construction. And his career seemed to reach its apotheosis when he bought a house (glimpse of a much-gabled, spec.-built desirable residence) with a building society loan. Or was this his nemesis? The two-tier profession boys would probably say he was a building technician, not an architect at all.

RISING ROAD COSTS

The opening of the Chiswick flyover was an unhappy occasion for the poor old Ministry of Transport. We must, of course, take the contractor's statements with a grain of salt (it certainly wasn't the Ministry's fault if the hand-made bricks were not delivered on time), and brick, mass concrete and fill may unfortunately be a cheap way of raising a carriageway. The economics of continuous prestressed concrete beams are queried often enough to lend respectability to the easy option of simple beams. But we are certainly left, once again, with the impression that the MOT is technically backward.

NO MORE TENDER TRAPS

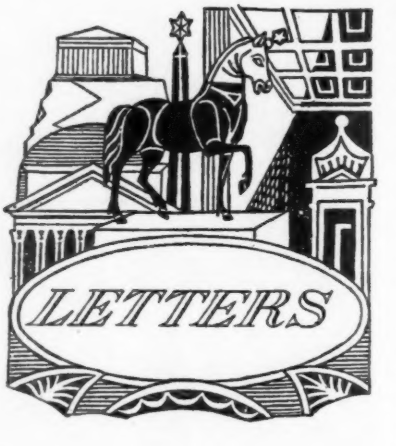
A new booklet* ought to end the misunderstanding, disappointment and rage that is usually associated with builders' tenders. There's nothing startling in it, but a lot of small points of procedure are neatly buttoned up. You're told how to write asking a builder if he wants to tender, how many builders you ought to ask and what happens when a mistake is made in the priced quantities. The booklet frowns on tenders which include completion dates as well as a price. And architects are asked to tell builders that if they don't want to tender it won't count against them next time. This would get rid of that bugbear, the "cover price." All this is no more than common sense, but it's nice to have it in black and white.

GROUND WORK FOR ARTISTS

Much has been said about what the newest kinds of abstract art are supposed to do to the room they're shown in. Architects can judge for themselves by visiting the new exhibition at the ICA, which is called, simply, *Place*. It consists of standard size big paintings which stand on the ground in twos and threes to make a sort of maze in which, at some points, the paintings are literally all you can see. The effect isn't completely convincing, but it's certainly stimulating for architectural imaginations.

ASTRAGAL

* *A Code of Practice for Selective Tendering.* Published by the Joint Consultative Committee of Architects, Quantity Surveyors and Builders. 2s. from NFBTE.



John Surtees, A.R.I.B.A.

Leslie Bilsby,
Director, Span Developments Ltd.

Eric Lyons, F.R.I.B.A., M.B.E.

T. A. Sutcliffe, F.R.I.B.A.,
Hon. Secretary, Hertfordshire Chapter of Architects.

Missing the Mark

SIR: I have just received my copy of the *Ideal Home* magazine and RIBA publication, *Book of Small House Plans* embracing the 30 winning designs of the recent competition. I feel, admirable as the publication is, the result has missed the mark. With about three exceptions, the houses illustrated are in the £3,000 and upwards bracket, and houses costing this amount are usually individually designed by architects.

What surely was and still is required, are house designs by architects in the £2,000-£2,500 range to compete with, and to lure the public from, the spec builder. It is in this price range that the spec builder has his greatest number of prospective clients. This is the case in the north-east and apparently throughout the rest of the country, with the exception, of course, of the London area.

JOHN SURTEES

Co. Durham

How much for £4,000?

SIR: While we are grateful for comment and publicity on our various activities (AJ, September 10, 1959) we do expect that behind the banter there is some degree of integrity. When you comment that people who are paying "nearly £4,000" expect "rather better detail and finish," against what standard is this judgment made? We have seen no battle joined before in your journal on the issue of finish, and the standards which we are achieving are simply those of the building industry of 1959. We know these are not as good as the standards of the craftsmen-built houses of the 1905 period, but where today in house building does this standard of finish obtain by which you make your comparison?

The writer has had some experience in building to architects' requirements (even building some architects' own houses), and has found it impossible since 1945 to produce a standard which is even as good as was possible in the 1930's.

When the comment goes on to "better detail" we are wondering just what this phrase means. Do you not like the sections of the window frames, is the skirting too narrow, are the doors too wide, or too tall, what does it mean?

On the question of price, it appears from your comment that you feel £4,000 too much to ask for such a house. Can you give us some comparable figures of houses in similar areas to show that we are not competitive?

We would suggest that there is a real difference between the sort of comment you make about our rather silly blurb on the Godwin sculpture as opposed to the ill-founded remarks regarding our houses and architectural design. We expect to be blasted when we are silly, we do not expect to be needled when we are producing in the context of today's standards work which is without equal.

LESLIE BILSBY

Director, Span Developments Ltd.

ASTRAGAL replies: it is precisely because Span and Eric Lyons have given such good leadership in the design of spec. built houses that I am disappointed to find them accepting the low standards of finish and workmanship (if Mr. Bilsby prefers that to detail) which prevail in the building world in 1959. The argument that nobody else is doing things any better is not the kind of argument one expects from Span, and I repeat, unrepentantly, that the customer who spends £4,000 is entitled to something better than the indifferent finish and workmanship, such as warped pelmets, cheap-looking doors, ill-fitting plywood panels and thin paintwork which I saw. I am not convinced it is impossible to do better, though it would, of course, cost the contractors and developers more and require stricter supervision.

Aesthetic control in Blackheath

SIR: I know that ASTRAGAL only does it because he knows it teases, but I would like to reply to his comments (AJ, Sept. 10). Not to the remarks about "finishes"— which seems to be the view of someone who knows all about modern building technology, but little about how buildings are built. It is the figure in the wall; this was only intended as a slight joke, and Span's publicity man did a slightly funny publicity-type write-up. The figure was meant to remind people of the poor old architect's position today—and if it is not a good likeness, it is roughly the way I feel at times. Friends have suggested that it is a Span Resident. . . .

However, the architects' position is not funny at all, and the battle with the planning bureaucrats is being lost on all fronts. The building at Hallgate, Blackheath, in which the sculpture is embedded, was itself the subject of an appeal. Briefly, the LCC imposed a condition that the colour of the *paint* should be to their approval, and should never be changed without their approval. I fought this on the principle that choice of paint was about the only freedom the architect has left, and also because I thought I was better qualified than a planning officer to decide what colours to use on a building that I had designed. Further, I thought that this condition was *ultra vires* as repainting of existing buildings is specifically excluded from planning control.

The appeal was upheld by the Minister and I was allowed to try out the colours all by myself. But although the appeal was won, the battle was lost, because, although *anybody* can paint any existing building *any* colour (even red, white and blue stripes), the Minister made it clear that a Planning Authority has the power to tell an architect what colours to use, and can make sure that the architect does not change the colours afterwards when the building is an "existing" building. I suggest that this is a ridiculous situation and one that architects must not tolerate.

At the moment Span and I have two other appeals pending. One is concerned with the development of some land *zoned for residential use*, but which the planning authority now thinks, having had a planning application, ought to be open space.

The other appeal, I think, involves a more important principle. The application to build a block of flats overlooking the Heath at Blackheath was turned down for the following reasons:

"the proposed development introduces a type of building of completely different character from the adjacent buildings of architectural and historic interest, namely, Colonnade House, Paragon House and the Paragon. The site originally formed an integral part of the Paragon development and the development in the manner proposed would be out of harmony and incongruous. It is considered that the *façade to Blackheath should be rebuilt as previously existing with any necessary alterations to the plan to bring it as near as possible into line with modern conditions.*"

I enclose a photograph (apparently the *only* one) of the previous building taken after it was bombed about 20 years ago. Nothing now remains; the remnants and railings have been carted away long ago. I never, never dreamed that all the king's horses and all the king's men would ask me to put a Dumpty together agen.

I hope that the point is clear. The æsthetic controllers are in the same camp as the prop-it-up at-any-cost boys. The country accumulates its clutter of spec-builders' rubbish and municipal bric-à-brac, and any kind of mediocrity is accepted if it conforms to the mediocrity next door. On the whole, yesterday's mediocre looks better than today's, so architects are consistently discouraged from thinking anew.

What can we do? I think we need a serious campaign to change this piece of decadent legislation. Æsthetic control is a poor substitute for town planning. I do not think you can have both.

ERIC LYONS

St. Albans Road, Watford

SIR: In your issue for August 27 is an article dealing with Mr. Goldfinger's design for offices and shops in St. Albans Road, Watford, in which it is stated that "the planning application was held up from last August until this spring in part by the æsthetic objections of the Planning Department and of the Architects' Advisory Panel of the Hertfordshire Chapter of Architects."

So far as the Panel is concerned, this case was first submitted for their advice on November 11, 1958, when no adverse comment was made, except that it was suggested, from the information available to them, that the building would perhaps form a better grouping with adjoining buildings if the taller block was placed at the opposite end of the site.

In order to investigate this point two members of the panel consulted on site with the Divisional Planning Officer a few days later, but the change suggested was found to be impracticable and was therefore abandoned.

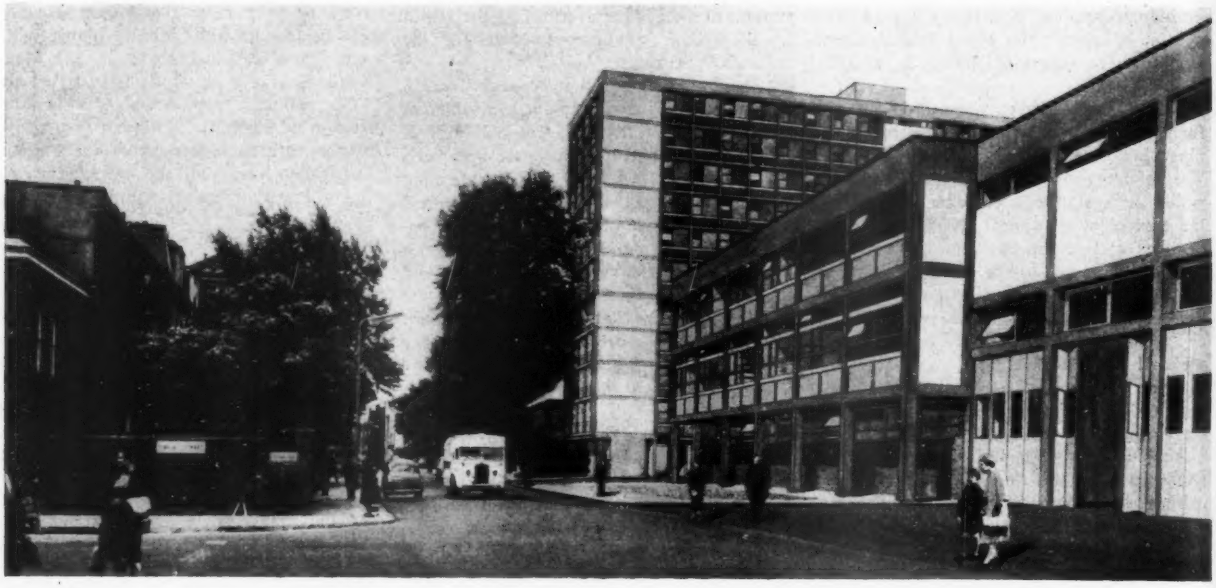
On January 13, 1959, a revised design for the building was brought before the Panel, which they recommended for approval, with the suggestion that further consideration might be given to the flank wall of the high portion where it abuts the lower portion. This suggestion was made because the submitted design showed an exposed frame on this flank, the beams of which did not relate to the horizontal components in the elevation of the lower portion. I am glad to note from your drawing that Mr. Goldfinger has accepted this suggestion.

With regard to the views expressed by the Panel on the Eustace Watkins garage in St. Albans Road, there are none since the application was not submitted for their advice. Advice on all cases submitted to the Panel is given immediately and responsibility for delay cannot be attributed to submission of the application for the Panel's advice.

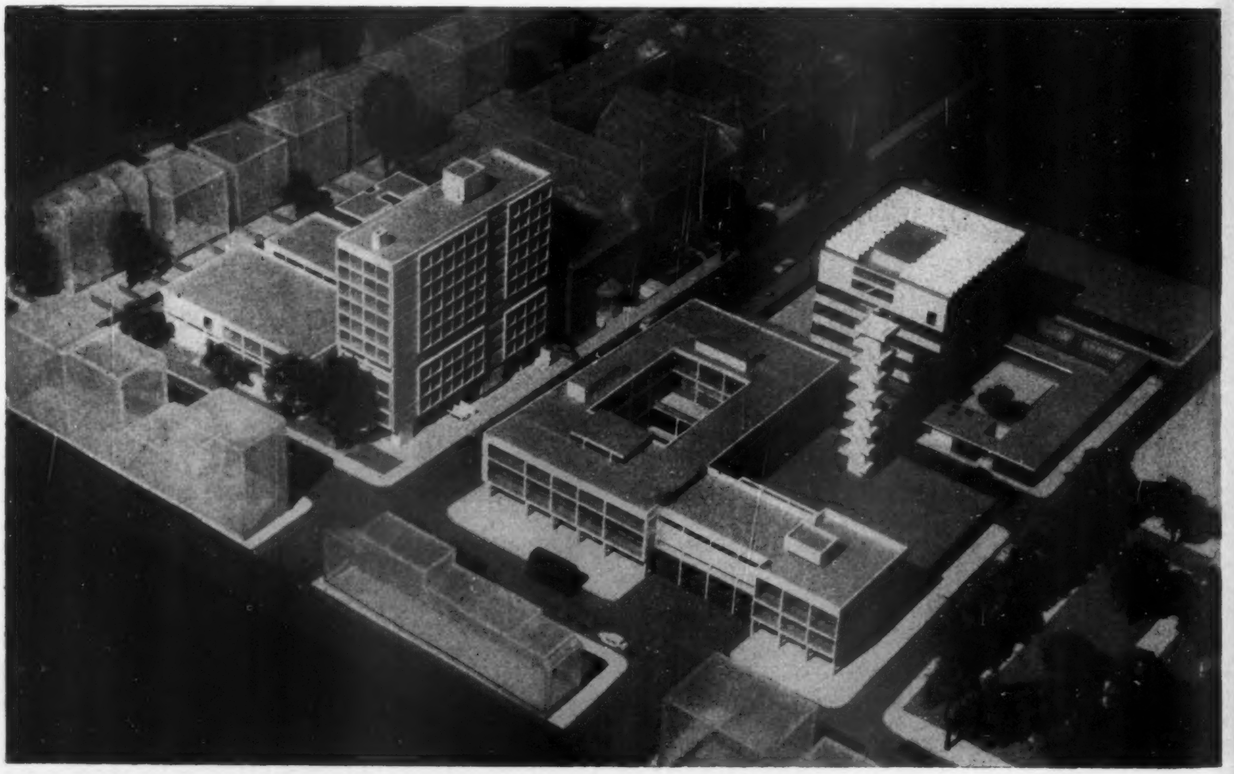
T. A. SUTCLIFFE
Hon. Secretary,
Hertfordshire Chapter of Architects
London

(Left) Photograph of the little Paragon before it was demolished, and below Eric Lyons' proposed block of flats which are the subject of a planning appeal. *See "Aesthetic Control in Blackheath."*

LCC TECHNICAL COLLEGES AND SCHOOL OF ART



The LCC architect's attempts to build in high density central areas will attract the attention of all city architects who have similar difficult problems to tackle. The perspective above shows four new buildings proposed for Manresa and King's Road, Chelsea. In the foreground is part of a fire station, the practice-tower for which is shown in the model below. Beyond is a three-storey teaching block, at the corner of King's Road and Manresa Road, which will house the department of chemistry of the Chelsea College of Science and Technology. It is planned with long corridors round an internal court to avoid traffic noise. At the end is the eleven-storey hall of residence for 198 students, raised on stilts to give circulation area to the two-storey communal building in the rear, see below. The regular elevation of single cells is broken on the fourth by one floor for the warden's flat and sick bay. The common rooms and assembly hall and dining room are in the communal building. The model, below, shows the new school of art, which replaces the former art departments of Chelsea College of Science and Regent Street Polytechnic. On the ground floor is the



IN OXFORD STREET AND CHELSEA

sculpture studios and common rooms flanking a central exhibition space, dining and assembly hall. Triangular-section northlights light the studios on the top floor. The Barrett Street technical college will occupy the first to sixth floors of a new building in Oxford Street. The rear of the site consists of a 22-storey office block by T. P. Bennett & Son. The ground floor will be let as shops, the entrance to the college being off side streets. The facade of the first floor is largely solid to keep out traffic noise and there are double windows above. The facade is random patterned with green and blue concrete blocks, the spandrel panels are blue-green and the stairs have irregular panels of blue and ruby glass to provide a striking effect at night when the building is illuminated. The college, costing about £600,000, will teach needle trades and hairdressing.

CIB CONGRESS

New Classification System Approved

The International Council for Building Research Studies and Documentation, known as CIB, has held its first Congress and has approved the new system of classification published in the JOURNAL on September 17, 1959. The Congress was held at Rotterdam from September 21 to 25, and was attended by 400 delegates, representing 34 countries. Among the delegates was Dargan Bullivant, AJ Research Fellow, who introduced the report of the International Building Classification Committee, of which he is a member. The adoption of this report means that the new system of classification has now received the backing of the most authoritative international organization, and is recommended for general adoption in the countries represented at the Congress.

Members of CIB are drawn from practically all Western and East European countries, and from a few outside Europe. The British members are the RIBA, BRS, TDA and the CCA. The Congress also received reports from other sub-committees, or working groups, which have been set up since the Council was formed in 1953.

The report of the working group on "Sociological and Functional Aspects of Housing Design" warned against the risks of interpreting results of social surveys on the basis of insufficient material or from the viewpoint of one type of expert (for example the sociologist). They stressed the need for integrated teams of sociologists, architects and health experts in dealing with the problems of housing.

A working group which has been studying safety factors in the calculation of structures emphasized the effect on building costs of over-generous safety factors resulting from insufficiently calculated structures. The investigations of another group on "The standardization of dimensioning on the building site . . ." pointed to the pressing need for modular co-ordination.

BRISTOL SYMPOSIUM

The Car in Urban Areas

A Correspondent writes:

A most successful symposium on "the motor car in urban areas" was held in Bristol last week by the Bristol and Somerset Society of Architects. The Society has already made a big contribution to the public discussion of this problem by preparing and exhibiting its own multi-level plan for the centre of Bristol. The symposium enabled architects, planners, businessmen and others to see the problem as a whole, in all its complexity—and that, surely, must be the foundation for any plan to deal with it.

Eric Rogers, the secretary of the Roads Campaign Council, described the economic background: his plea, inevitably, was for new roads to enable traffic to move and the national economy to function. Colin D. Buchanan, in a masterly paper on "the moving vehicle," questioned whether the problems created by the growth of motor traffic could be solved simply by spending more money on engineering works, and approached the problem from an entirely different standpoint.

Instead of regarding pedestrians as obstructions to the flow of traffic, and allowing the motor vehicle to grind away civilized life in the town centres (the very places where civilized life might be expected to find its most convincing expression), we had above everything else to restore civilized conditions for pedestrians. Unless this was the primary aim all efforts at reconstruction would fail. What was required was not pedestrian segregation, but vehicular segregation for the purpose of achieving pedestrian liberation.

Mr. Buchanan placed great emphasis on the need for more study of these problems, for which he could see no easy solution, and particularly a study of the use of vehicles in towns. He stressed the need to hammer out the grand strategy before discussing the details, but nevertheless went on to examine a number of solutions. The "new town formula" of the pedestrian street with vehicular access from the rear worked out at Crawley, Harlow and Stevenage represented, he thought, the maximum that could be got out of the precinct theory. They proved that pedestrian shopping worked. But the centres were approached through dreary back areas, car parks and bus stations, and it was less obvious that they would work in a large town. His conclusion was that the space required for pedestrians and vehicles could only be obtained, without tearing the city apart, by seeking extra space vertically. He also made what he called the startling proposition that traffic in urban areas was primarily an architectural problem, because architects alone were trained to solve complicated circulation problems—and what else was a city centre but a big building with a complicated circulation problem?

Walter Bor, who spoke on car parking, was the only speaker to raise the fundamental question whether the use of the private car would have to be restricted in central areas. His conclusion, supported by slides of car parking conditions in methods here and abroad, was that the best (though the most expensive) solution was to store cars out of sight in underground car parks. He did not think that the architectural problems of the multi-storey car park had yet been successfully solved, and thought that the economic problem would often suggest a combination of uses in one building, or roof parking.

Noel Tweddell, the Deputy Director of the Civic Trust, raised fundamental questions to which answers would have to be found: did we want every family to have a car, and to go everywhere and park everywhere? What sort of cities did we want? Were we prepared to pay the price for being able to go to the office by car? We had been trying petty palliatives for 25 years, and would have to decide whether to control the motor-car, to cut it out in some way, or to give it space.

MANCHESTER

Building Centre

The Manchester Building Centre Limited has been formed with the support of The Building Centre London to which it is affiliated.

The objects of The Manchester Building Centre Limited are similar to those of The Building Centre London. There will be an unbiased information service and space for lectures and visiting exhibitions, and the sole source of income will be from the letting of space to exhibitors. Any surplus revenue derived from the letting of space to manufacturers will be expended under the terms of the Constitution on expanding the services of The Manchester Building Centre Limited and on architectural and building education and research.

Prior to the appointment of a permanent Council, the Organising Committee is: Eric S. Benson, Raymond O. Gerrard, John P. Griffiths, Leonard C. Howitt, Frank Hyams, Haydn W. Smith, William G. Thorpe, J. R. Townson, F. R. Yerbury (representing The Building Centre London).

Correspondence is being dealt with by the Director, Mr. John P. Griffiths, at the temporary office in the Department of Building, The College of Science and Technology, Sackville Street, Manchester 1.

BUILDING CONFERENCE

Sundridge Park Courses

Another tripartite conference, similar to the one held last year, and organized by the LMBA in conjunction with the RIBA and RICS is to be held at Sundridge Park between December 2 and December 5. Twenty-four members, eight from each branch of the industry, will take part.

The conference will discuss a number of the problems facing the building industry in groups and in general discussions, and may publish a report on the lines of "Communications in the Building Industry," should the importance of the discussions warrant it.

The conference will be preceded, in the same week, by a management course, also consisting of eight members from the three organizations. The course is intended for directors and senior executives who have not previously attended a top-level management course, and consists of lectures and discussions on the general principles of management as they apply to the building industry.

OBITUARY

R. A. H. Livett

R. A. H. Livett, who died suddenly on September 20, was the first City Architect of Leeds and retained the appointment until his death. When Deputy Housing Director in Manchester in the early 1930's he was responsible for the first part of the Wythenshawe Estate. In 1934 he was appointed Housing Director in Leeds, and was responsible for the Quarry Hill flats (among the first to incorporate the Garchey system of refuse disposal) before being appointed City Architect in 1946. He has been a member of the Council and of the Executive Committee of the RIBA, and of many other committees, and received the OBE in 1944.

IN BRIEF

Aluminium in Architecture

The American Institute of Architects has announced regulations for the Fourth Annual $25,000 R. S. Reynolds Memorial Award for significant use of aluminium in architecture. Prime consideration will be given to the creative value of the architect's contribution to the use of aluminium and its potential influence on the architecture of our times. Nomination forms can be obtained from the AIA, 1735 New York Avenue, N.W., Washington, D.C.

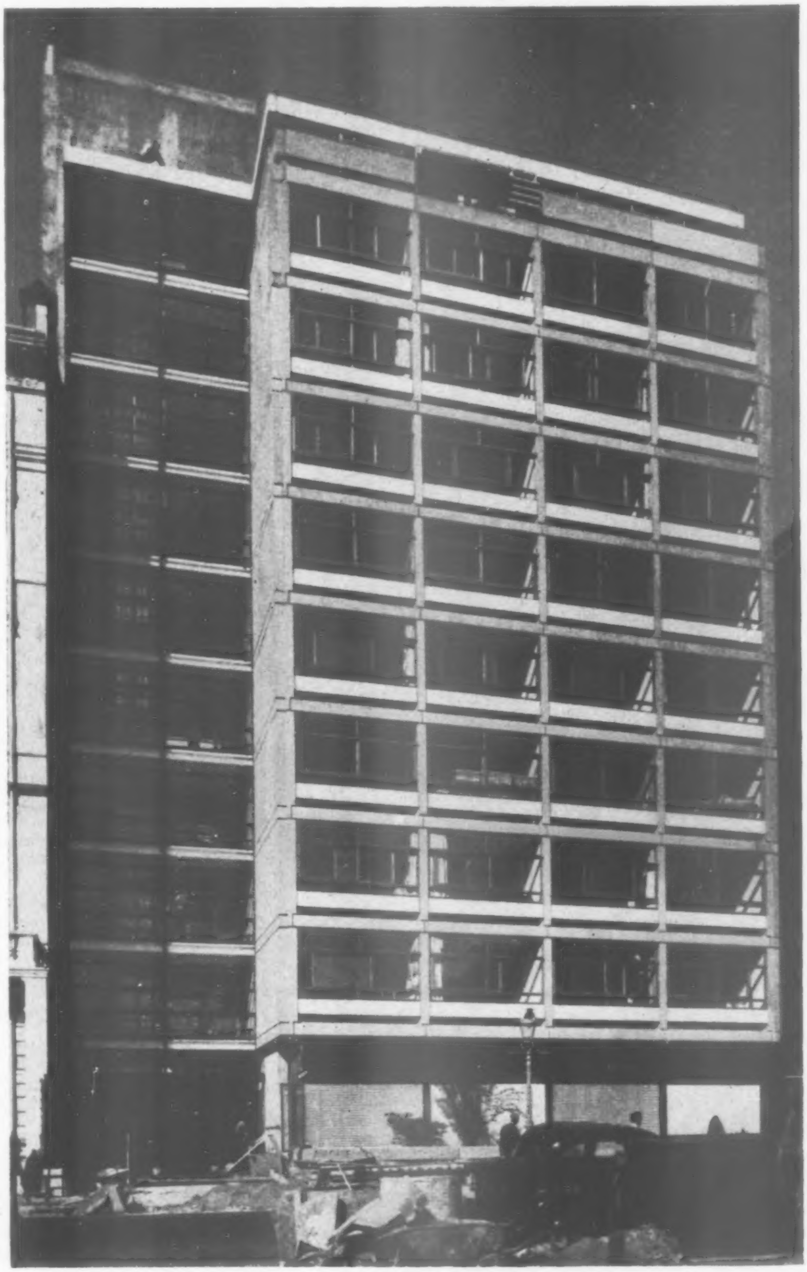
Rome Scholarship

The Faculty of Architecture of the British School at Rome have revised the conditions of the Rome Scholarship. The competition has been shortened, and may be taken soon after a candidate has completed his final examination. The winner will thus be able to go to Italy in the late autumn of the year of his graduation. The Rome Scholar will be required only to hold the scholarship for one year (at present it is two) although an extension for a second year will normally be granted. No specific course of study is laid down, and scholars are not precluded from interesting themselves in modern Italian architecture.

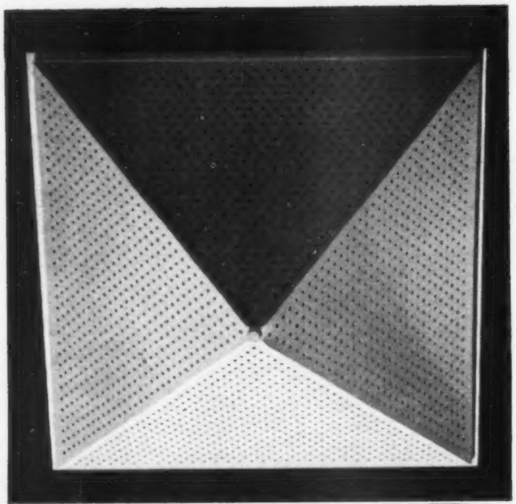
Correction

Mark Hartland Thomas was the only architect named in the JOURNAL of August 20 as taking part in the Aluminium Development Association's Symposium on Aluminium in Buildings held at the RIBA on July 9 and 10. In fact three other architects presented papers at the Symposium: H. G. Dunn (on aluminium roofing), H. W. Johnson (on aluminium curtain walling) and E. Muller, of Switzerland, on curtain walling in Europe. We regret the omission of these names.

HALL OF RESIDENCE AT THE IMPERIAL COLLEGE

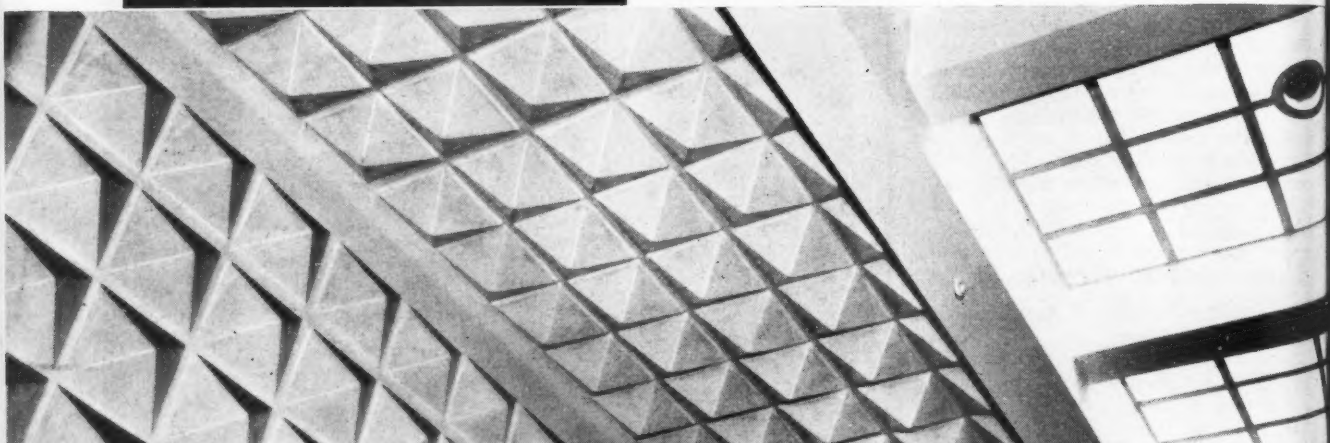


The first of several Halls of Residence being built for Imperial College in Prince's Gardens was opened last week. Designed by Richard Sheppard, Robson and Partners, Weeks Hall is the first part of the architects' scheme to develop Prince's Gardens as a residential and social precinct, and though designed as a separate building it is linked with the future developments through a glass-fronted staircase and lift tower. Study-bedrooms, grouped in sets of eight on each floor, share bathroom, shower, lavatory and pantry; there is a flat for the warden's family on the ninth floor and the ground floor contains commonrooms and conference room. The reinforced concrete structure consists basically of three cross walls supporting precast, prestressed floors, and the exterior is faced with Cornish granite and Norwegian quartz. General contractors, Tersons Ltd.



MARLEY

acoustic pyramids absorb unwanted sound



A reduction of 10 decibels was achieved by the installation of Marley acoustic pyramids at this swimming pool. From the point of view of persons using the bath, this gives the effect of 50% reduction in noisiness.

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technical section

THE INDUSTRY

From the industry this week Brian Grant describes a gas cooker with a roasting spit, an oil-fired boiler, a new radiator, an expansion joint filler and aluminium cladding.

New gas cooker
Cannon have just announced a new gas cooker in which the eye level grill has been modified to include an electrically driven roasting spit which is big enough to cook the largest chicken, joints of meat or a small turkey. Apart from the fact that this is probably a more efficient method of cooking, it also means that the oven is used mainly for baking, and therefore does not get covered with burnt fat, which is always very difficult to clean. The electric motor folds away when the spit is not required and the grill can be used in the ordinary way. The rest of the cooker follows the usual pattern, with a four burner hot plate, baking oven and a large capacity storage and warming drawer, with automatic ignition to all but the latter. The cooker costs £68 5s. 0d. and will be available in the London area this month, and in the rest of the country later. (*Cannon Ltd., Deepfields, Bilston, Staffs.*)

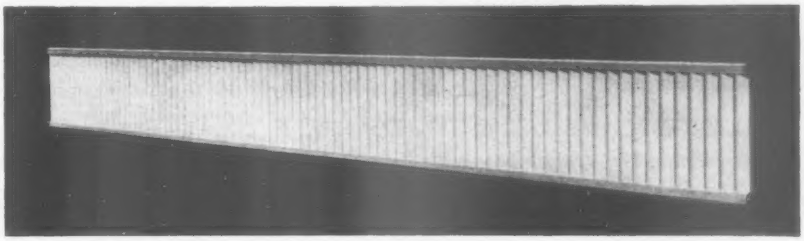
Oil-fired boilers
The illustration above right shows the new Delmore oil-fired boiler, which is produced in three sizes with outputs of 32, 43 and 64 thousand B.Th. U. per hour at prices of £87, £98 and £125. The makers claim an efficiency of 80 to 82 per cent. and the largest model occupies a floor space of only 19 by 20 in. The prices quoted are for the de luxe model, but a simpler version is available without the thermometer or towel rail or the controlled convector on top of the boiler, which provides extra heat for the kitchen if required. These models cost £10 less. (*Delmore Engineering, Co., Ltd., 51 Gresham Road, Staines, Middlesex.*)

Above left, the New Cannon cooker with a roasting spit. Above right, the Delmore oil-fired boiler.

New radiator
The illustration below shows the new Ideal Neoline cast iron radiator, which can be made up to any required length. The main surface is fluted, forming vertical waterways which give a wide angle of radiation, while small integral fins at the back give a high emission area without increasing the depth, which is only 3½-in. The radiator is made in three heights; 18 in., 24 in. and 30 in. (*Ideal Boiler and Radiators Ltd., Ideal Works, Hull.*)

Expansion joint filler
J. R. Gordon and Co. Ltd., a member of the Powell Duffryn Group and manufacturers of P.D. insulating board, are now marketing an expansion joint filler called "P.D. Resilex." It is the result of impregnating a resilient base, which gives good compressibility and recovery characteristics, with a new improved weatherproof composition by the solvent injection process. It is claimed that this process ensures maximum saturation of the fibres and contributes to the exceptionial wet strength and weathering properties of the product. It is the first all wood fibre expansion joint filler manufactured from home produced materials and whilst made in the standard ½ in. thickness, it is also available in an unlaminated 1-in. thickness, especially designed to meet the demand for wider joints in road and other concrete construction. Resilex is available in a full range of sizes and is suitable for roads, runways,

The Ideal Neoline radiator.



What home Buyers want to see—

A Bilston ATLANTA

even in a small bathroom!

Selected for the Design Centre,
the Bilston Atlanta comes in five sizes. This famous bath
can be fitted in any bathroom, large or small.
The Atlanta costs no more than an ordinary bath,
yet it has the superior Bilston finish and durability,
plus design features that make it
particularly safe and comfortable.
Home buyers want the best, that's why
you should fit the Bilston Atlanta.

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OLYMPIA LONDON
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All this with the ATLANTA-

Flat Bottom. The Atlanta flat bottom helps to prevent slipping ... ensures comfort. Particularly suitable where a shower is to be fitted.

Safety. The low sides make the Atlanta safer for young and old. It can be fitted to give an overall height of only 16".

Taps can be fitted centrally, or on either corner to facilitate installation and maintenance.

Fittings. The Atlanta is supplied with or without overflow ... with or without hand grip. The feet can be adjusted to accommodate all types of trap, including the Bilston 'Wasteflo' prefabricated waste, trap and overflow unit. *Also available with the Bilston O.P. Hand Grip helpful to the elderly or infirm.*

Colours. The Bilston range includes white, or the exact colour required for any decorative scheme.

BILSTON the bath *SPECIALISTS*

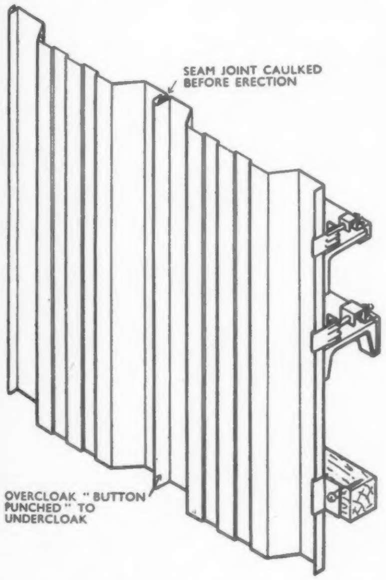
Bilston Foundries Ltd., Bilston, Staffordshire. Illustrated literature available on request.

technical section

floors and walls of buildings of many types, and it can also be used as an anti-vibration agent for machinery. (*J. R. Gordon and Co. Ltd., Newgate Street, Chester*).

Aluminium wall cladding

Rigidal Seamwall is a new system of aluminium wall cladding which has been evolved for use on the larger type of industrial building where a bold profile is needed to give interest to large areas of walling, and where the usual fixings of ordinary corrugated or troughed sheeting may be thought to look somewhat rough and ready. The sheets have a cover width of 12 in., and are produced in lengths up to 40 ft., so that end laps are not necessary on most jobs. Corner flashings formed from the standard panel are produced and where the length of the wall is not a multiple of 12 in., wider or narrower filler panels



can be formed on site using a special splice section.

The panels can be fixed to angle or channel sheeting rails, or to timber battens and where a concealed fixing is required a clip is hooked over the single upstand of the panel and secured to the sheeting rail. The double upstand of the next panel, which is factory filled with caulking compound is then pressed down over the first panel and the three thicknesses of the seam are then clenched with a "button" punch above and below each clip so that the cladding becomes in effect in a single skin. No drilling or punching of holes is necessary and the cladding can be quickly and easily fixed. If insulated walls are required, a special Seamline inner panel is available. The system is intended for use as vertical cladding only, as the makers feel that the mastic filled seam should not be relied upon for roof surfaces where considerable volumes of water can build up in heavy rain or melting snow. (*The British Aluminium Co. Ltd., Norfolk House, St. James's Square, London, S.W.1.*)

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.

A
72·01

9.66 design: general
AESTHETICS OF CONCRETE

Concrete: The Vision of a New Architecture. Peter Collins. Faber and Faber. 63s.

To the reader brought up in the main stream of modern architecture the title of this book will seem misleading in two respects. First, in that, though it is certainly about concrete, it is even more about Auguste Perret, the second half of the book being no more nor less than a biography of this great man to the exclusion of all others. Second, in that it is not at all a picture book or an "*ouvrage de haute vulgarisation*" as its sub-title would seem to suggest, but a serious and important work. Peter Collins is an associate professor in architecture at McGill University and was trained as an architect under Perret. The first half of this book is a scholarly account of the development of concrete during the heroic age of Coignet and Hennebique. The only other work of equal weight on this subject is Dr. A. H. Hamilton's *A Note on the History of Reinforced Concrete in Buildings* published by HMSO last year. But the exploitation of concrete was emphatically a French achievement and for this reason Mr. Collins's account is probably to be preferred.

Mr. Collins opens the second part of his book by asking the big question "What is architecture?" and answering it in French classical terms. The difference between French Renaissance architecture and any other lay in the French insistence on showing structure on the façade; an insistence which was justified at the emotional level by the fact that the structure thus revealed the original timber forms of Greek temple architecture and thus (if we have understood him rightly) gave to architecture its fundamentally religious connotation.

In the history of concrete, Perret (who we must remember, though trained as an architect, practised as a building contractor) is associated with fair-face technique. As he could control his workmen, he was able to exploit this technique at a time when his architect rivals could not. As an architect he followed the classical functionalist (or, rather, "rationalist") tradition of Labrouste and Guadet. At the time when he first broke through the barrier of art criticism (c. 1903) his buildings were so greatly preferable on the score of neatness and fitness to anything else to be seen that he became an acknowledged leader of the modern movement. But this was for him a false position, for he was in fact in solid opposition to the painterly and machine aesthetic ideas which time was to show to be its most characteristic aspects.

The writer of this review, who has been conditioned by the modern movement in its accepted sense, finds real difficulty in admiring the buildings which, to Mr. Collins, are the sole authentic works of architecture of the last half century. The Perret architectural doctrine, however respectable, does not seem to give a sufficient elbow room, either in building technique or in the handling of space, to meet the needs of our time. But this is a well written, well documented, well thought-out book and as such is a valuable contribution to our architectural debate.

(93)
725·4

10.186 design: building types
FACTORY LIGHTING

The Lighting of Factories. By M. J. Keyte and H. L. Gloag. Factory Building Study. HMSO. 3s. 6d.

This is the second instalment of what promises to be a most useful series of booklets. The chief difficulty of publishing a functional study on any building type is that of giving advice which is sufficiently concrete to be useful. This booklet has got over this difficulty and could well be a model for future works in the genre. Perhaps the most useful part of the authors' treatment is that which deals with the effect of fenestration on daylighting. There is a long series of sectional diagrams showing the familiar factory profiles—north light monitor, shed, flat roof—each of which is glazed to give predetermined minimum percentage daylight factors; 5 per cent, 10 per cent and 20 per cent. The advantage of this treatment is that it shows at once the effect of architectural form on functional performance; and it is this kind of knowledge which is at present so grievously lacking in the profession. On artificial lighting the authors give a useful rule of thumb for estimating electric loading; $\frac{1}{5}$th of a watt for filament light or $\frac{1}{15}$th of a watt for fluorescent light per sq. ft. for each lumen required at the working plane. But the emphasis throughout the booklet is on *quality* of light, not quantity. After pointing out that on average only one third of the light given out by an installation reaches the working plane, they hasten to point out the error of trying to improve on this by lowering the heights; for by doing this you increase glare contrast and make seeing more difficult.

Throughout this booklet we are aware that the authors are architects trained in the best tradition of functionalism, for it brings to this specialist subject the kind of ability which people expect from the architect; the

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ability, that is, to see problems in the round. A good example of this occurs early in the booklet when the authors are discussing the illumination of the task and point out that lighting is not the only method of making a task easier to see. If you double the size of the object (perhaps by optical means) it may be as effective as if you had ten times as much light and you can also change the colours of objects to give a better contrast or to raise the average lightness of the work. In advice of this kind there is that quality of inspired common sense which is too often lacking in publications by specialists.

(93)
726·4

10.187 design: building types
FACTORY FLOORS

Floor Finishes for Factories. By F. C. Harper and P. A. Stone. Factory Building Studies No. 3. HMSO 1s. 9d.

Since floor finishes for factories is an old subject for BRS this booklet owes much, inevitably, to previous publications: and in particular, to the Digests 24 (Granolithic Concrete Floors published 1950) and 73 and 74 (Corrosion Resistant Floors, 1955). Much of the advice and tables is a summary of these, but not all. In the last 10 years the power float has done much to improve the all-purpose concrete finish which is still the commonest in factory work. The great advantage of the power float is that it enables a dry, harsh mix to be used, which is the best security against cracking and "dusting." The first original contribution of this booklet is therefore an interesting discussion on the "monolithic" concrete floor. This type lasts longer than the type in which the screed is laid separately, but of course is more difficult to take up when it is worn. Since you have to take up a floor when it is worn in places to a depth of ½ in. there is no point in making a monolithic screed deeper than ¾ in. Unfortunately when you come to re-lay, the new screed must be at least 2 in. thick so you have to cut 1¼ in. off the base concrete. The second contribution of this booklet consists in its discursiveness. For example it discusses the issue of wheeled traffic on floors. Rubber tyred trucks are kinder to the floor, but are harder to move by hand. With powered trucks, however, this does not matter; and it seems therefore that this is a new and important point in favour of mechanized handling.

There are good paragraphs on specialized floors: for freedom from dust, high impact loads, freedom from sparks and chemical resistances and the booklet rounds up with a table of comparative costs, based on an order for 20,000 sq. ft. In general, if x is the average price per sq. ft. for concrete, wood blocks come out at 2x and clay tiles 4x. Like its predecessors in the series, this booklet is a useful addition to the literature of the architecture of functionalism.

Wood Floors, a TDA booklet reviewed in the JOURNAL for September 10 under Information Centre 13.143, is no longer being distributed free: it now costs 3s.

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24 LIGHTING

the use of permanent supplementary artificial lighting

If we are to fulfil present day standards of daylighting in offices and other large buildings we must limit room depths, raise ceiling heights to permit large windows and must screen these windows to prevent glare. In these circumstances it is both cheaper and better to provide a permanent artificial supplementary lighting for interiors ("PSALI"). The authors of this article, R. G. Hopkinson and J. Longmore of BRS, discuss the technical considerations which bear on this problem and then tell the architect how to make a provisional design for a PSALI installation, warning as they do so that the final version is a job for a specialist consultant. This article is printed by permission of the Director of Building Research.

There is a need to think afresh about how to light buildings. Economic and technological patterns are changing quickly, and thought and ideas that were adequate only ten years ago need revision. It was once thought that daylight was "free," and that artificial light was something rather expensive and rather unsatisfactory, an unfortunately necessary evil to be installed by an "electrician," but no direct concern of the architect. This is no longer true (if indeed it ever was) but the prejudice is reflected in the attitude of many otherwise forward-thinking architects to the claim, made more often in the USA at the moment than here, that better and more comfortable lighting can be installed and maintained more cheaply from electric power sources than from natural daylight.

These claims must be taken seriously, but without necessarily sacrificing one's instinctive belief that the total exclusion of daylight must lead to a sense of deprivation, even if the worst fears of claustrophobia and hysteria are not realized. Factual evidence on such matters is difficult to assemble. One hears in Scandinavia, however, of the well-attested *Lappsjukdom*, the neurosis which afflicts many who have to work through the long arctic winter and which is

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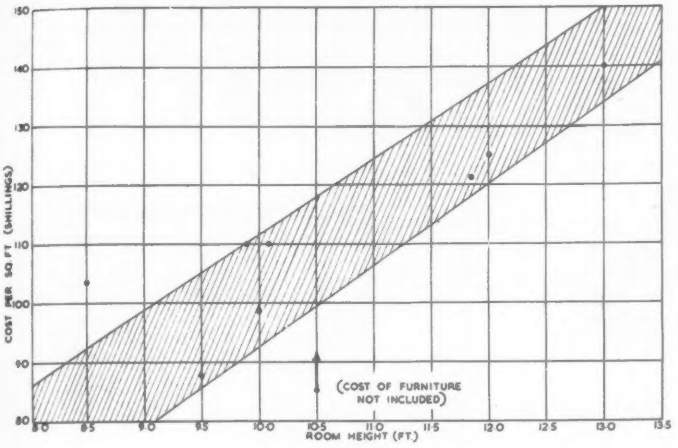

Fig. 1. Cost study on industrial laboratories of the variation with room height of the cost per sq. ft. Data on the cost of laboratory building, related to room height. (Division of Architectural Studies, Nuffield Foundation.)

believed to be associated with the lack of daylight. Swedish "colonists" from the south of Sweden who have to work in the far northern undeveloped territories are said to sometimes send their families home south for the winter to avoid the "Lapp sickness" amongst those most susceptible, just as English administrators in tropical climates used to protect their more vulnerable dependents from the climatic rigours by sending them home or up into the hills. This kind of evidence is by no means conclusive, but if one wants to believe that daylight is necessary for human well-being, it reinforces that belief.

But however desirable daylight may be, it is clearly too expensive a source of light as the exclusive illuminant of modern buildings. This is due to many reasons. The post-war years have seen a demand for lighting which has raised "norms" threefold or more, and is still raising them. It is not too difficult to realize these higher standards by electric lighting, but to do so by daylight is another matter. Work-people who can switch on the electric light and get 50 lumens per sq. ft. will not be content with 5 lumens per sq. ft. filtering through an obstructed window in a built-up area, even though the same window served their pre-war predecessors without complaint. If we try to provide higher standards of illumination entirely by natural means, we are faced with excessive sky glare in summer, and loss of interior heat in winter.

Changes have happened not only in lighting standards, but in constructional methods. It is no longer expected that ventilation will be by natural means, and so large windows and high ceilings are not necessarily needed. A recent survey of industrial laboratories by the Nuffield Division for Architectural Studies under R. Llewelyn Davies showed a clear correlation between the cost of a building and the height of the ceiling (see Fig. 1). Much can also be saved by making rooms deeper and with fewer partitions. All such techniques save money but make good natural lighting difficult or impossible to achieve.

Clearly we are forced to consider artificial lighting. In this country, however, we are not adapted, yet, to the American idea of the controlled artificial environment, conditioned air, artificial light, and so on. To reconcile our desire to have daylight, and our need to have high working levels of illumination, the only solution is to employ Permanent Supplementary Artificial Lighting in Interiors (PSALI).

When we first looked into this solution at the Building Research Station, we discovered that the idea, rather than being an unsatisfactory compromise between desires and needs, could in fact be made to provide better and more comfortable lighting than daylight alone in many cases. If the daylight and the supplementary light were designed together, rather than the daylight first and the artificial light later as an afterthought, a better all-round result could be achieved. The rooms would be freed from restrictions in depth imposed by daylight penetration and greater consideration could be given to the design of windows to avoid sky glare.

One of the first deliberate essays in PSALI is shown in Fig. 2. This is the Harris College at Preston where a built-in laylight is used to supplement the daylight from a window provided with fixed louvered sky-glare shields. Such a daylighting system could not normally provide more than one half of the necessary working light in such a deep room, but a satisfactory solution results from the combination of daylight and permanent supplementary artificial lighting. The experiments which were done at the BRS on this problem are described in a paper by the present authors (Hopkinson and Longmore, Trans. IES, 1959, in the press). It was found that the supplementary light should be determined, not merely as a "topping-up" light to the daylight, but as a means of achieving a correct visual balance with the daylight. In order to understand this principle of design, it is necessary to consider the facts of visual adaptation in an interior.

Adaptation should not be either an unfamiliar word or an unfamiliar concept to the architect. The adaptability of the human being to a wide variety of surroundings makes life not only tolerable in diverse climates, but interesting and stimulating. In moonlight, and in full sunlight, the eye can still see; the scene looks different, and partakes of a special character. In daylight this adaptation process may take place so inevitably that only the observant are aware of it. When out of doors, we can see most of the things around us, but if we look from outside through an open door into a room, things in the room seem dark. Go into the room, and in a few moments things are once again clear—we have *adapted*.

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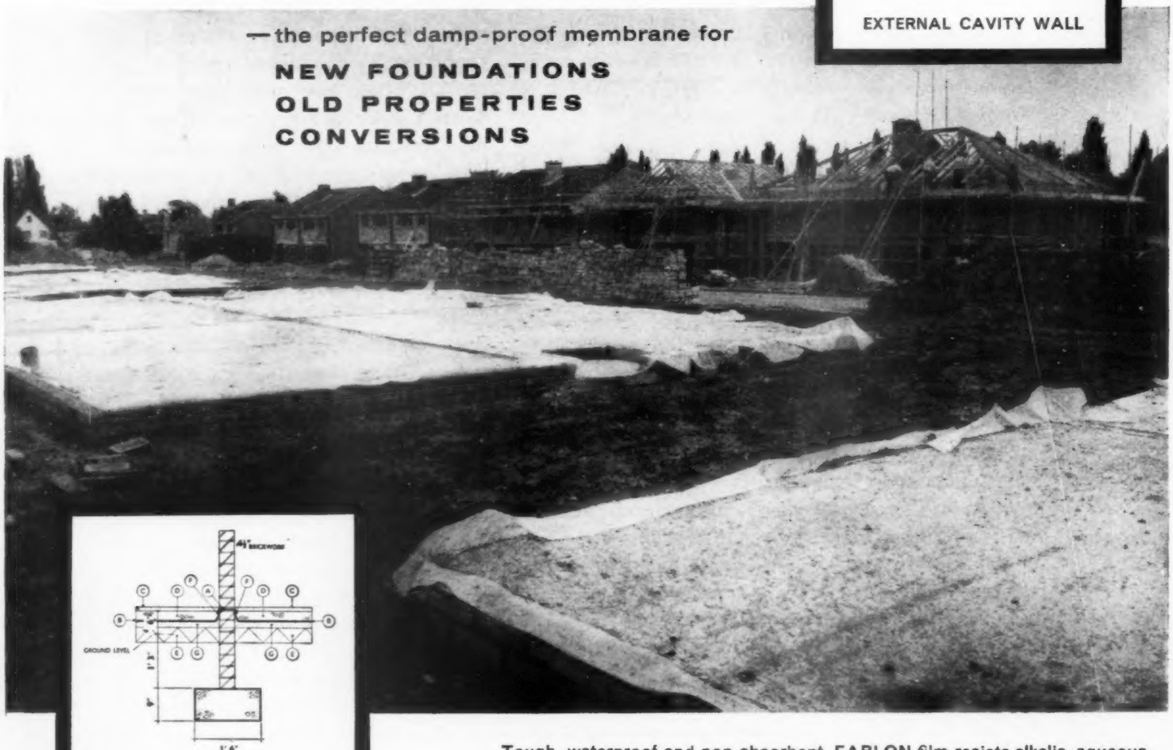

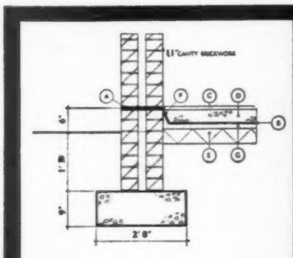

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technical section

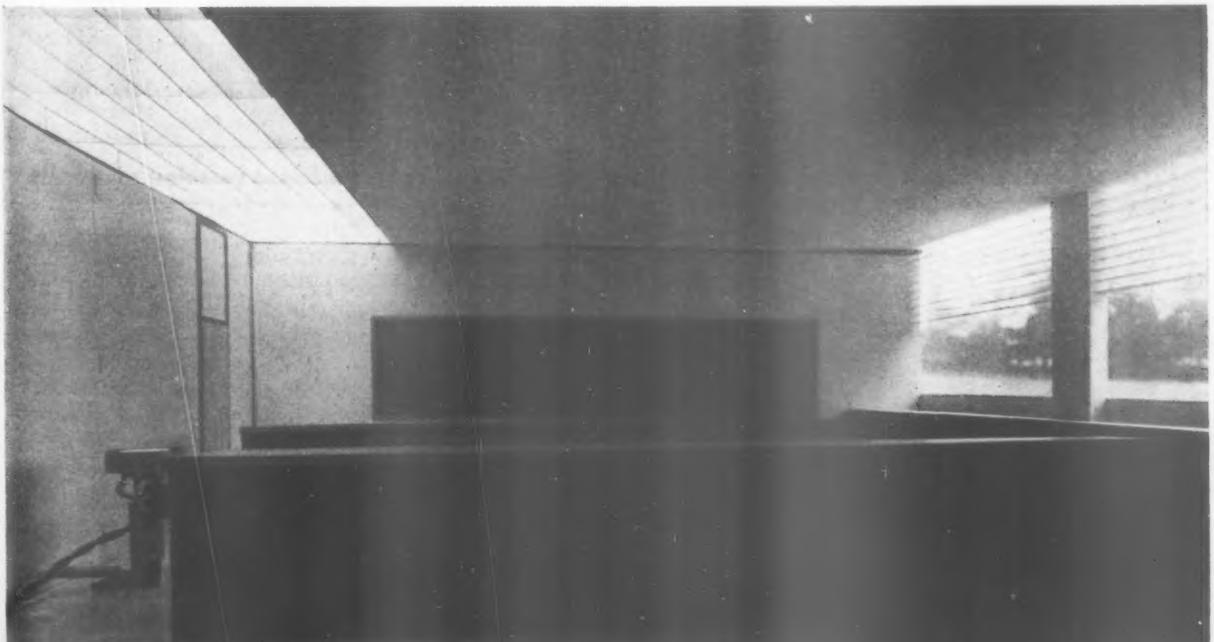
If when in the room there is still a very large view of sky, our eyes may be adapted only half way. Consequently those parts of the room receiving the least light may appear dark and gloomy, almost as they did from outdoors. If we shade our eyes from the sky, we can see better in these dark places, but there is no time for this pantomime during the busy working day. It is the job of the supplementary light to brighten up these *apparently* darker areas and make them look as bright as the rest of the room, *without destroying the essential character and direction of the dominant daylighting.*

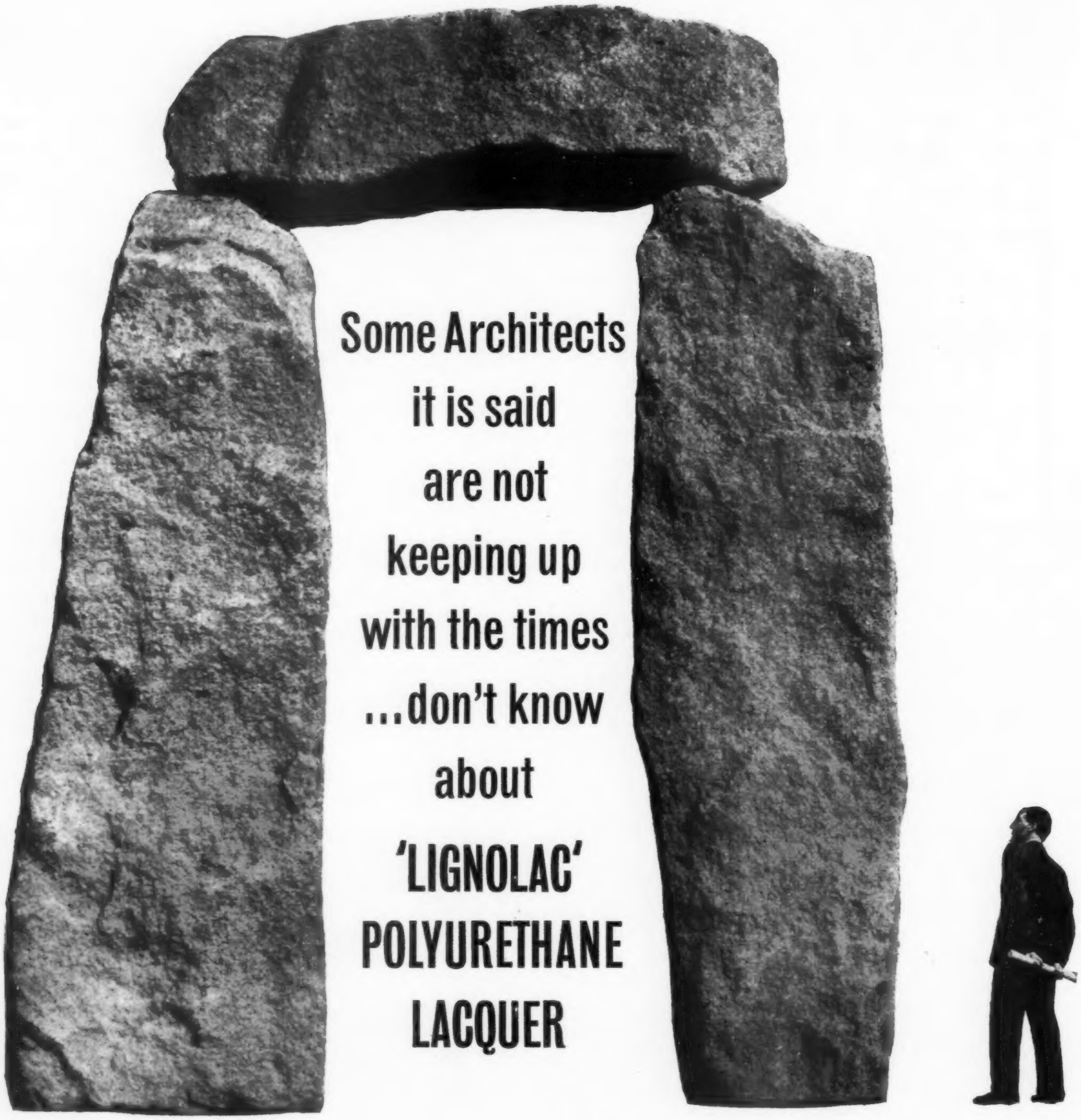
The necessary level of supplementary light will depend not only on how much daylight comes into the room, but also on how bright it *looks,* and this will depend on the view of sky. In a deep room, with curtain walls of transparent glass, people indoors may be adapted half-way to outdoor conditions, so that the deeper parts of the room may need very high levels of supplementary light to achieve the desired balance of brightness. The BRS experiments showed that levels of supplementary light must be of the order of 30 to 100 lumens/sq. ft.

Levels of this order are not cheap, either in initial cost or running cost. It is important not to forget that the supplementary lighting is *permanent.* It is not switched on or off according to the prevailing outdoor light, as would be the normal artificial lighting. It is part of the building. It comes on when the building is occupied first thing in the morning and is left on all day. Nobody has to decide whether or not to switch it off. But even though this may be expensive, the cost must be weighed against the cost of building higher ceilings with more glass, and we must also consider the economies effected by the use of the inner recesses of deep rooms. If these things are taken into account, the total annual cost of permanent supplementary lighting may well be offset by economies in building costs. Several buildings are now going up with PSALI incorporated into the design. These are buildings of a type which would normally be lit entirely by daylight. The initial costs of these buildings are being carefully noted and the running and maintenance costs will be recorded, so that some idea of the economies of PSALI will be obtained.

PSALI should, of course, be realized with fluorescent light. This is not fundamental, but there are advantages. It is difficult to obtain levels of illumination as high as those generally necessary for PSALI by means of filament lighting without introducing a radiant heat problem. Initial costs are lower, but running costs higher with filament lighting used for long periods. Colour match with daylight would not be good, whereas fluorescent lamps of "daylight"

Fig. 2. Interior of a model of a teaching laboratory for the Harris College, Preston, showing louvred window to combat sky glare and laylight giving 40 lumens per sq. ft. of fluorescent permanent supplementary lighting.





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type would give a reasonable match with mixed sun and skylight.

A match between the colours of the supplementary and natural sources of light is not the only requirement, it is perhaps even more necessary to obtain good agreement between surface colours as seen in daylight and in the artificial light. It must be admitted that even modern lamps leave much to be desired here. Care exercised in the choice of room surfaces and decorations can help a great deal. Some colours do not change violently with the change from natural to artificial light, and others change, but not unpleasantly. Some unpublished work exists at the BRS on this problem, but careful personal inspection of proposed surface colours may be the quickest method of selection.

The supplementary light can with advantage be built into the ceiling in the form of a large laylight, as in Fig. 2, but this is not the only way. The position of this laylight is subject to some variation, and much depends on the nature of the work. In an office or schoolroom the laylight is best placed somewhere near the back wall (the exact position is not critical), but if there is a strong demand, as there is in Scandinavia, for all the light to come from the left, the laylight can be placed near the window, and fitted with some light-directing device to send the light to the back of the room. The laylight can span the whole width of the room, but if patterns of light on the walls are to be avoided, it can be stopped short about three feet from the walls. Simple white painted vertical diffusing louvers suffice to prevent direct view of the lamps; or plastic materials, of which there are a great many now available, can be used. No bare lamp should be visible at any angle below 45 deg. to the horizontal, and if there is any danger of annoyance from reflections of lamps in polished surfaces, additional diffusion in the form of plastic sheeting should be built into the laylight. These are matters of lighting design, however, on which a great deal of experience exists, and for which the architect should consult a lighting engineer.

A supplementary system using conventional fittings of ceiling mounted or suspended type is quite feasible. Such a system can be integrated into the general artificial (after-dark) lighting system without difficulty.

What to do with the supplementary lighting after dark is at the moment a problem. Ideally there would be a separate night-time lighting, of a different character; the supplementary lighting would be switched off when darkness began to fall. Economy, or perhaps parsimony, makes such a solution difficult to achieve at present except in "prestige buildings." The levels of supplementary light are higher than is customary for normal artificial lighting at the present time, so that it may be necessary to switch off some of the supplementary lamps when the normal night-time lighting comes on. If this has to be done, a time should be chosen (a break for tea, or a change of lesson) when the change would be unnoticed.

When PSALI is necessary

The need for supplementary light is felt when the overcast sky fails to provide levels of lighting at the back of the room which are subjectively comparable with those near the window, that is, when the back of the room *looks* gloomy, even though the light meter shows plenty of light on the dial. This need is felt when there is a diversity of more than 10 to 1 in the natural lighting and the minimum working daylight factor is down to about 1 per cent. or below. Under such conditions, the overcast sky produces 50 lumens/sq. ft. near the window, but only 5 at the back of the room. Single-side lit rooms of 20 to 40 ft. depth or two-side lit rooms up to 80 ft. in depth benefit by supplementary lighting. Rooms of less than these depths may benefit if windows are obstructed or if some exacting task is to be done.

The level of supplementary light

The outdoor level of daylight varies continually with time of day and with the seasons over a wide range, but the levels which are normally considered suitable to supply indoor daylighting lie between the brightest summer sky, giving about 4,000 lumens/sq. ft. and the overcast sky at about 500 lumens/sq. ft. When the outdoor sky illumination falls below 500 lumens/sq. ft. the ordinary artificial lights would usually be switched on.

The experimental studies at the BRS demonstrated that the most satisfactory subjective balance of brightness between the daylit parts of the room and those lit by PSALI is achieved when the level of the supplementary light varies in proportion to the daylight, that is, the brighter the sky, the *more* artificial light is needed to effect a good balance. It was also found, however, that a constant level of supplementary light would be acceptable over a range of sky brightness of about 6 to 1. These experiments are described in detail in the authors' paper in the Transactions of the Illuminating Engineering Society (1959).

An artificial installation based on a sky level of 1,000 lumens/sq. ft. has been found to be a reasonable compromise for skies between 500 and 3,000 lumens/sq. ft., thus covering the full range except for the brightest summer skies. The level best suited to a particular room depends on many things, and simple rules cannot be given here. In practice, however, for normal office or classroom type of work, a room with a minimum daylight factor of 1 per cent. will require a level of PSALI of 50 lumens/sq. ft., and so on in proportion. Thus:

Level of Supplementary Light $E = 50D$ lumens/sq. ft. where D per cent. is the Daylight Factor (average) of the darker parts of the room to be supplemented with permanent artificial light.

However, not less than 40 lumens/sq. ft. should be used even when the daylight factor is less than 1 per cent. because of sky glare and adaptation effects, but if window protection devices such as louvers are used to reduce the visible brightness of the sky, the level of

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supplementary light can be reduced to 30 lumens/sq. ft.

The design of the windows

One essential principle of PSALI is that more freedom exists to modify the design of windows, so that sky glare can be alleviated, the consequent loss of daylight being made up by the supplementary light. The architect may therefore consider the various means which exist for reducing sky glare such as horizontal interior or exterior baffles, fixed white louvers, adjustable louvers of sound mechanical construction, and neutral tinted glass. Such devices can be added to an existing building whose lighting is to be improved. When a new building is designed, the whole system of fenestration should be planned deliberately in relation to the use of supplementary lighting.

Procedure in the calculation of supplementary lighting

The design of a PSALI system should be worked out by the architect and a qualified lighting engineer in co-operation. Methods do exist, however, which permit the architect to essay a design, and one of these, for use where the supplementary lighting is to be provided by a laylight, is given here in brief.

The procedure is as follows:

1. Determine the average daylight factor for the part of the room to be supplemented by permanent artificial light, and thence the level of PSALI to be provided.

2. Make a preliminary design of the system and compute the number of lamps needed to provide the supplementary lighting.

3. Estimate the probable level of glare, and modify the system as required. Finalize the design.

1. *Daylight factor:* The average daylight factor can be found by any of the well known techniques. For the approximate value which is all that is necessary for the purpose, the BRS Simplified Daylight Factor Tables (HMSO, National Building Studies, Special Report No. 26, 1958) will be found to give a quick and ready answer. Otherwise the BRS Protractors (DSIR Building Research Technical Paper No. 28, HMSO, 1946), together with the BRS Nomograms (R. G. Hopkinson, ARCHITECTS' JOURNAL, August 5, 1954) will give a more detailed and accurate solution.

2. *Level of artificial light and number of lamps:* The level of supplementary light will be found by the formula $E = 50\,D$ lumens/sq. ft.

Thus if the average daylight factor in the parts of the room to be supplemented is 1 per cent, the necessary level of PSALI will be 50 lumens/sq. ft.

Now examine the room, or the plans, and determine the approximate size and position of the laylight on architectural grounds, remembering, however, that if glare or distraction is to be avoided, the area of laylight should not be much less than one half of the working area to be supplemented, unless special optical control of the supplementing light is intended (and the job is then one for a qualified engineer). More precisely, the area of laylight is given by the formula

$$\text{Area of laylight (sq. ft.)} = \frac{\text{Total lumens on the working plane}}{100}$$

or,

$$\text{Area of laylight} = \frac{\text{Level of illumination (l./sq. ft.)} \times \text{area of working plane}}{100}$$

Hence, if the working area to be supplemented by 50 l./sq. ft. of artificial light is 20×15 sq. ft., *i.e.* 300 sq. ft., the area of laylight must not be less than $\frac{50 \times 300}{100} = 150$ sq. ft. (The area of room to be provided with supplementary light can be determined from the daylight factor contours in the room and from the intended light distribution from the laylight. Usually the rear third of the room would require supplementary light.)

Having found the approximate size of the laylight, a first design should be made and the position of the laylight in the ceiling fixed. This is an architectural procedure. The laylight can be taken right from wall to wall, but if brightness patterns on the walls are feared, the laylight can be stopped short of the walls by, say, 3 ft.

The BRS Protractors Nos. 9 and 10 are then used to determine the "sky factor" of the proposed laylight as seen from a significant point on the working plane say the point centrally below the laylight. Let this "sky factor" be denoted by S per cent. (The value of S for a typical laylight will be of the order of 20 per cent to 40 per cent.)

Some simple mathematics must now follow. As for daylight calculations, the *direct component* and the *reflected component* of the supplementary light must be fed into the computation.

Direct component

The direct component is given by

$$E_d = \frac{F_d \, . \, S}{100 \, . \, a} \text{ lumens/sq. ft.}$$

where

E_d is the direct component of the laylight illumination.

F_d is the downward flux from the laylight (in lumens).

S is the "sky factor" (per cent) of the laylight as just found.

a is the area of the laylight (sq. ft.).

Reflected component

The reflected component is obtained by a simple modification of the Split Flux principle (Hopkinson, *Light and Lighting*, 1955, **49**, p. 315). The formula is:

$$E_r = \frac{F_d \, . \, R_{fw}}{A(1 - R)} \text{ lumens/sq. ft.}$$

where

E_r is the reflected component (lumens/sq. ft.).

F_d is the downward flux (lumens).

R_{fw} is the average reflectance of the floor and walls over the part of the room receiving supplementary light (R_{fw} is expressed as a decimal of 1, not as a percentage).

R is the average reflectance of the floor, walls and ceiling including the laylight, over the part of the room receiving supplementary light (expressed as a decimal of 1).

A is the total area of all these surfaces (sq. ft.).

N.B. In calculating the average reflectances R_{fw} and R, the supplemented part of the room is treated as if it were a room with an open end, the gap on the window side being given zero reflectance.

Total illumination

The total illumination E_t from the laylight is given by the sum of the direct and reflected components, as with daylight calculations. Thus:

$$E_t = E_d + E_r$$
$$= \frac{F_d \,.\, S}{100 \,.\, a} + \frac{F_d \,.\, R_{fw}}{A(1 - R)}$$
$$= F_d \left(\frac{S}{100 \,.\, a} + \frac{R_{fw}}{A(1 - R)}\right) \text{ lumens/sq. ft.}$$

Flux from the laylight, and number of lamps

The amount of light required from the laylight can now be found. The downward flux is

$$F_d = \frac{E_t}{\dfrac{S}{100 \,.\, a} + \dfrac{R_{fw}}{A(1 - R)}} \text{ lumens}$$

The number of lamps necessary to provide these lumens can then be found by:

$$N = \frac{F_d}{F \,.\, e}$$

where F is the flux, in lumens, emitted by each lamp *e* is the maintained efficiency of the laylight.

In practice fluorescent "daylight" lamps might be used. At present (1959) the manufacturers state that a 5-ft. 80-watt lamp will give 4,080 lumens of maintained flux throughout life.

So, for example, if we wish to provide 50 lumens/sq. ft. (*i.e.* $E_t = 50$) from a laylight whose area has been tentatively set at 150 sq. ft. ($a = 150$), subtending a "sky factor" of 25 per cent ($S = 25$) on the working plane, and the values of reflectance are $R_{fw} = 0{\cdot}3$ and $R = 0{\cdot}4$ respectively, in a room where the total area of all surfaces receiving supplementary light is $A = 1{,}200$ sq. ft., we have from the formulae

$$F_d = \frac{50}{\dfrac{25}{100{\cdot}150} + \dfrac{0{\cdot}3}{1{,}200\,(1 - 0{\cdot}4)}} \text{ lumens}$$
$$= 24{,}000 \text{ lumens approximately.}$$

We have to get this number of lumens out on to the working plane. A laylight is not a very efficient device unless designed with good optical control of light. A simple white box with white louvres will be unlikely to have a maintained efficiency much in excess of 50 per cent. If we take this value ($e = 0{\cdot}5$) for the efficiency, we have:

$$\text{Number of lamps } N = \frac{24{,}000}{4{,}080} \times 0{\cdot}5 = 12 \text{ lamps.}$$

We now have a tentative design, a laylight designed, proportioned and placed in the ceiling on an architectural basis and the engineering calculations worked out to show that twelve 5-ft. 80-watt "daylight" type fluorescent lamps should be uniformly spaced in the laylight.

We now need to check that the installation will be reasonably free from glare.

The calculation of glare

The procedure which follows gives a basic technique. In practice a modified technique, or more likely a simple comparison with existing practice, when such practice is built up, would be made.

First select a significant viewing position, that is, the position from which glare could be expected to give the most trouble. The outline of the glare source (here the laylight) is then traced on the BRS modified solid angle diagram (Petherbridge and Longmore, *Light and Lighting*, 1954, 47, p, 173) and the area planimetered to give the effective solid angle ω subtended at the eye by the source.

Next determine the brightness of the laylight as seen from the chosen position. The brightness (luminance) of a white laylight with white diffusing louvres is given approximately by the formula:

$$B = \frac{F_d}{a} \text{ foot lamberts.}$$

The brightness (luminance) of the surroundings must now be found. This is a function not only of the supplementary artificial light from the laylight, but of the daylight as well. It will therefore vary with the sky brightness, and it will be necessary for the calculation to assume a value. This should be 500 foot lamberts in a check calculation, unless it is known that the most troublesome glare will occur with some other value of sky brightness, when this other value should, of course, be used. The calculation then is designed to give the illumination received on the eye of the observer from the whole field of view, less the laylight. An approximation to this value is given by the following procedure:

(*a*) Find the reflected component of the daylight illumination. This will be given by multiplying the indirect component of the daylight factor (already obtained from the BRS Nomograms or the BRS Simplified Daylight Factor Tables when the original Daylight Factor was calculated) by the assumed value for the sky brightness. Thus if the indirect component had been calculated as 0·7 per cent out of the total of 1 per cent daylight factor in our example, the reflected component of daylight illumination will be:

$$\frac{0{\cdot}7}{100} \times 500 = 3{\cdot}5 \text{ lumens/sq. ft.}$$

(*b*) Find the reflected component of the artificial illumination. This will be given by:

$$E_r = \frac{F_d\, R_{fw}}{A(1 - R)} \text{ lumens/sq. ft.}$$

from our previous example we would have:

$$E_r = \frac{24{,}000 \times 0{\cdot}3}{1{,}200\,(1 - 0{\cdot}4)} = 10 \text{ lumens/sq. ft.}$$

(*c*) Sum the two components. The surround brightness B_b (luminance) is equated numerically to this sum, expressed in foot lamberts. Thus in the example:

Surround luminance $B_b = 3{\cdot}5 + 10 = 13{\cdot}5$ foot lamberts.

Finally substitute the values found for the source size ω

technical section

(*i.e.* the effective solid angle subtended at the eye as determined from the BRS solid angle diagram) for the source luminance B_s and the surround luminance B_b in the BRS Glare Formula:

$$\text{Glare Constant } G = \frac{B_s^{1\cdot6} \times \omega^{0\cdot8}}{B_b}$$

In our example, if we assume a viewing position which would result in the laylight subtending a solid angle of 0·075 steradians (a fairly typical value for such a case), we would obtain:

$$G = \frac{160^{1\cdot6} \times 0\cdot075^{0\cdot8}}{13\cdot5}$$

$$= 31$$

The value of glare constant should be less than 50 in an office or schoolroom. G must on no account be above 150, as most people will then notice definite discomfort unless the activity in the place holds their attention. The design in this case would be satisfactory. If it had not been, the procedure would have been to increase the size of the laylight without changing the number of lamps, until the glare constant was below the recommended value.

Supplementary lighting can, of course, be provided with conventional fittings, and the level of illumination can be found by standard methods such as the Harrison-Anderson (*ELMA Handbook*) method. Most manufacturers can give details of the luminances of their fittings, so that glare can be calculated in the usual way (Petherbridge and Hopkinson, *Trans* IES, 1950, p. 39). The laylight solution has been elaborated because it is one which may have special appeal to the architect.

A worked example

The following example gives the bare bones of the calculations which went into the design of the supplementary lighting for the laboratory illustrated in Fig. 2 (the Harris College, Preston—Architects: Ministry of Education Development Group, Chief Architect, Anthony Pott).

The room is 36 ft. wide and 28 ft. deep with a 10-ft. ceiling.

Daylight factor

Using BRS Protractors 1 and 2, the minimum sky component at 2 ft. from the back of the room, with an exterior obstruction of 5 deg., is found to be 0·33 per cent. The minimum indirect component, assuming an average reflection factor of 40 per cent for the interior surfaces, is found from BRS Nomogram II to be 0·66 per cent. The daylight factor 2 ft. from the wall at the rear of the room is hence

$0\cdot33 + 0\cdot66 = 0\cdot99$, say 1 per cent.

Similarly the maximum daylight factor 2 ft. from the window is found to be 14·7 per cent.

Thus the minimum daylight factor is less than the value of 2 per cent required for a teaching area, and the diversity is nearly 15 to 1. It is therefore necessary to provide supplementary lighting to raise the illumination level at the back of the room and dispel the appearance of gloom caused by contrast with the bright areas near the window.

Design of window

White fixed louvres are to be provided to reduce the view of sky and so reduce sky glare. (See Fig. 2.)

Level of supplementary light

By the formula, the level of illumination required is:

$E_t = 50D = 50 \times 1$ (taking 1 per cent as the relevant daylight factor at the back of the room).

As louvres are to be used to reduce the visible area of the window, this level can be brought down to 40 *lumens/sq. ft.*

Necessary light flux and number of lamps

The supplementary light will be provided by 5-ft. 80-watt "daylight" type fluorescent lamps, each giving 4,080 lumens, placed in a shallow laylight at the back of the room, as shown in Fig. 2.

The minimum area of this laylight is given by the formula:

$$\text{Area of laylight} = \frac{\text{Illumination level} \times \text{area to be lit}}{100}$$

$$= \frac{40 \times (36 \times 28/3)}{100} = 134 \text{ sq. ft.}$$

(taking the rear third of the 28 ft. deep room as that to be lit by supplementary light.)

This is the minimum acceptable area. For reasons of proportion and design, it was decided in this case to design for a laylight 6 ft. wide, running the full width of the room, from wall to wall, as shown in Fig. 2. Such a laylight would have an area of 36 × 6 = 216 sq. ft., well above the minimum.

The reflection factors of the room surfaces are as follows:

Floor: 30 per cent.

Walls: 40 per cent.

Ceiling with louvres: 50 per cent.

A simple calculation gives the following values:

$R_{fw} = 0\cdot24$

$R = 0\cdot29$

$A = 1{,}272$ sq. ft.

The "sky factor" of the 36 × 6 ft. laylight, measured from a point centrally below, is found, with the aid of BRS Protractors 9 and 10, to be 27·9 per cent. The total downward flux necessary will therefore be:

$$F_d = \frac{E_t}{\left(\frac{S}{100_a} + \frac{R_{fw}}{A(1-R)}\right)} \text{ lumens}$$

$$= \frac{40}{\left(\frac{27\cdot9}{100} \times 216 + \frac{0\cdot24}{1{,}272\,(1 - 0\cdot29)}\right)}$$

$$= 26{,}800 \text{ lumens}$$

Assuming a maintained efficiency of the installation of 50 per cent, the number of lamps required will be:

$$N = \frac{F_d}{F\,.\,e}$$

$$= \frac{26{,}800}{4{,}080} \times 0\cdot5$$

$$= 13$$

Therefore 13 lamps, 5 ft. 80 watt "daylight" type, will be required to give the necessary illumination of 40 lumens/sq. ft.

technical section

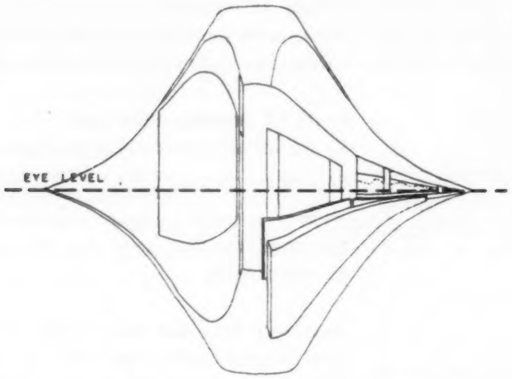

Fig. 3. Interior surfaces of the laboratory shown in Fig. 2, as seen from a point below one end of the laylight, plotted on the BRS modified solid angle diagram. This diagram gives solid angles modified for the reduced glare effect due to displacement from the direction of view and is more suitable for assessing glare from a fixed direction of viewing.

Glare check

The interior of the laboratory as seen from seated eye-level below one end of the laylight is plotted on the BRS modified solid angle diagram in Fig. 3. The result of planimetering the laylight on this diagram is to give a value of 0·074 *steradians* for the value of ω to be inserted in the glare formula.

The luminance of the laylight is given by

$$B_s = F_d/_a = \frac{26{,}800}{216} = 124 \text{ foot lamberts}$$

The indirect component of the daylight factor was found to be 0·66 per cent. The reflected component of the daylight illumination will therefore be, assuming 500 lumens/sq. ft. from the sky, given by

$$\frac{0{\cdot}66}{100} \times 500 = 3{\cdot}3 \text{ lumens /sq. ft.}$$

The indirect component of the supplementary light will be given by :

$$E_r = \frac{F_d \,.\, R_{fw}}{A(1 - R)} \text{ lumens/sq. ft.}$$

$$= \frac{26{,}800 \times 0{\cdot}24}{1{,}272\ (1 - 0{\cdot}29)} = 7{\cdot}1 \text{ lumens/sq. ft.}$$

The total reflected illumination will therefore be $3{\cdot}3 + 7{\cdot}1 = 10{\cdot}4$ lumens/sq. ft.

The value of surround brightness (luminance) to be inserted in the glare formula will therefore be

$B_b = 10{\cdot}4$ foot lamberts

The glare constant can now be evaluated, for the normal working viewing conditions, as follows:

$$G = \frac{124^{1\cdot6} \times 0{\cdot}074^{0\cdot8}}{10{\cdot}4}$$

$$= 27$$

Since this is less than 50, there should be no discomfort caused by glare from the laylight to the majority of the occupants.

The glare from the window can be found in the same way, the panimetered plot of the window on Fig. 3 being taken as the value of ω to be substituted in the glare formula. The value B_s should, however, be the *highest* sky brightness likely to be experienced under normal conditions. More detailed techniques exist for the more accurate determination of the surround brightness B_b but these cannot be given here.

The Gas Council on flues in tall buildings

On the following pages is a supplement on gas appliances and flues in tall buildings which is sponsored by the Gas Council. This is the sixth of a series of supplements which have as their object to give a full technical description for architects of the different uses to which gas and coke can be put. Like Information Sheets, these supplements are a journalistic hybrid: they are " advertisements " in the sense that the space they occupy is paid for by the sponsors and that their ultimate object is to foster the greater use of gas: but they are " editorial " to the extent that the means chosen is to provide as much reliable information as possible and that this information has in fact been " approved " by the JOURNAL'S *Technical Editor. We hope that readers will extract and keep these supplements for future reference. For this purpose a special binder can be obtained, free of charge, on application to the Publicity Manager, Gas Council, 1 Grosvenor Place, S.W.1. Alternatively, readers may apply through the business reply folder at the back of this issue. The first five supplements " Domestic Space Heating 1. Fires and unit heaters," " Domestic Space Heating 2. Central heating by gas and coke," " Domestic Water Heating," " Gas Flues " and " Coke," appeared in the* JOURNAL *for November 29, 1956, April 25, 1957, and September 26, 1957, and April 24, 1958 and January 22, 1959, respectively.*

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GAS APPLIANCES AND FLUES IN TALL BUILDINGS

In the supplement on gas flues published in the JOURNAL of April 24, 1958, mention was made of branched flues (*i.e.* systems in which gas appliances discharge into a " branch flue " which rises one storey and then joins a main flue); and a fairly full description was given of the SE duct (a system named after the South Eastern Gas Board in which gas appliances receive air from, and discharge fumes into, a single common flue). But at that time there was little experience of either system. Since then, however, both systems have been developed and both have proved satisfactory. This supplement describes in some detail a SE-duct installation in a 10-storey block of flats at Gateshead and branched flue installations in an eight-storey block of flats at West Ham and in an old six-storey block of flats in Westminster.

Introduction

When the Supplement on Gas Flues was published in the ARCHITECTS' JOURNAL in April 1958, no building incorporating SE-ducts and branched flues had been completed and therefore only simple drawings could be shown to illustrate the principles of these flues.

Buildings incorporating these flues are now completed and working and others are either in the course of construction or are planned. Facilities have been granted on some of these early installations for the temporary installation of recording instruments (usually well out of the way in the tank room) for the observation of the pattern of usage of the appliances and temperature, pressure and flow conditions in the flues: very satisfactory agreement between theoretical calculations and practical results has been obtained.

To meet the demand for the most up-to-date information, it has been felt desirable to issue this second supplement on practical experiences with SE-ducts and branched flues, illustrated by photographs of actual installations and of the appliances fitted to them. This information should be read in conjunction with the Gas Flues Supplement previously published.

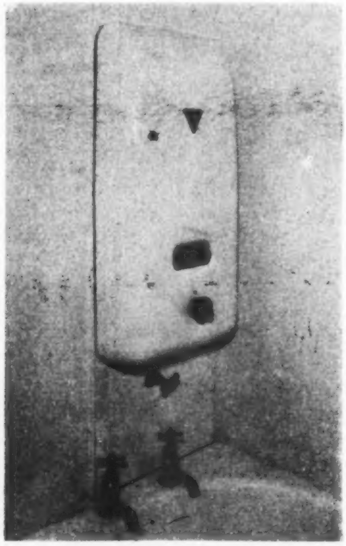
SE-duct installations

The first completed installation in tall flats has been at Ann Street, Gateshead, where Ascot 727 multi-point instantaneous water heaters (Fig. 1) and Clifford " Driflu " drying cabinets (Fig. 2) have been installed on No. 2 size SE-ducts. Flamborough convector gas fires have been installed with individual asbestos cement flues: high efficiency convector gas fires for use with SE-ducts are under development. This 10 storey block consists of 160 flats and the installation is working very satisfactorily: the continuous records taken of the volume flow and CO_2 percentage in the SE-duct have confirmed the predicted performance.

Ascot 727 water heaters have also been installed since 1958 on SE-ducts in 7 blocks of 4 storey flats at Crawley New Town with individual True Flue X block flues for gas fires. Approx. 30 other building projects utilizing SE-ducts in London and the provinces are in varying stages of progress from the early planning stages to completion and there is the fullest co-operation between architect, Gas Board, True Flue Ltd. (the sole makers of the special flue blocks) and the appliance manufacturers.

The increasing range of gas appliances specially designed for installation with SE-ducts now includes Ascot multi-point water heaters, drying cabinets, gas circulators, warm air heaters and convector heaters.

The SE-duct is constructed of standard 18-in. blocks, the horizontal duct being laid on a concrete bed below the lowest floor to be served and of a cross sectional area not less than that of the vertical duct (Fig. 3). The blocks are made of dense acid-resistant refractory concrete and the ends of each one are rebated ½-in: the jointing material recommended is either 1 : 1 sand/cement mortar or a plasticised fireclay compound: although the blocks are acid-resistant, condensation has not in fact occurred even when all ten drying cabinets at Ann Street, Gateshead were working simultaneously with loads of wet washing.



Figs. 1 and 2. Equipment used in Gateshead flats; above, a 727 Ascot multipoint water heater; below, a " Driflu " drying cabinet.

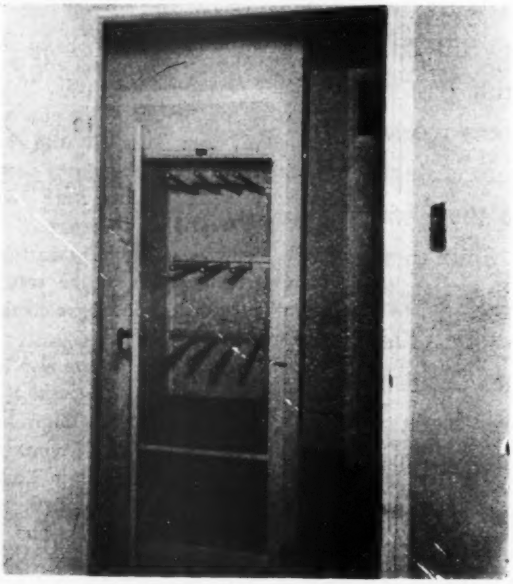


Fig. 3. Assembly and jointing of base duct blocks at Gateshead. Note concrete bed.

Any rubble and surplus jointing material can be removed as the blocks are assembled.

Normally no special precautions are needed to avoid seepage of water into the duct but if the site should be wet the following solutions are suggested to avoid seepage, which would reduce the effective cross sectional area of the horizontal duct:—

(*a*) The provision of trapped drainage outlet at the lowest point of the flue connected to a suitable storm outlet to prevent flooding.

(*b*) The provision of a porous land drain alongside and just below the flue to drain off surplus ground water.

The Tee junction of heavier construction for connecting the vertical duct with the two horizontal inlet ducts consists of two components, a base junction unit containing the three apertures and a gather unit which sits on top of it: the base junction unit contains a recess which will accommodate a limited amount of rubble, which might fall into the duct during building operations. Where the horizontal duct passes through a load-bearing wall, a lintel should be provided over the duct to carry the load above it.

Fig. 4 illustrates a non-standard Tee junction cast on site and this method may also be applied to the horizontal duct.

The two air inlets (normally at opposite sides of the building) are positioned above the ends of the horizontal ducts and should ideally be located approximately 5 ft. above the ground level to avoid risk of damage and interference by children and the risk of blockage by rubbish, driven snow, etc. (Fig. 6). Where the construction does not permit the use of air inlets at opposite sides of the building, right angled underfloor inlet ducts may be employed or, alternatively, use can be made of a " neutral pressure zone " if there is a central entrance hallway which is adequately ventilated and from which the inlet air can be taken: the advice of the Gas Board or True Flue Ltd. should be sought at an early stage in such cases. A polythene-covered wire grid with a high proportion of free area is fitted to each inlet, Fig. 6. Fig. 7 illustrates an alternative position where the inlet to the duct could not be built into the wall of the building.

The vertical duct may be located in any part of the building and the choice of position is governed by the house plan and the most convenient location for the appliances. It is practicable to site a large-sized shared duct between flats which are back to back and to connect appliances to it, supplying the flats on either side. Where a convector heater of the radiator type is to be used one side of the duct must form part of the wall of the room to be heated. The cross-sectional area is the same as that of the horizontal ducts and the same type of block is used. To comply with building bylaws and to avoid the risk of external damage to the duct, it should be clad with breeze blocks, rendered and plastered to give an overall cover of not less than 3½ in. and not more than 4½ in. The bottom block of the vertical duct incorporates an access panel measuring 10 in. × 10 in. This enables a wooden shelf to be inserted during erection to catch

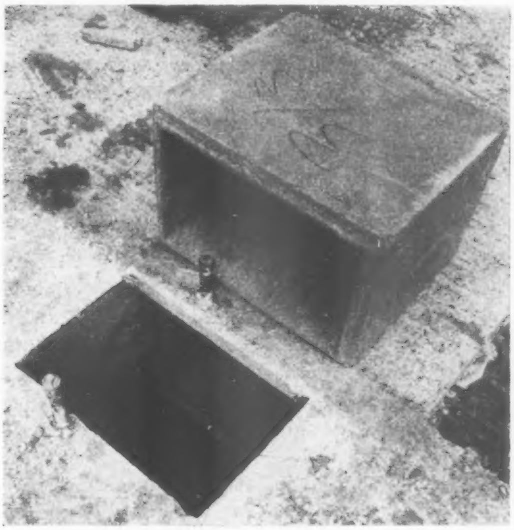


Fig. 4. Non-standard tee piece of in-situ *concrete connecting the base and vertical ducts at Islington.*

Fig. 5. (above right). Inlet unit at one end of base duct at Islington. Inlet at other end can be seen in background on right and the first block in the vertical duct can be seen ranging between the two.

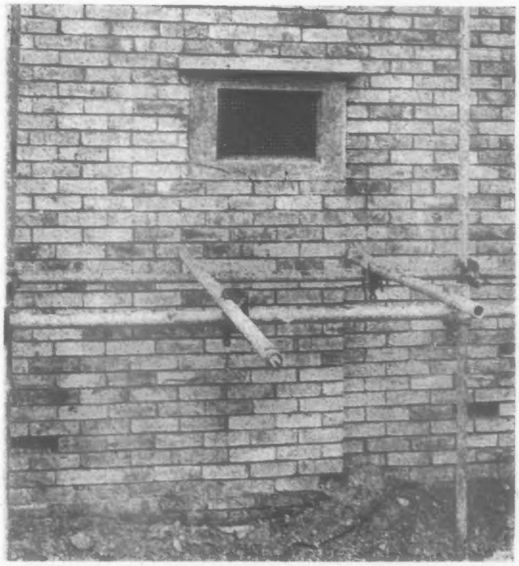


Fig. 6. Inlet at Islington 6 ft. above ground. Note p.v.c. covered metal grille.

Fig. 7. "Pillar-box" air inlets at Gateshead. This type is used when air inlet and duct cannot be built with the wall of the building.

gas supplement

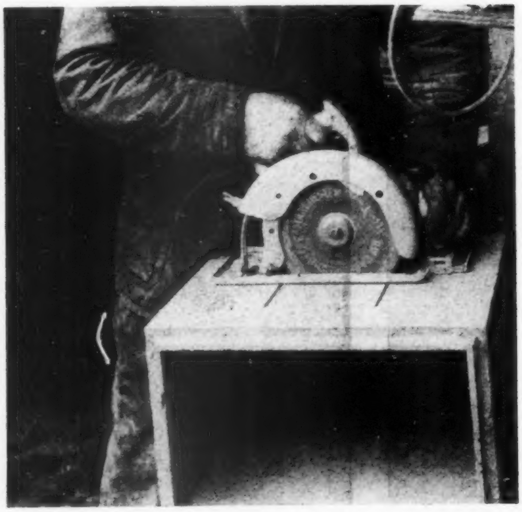


Fig. 8. Cutting blocks in-situ. *Note support for cutting tool.*

Fig. 9. Simplest way of cutting air inlet and flue outlet holes in duct. Place block in position, mark holes, take block down and cut it as shown with thin carborundum wheel.

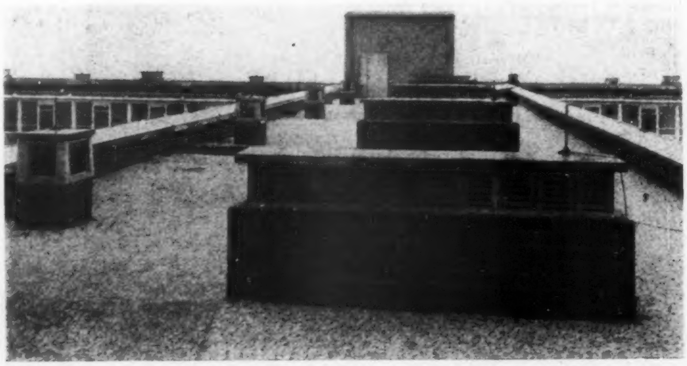


Fig. 10. Gas flues on roof at Gateshead. S.E. duct terminals on left, flues for gas fires on right.

any mortar or rubble droppings and provides access to the base of the duct for removal of rubble: on completion, the panel is permanently bedded back into position. In order to obviate too great a load being imposed on the base of the duct, a bearer block is built in at each floor. The joint will not necessarily coincide with the floor level and any space between the shoulder and the floor slabs can be bricked up as necessary. The cladding (*e.g.* 3 in. breeze blocks) will rest on the shoulder at the base of the block.

Holes to accommodate the air inlet and flue spigots of the appliances can be cut either by drilling a series of holes close together with a durium tipped drill or by using a thin power-operated carborundum wheel, with which a practised operator can cut a hole quickly (Fig. 8). Cutting is sometimes simplified if the block is placed in position, the position of the hole marked and then the block removed and the hole cut with the block horizontal on the floor (Fig. 9). It is particularly important to ensure that sound joints are made on the vertical duct to avoid any risk of leakage of products of combustion.

The duct should extend above the roof to at least the height of the parapet or lift motor or tank room and not placed too near them in order to avoid adverse pressure conditions (Fig. 10). The terminal consists of a cap unit and two front and two side panel units: each of these four panel units is fitted with a polythene-covered wire grid resistant to the corrosive effects of weather and products of combustion: the grids, as on the inlets are of wide mesh with a high proportion of free area.

SE-duct block have hitherto been available in three sizes but a No. 4 size has now been introduced for very high buildings and where there is a larger number of appliances to be installed: the dimensions of the No. 4 block are 22 in. × 15 in. internal and 25 in. × 18 in. external.

SE-duct sizes for various appliances and height of building

All SE-duct units are 18 in. high. The internal dimensions No. 1 size 8 in. × 12 in., No. 2 size 9 in. × 15½ in. and No. 3 size 13 in. × 19 in.

Appliance rating	Number of storeys					
	4/5	6/7	8/9	10/11	12/13	14/15
Continuous appliances						
Up to 17,500 B.t.u./hr.	1	1	1	1	1	2
18,000 to 30,000 B.t.u./hr.	1	1	1	2*	2*	2
Intermittent appliances						
Instantaneous Water Heater 97,500 B.t.u./hr.	1	1	2	2	3*	3*
Drying Cabinet 10,000 B.t.u./hr.	2	2	2	2	3	3
Instantaneous Water Heater 97,500 B.t.u./hr. plus Continuous Appliance						
7,500 B.t.u./hr.	2*	2*	2*	3*	3*	3*
15,000 B.t.u./hr.	2*	2	3*	3*	3*	3
25,000 B.t.u./hr.	2	2	3*	3*	3	3

* Ducts of sizes marked with an asterisk are adequate for drying cabinets in addition to the appliances specified.

Duct sizes without an asterisk are not adequate when a drying cabinet is fitted in addition to the appliances specified and in consequence a duct of the next larger size should be used for such installations.

gas supplement

Fig. 11. Main 271 gas fire at West Ham. To permit a solid fuel stove to be installed, if necessary, flow and return pipes project in front of the wall face. This is the reason for the extension piece behind the fire.

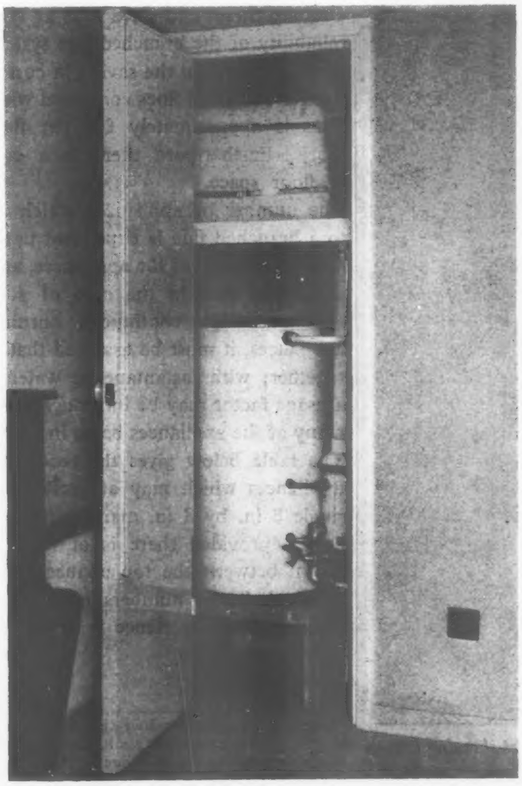


Fig. 12. C.12 gas circulator and storage cylinder with economy valve and insulated cold feed tank. Air for combustion enters cupboard through grille from kitchen. Flue of circulator (which has low gas rate) discharges into kitchen.

Branched flue installations

In addition to a number of installations of solid fuel appliances with branched flues, there are two examples of gas appliances connected to branched flues. Facilities have been granted on both these schemes for the temporary installation of recording instruments to observe the performance of the flues under varying conditions.

In a new 8-storey block of flats at Hermit and Blake Road, West Ham, London, planned for solid fuel openable stoves with back boilers, one group of seven stoves was displaced by Main Century 271 convector gas fires. The two main stacks are built up of standard 12-in. blocks of 8 in. by 8 in. section with 8 in. by 6 in. branches with a 10-ft. " lift " from each fire to the junction with the main stack. The top fire is

Fig. 13. Flue blocks at West Ham. Circular opening is for originally planned solid fuel stove. Square opening is flue access panel. Opening facing upwards is for individual flue if required.

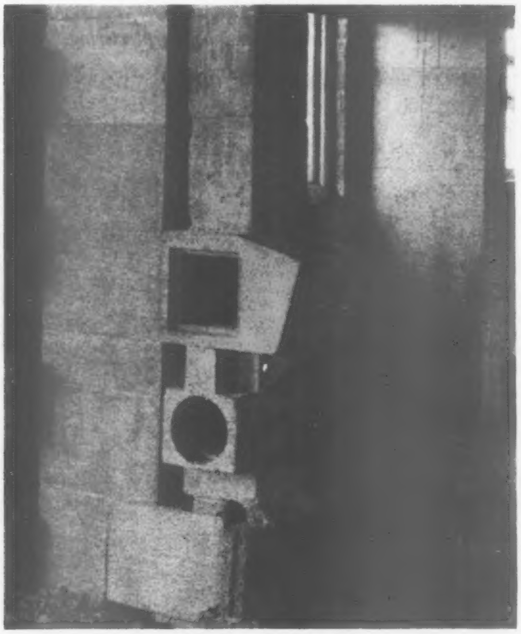


Fig. 14. Terminals at West Ham. Largest is for two main flues, the next largest for top floor flat and the remainder are for stand-by individual flues if ever put into operation.

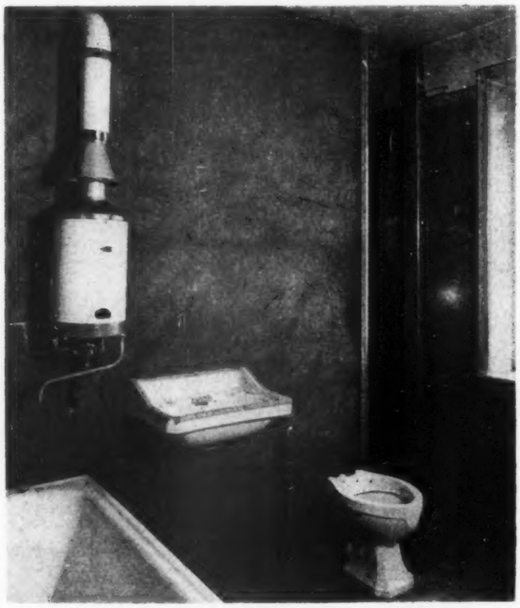


Fig. 15. Service duct at Abbey Orchard Street after rendering and before plastering. Access panel is on right.

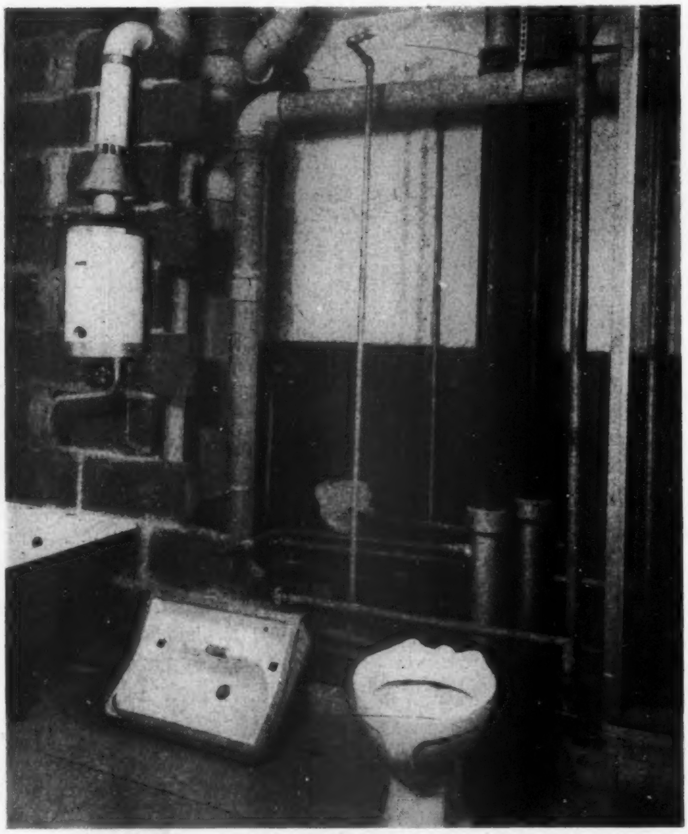


Fig. 16. Service duct at Abbey Orchard Street showing heavy duty asbestos cement flues. Ewart S.140 water heaters (left) have 4-in. flues leading to main 8-in. flue. To provide a comparison, similar heaters on far side of duct have independent 4-in. flues, each rising 12 ft., turning horizontally and discharging through aerolite terminals 8 ft. away.

independently flued. This is the usual practice since, if the top fire is connected to the main stack, there must be a height of at least 20 ft. from the top of the appliance to the terminal: this is rarely obtainable. The minimum height, if the fire is independently flued, is approximately 10 ft. In the West Ham flats (Fig. 11) the forward projection of the fire is due to the water connections for the originally planned solid fuel stove with back boiler and the inspection cover above the fire is also part of the originally planned installation. Hot water is now provided from a storage cylinder and small gas circulator (Fig. 12) which is vented into the kitchen. Figs. 13 and 14 show the construction of the branched flue and terminals.

Another installation of interest is at Abbey Orchard Street, Westminster, where an old 6-storey block of flats has been modernized by the construction of bathrooms with Ewarts S140 single point water heaters (Fig. 15). True Flue 8 in. by 8 in. blocks with 8 in. by 4 in. branches vent seven of the water heaters in one of the blocks with the top three water heaters having individual flues. In the other block an 8-in. diameter asbestos cement flue serves as the main stack with 4-in. diameter branches venting five water heaters, the top flat having an individual flue (Fig. 16). In both installations there is an 8-ft. "lift" from the water heater to the main stack.

Continuous pressure records since 1956 at Abbey Orchard Street and since 1958 at West Ham prove the reliability of the branched flue system. Present experience suggests that the saving in cost of installation per flat for branched flues compared with traditional brick flues is approximately £10 per flat for a 10-storey block. Furthermore there is a considerable saving in floor space.

The number of appliances which may be connected to a branched flue is dependent upon the type, rating and likely usage of the appliances, and upon the size of the main flue. In the case of some space heating appliances and continuous burning water heating appliances, it must be assumed that all may be in use together; with instantaneous water heaters, however, a usage factor may be introduced since the chances of many of the appliances being in use together is remote. The table below gives the recommended number of appliances which may at present be connected to a single 8 in. by 8 in. main duct for various types of heater, provided there is at least 20 ft. of vertical height between the top connected appliance and the terminal. These numbers may possibly be increased when further experience is available.

Type of appliance	No. of appliances
Medium recovery rate circulator *e.g.* Radiation C.28	12
High recovery rate circulator *e.g.* Radiation C.60	10
Warm air heater *e.g.* Sugg Halcyon	10
High efficiency convector fire *e.g.* Main 271	5*
Instantaneous bath heater or multipoint *e.g.* Ascot 709	10
Domestic central heating unit *e.g.* Potterton Diplomat 30	9

* Where there is a height of about 40 ft. between the top appliance connected to the system and the terminal, this figure may be increased to six.

building illustrated

SfB File No.	A
UDC No.	025·4

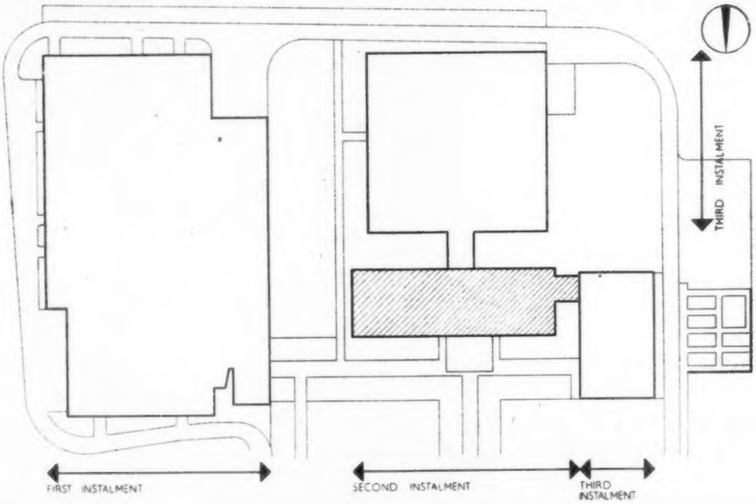
TECHNICAL COLLEGE

NORTH EAST ESSEX TECHNICAL COLLEGE, COLCHESTER, designed by H. CONOLLY, county architect; D. SENIOR, deputy county architect; W. C. B. SMITH, assistant county architect, Education; architect in charge, N. P. ASTINS; assistant architects, P. R. CANSDALE, D. M. NICHOLS, D. A. L. STANHOPE; quantity surveyors, FLEETWOOD, BUSS and ANNS; consultants, structural, B. J. NICHOLS; mechanical and electrical, A. E. MOHRING and SON; general contractors, HUTTON (BUILDERS) LTD.

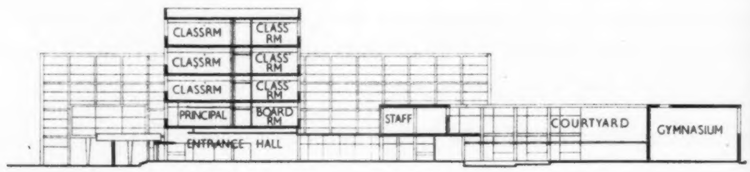
The building illustrated here is the main classroom and administrative wing of a new technical college, and forms the second of four instalments which will eventually be built. In addition to the classrooms and offices there is a library and the principal college entrance hall on the ground floor, three laboratories and a domestic science room.

The College from the north.

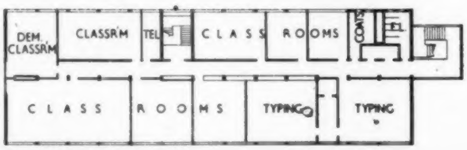
building illustrated



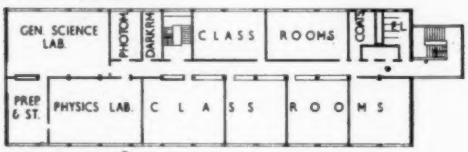
Site plan



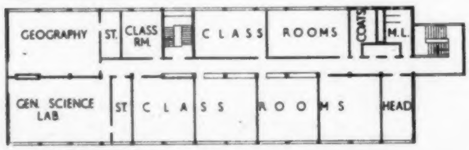
Cross section



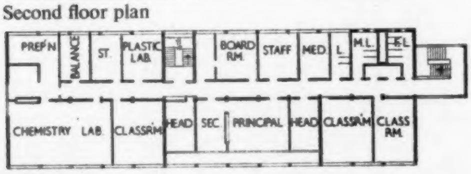
Fourth floor plan



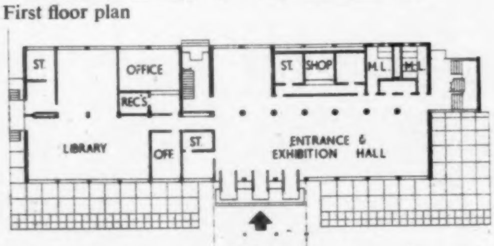
Third floor plan



Second floor plan



First floor plan

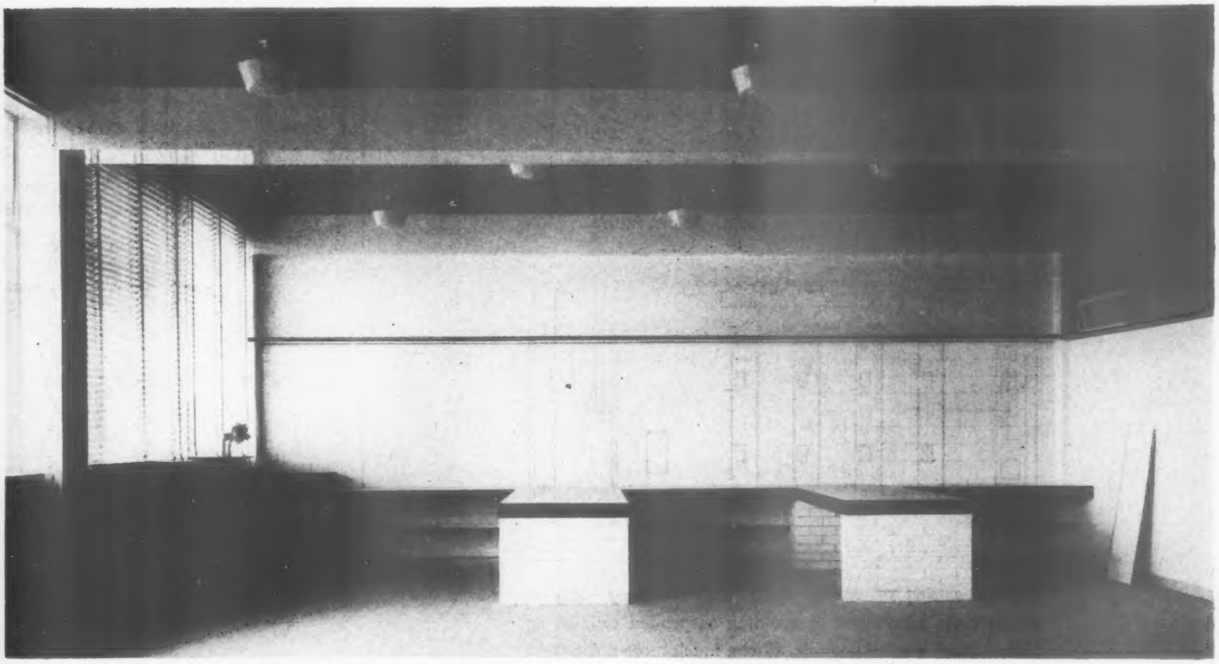


Ground floor plan [Scale: $\frac{1}{32}'' = 1' 0''$]

APPRAISAL: There is nothing about this building which is spectacular, but, besides containing details worth the attention of architects preparing similar schemes, this building suggests that some of the major problems in technical college design can be more easily solved than is popularly supposed. Furthermore it has a general interest because it represents a standard of seemliness, value for money and competence of execution (especially in the face of present-day difficulties) which, if more frequently achieved, would automatically do more to raise the standing of the architectural profession than any amount of public relations work.

Working conditions: Present-day difficulties are no more than the conditions society involuntarily imposes upon the architect, and they stem in the main from the slenderness of the resources available for meeting national commitments in the post-war era. That colleges of further education have had to be built in instalments, that it has proved impossible in most cases to foretell precisely either what future instalments would contain or when the money would be available for them is the fault of no individual in either central or local government. But, although everyone has done his best, changes of mind have been inevitable and have often led to wasted effort, sometimes to wasted money, and always to grey hair. This building was originally conceived as a classroom block, and although it is still a classroom block in the main, the drawings had to be amended to incorporate the three laboratories and the domestic science room. There was originally to be a canteen and kitchen on the ground floor and the drains for the kitchen equipment had already been laid when circumstances changed, and the present library was substituted. Finance was not expected to be forthcoming for the remaining instalments for about ten years, so a temporary chimney had to be erected in the meantime; but as it happened the third and fourth instalments followed without a break, so that after only 9 months' service the temporary chimney will now have to be dismantled and probably sold at a considerable loss. Finally, there is the constant pressure to get accommodation on the ground; a country starved of technical manpower cannot afford to wait upon perfection; and the architect's best service to society is to get on with the job, to be flexible in his concepts, ready to improvise and willing to take quick decisions at short notice. At one stage this building was re-designed in six weeks and the working drawings were done in four months by only four people. Critics and historians please note.

Classroom concept: As the plans and section show, the shell of this building is as simple as possible: *in situ* r.c. columns and beams with slab floors spanning between them. External walls consist mainly of equally spaced mullions capable of receiving the ends of partitions in a way that allows for a variety of room size and for any change of partition layout that may be required later on. As the mullions are of solid Portland stone, they are much better suited to receive partitions than are the thin metal sections of " curtain walling " and give a better brightness grading as the light falls away from the window. The width of the building necessitated by the larger rooms makes the window frontage of the smaller ones too narrow for their depth and this could have been remedied to some extent by carrying the mullions right round the building instead of having solid walls at the ends. But by and large, the concept, with its double-banking along a central corridor, solves without difficulty the main problems of this sort of accommodation.



General view of third floor science laboratory.

" polythene wastes sag if unsupported . . . a site decision to overcome the problem with V-section softwood troughs."

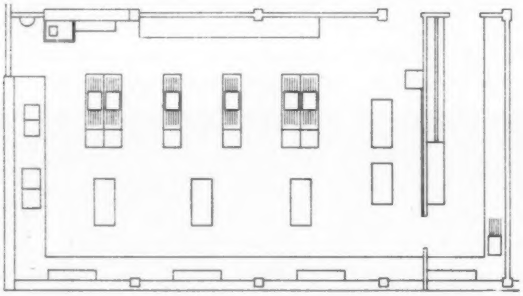
Introduction of laboratories : While current theory admits that nothing more than this is required for only basic heating, lighting and sanitary services, it assumes that as soon as any kind of laboratory is introduced there must then be a hollow floor or a suspended ceiling to accommodate laboratory services and to allow them to be subsequently re-arranged should the need arise. The ease with which laboratories have been introduced here shows that the theory does not apply for simple laboratories of this kind. The only suspended ceiling beneath laboratories in this building is the one in the ground floor library, but this has in no way proved embarrassing. It must be admitted that the laboratories are free from the complications of advanced research work, and that by placing one above the other it has been possible to avoid long horizontal runs of wastes and other services. Where it has been impossible to dispense with runs below the floor this has been accepted without fuss, and the unconcealed pipes, at any rate in the kind of working environment in which they appear, are quite acceptable.

This is partly the result of a rapidly devised improvisation. The polythene wastes sag if unsupported and therefore a site decision was made to overcome the problem by means of V-section softwood troughs.

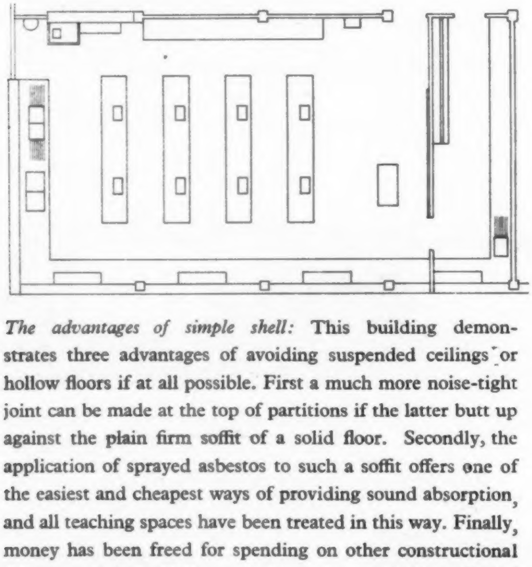
building illustrated

Wastes are finally carried down the building in two vertical ducts, one associated with the lavatories and another at the east end of the block.

A further temporary expedient is the domestic science room, on the top floor, which will eventually be moved elsewhere and replaced by a further science laboratory. This is not only typical of the adaptability demanded in buildings of this kind, but shows that such adaptability can be provided by very simple means. The diagrams show the present and future layouts of the same room.



Above, present domestic science room. Below, future conversion to science laboratory.

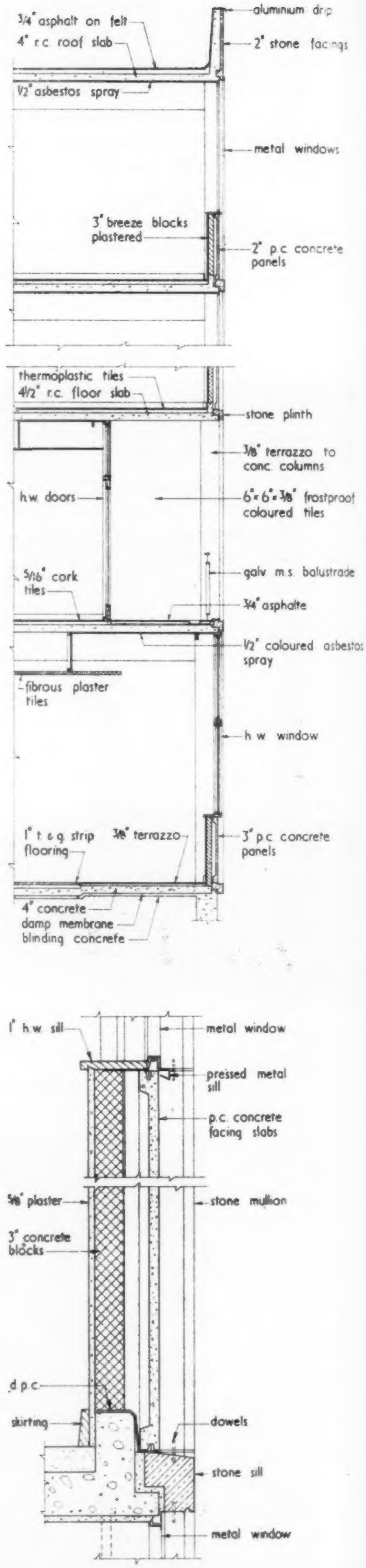


The advantages of simple shell: This building demonstrates three advantages of avoiding suspended ceilings or hollow floors if at all possible. First a much more noise-tight joint can be made at the top of partitions if the latter butt up against the plain firm soffit of a solid floor. Secondly, the application of sprayed asbestos to such a soffit offers one of the easiest and cheapest ways of providing sound absorption, and all teaching spaces have been treated in this way. Finally, money has been freed for spending on other constructional elements of the building as is shown by the high quality of finish and the amount of built-in furniture provided within the overall figure of 85s. per square foot.

Quality of finish and detail. No one could argue from this building that the Ministry of Education cost ceiling was too low to allow satisfactory finishes. It is faced externally (apart from the exposed aggregate panels below the windows) with 2-in. thick Portland stone and the mullions are solid Portland stone throughout, built up in dowelled lengths of about 3 ft.

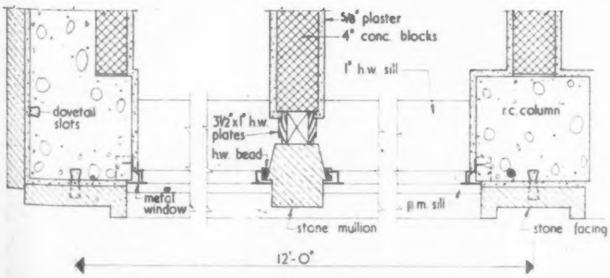
The entrance canopy is covered in copper sheet and has a hardwood strip soffit which gives an immediate impression of high quality to the visitor. Although this canopy is completely detached from the building full shelter is still obtained because the smaller porches project beneath it.

Stairs and balustrades are a further example of the quality evident throughout the building, as is the elegant display



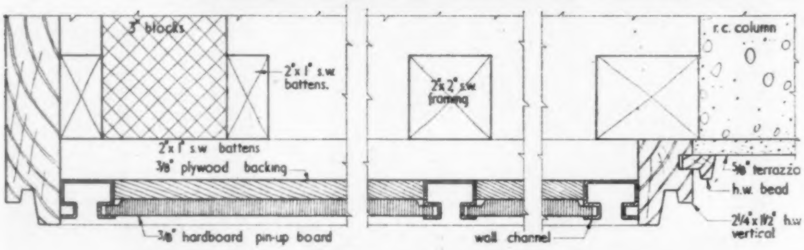
Details of curtain wall construction
[Scale: 1/8" and 1" = 1' 0"]

" faced externally with 2-in. thick Portland stone. . . "



Detail of curtain wall construction [Scale: ¼" = 1' 0"]

building illustrated

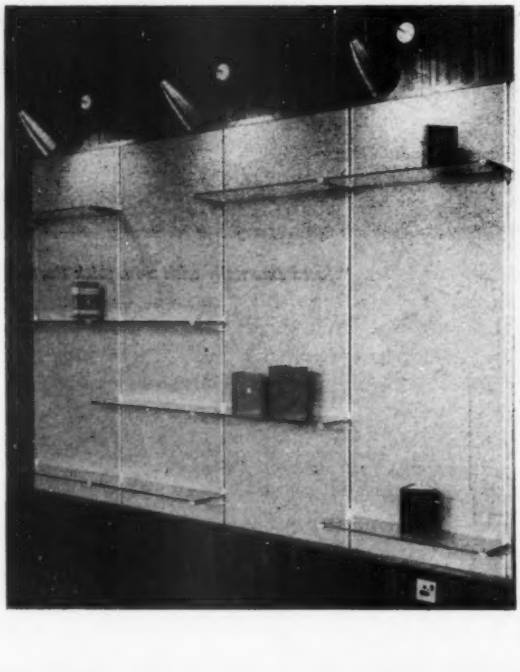


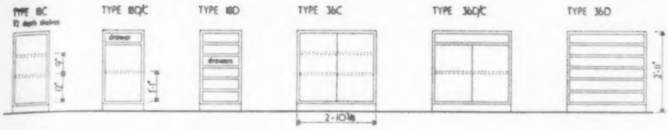
Detail of fixing of display panel [Scale: 3" = 1' 0"]

" The entrance canopy . . . gives an immediate impression of high quality " (*above*).

" elegant display panel in the library " (*below left*).

' a further example of the quality . . ." (*below*).





Range of laboratory bench units [Scale: $\frac{3}{16}$" = 1' 0"]

panel in the library. This panel, made up of shop-fitting studs and brackets with hardboard pin-up panels between them, forms a detachable cover to the duct at the east end of the building.

Details of interest: There is no doubt that some of this high quality of finish would have had to go if the architects had provided more ambitious partitions than 3 in. or 4 in. plastered breeze blocks. It is often suggested that the need for flexibility and re-arrangement of partitions means that they should be demountable. The architects discount this view, however, believing that such rearrangement will be so infrequent that to knock down a partition here and there and put a new one up is no great inconvenience or expense, and they prefer the tangible advantages of economy to theoretical ones. They add that conventional partitions of this kind are both easier to fix things to and provide a better noise barrier.

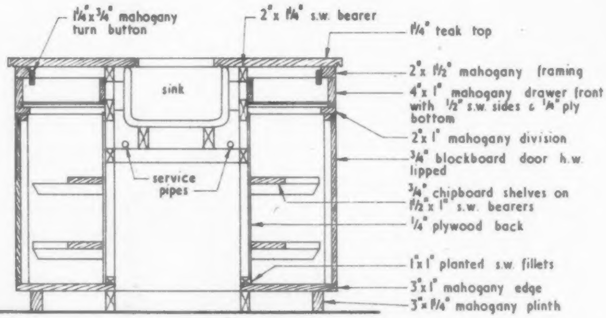
Considerable attention has been given to the laboratory benching, which consists in the main of a continuous bench-top supported on storage units separated by knee space. A range of units has been designed to give a variety of storage, some of it tailor-made to a particular purpose, like the retort-stand cupboards illustrated here, and the remainder generalised, as it were, for purposes which cannot be so precisely foreseen. No inconvenience seems to have been suffered by users who thereby have had to adapt this generalised storage to their own particular requirements. Gas and water pipes, horizontal wastes, and where necessary, electric wiring, are accommodated centrally in the bench run between storage units placed back to back as the section shows.

As a result of earlier experience with iroko, teak bench-tops have been used in the present instalment, yet it must be repeated that all the built-in fittings both in laboratories and other rooms, have been provided within the overall cost ceiling set by the Ministry of Education.

Fume cupboards are often a source of complaint from users of laboratories, but those provided here have worked well during the year they have been in operation, although recently their efficiency is said to have fallen off. This suggests that fume-cupboard failures may be due less to faulty design than to inadequate maintenance, especially of the extract fan which being out of sight tends to be out of mind as well.

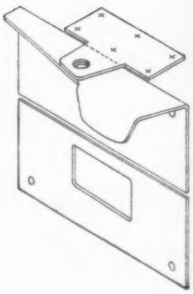
" tailor-made retort stand."

"Fume cupboards have worked well. . ."



Detail of laboratory bench [Scale: ⅛" = 1'_0"]

building illustrated



Detail of catch and number plate of locker

" *left-luggage lockers.*"

" *thoughtful detailing of the entrance foyer. . . .*"

The best way of providing students' lockers is a particularly intractable problem in buildings of this kind. The reason is that if they are centralised they are bound to be too remote from much of the accommodation, while to provide lockers outside every room means that they will be too much under-used to justify their cost. However, the classrooms are the most heavily used of all the accommodation in a college, and therefore lockers have been placed outside all the classrooms in this block. No locker is allocated exclusively to one particular student: instead they are used rather like the left-luggage lockers now found in the larger railway termini. Each student simply selects an empty locker wherever or whenever he needs one and locks it with his own padlock, which he carries round with him. The design of these locker units is particularly thoroughly conceived, with padlock clasps, handles, doors and numbers well integrated with each other. Note the suspended ceiling in the corridor—the amount of sound absorption throughout the building makes it an exceptionally quiet, pleasant and civilised place to work in.

The thoughtful detailing of the entrance foyer is characteristic. The quality of the natural lighting is excellent, and this is due to the fact that the lower suspended ceiling stops short of the window line and that the higher ceiling near the window has a much lower coefficient of reflection. This is an ingenious way of reducing surface brightness where the light is strongest so as to reduce the contrast with the back of the room. At the same time the light-toned paving just inside the window catches the light and reflects it back into the room. The combination of these features solves most successfully the problem of linking the outside with the inside—much more successfully than the old cliché of taking plate glass down into a flower bed. This is one sign of an aesthetic which is free from theoretical pre-conceptions and arises as it should from the struggle to master the problems of technique.

analysis

CLIENTS' REQUIREMENTS

A classroom and laboratory block was required as the second phase of North-East Essex Technical College.

PLANNING AIMS

To provide a central teaching block which would link the existing workshops, built as the first instalment of the technical college, with the practical rooms which will compose the third instalment, and the communal area, which is to be the fourth and final instalment. (See Plan.)

SUMMARY

Ground floor area, 8,303 sq. ft.
Total floor area, 42,150 sq. ft.
Type of contract, RIBA as amended for use of Local Authorities.
Tender date, March 10, 1956.
Work began, March 21, 1956.
Work finished, January, 1958.
Tender price of foundations, superstructure installations and finishes, £179,137 10s.
Tender price of external works, £16,569 10s.
Total, £195,707.
(Note that this figure is adjusted to exclude groundsman's bungalow and to include extensive planning amendments made soon after the contract works had started).

	s	d
Preliminaries and insurances	4	6
Contingencies	1	10½

(Part of these items is attributable to external works).

Work below ground floor level — 5 8½
Bored piles, pile caps, ground beams, hardcore and ground floor reinforced concrete slab.

STRUCTURAL ELEMENTS

Frame or load-bearing element — 11 11¾
In situ reinforced concrete columns, beams, floors, roof and walls.

External walls
(*a*) A cladding frame of Portland stone fastened to columns and floor edges with 2 in. slabs, to gable end walls. — 5 3½
(*b*) Panel infilling of precast concrete exposed aggregate slabs with breeze backing below windows. — 1 3¾

$$\text{Ratio: } \frac{\text{solid wall}}{\text{floor area}} = \frac{0{\cdot}348}{1}$$

Windows — 3 7¼
Purpose-made galvanised metal casements on upper floors.
Polished hardwood-framed windows on ground floor.
Patent curtain walling, all clear glazed, to link staircase.

$$\text{Ratio: } \frac{\text{windows}}{\text{floor area}} = \frac{0{\cdot}274}{1}$$

External doors — 0 8½
Purpose-made galvanised pressed metal glazed double doors.
Polished mahogany glazed double doors.
7 pairs.

$$\text{Ratio: } \frac{\text{doors}}{\text{floor area}} = \frac{0{\cdot}01}{1}$$

Upper floors — s d
Included under " Frame."

Staircases — 2 9½
2 reinforced concrete staircases finished with *in situ* terrazzo on treads, risers and landings, and with metal balustrade with hardwood handrail and knee rail.
Width: Main staircase, 5 ft. Other staircase, 4 ft. to first floor, then 3 ft. 6 in.
Total rise: 44 ft. 6 in.

Roof construction
Included under " Frame."

Rooflights — 3
Glazed softwood with opening gear.
19 lights: total area, 171 sq. ft.

Glazing — 1 1¼
Includes toughened glass panels in all glazed doors.

Total of structural elements : 27s 1½d

PARTITIONS AND FITTINGS

Internal partitions — 1 0¾
3 in. and 4 in. breeze slabs.

Internal screens and doors — 3 9
Purpose-made flush doors (half-glazed to classrooms), some with mahogany veneer finish.
Polished hardwood glazed two-panel doors to lobbies, staircases, etc.
Borrowed lights in hardwood frames, with metal opening lights, to corridors.
No. of single internal doors, 113.
No. of double internal doors, 23 pairs.

Ironmongery — 1 0
Generally, upright two-lever mortice locks with S.A.A. lever furniture. Specially designed pull handles and push plates to the staircase and external doors. Floor springs, kicking plates (bronze on polished doors), etc.

Fittings — 4 11¼
West African mahogany panelling to entrance hall, library shelves and fittings.
Hardwood fittings to laboratories; built-in fittings to bookstore, office, Principal's room, lockers in corridors, etc.

Total of partitions and fittings : 10s 9d

FINISHES

Floor finishes — 6 0¼

Type of finish	*Location*	*Area in sq. ft.*	*Price per sq. yd.*
1 in. nominal wood block	Classrooms and laboratories	21,240	39s.
Cork tiles	Principal's room boardroom, library	3,312	25s 9d½
Rubber floor	Corridor	3,400	55s 6d
Hardwood strip	Entrance hall	2,400	41s 9d
⅛-in. Vinyl tiles	Geography and temporary cooking rooms	2,700	30s 5d.

Lightweight screeds under all types of floor finish.

Wall finishes — 11¼
Plaster throughout.

analysis

	s	d
Ceiling finishes	1	11¼

Tiled dadoes in lavatories.
⅛-in. sprayed asbestos to classrooms and laboratories.
Fibrous plaster to entrance hall.
Suspended ceilings to library, principal's room, board room and corridors.

Roof finish 11

Asphalt on lightweight screed, and carried up the sides of parapet walls.

Decorations 2 6½

Two coats emulsion paint to walls generally, but corridors finished semi-gloss oil paint.
Some wallpaper in administration rooms, library and entrance hall. Plastic glaze in coat spaces.

Total of finishes: 12s 4¼d

SERVICES

External plumbing 1 0¼

Flashings and drips, copper roof and cladding to tank and lift house, copper roof to entrance canopy, C.i. internal r.w.p.s and rainwater outlets.

Hot and cold water installation 1 3½

Cost includes wastes and stack pipes and polythene wastes and fittings to laboratory equipment and water taps, etc.

Sanitary fittings 2 8

Type of fitting	*Number of each type*
W.c.s	26
Urinals	8
Lavatory basins	43
Laboratory sinks	42
Sinks	17
Drinking fountains	7

Heating and ventilation 6 11¾

Internal temperature 62 deg. F. with outside temperature 30 deg. F. and severe wind.
Two air changes per hour in all rooms.
"U" values: curtain wall (average of glass and slabs) 0·81 BTUs per sq. ft. per deg. F.
Gable end walls, 0·30 BTUs.
Roof, 0·18 BTUs.

Gas installation 4

105 points in laboratories.
External services.
Roads, paths, grading of site

Electrical installation 5 3

Type of fitting	*Number of each type*
Lighting points	757
13-amp. socket outlets	220
30-amp. socket outlets	2

Power supplied to lifts, boiler house, etc., as required.
Conduits for private telephone system. Wiring for low voltage systems to laboratories, etc.

Lifts 5 7¼

Two fully coupled automatic express passenger lifts serving all floors.

Total of services: 23s 1¼d

	s	d
Sundries		
Arms and rails for maintenance cradles.		3
Tank and lift motor room on roof.		7
Drainage		8
External works		
External services	1	6
Temporary boiler house, substation, greenhouse, cycle sheds, etc.	1	6
Roads, paths, etc.	3	0

Total per sq. ft. of floor area:

$$\frac{\text{£179,137 10s. (net cost excluding external works)}}{\text{42,150 sq. ft. (floor area inside external walls)}} = 85\ 0$$

COST COMMENTS

The same broad pattern of cost distribution is evident here as in previous technical colleges and reference should be made to the comparative table of technical college costs in earlier commentaries (AJ, January 29, 1959, and May 14, 1959).
The main elements groups expressed as a percentage of total cost are as follows:

	Per cent		*Per cent*
Preliminaries, etc.	7	Partitions	12
Work below ground	7	Finishes	15
Structure	32	Services	27

"Work below ground level" is the only element which appears to be slightly out of line for a multi-storey building. No soil details are given, but note that the site has piled foundations compared with strip and pad foundations used in previous colleges analysed.
Vertical circulation in the form of lifts and stairs again claims 10 per cent of the total cost, as in Slough (AJ, May 8, 1958) and Bedford (January 29, 1959). Whether this is coincidence or a fairly accurate guide to the money that can be cost planned for this function will appear from further analyses of similar buildings.

CONTRACTORS

Clerk of Works: B. W. Mortlock. *General contractors:* Hutton (Builders) Ltd. *General foreman:* G. Duncan. *Sub-contractors: Mechanical and heating:* Corton & Bergin Ltd. *Electrical:* Christy Bros. Ltd. *Piling:* The Cementation Co. Ltd. *Lifts:* Express Lift Co. Ltd. *Metal windows:* Crittalls. *Laboratory fittings:* Geo. M. Hammer & Co. Ltd. *Portland stone:* E. P. Austin. *Chalkboards:* Tabula Chalkboards Ltd.; Mann & Egerton Ltd. *Lettering:* The Lettering Centre. *Woodblock and strip floors:* S. Bennett & Son Ltd. *Thermoplastic and PVC floor tiles:* Rowan & Boden Ltd. *Rubber floors:* The North British Rubber Co. Ltd. *Cork floors:* Haskel Robertson Ltd. *Asphalt:* Pilkington's Asphalte Ltd. *Terrazzo:* The Arcanum Terrazzo & Stone Co. Ltd. *Architectural metalwork:* Light Steelwork (1928) Ltd. *Asbestos spray finish:* Turners Asbestos Co. Ltd. *Door furniture:* James Gibbons Ltd. *Sanitary goods:* Adamsez Ltd. *Wallpaper:* Palladio Wallpapers; Wallpaper Manufacturers Ltd. *Paints:* John Hall (London & Bristol) Ltd. *Acid catalysed wood lacquer:* W. W. Hill, Son & Wallace Ltd. *Tiles:* Carter & Co. Ltd. *Laboratory tape:* J. S. & F. Folkard Ltd. *Preformed copper traps and wastes:* Econa Modern Products Ltd. *Tape and waste fittings:* Barking Brassware Co. Ltd. *Curtains, materials:* Heals Ltd. *Manufacturer:* R. C. Twitchett Ltd. *Lighting fittings:* Forrest Modern Fittings; Merchant Adventurers; Troughton & Young Ltd.; Frederick Thomas Ltd. *Clocks:* Gent & Co. Ltd. *Paving and precast cladding slabs:* Hutton (Builders) Ltd. *Blackout and sunblinds:* J. Avery & Co. Ltd.

working detail

GLAZED WALL TO LIBRARY: HOSPITAL IN STUTTGART

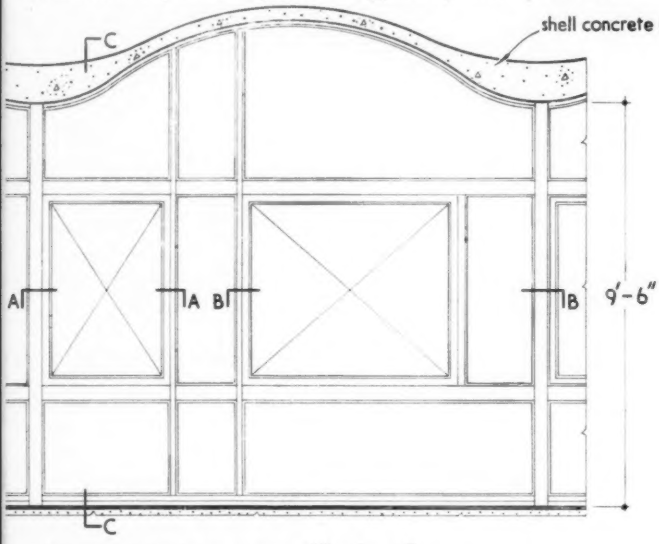
J. Herkommer, architect (material supplied by D. G. Williams)

The visual success of this wall is due in part to the fact that the rectangular framing is substantial enough to " hold " the wave forms of the shell concrete roof. The overhang is to prevent sunlight from penetrating the library and the large area of glass is to give a sufficient percentage daylight factor. The fixed frames are painted white, the opening lights, blue green. All lights are double glazed, but some of the insulating value must be lost by the " cold bridge " effect (i.e. the uninterrupted passage of heat through the steel frames).

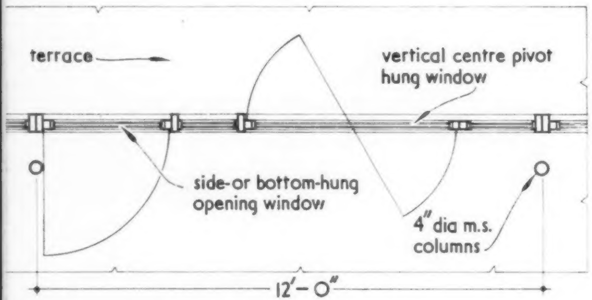
working detail

GLAZED WALL TO LIBRARY: HOSPITAL IN STUTTGART

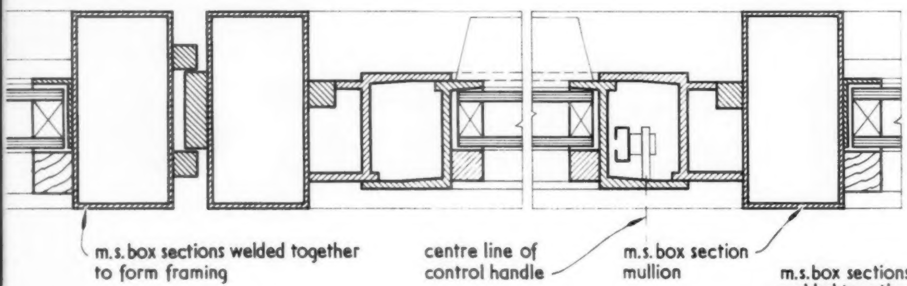
J. Herkommer, architect (material supplied by D. G. Williams)



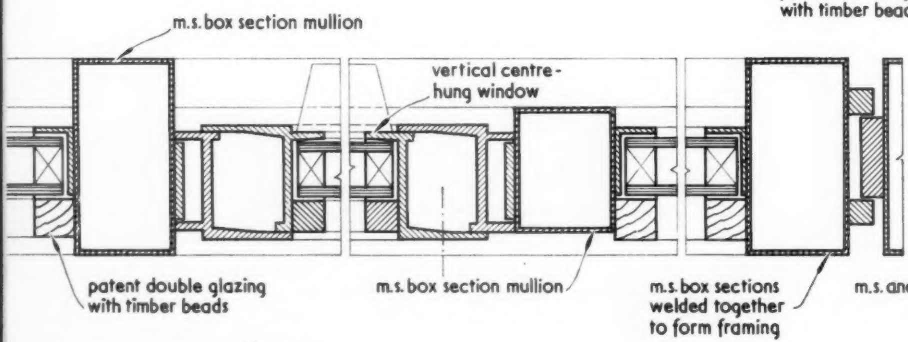
INTERNAL ELEVATION. scale ¼" = 1'– 0"



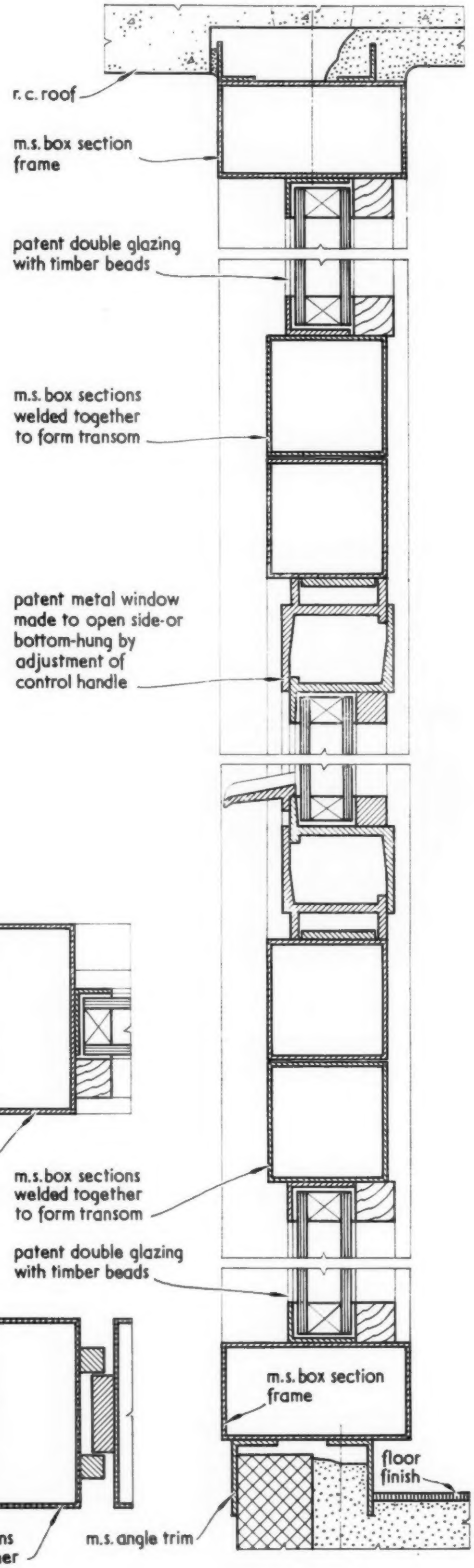
PLAN. scale ¼" = 1'– 0"



PLAN AT A – A. scale ¼ full size



PLAN AT B – B. scale ¼ full size

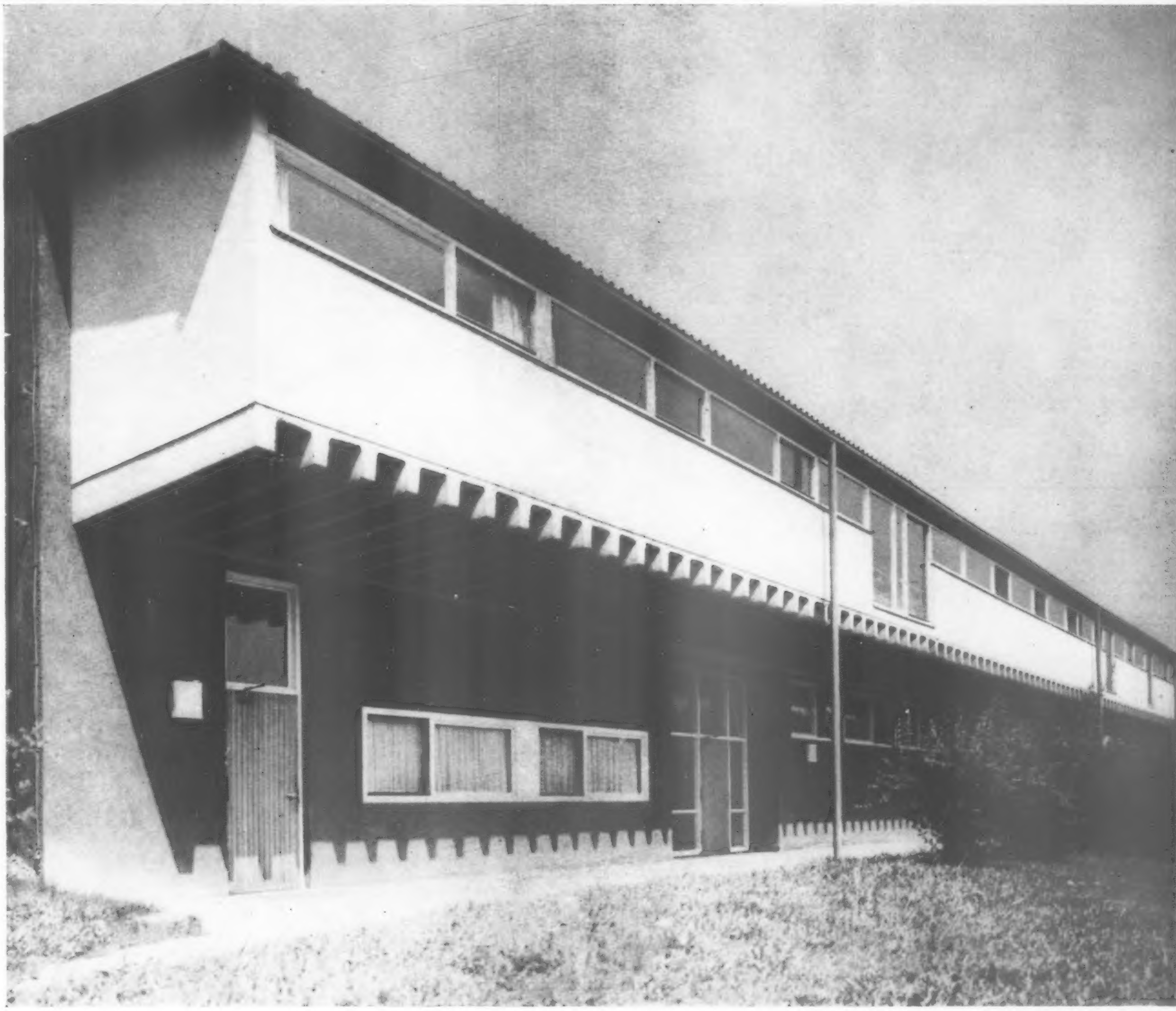


SECTION C – C.

note: figured dimensions in feet and inches are approximate working detail

WINDOWS: SCHOOL IN STUTTGART

Gunther Wilhelm, architect (material supplied by D. G. Williams)

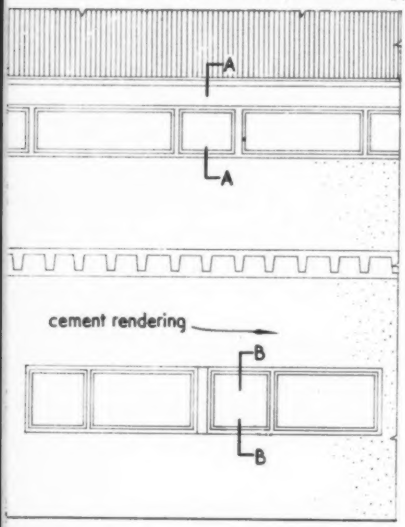


This reversion to in-situ concrete for the external wall of the first floor is reminiscent of the early days of the modern movement. Note the double roof with air space between and the use of aluminium trim at sill and head of the upper range of timber windows.

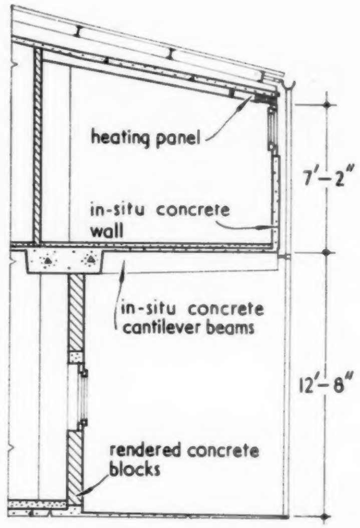
working detail

WINDOWS: SCHOOL IN STUTTGART

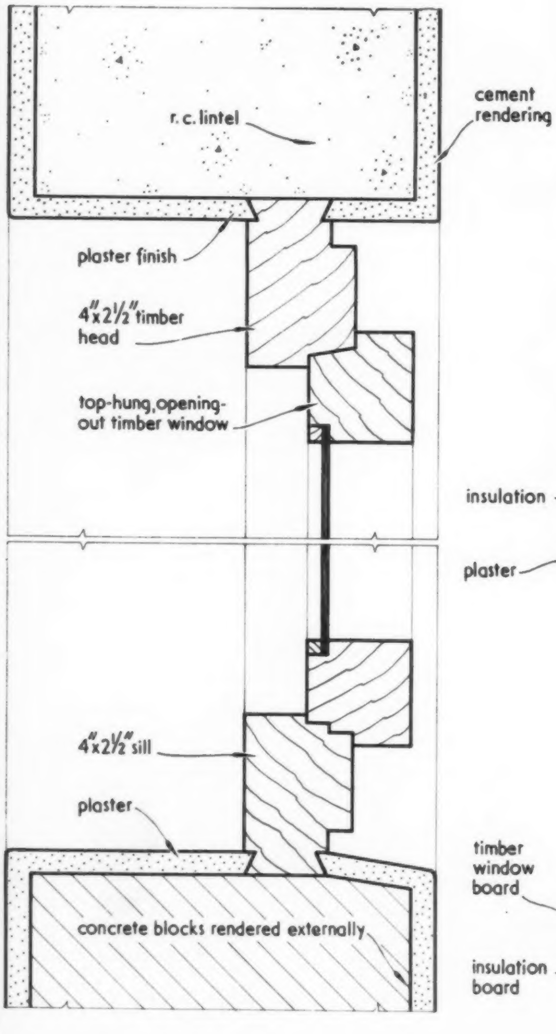
Gunther Wilhelm, architect (material supplied by D. G. Williams)



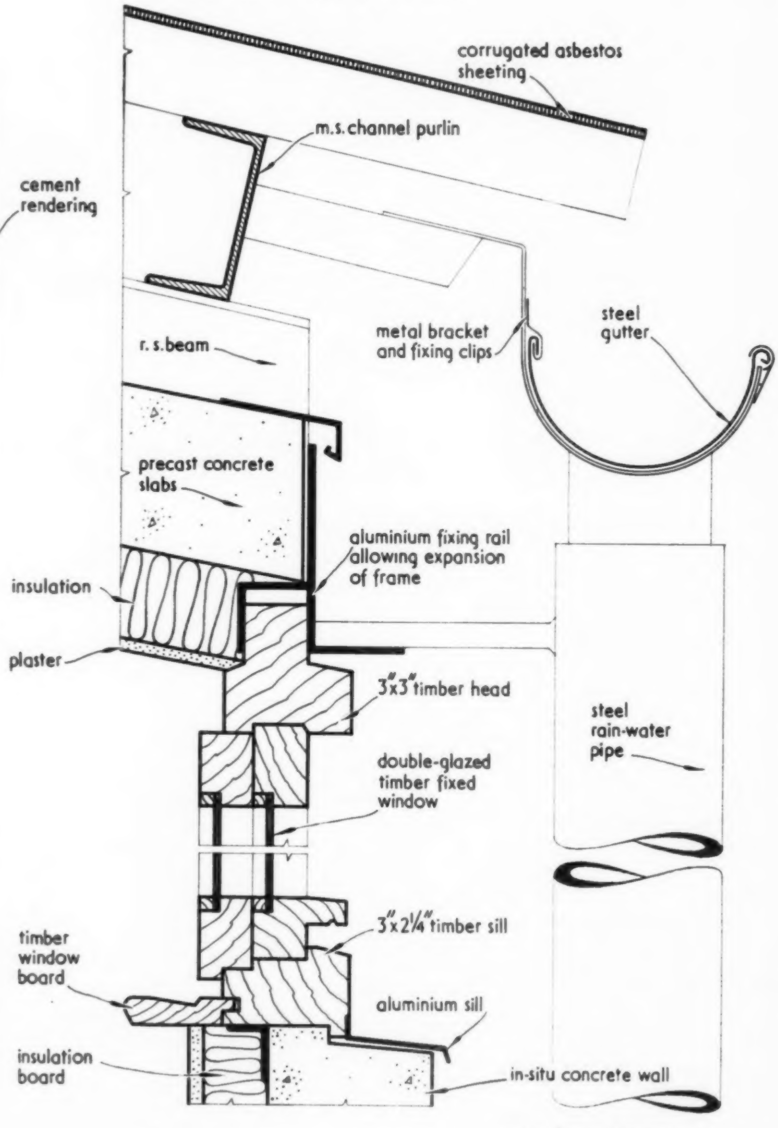
ELEVATION. scale 1/8" = 1' – 0"



SECTION. scale 1/8" = 1' – 0"



SECTION B – B. scale ¼ full size



SECTION A – A.

note: figured dimensions in feet and inches are approximate.

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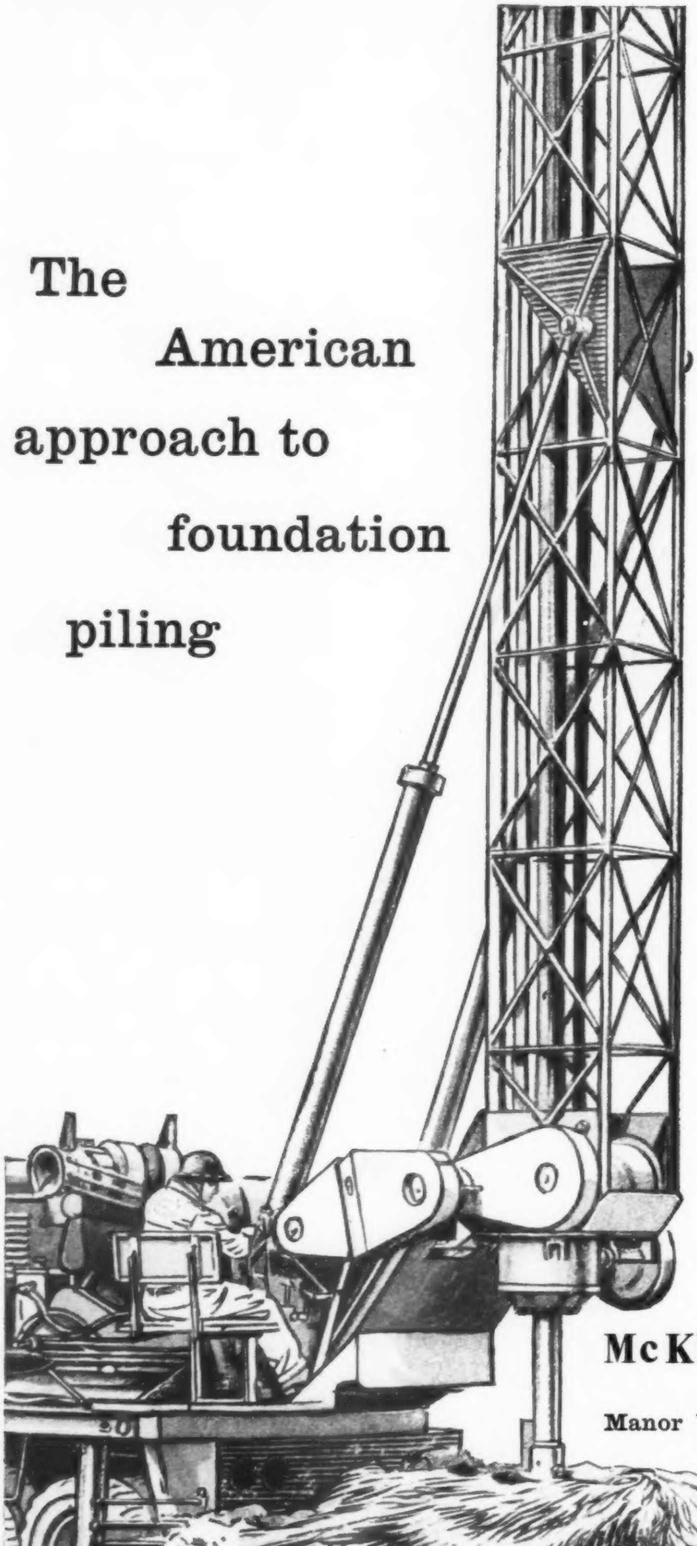

The recently formed British company, McKinney Foundations Limited, backed by the resources of John Laing and Son Limited, makes available, for the first time in this country, the considerable American experience in the design and construction of bored pile and caisson foundations for multi-storey buildings and civil engineering structures.

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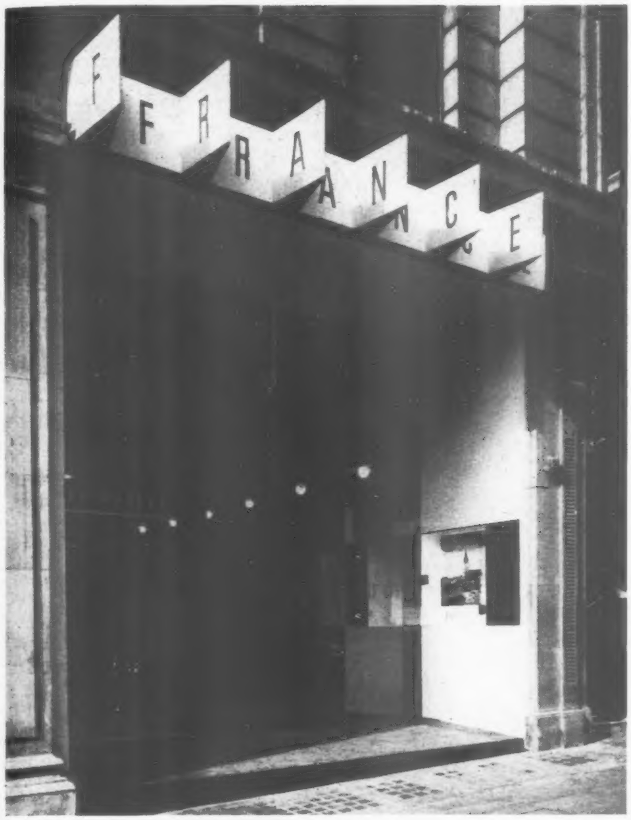
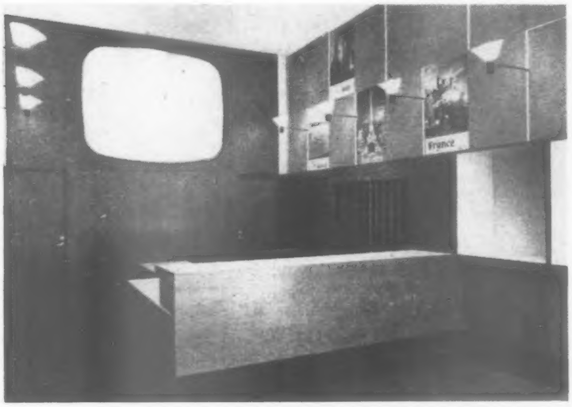
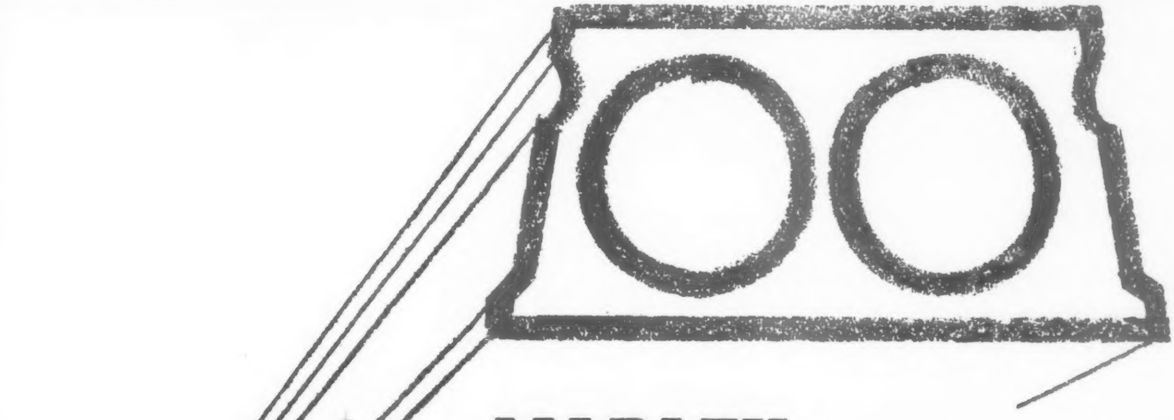


This new information office for the French Government Tourist Office in the Haymarket was opened last week. It was designed by Erno Goldfinger and Charlotte Perriand. The shop front (left) is set back 4 ft. 8 in. from the building line, forming a porch which is paved with 8-in. by 8-in. Staffordshire Blue quarries. The office has charcoal grey floor and skirtings, with a ceiling of white acoustic plaster. The side walls are staggered cork panels. The back wall (below) is painted red ochre around a projection screen. The general contractors were Frederick Sage & Co. Ltd.





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Announcements

PROFESSIONAL

John Godwin, A.R.I.B.A., A.A.Dipl., and Gillian Hopwood, A.R.I.B.A., A.A.Dipl., have moved their office to 27, Boyle Street, Lagos, Nigeria, cable address Godwood, Lagos. The postal address, Private Mail Bag 2148, and telephone number, Lagos 20415, remain unchanged.

The School of Architecture at the University of Manitoba have moved into a new building and are attempting to completely renovate the building materials library and sample rooms. They would therefore appreciate literature and samples from manufacturers of building materials, equipment and fixtures. This should be marked for the attention of Professor Roy Sellors, University of Manitoba, School of Architecture, Winnipeg, Manitoba.

Alec F. French & Partners of Halifax House, St. Augustine's Parade, Bristol, 1, and Pearl Assurance House, Royal Parade, Plymouth, have taken M. C. Collings, A.R.I.B.A., into partnership. The name of the firm will remain unchanged.

Knight and Benwell, Chartered Quantity Surveyors of 12, Queen Square, Brighton, have opened an additional office at Verger's House, Shoreditch Church, London, E.1 (telephone Shoreditch 9153).

B. H. P. Vail, F.R.I.C.S., and J. D. Macara, A.R.I.C.S., Chartered Quantity Surveyors, previously of Merz and McLellan, Consulting Engineers, have commenced practice under the style of Vail and Macara at Grainger Chambers, Hood Street, Newcastle-upon-Tyne (telephone 23031). Trade literature would be appreciated.

TRADE

John Laing & Son Limited have formed a new company to be known as Ground Engineering Limited.

J. M. Marshall, senior North of England technical representative for Langley London Ltd., has changed his address and is now at Knox Mill Lane, Killinghall, Harrogate Yorkshire. F. W. Dewhurst, Cheshire and Lancashire technical representative, has also moved and lives at 6, Cliff Grove, Heaton Moor, Stockport, Cheshire. K. A. Minns has been appointed technical representative for East Anglia and South Lancashire.

H. Newsum Sons & Co. Ltd. have changed the address of their London office to Mellin's House, 56/60, Hallam Street, W.1 (telephone Langham 8423).

Holoplast Limited have appointed John McNeill Limited of Belfast as Decorplast distributors in Northern Ireland.

Atlas Lighting Ltd. have moved their Head Office to Thorn House, Upper St. Martin's Lane, London, W.C.2. Also their Fittings Design Department, Illumination Engineering Department for the London sales area and Advertising Department will be located in the new building. All other departments in the London area will remain at their present address.

Rudders & Payne Ltd. have been appointed as main distributors for Weyroc, Weydec and Hardec by the Airscrew Company & Jicwood Limited.

Semtex Ltd. have concluded an agreement with Morris de Leval Ltd. whereby the Semtex Company are appointed the sole distributors in the United Kingdom of Synthanite.

Semtex Ltd. have appointed Norman Daniel as assistant general manager.

The Development Branch of the Development and Research Department of The Mond Nickel Company Limited has been reorganized into four divisions under the General Managership of F. Dickinson, a Director of the Company. The divisions are: Ferrous Division—Manager, W. W. Braidwood; Non-Ferrous Division—Manager, J. Hinde; Applicational Engineering Division—Manager, Dr. A. B. Everest; General Division—Manager, Dr. E. C. Rhodes.

T. R. Manderson is now the Southern Area Manager for The Benjamin Electric Limited.

The Commercial and Export Sales Section of Ekco Heating has been transferred to the London Depot at the Civic Hall, Exhibition Grounds, Wembley (telephone Wembley 3085/7).

British Insulated Callender's Cables Limited has signed an agreement with the Burndy Corporation of Norwalk, Connecticut, USA, to form a new company in the United Kingdom to be known as BICC-BURNDY Ltd.

Aluminium Union Limited has changed its name to Alcan (UK) Limited.

C. Geoffrey Cullen, Director of the Building Boards Division of Bowaters Sales Company Limited has been elected President of the Federation Europeene des Syndicats de Fabricants de Panneaux de Fibres (FEROPA).

Correction

In the JOURNAL for September 24, under Professional Announcements, the name Bader and Mill should have read Bader and Miller.

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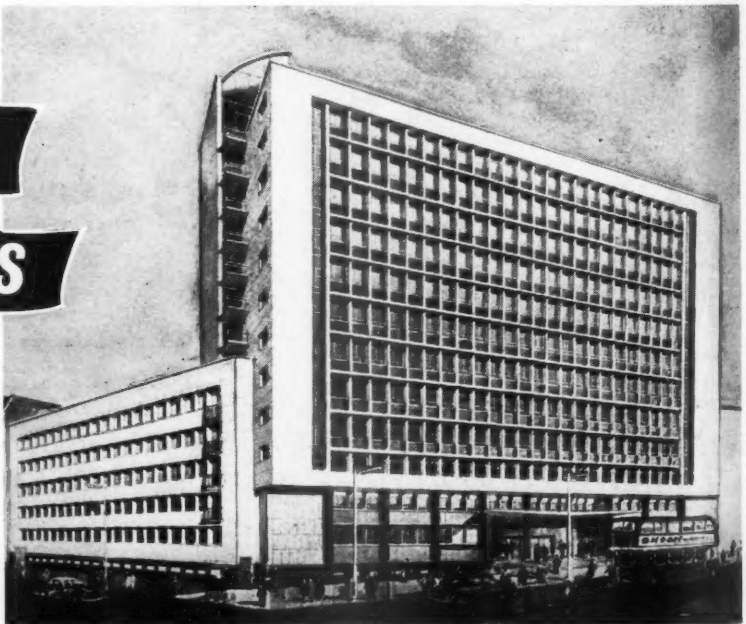

Architects: KENNETH WAKEFORD, JERRAM AND HARRIS.
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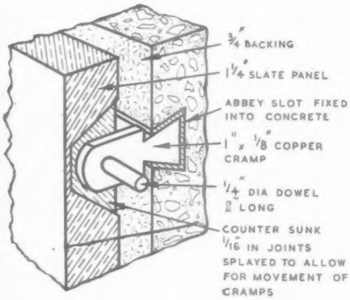
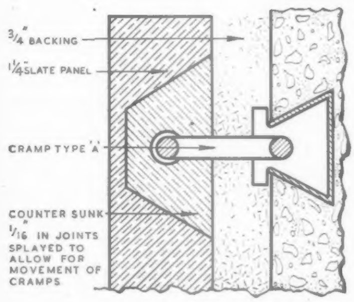
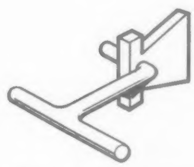


TYPICAL CRAMP

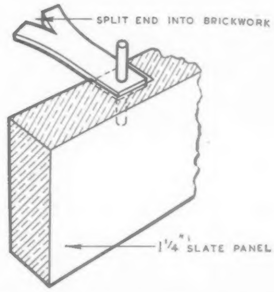
A 1 in. by 1/8 in. copper cramp is (*a*) dowelled into a 1/16 in. splayed counter sunk in a panel of Broughton Moor slate, and (*b*) set into an Abbey slot in the concrete.



CRAMP TYPE A



Splayed counter sunk and swivel type cramp make ample allowance for movement.



CRAMP TYPE B
CRAMP AND PIN

One end of 4 in. long cramp is split for setting into brickwork. The other is drilled to receive 2 in. long pin.

It was to be no ordinary building, and no ordinary facing slate would do. That is why Messrs. Easton and Robertson chose Broughton Moor Light Sea Green Slate (frame sawn and finely rubbed). They know it to be the ideal slate for both internal and external facing. They know too that centuries hence it will be still sound and beautiful. Architects can specify Broughton Moor stone in three shades and a variety of delightful finishes. There is nothing quite like Broughton Moor for facings, pavings, steps, cills, pilasters, fireplaces and indeed, most architectural purposes.

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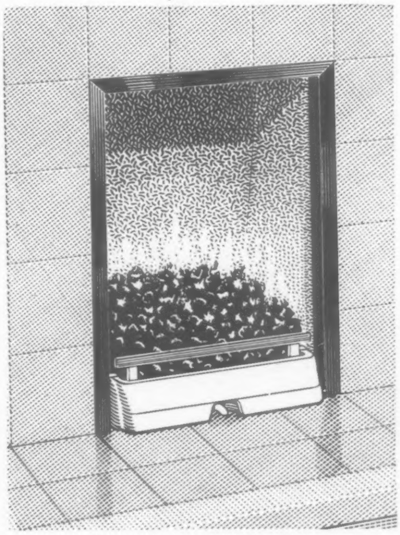

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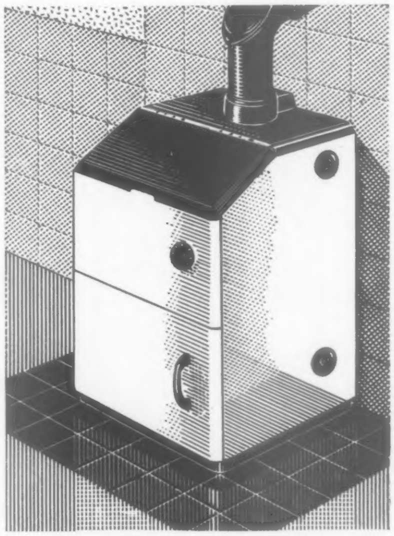

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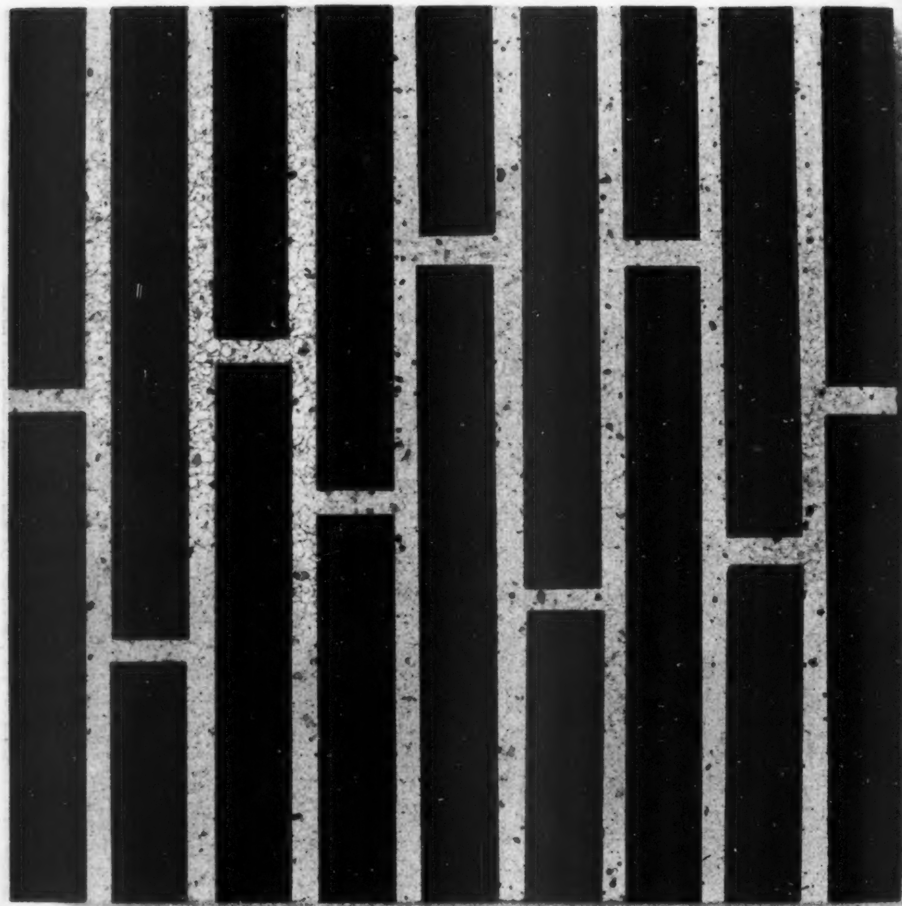

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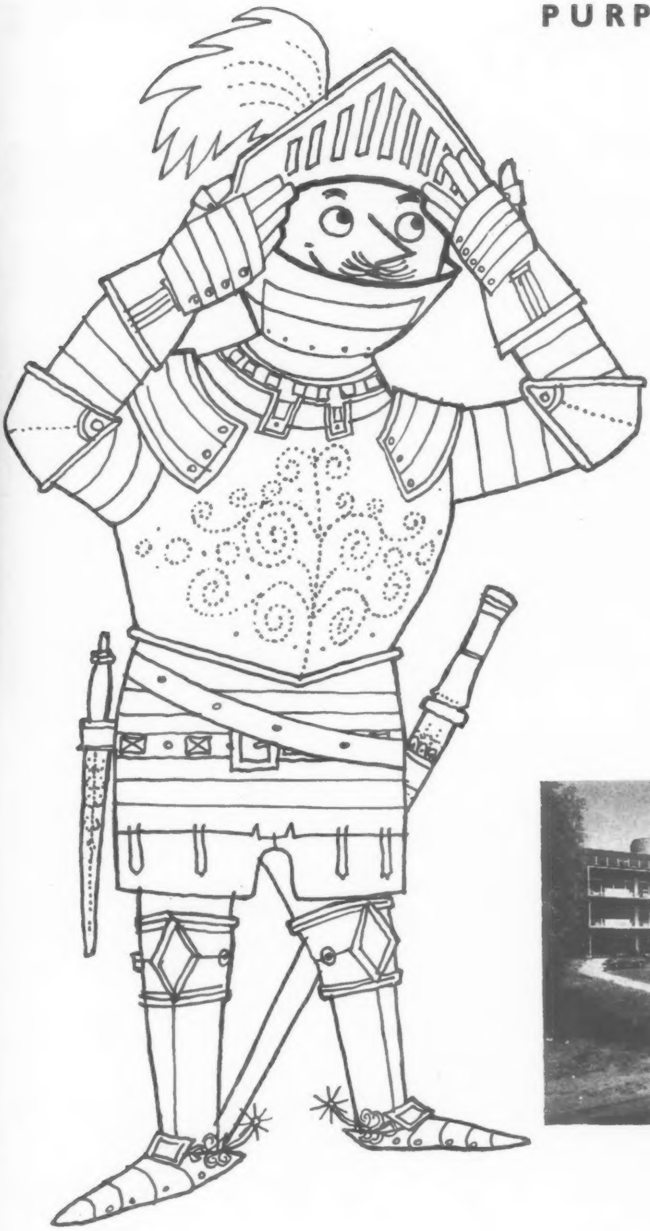

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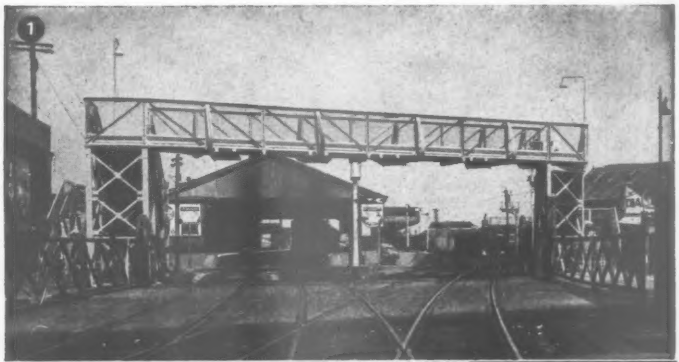
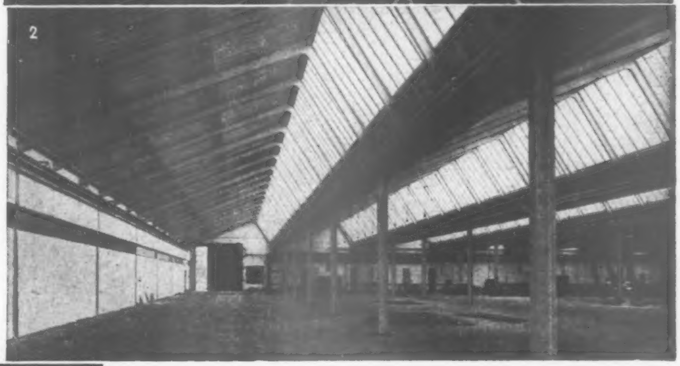
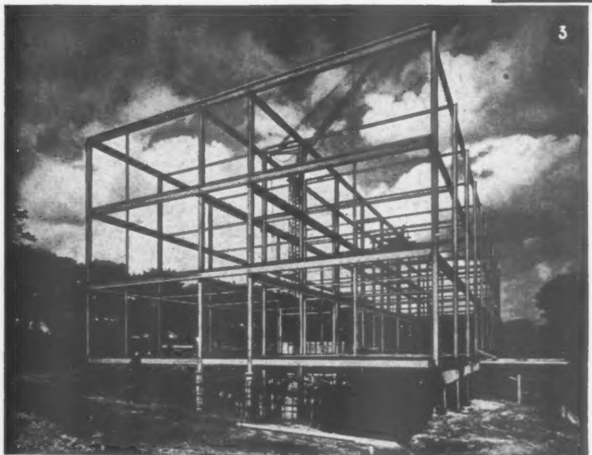
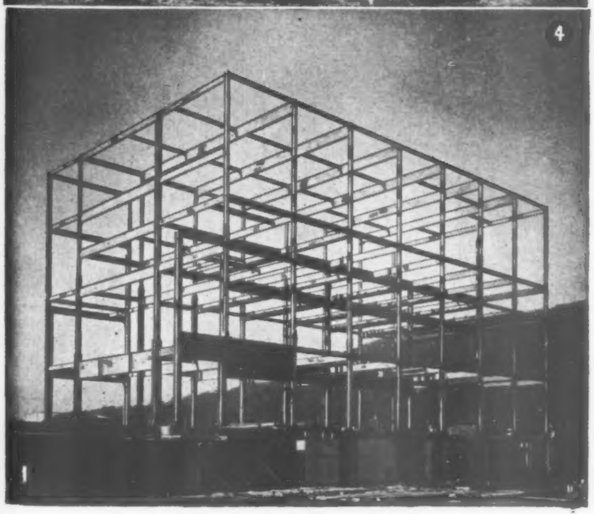
3. **Sowerby Bridge Secondary School.**
4. **Control Room, Services and Welfare Block, Elland Power Station.**





STRUCTURAL STEELWORK





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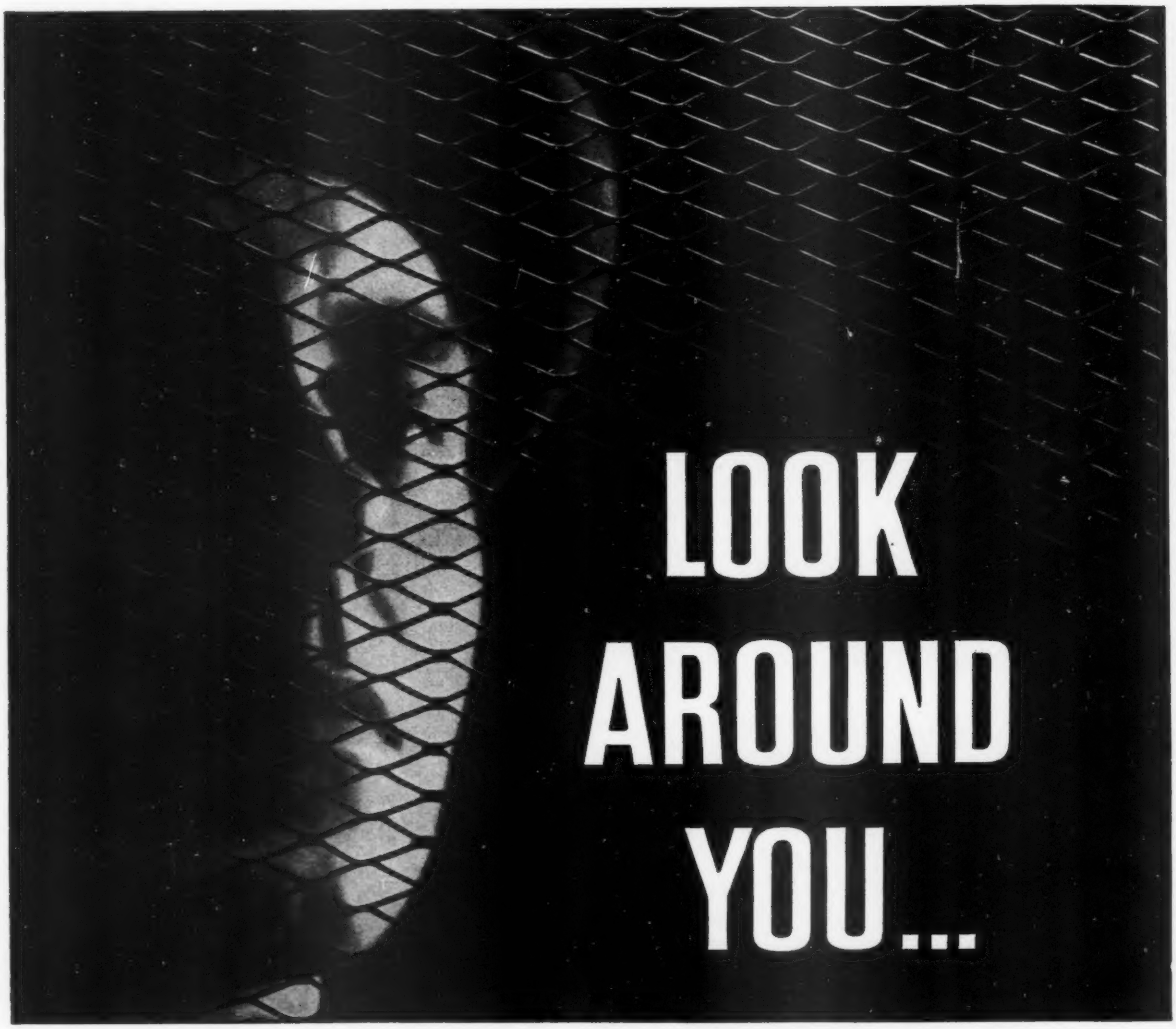

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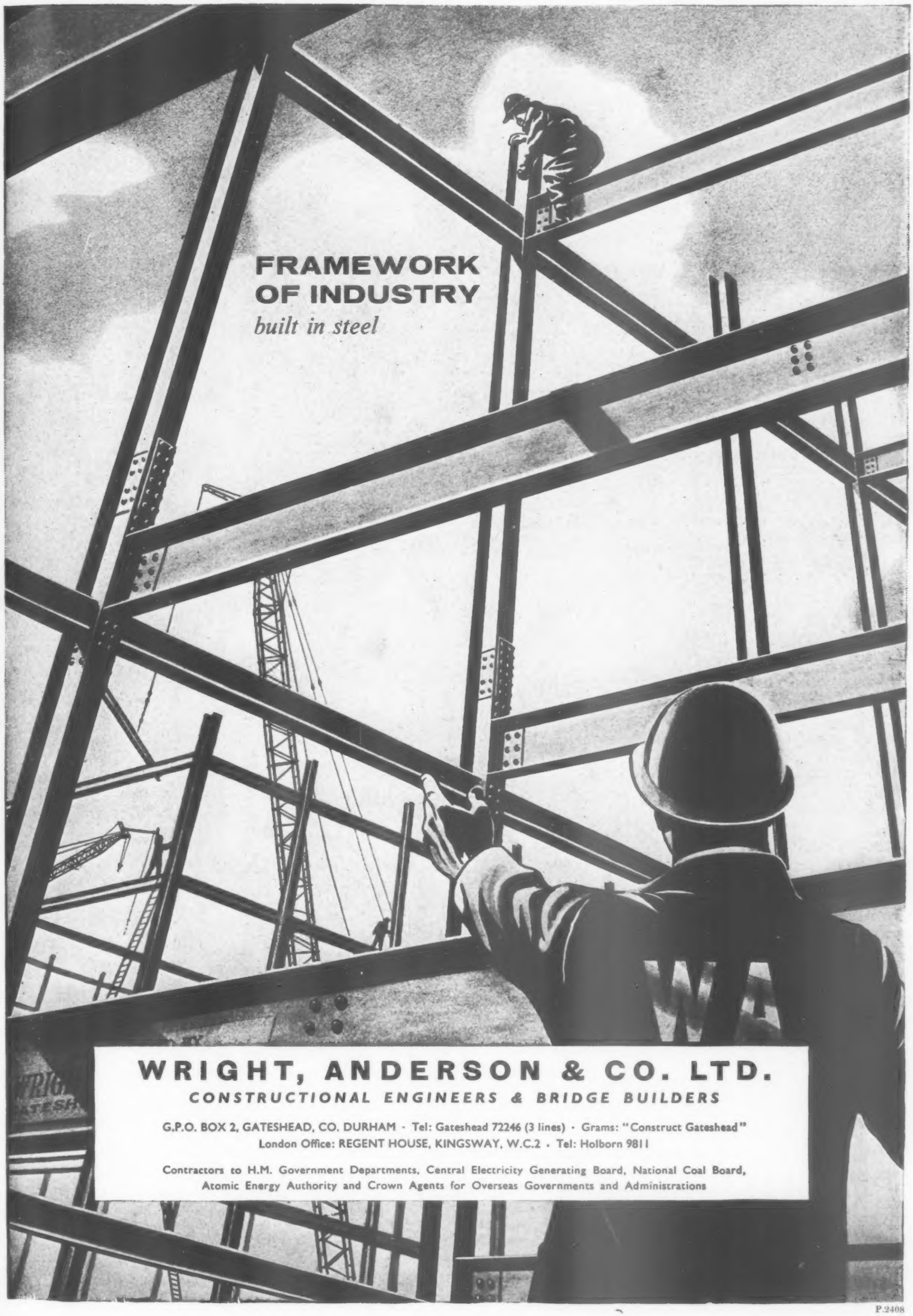
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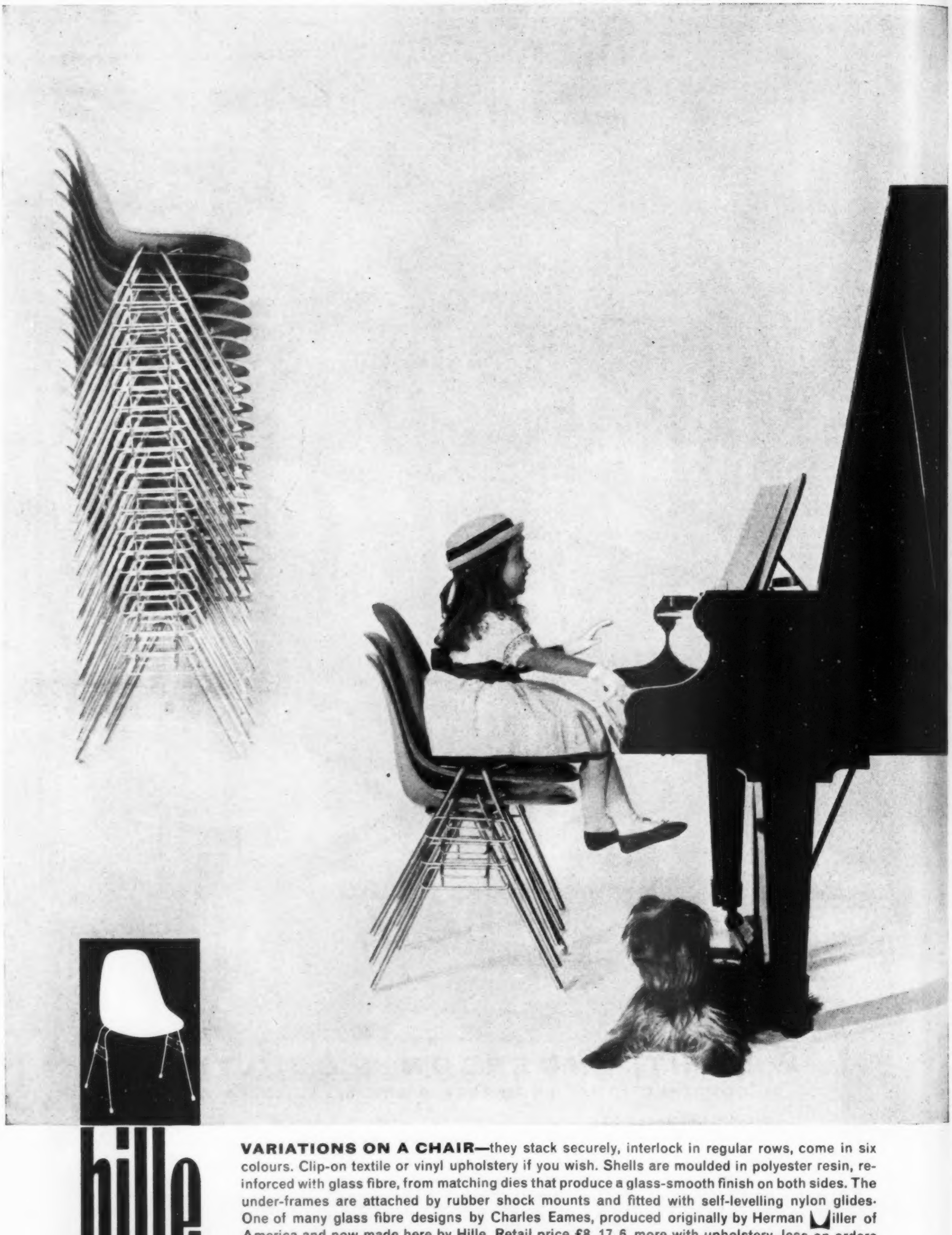

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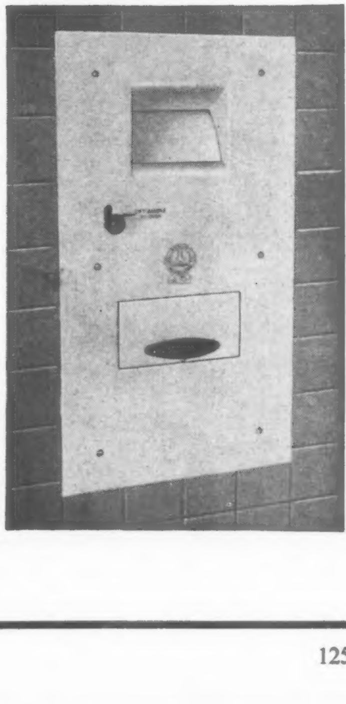

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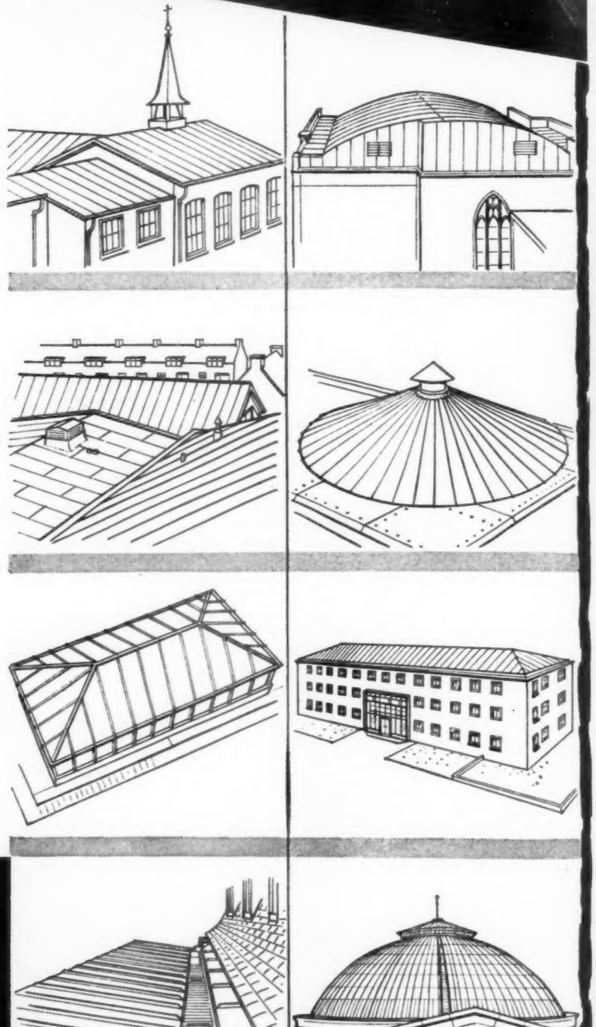

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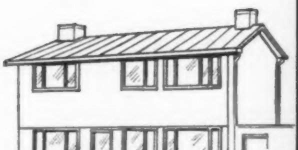

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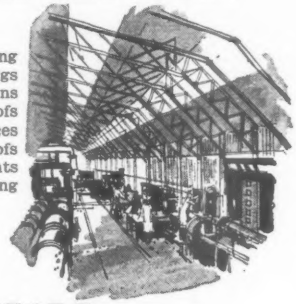

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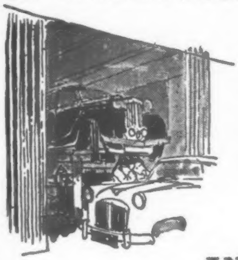

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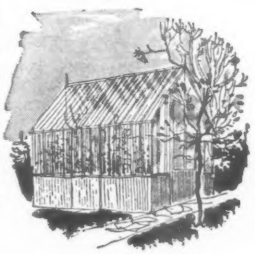

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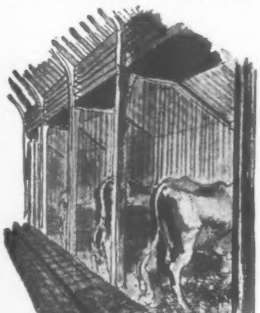

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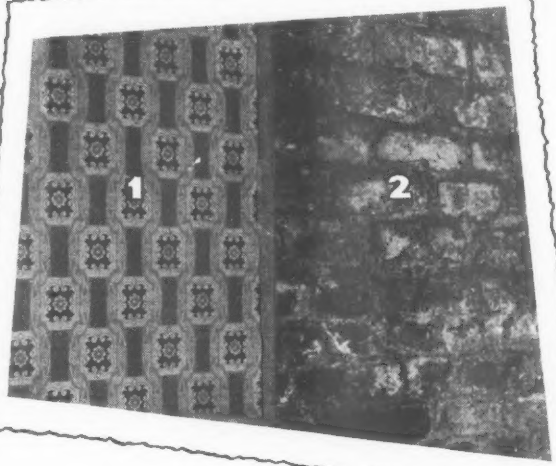

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drives out damp permanently

internally-externally

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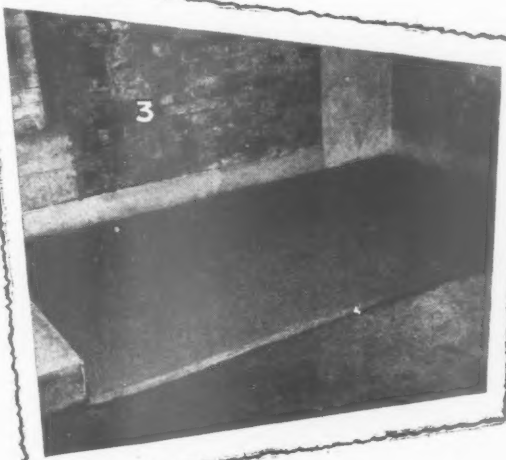

1/2 Right: Damp brick wall in cellar prior to application of Stroma. Left: same wall after treatment.

3 Jointless Magnesite Flooring on Stroma treated screed on damp sub-floor. Note untreated damp brick wall in background.

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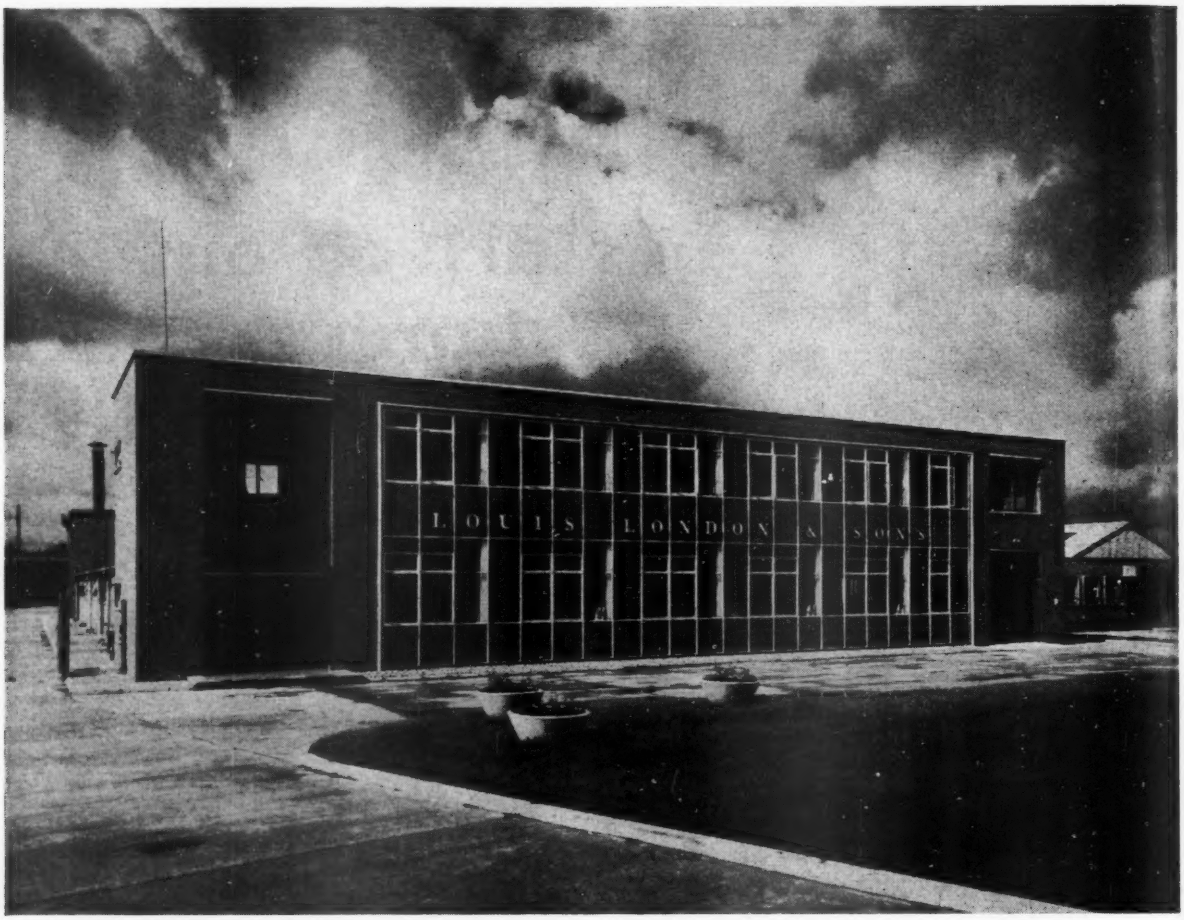

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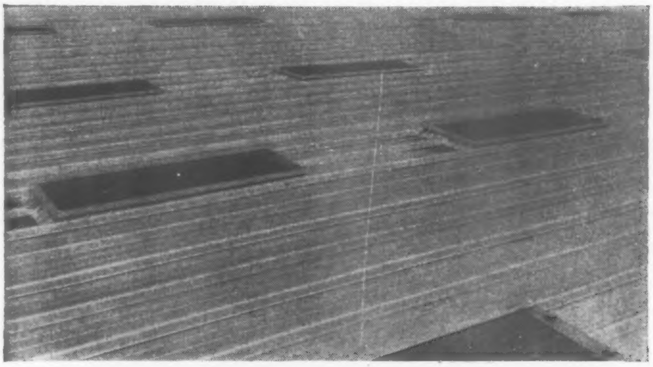

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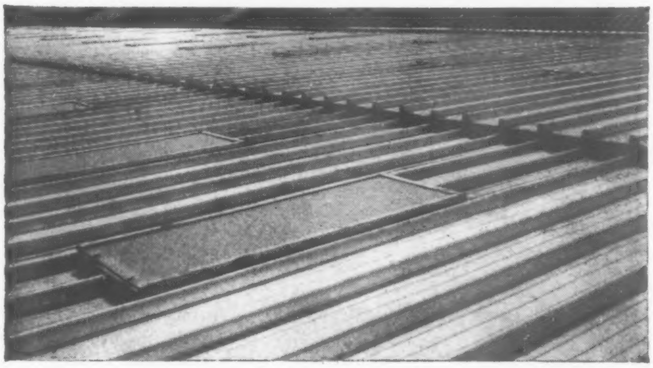

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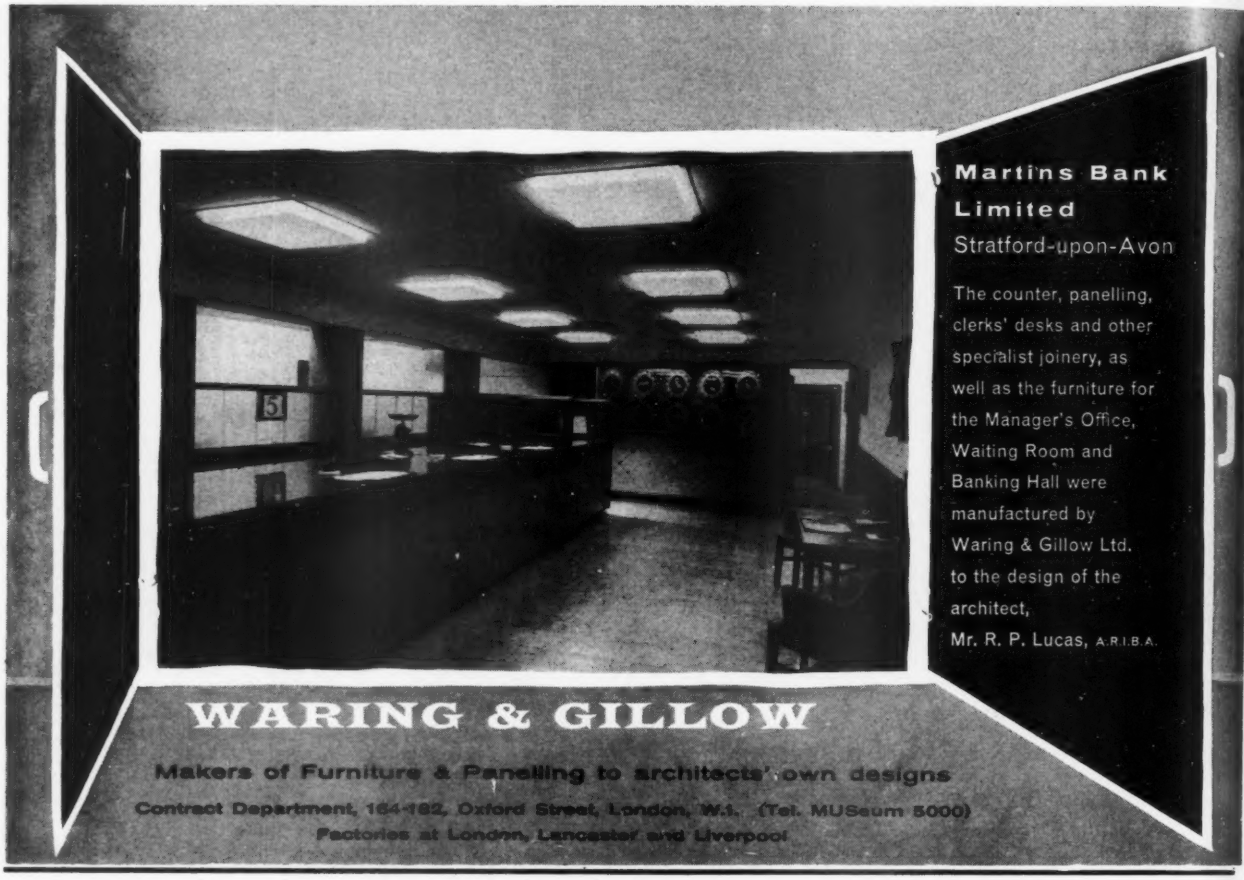
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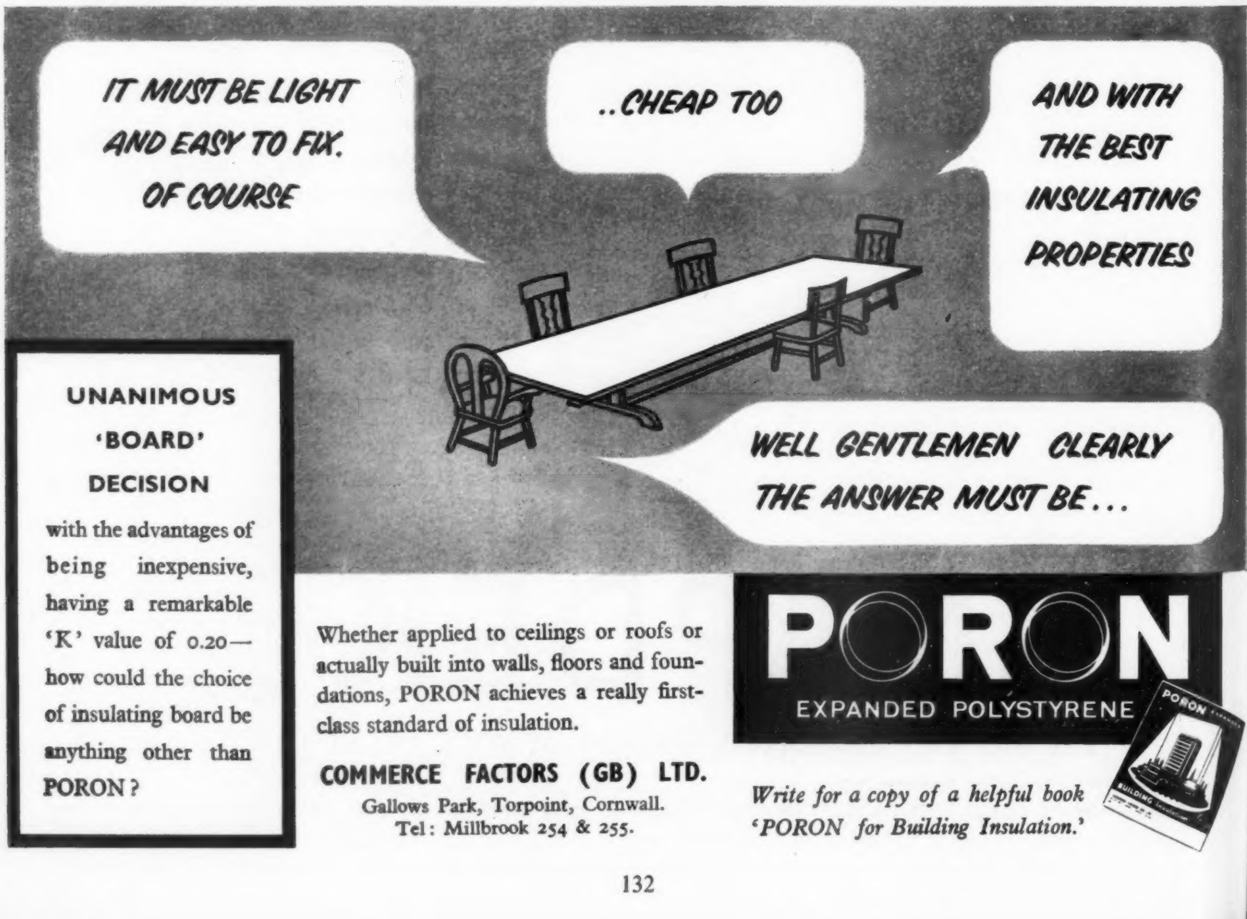
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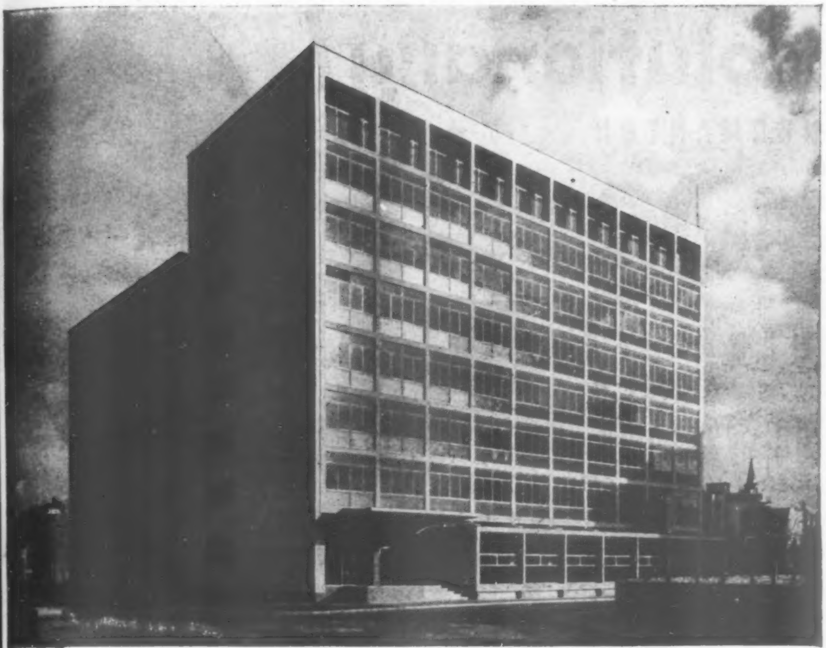

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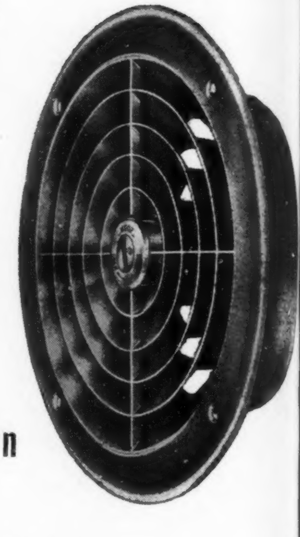

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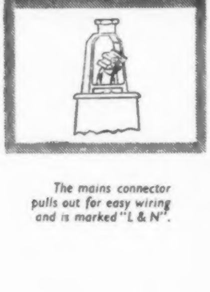

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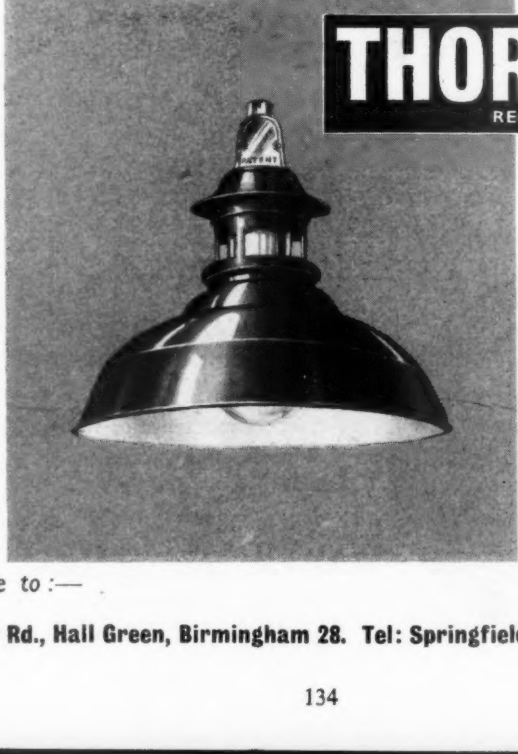

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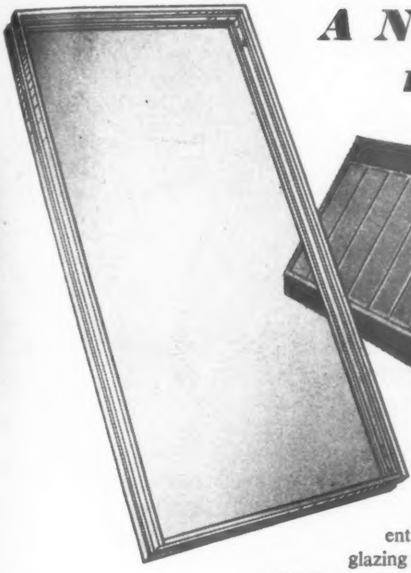

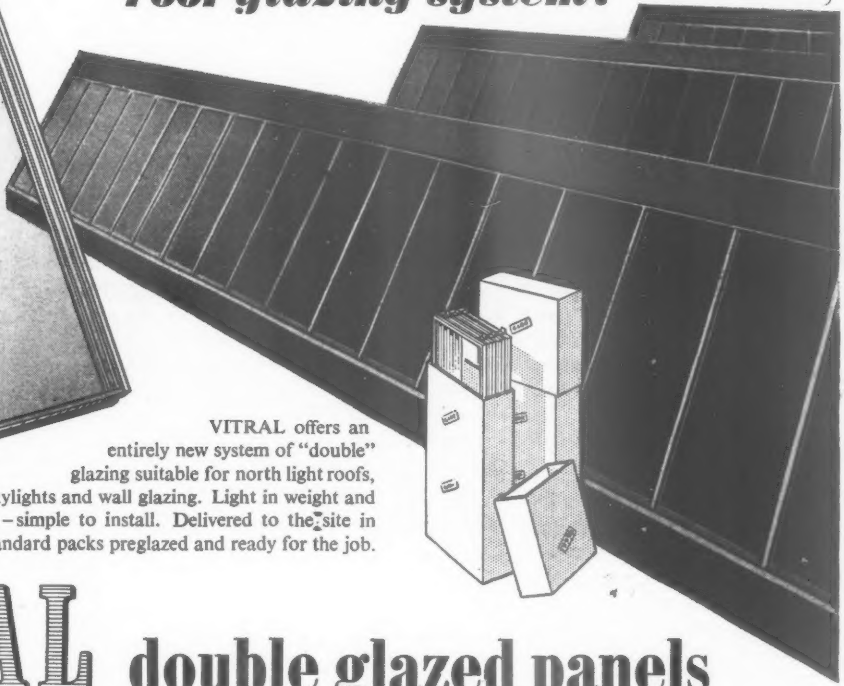

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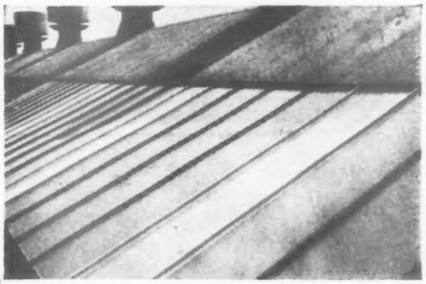

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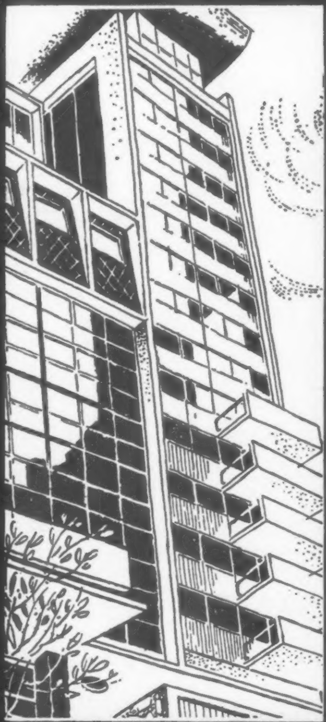

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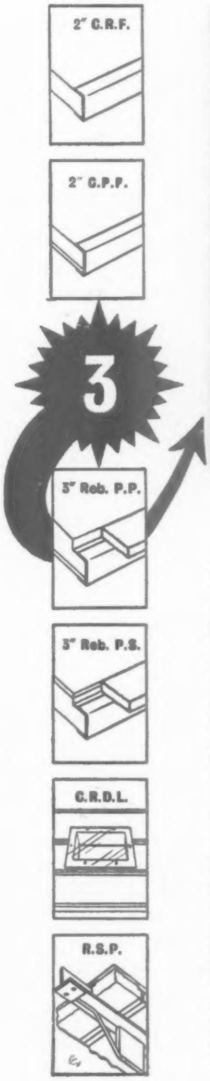

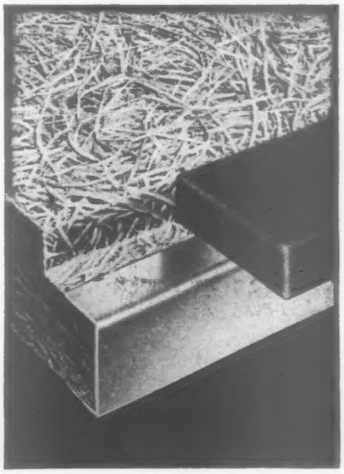

3" Reb.

"3" Reb." is the indentification symbol for our 3" Rebated Channel Reinforced Wood Wool Roofing Slab, which is designed for use in conditions of high humidity. A strip of cork or ONAZOTE lies snugly in the recess formed by two adjacent channels when the slabs are butted together, creating a discontinuity and so eliminating the "cold bridge" effect which would otherwise cause condensation along the steel reinforcing strips. Only Thermacoust offers this advantage.

Rated at 0.17 B.T.U., its overall thermal insulation is excellent.

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FIRE RESISTANCE. *An independent test by the Fire Research Station at Boreham Wood showed that Thermacoust 3" Reb., screeded and felted in the usual way, was able to contain for more than two hours an INTERNAL fire of 1,000°C—another major reason for specifying these slabs in preference to other roofing materials. Copies of the Fire Research Station Report No. F.R.O.S.I. No. 989 will be sent free on request.*

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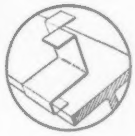

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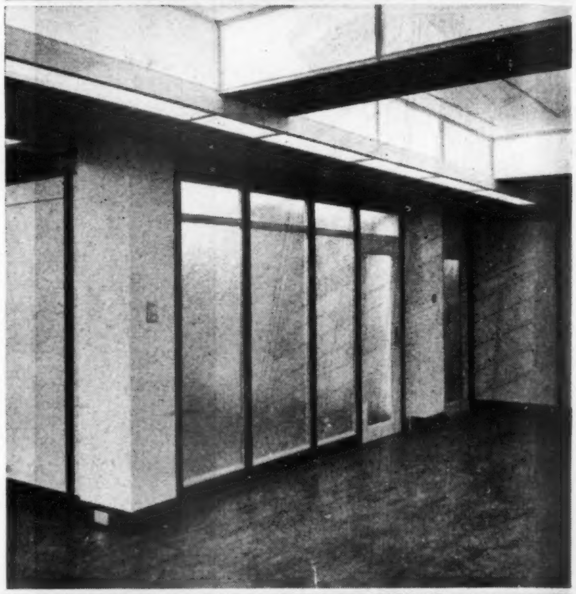

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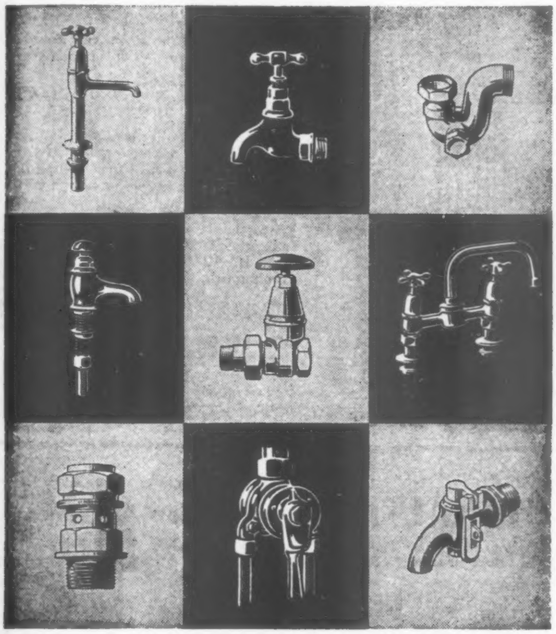

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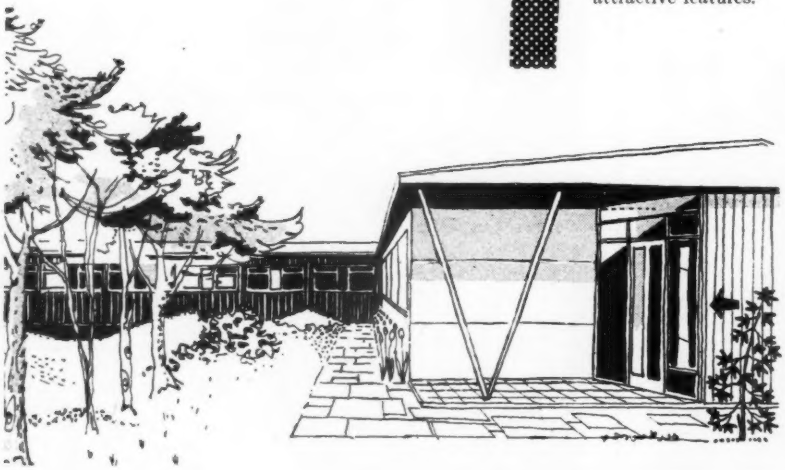

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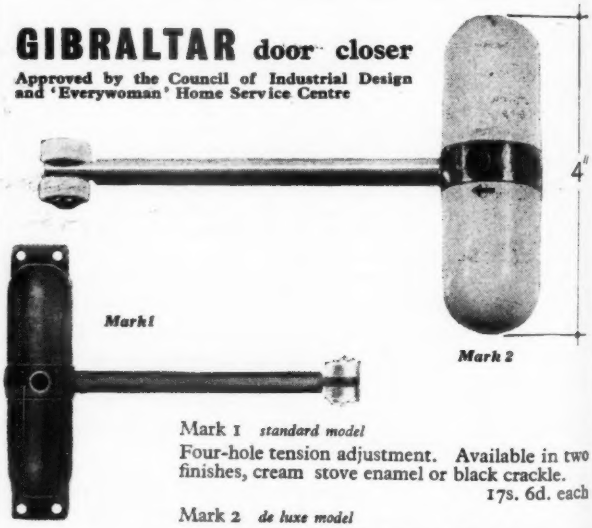

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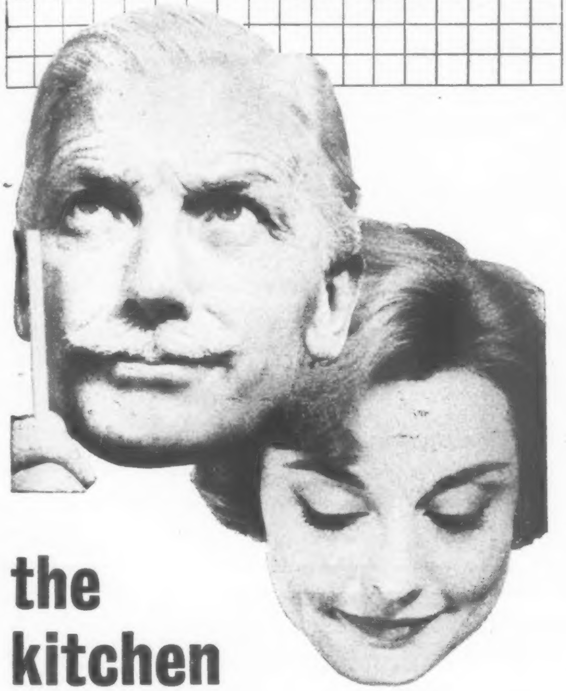
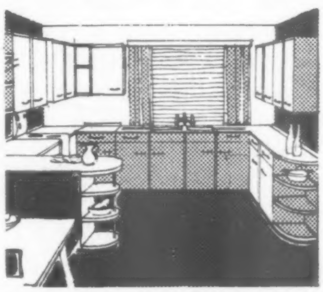


the kitchen she dreams about



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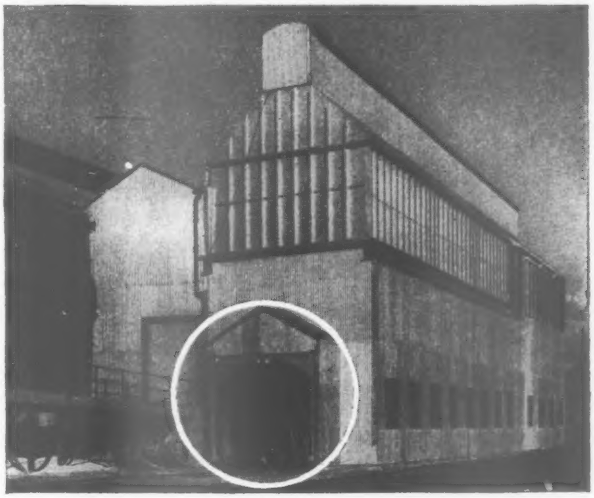

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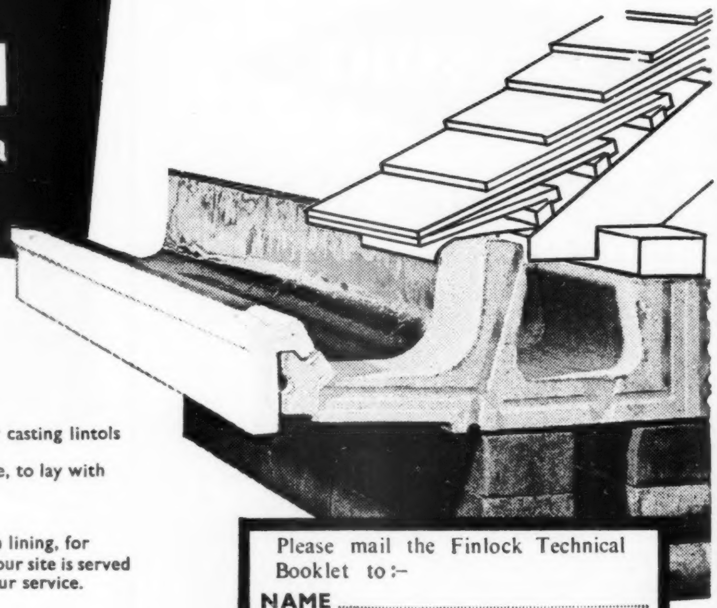
ROYSTON
artificial stone fascia



and GUTTER

(Provisional patent No. 6100/57)

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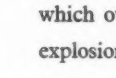

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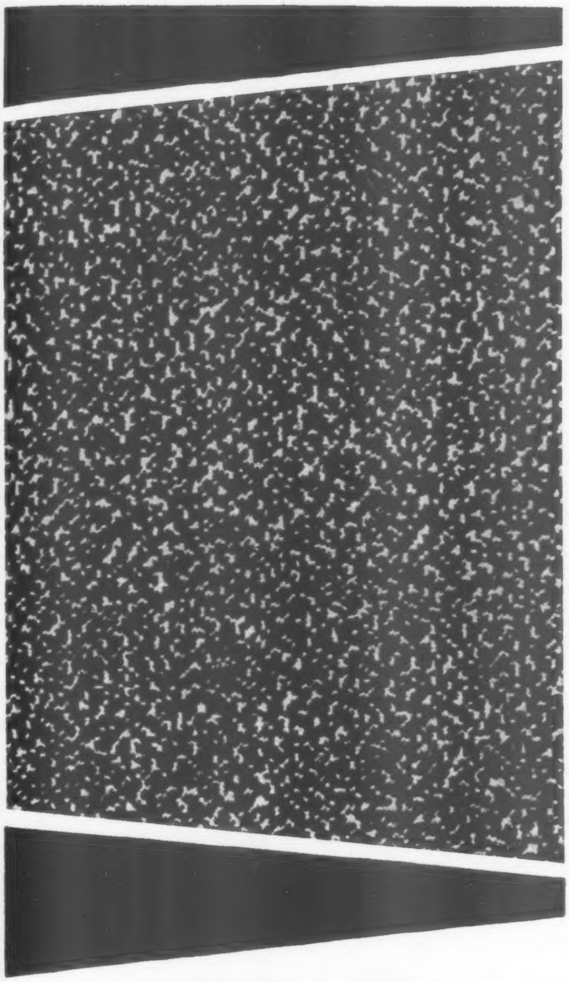

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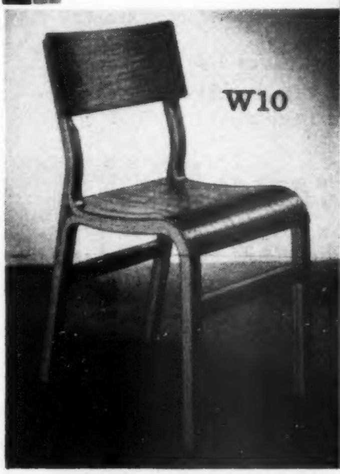

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(Patent Application No. 6466/59

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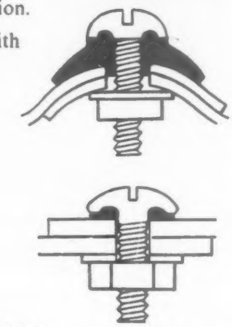

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(Patent No. 673953)

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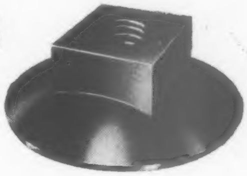

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(Patent Application No. 26584/58)

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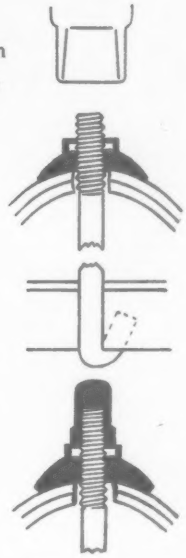

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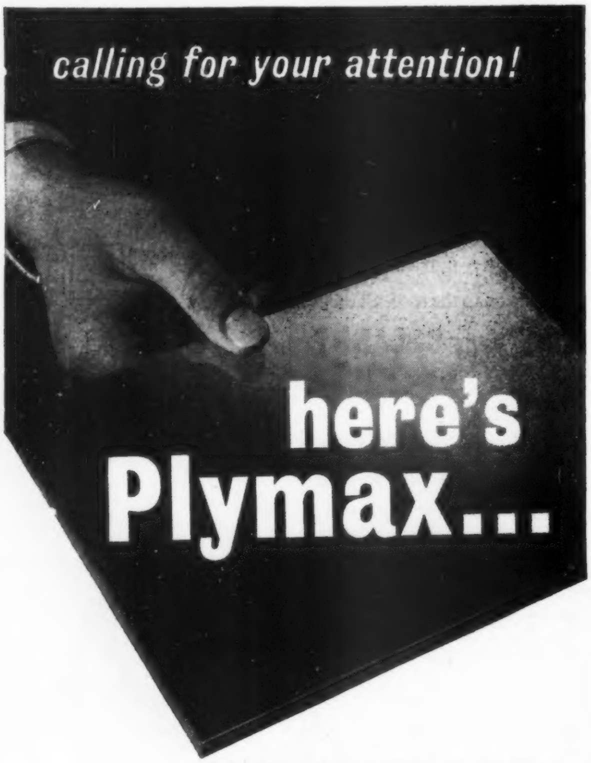

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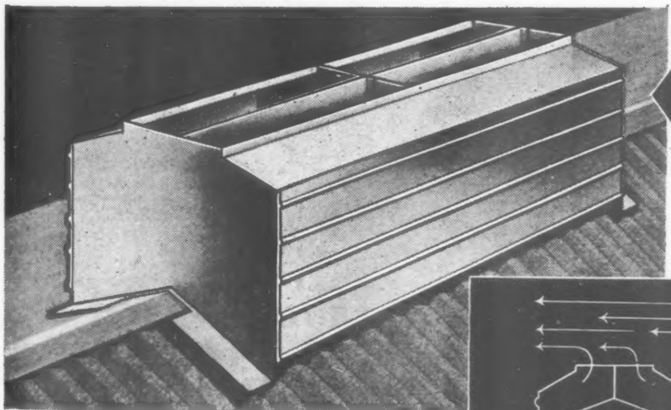

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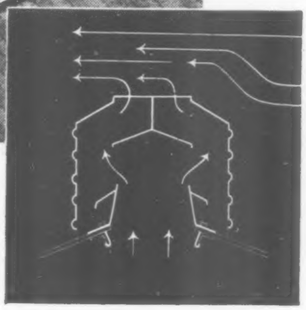

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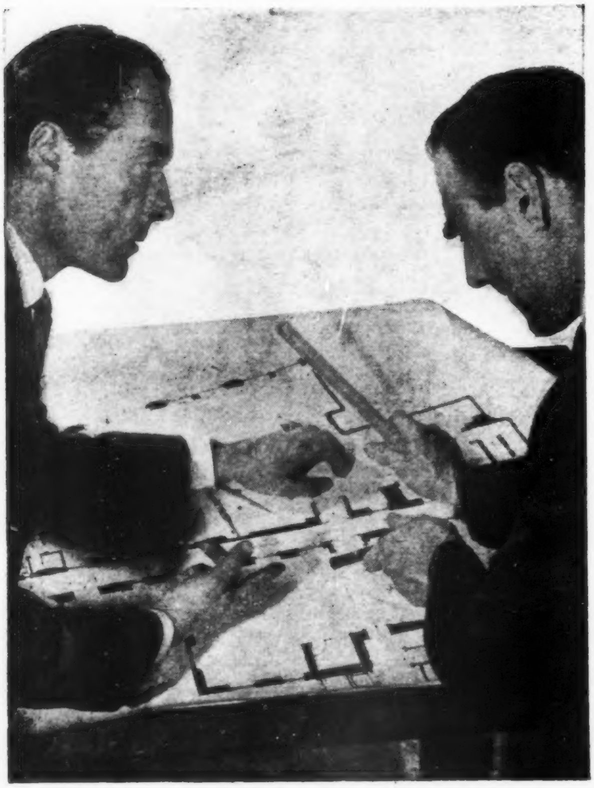

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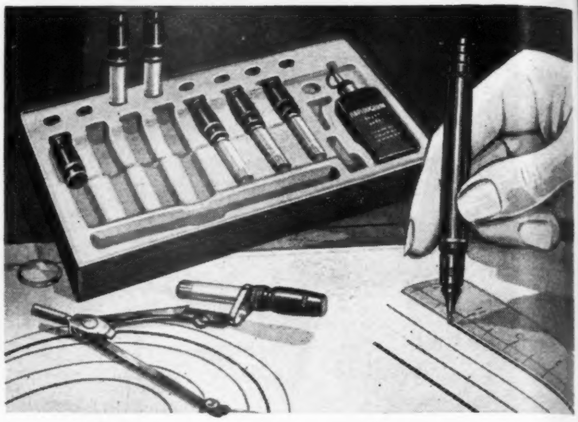

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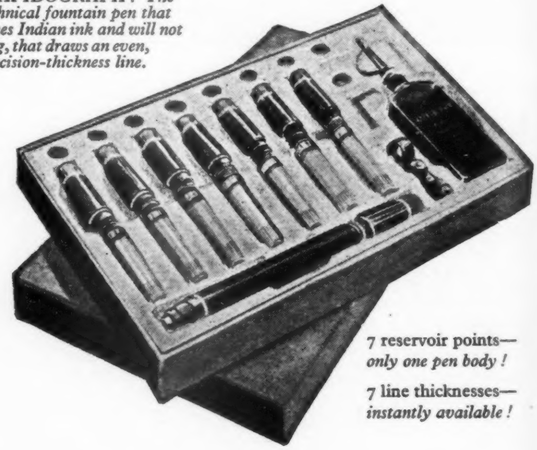

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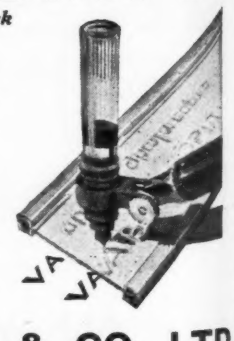

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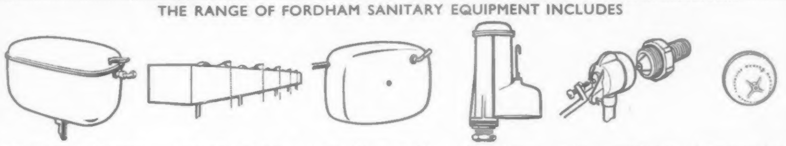

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Translated by Jacqueline Cullen

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Translated by Frederick Etchells

THIS HISTORIC book has had more influence on English architectural thought than any one publication of the last half-century. It first introduced the writings of Le Corbusier to the English public and was the first exposition in English of that modern movement which established itself on the Continent during the first quarter of this century. Size 8½ in. by 5⅝ in. 272 pages, many halftones; also many line drawings by the author. Second impression. 18s. net., postage 1s. 2d.

Concerning Town Planning

Translated by Clive Entwistle

CONTAINS Le Corbusier's answers to many questions about contemporary planning problems and a reasoned discourse on town planning principles, and affirms the author's belief that, properly applied, this young science could transform the whole environment of mankind. Size 8½ in. by 5½ in. 128 pages, over 60 line illustrations. Second impression. 10s. 6d. postage 10d.

The Home of Man

With François de Pierrefeu

Translated by Clive Entwistle and Gordon Holt

THE SECOND of Le Corbusier's post-war books published by the Architectural Press. M. de Pierrefeu writes the introductory text and Le Corbusier contributes the book's principal contents: his own inimitable drawings, accompanied by his personal commentary. Size 8 in. by 5½ in. 156 pages, containing a large number of drawings by Le Corbusier. Second impression, 15s. net., postage 10d.

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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.

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In response to requests from a number of Overseas subscribers for air-mail delivery of Public and Official Appointment details and Other Appointments Vacant, we have been pleased to arrange that cuttings of all such classified advertisements appearing in the A.J., shall be despatched by air-mail on Wednesday of each week (one day prior to A.J. publication date). The cost of this special service to Overseas subscribers will be 5s. for four weeks (1s. 3d. for each additional week) and prepayment should be sent by subscribers wishing to take advantage of this service. The charge we are making represents only the actual cost of the postage involved.

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4812

BUILDING SURVEYORS

Architect's Department, London County Council, has vacancies in Building Regulation Division and District Surveyors' Service for work in connection with applications under the London Building Acts and Byelaws. District Surveyors' offices are in the Metropolitan Boroughs and work involves negotiations with developers and supervision of works in progress.

Up to £1,135 commencing according to qualifications and experience. Application form and particulars from Hubert Bennett, F.R.I.B.A., Architect to Council, EK/81/59, County Hall, S.E.1. (1906). 5554

WARWICKSHIRE COUNTY COUNCIL
ARCHITECT'S DEPARTMENT

Applications are invited for the following appointments:—

1. ASSISTANT ARCHITECTS—Special Grade (£785—£1,070).

Applicants must have passed Parts I and II of the R.I.B.A. Final or special examinations or their equivalent at one of the recognised schools of architecture. The successful applicants will work in teams on large projects, but opportunity will be given to men with enthusiasm and ability to design and carry out smaller projects under a Group Architect.

2. ASSISTANT HEATING ENGINEERS—Grade A.P.T. III (£880—£1,065).

Applicants should have had some years in the design of heating and water supplies.

The commencing salary can be within the grade according to ability and experience. Application forms and other conditions applicable to the appointments can be obtained from G. R. Barnsley, F.R.I.B.A., County Architect, Shire Hall, Warwick.

L. EDGAR STEPHENS,
Clerk of the Council.

Shire Hall,
Warwick. 5946

BOROUGH OF CLEETHORPES
BOROUGH ENGINEER & SURVEYOR'S DEPARTMENT
ARCHITECTURAL ASSISTANT

Applications are invited for the above appointment, salary A.P.T. II (£765—£880). Applicants should have good general experience particularly in the preparation of drawings and specifications for municipal housing and buildings including flats.

Preference will be given to Applicants who have passed the Intermediate examination of the Royal Institute of British Architects.

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

Applications, stating age, qualifications and experience, together with the names and addresses of three persons to whom reference may be made should be delivered to the undersigned not later than Monday, 12th October, 1959.

G. SUTCLIFFE.
Town Clerk.

Council House,
Cleethorpes.
22nd September, 1959. 5926

BOROUGH OF WILLESDEN
BOROUGH ENGINEER & SURVEYOR'S DEPARTMENT

Applications are invited from suitably qualified and experienced persons for the following permanent appointments:—

ASSISTANT ARCHITECT within Special Grade (£750—£1,030 p.a.).

London weighting, maximum £30 p.a. is payable in addition to the above salary.

The Council is unable to assist with housing accommodation.

Forms of application and conditions of appointment may be obtained from the Borough Engineer & Surveyor, Town Hall, Dyne Road, Kilburn, N.W.6. Applications to be returned to the undersigned not later than 9 a.m. on Monday, 12th October, 1959.

R. S. FORSTER,
Town Clerk.

18th September, 1959. 5898

DEPARTMENT OF HEALTH FOR SCOTLAND. The Architectural Division which covers work on housing, hospitals, schools, local authority buildings, agricultural colleges and State Institutions and includes development work, has vacancy in Edinburgh for an ASSISTANT ARCHITECT. Salary range £805—£1,260. Write Establishment Officer, Department of Health for Scotland, Room 30, St. Andrew's House, Edinburgh 1, for application form. Closing date Friday, 23rd October, 1959. 5856

CORPORATION OF GLASGOW
ARCHITECTURAL AND PLANNING DEPARTMENT
ASSISTANT ARCHITECTS
ASSISTANT CIVIL ENGINEERS
ASSISTANT QUANTITY SURVEYORS

Vacancies exist for a number of Assistants as above, minimum qualification Intermediate examination of the appropriate professional body. Salary scale £675—£1,240 per annum with placing according to experience and qualifications.

Form of application may be obtained from the Principal Administrative Officer, 20, Trongate, Glasgow, C.1.

A. G. JURY,
City Architect and Planning Officer.
5915

CAERNARVONSHIRE COUNTY COUNCIL
COUNTY PLANNING DEPARTMENT

Applications are invited for posts of:—

(a) SENIOR PLANNING ASSISTANT, A.P.T. III/IV (£880—£1,220).

Applicants should be corporate members of the Town Planning Institute or hold an equivalent qualification. They should have had experience in preparation of development plans, particularly town maps and preferably including comprehensive development areas.

(b) PLANNING ASSISTANT, A.P.T. II (£765—£880).

Experience is required either in development control, including the preparation of layouts and amendment to elevations or in preparation of town maps.

(a) and (b). Commencing salary according to qualifications and experience.

Housing accommodation may be available if required.

Further particulars and application forms from Clerk of County Council, Caernarvon. Closing date 19th October. 5945

STEPNEY M.B.C. requires:—

SENIOR ARCHITECTURAL ASSISTANT. Salary £1,095—£1,250 p.a. Applicants must be members of the R.I.B.A. and experienced in design, construction and administration of large building contracts.

ARCHITECTURAL ASSISTANT (unestablished). Salary £640—£1,100, commencing according to qualifications and experience.

Particulars and application forms from Town Clerk, 227, Commercial Road, E.1. 6021

WORCESTERSHIRE COUNTY COUNCIL

Applications are invited for the post of ARCHITECTURAL ASSISTANT, Grade A.P.T. II (£765—£880). The vacancy is in the Section concerned with major School projects. The County Council owns some housing accommodation for which a successful candidate may apply.

Application forms and further particulars can be obtained from L. C. Lomas, F.R.I.B.A., County Architect, 14, Castle Street, Worcester, not later than 19th October, 1959. (R282.) 6024

UNIVERSITY OF HONG KONG
LECTURESHIP IN ARCHITECTURE

Applications are invited for the above post. Applicants should preferably have a degree from a university or school recognized by the Royal Institute of British Architects. They should be A.R.I.B.A. and have good practical experience. Some previous teaching experience is an advantage.

The successful applicant will be required to perform the duties of a Studio Master.

Annual salary (superannuable) is £1,575 × £50—£2,175 for a man or £1,200 × £40—£1,680 for a woman. There is also an expatriation allowance of £225 a year if applicable. The equivalent of income tax in the Colony is comparatively low.

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Further particulars and information as to the method of application may be obtained from the Secretary, Association of Universities of the British Commonwealth, 36, Gordon Square, London, W.C.1.

Applications close, in Hong Kong and London, on 20th November, 1959. 6004

COUNTY BOROUGH OF WEST HARTLEPOOL
APPOINTMENT OF SENIOR ASSISTANT ARCHITECT—GRADE A.P.T. IV

Applications are invited for the above appointment in the Borough Architect's Department at a salary in accordance with Grade A.P.T. IV (£1,065—£1,220 per annum), primarily for work in connection with a scheme for the new College of Further Education.

Candidates should be Associate Members of the Royal Institute of British Architects or hold equivalent qualifications.

The appointment is subject to the Scheme of Conditions of Service of the National Joint Council for Local Authorities' Administrative, Professional and Technical and Clerical Services and to the provision of the Local Government Superannuation Act. The appointment is subject to one month's notice on either side, and the successful candidate will be required to pass a medical examination.

Applications, stating age, experience and qualifications, together with the names of two referees, should be addressed to the Borough Architect, Municipal Buildings, West Hartlepool, and received by him not later than Monday, 9th November, 1959. They must planning, design and construction.

ERIC J. WAGGOTT,
Town Clerk.

Municipal Buildings,
West Hartlepool.
1st October, 1959. 6050

BERKSHIRE COUNTY COUNCIL

ASSISTANT ARCHITECT, A.P.T. Grade IV, £1,065—£1,220. Candidates should have had good architectural training and be experienced in be Associates of the R.I.B.A.

Application forms and further particulars can be obtained from J. T. Castle, A.R.I.B.A., A.M.T.P.I., County Architect, Wilton House, Parkside Road, Reading, to whom they should be returned not later than 20th October, 1959. 6076

BOROUGH OF NEWCASTLE-UNDER-LYME
ARCHITECTURAL ASSISTANT
GRADE A.P.T. II (£765—£880)

Applications are invited for the above appointment. The commencing salary will be in accordance with experience and qualifications.

Applicants should have passed the Intermediate R.I.B.A. Examination and should be able to prepare working drawings under minimum supervision.

Favourable consideration will be given in the provision of housing accommodation in suitable cases.

Application forms and conditions of appointment may be obtained from the Borough Surveyor, Lancaster Building, High Street, Newcastle, Staffs., and must be returned to him not later than Tuesday, 20th October, 1959.

C. J. MORTON,
Town Clerk.
6079

BOROUGH OF JARROW

Applications are invited for the following appointments:—

(a) CHIEF ASSISTANT ARCHITECT. Salary Grade A.P.T. IV. Applicants to be A.R.I.B.A. or equivalent.

(b) ASSISTANT ARCHITECT. Salary Grade A.P.T. II.

Details and application forms obtainable from the Borough Engineer, Town Hall, Jarrow, Co. Durham. Completed applications must reach the undersigned not later than 24th October, 1959.

M. L. ROTHFIELD,
Town Clerk.

30th September, 1959. 6059

CITY OF NOTTINGHAM
CITY ENGINEER'S DEPARTMENT
ASSISTANT ARCHITECTS—SPECIAL GRADE
(£785—£1,070 p.a.)

Applications are invited for the above positions in the City Engineer's Department, Nottingham. Applicants should be Associate Members of the Royal Institute of British Architects; the position is suitable for newly-qualified men and offers opportunities of taking charge of design and construction of individual projects. Housing accommodation is available. Commencing salary will depend on experience. Forms of application are to be obtained from R. M. Finch, O.B.E., M.I.C.E., City Engineer and Surveyor, Guildhall, Nottingham, and are to be returned to him not later than Friday, 30th October, 1959. 6063

CITY OF NEW SARUM
CITY ENGINEER'S DEPARTMENT

Applications are invited for the position of ASSISTANT QUANTITY SURVEYOR at a salary within A.P.T. I, £610—£765, or A.P.T. II, £765—£880, from persons suitably trained in a Quantity Surveyor's office and with considerable experience of measurement of variations and checking of final accounts, etc., etc., of large building contracts, etc.

The post is subject to the provisions of the National Scheme of Conditions of Service and Local Government Superannuation Acts, and to the passing of a medical examination.

Applications, stating age, qualifications, present and previous appointments, with salaries, details of experience, together with names of two referees, should be sent to the City Engineer, The Council House, Bourne Hill, Salisbury, not later than 14th October, 1959.

GEO. RICHARDSON,
Town Clerk.
5974

CITY OF BIRMINGHAM EDUCATION COMMITTEE
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Applications are invited for the appointment from the 1st January, 1960, of a full-time 5th year STUDIO MASTER in the School of Architecture, who will also be responsible for teaching structures to 4th and 5th year students.

Salary in accordance with the Burnham (Further Education) Scale (Men). Senior Lecturer: £1,550 × £50 to £1,750 p.a.

Forms of application may be obtained from the Principal, College of Art and Crafts, Margaret Street, Birmingham, 3 (s.a.e.).

Closing date: 23rd October, 1959.

E. L. RUSSELL,
Chief Education Officer.

30th September, 1959. 6064

WEST SUSSEX COUNTY COUNCIL

Applications are invited for the undermentioned appointment in the County Planning Department, County Hall, Chichester:—

TECHNICAL ASSISTANT (Architectural). Salary:—for Qualified Persons: Special Scale (£785 × £40—£1,070 p.a.), otherwise A.P.T. Grade II (£765—£880 p.a.).

The duties of the post will include the preparation of redevelopment schemes and designs relating to development control. Preference will be given to applicants able to prepare perspectives and freehand sketches.

Application Forms and further particulars may be obtained from Mr. John G. Jefferson, County Planning Officer, County Hall, Chichester, to be returned by Monday, the 31st October, 1959. 6039

RUTLAND COUNTY COUNCIL

Appointment of ARCHITECTURAL ASSISTANT, A.P.T. Grade II. Salary £765—£880 per annum.

Applications are invited for this post which is subject to the Local Government Superannuation Acts, 1937 to 1953, and the National Conditions of Service.

Preference will be given to those holding the Intermediate R.I.B.A. examination.

Particulars of age, experience and qualifications, with names of two referees, should be sent to T. Brian Kennedy, A.R.I.B.A., M.T.P.I., County Architect and Planning Officer, Catmose, Oakham, Rutland, not later than Monday, 19th October, 1959.

A. BOND,
Clerk of the County Council.

County Offices,
Catmose,
Oakham, Rutland. 6036

NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD

SENIOR ASSISTANT ARCHITECT required. Applicants must be Associate members of the R.I.B.A. and have had considerable experience in design and construction, preferably in hospitals and associated buildings. The Board are engaged on a number of new building projects including a new hospital at Welwyn.

Salary scale: £1,050 × £30 (3) × £35 (3)—£1,245 plus £50 London weighting. Apply giving age, qualifications and experience to Secretary, North West Metropolitan Regional Hospital Board, 40 Eastbourne Terrace, W.2, by 26th October, quoting reference 775. 6072

LANCASHIRE COUNTY COUNCIL
CHIEF QUANTITY SURVEYOR

The post of Chief Quantity Surveyor in the County Architect's Department will become vacant in March, 1960. Scale G, £1,990—£2,280 according to qualifications and experience.

Applications are invited from qualified Quantity Surveyors who have wide experience in administration of all branches of quantity surveying including cost analysis and cost planning.

Application forms obtainable from the County Architect, P.O. Box 26, County Hall, Preston, to be returned by 2nd November, 1959, quoting reference A/AJ. 6041

BOROUGH OF ROMFORD

Applications are invited for the under-mentioned vacancies:—

(*a*) SENIOR ASSISTANT ARCHITECTS: A.P.T. IV (£1,065—£1,220 per annum).
(*b*) ARCHITECTURAL ASSISTANTS: A.P.T. I—II, Special Grade (£610—£1,070 per annum).

Appointments will be made at a salary within the Scale according to qualifications and experience.

Applicants for (*a*) must be Associate Members of the Royal Institute of British Architects and have had at least three years' experience subsequent to election.

With regard to (*b*) newly elected Associates of the Institute will be considered for appointment within the Special Grade. Persons who have passed the Intermediate examination of the Institute or who are probationers will be considered for appointment in A.P.T. I—II and successful applicants will, on qualifying, be placed in the Special Grade.

Consideration will be given to the payment of reasonable removal expenses and, if required, to the provision of housing accommodation.

Particulars and conditions of each appointment may be obtained on application to the Town Clerk, Town Hall, Romford, to whom completed applications are to be sent by the 22nd October. 6038

LONDON COUNTY COUNCIL

ARCHITECTS (up to £1,135) required for Housing, Schools and General Divisions of Architect's Department. Full and varied programme of new work including schools, multi-storey flats and town development. Starting salaries according to qualifications and experience.

Particulars and application form from Hubert Bennett, F.R.I.B.A., Architect to Council, EK/77/59, County Hall, S.E.1. (1879.) 5551

ARCHITECTS AND MAINTENANCE SURVEYORS. Pensionable posts for men and women at least 25 and under 35 on 1.1.59 (extension for regular Forces service, Overseas Civil Service, established civil service and temporary Government service as Architect or Maintenance Surveyor). Candidates must be registered Architects or, alternatively, for Maintenance Surveyor posts, have achieved Corporate membership of R.I.C.S. (Building Section), or have passed examinations necessary for attaining Corporate membership. Starting salary (men, London) from £830 to £1,125 according to age. Scale maximum (London) £1,300. Promotion prospects. Write Civil Service Commission, 17, North Audley Street, London, W.1, for application form, quoting S60-61. 5996

METROPOLITAN BOROUGH OF WOOLWICH
BOROUGH ENGINEER'S DEPARTMENT

SENIOR ASSISTANT ARCHITECT required, Grade V, £1,220—£1,375, plus London weighting. A.R.I.B.A. or equivalent essential. Superannuation Scheme. Medical examination.

Applications (stating age, qualifications and experience, and giving two referees) to Town Clerk, Woolwich, S.E.18, by 19th October, 1959.

Canvassing disqualifies. 5997

BOROUGH OF MANSFIELD
JUNIOR ASSISTANT QUANTITY SURVEYOR
Grade A.P.T. I, £610—£765.

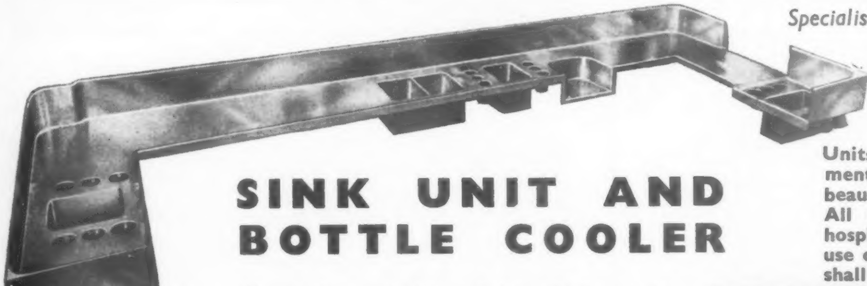
Applications are invited for the above temporary appointment in the Borough Engineer and Surveyor's Department.

Applicants should have completed training as required by R.I.C.S., commencing salary in accordance with age and experience.

Applications, giving details of training, age and experience, together with names and addresses of three referees, should be sent to the Borough Engineer and Surveyor, Carr Bank, Mansfield, on or before Monday, 19th October, 1959.

The Council prefer that the person appointed shall live within the Borough.

A. C. SHEPHERD,
Town Clerk.
6001



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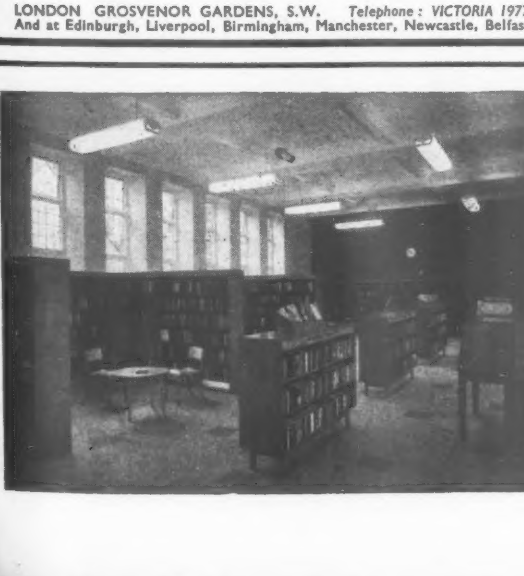

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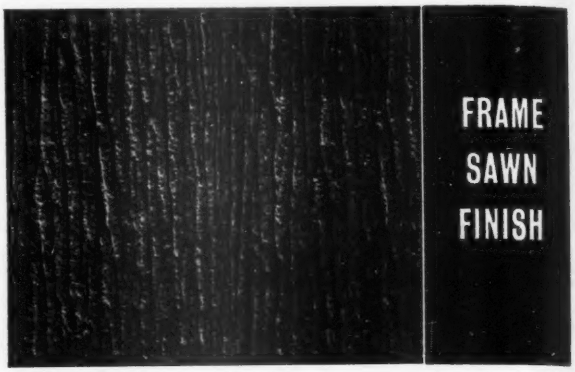
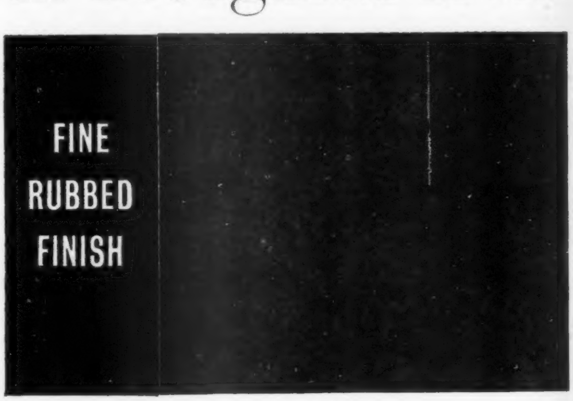
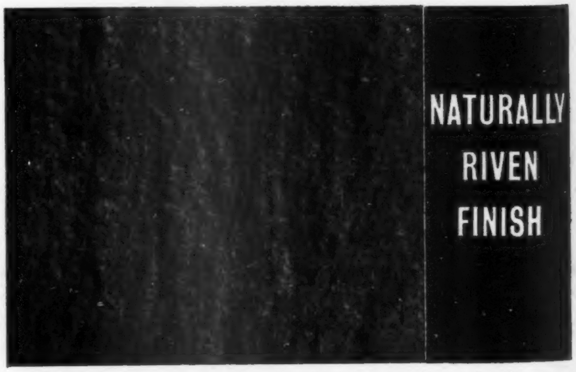


in Broughton Moor



Green Slate



Technical pamphlets showing typical methods of fixing are available on application:

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CONISTON, THE LAKE DISTRICT, LANCS. Tel: CONISTON 225/6

ASSISTANT ARCHITECTS required. Borough Architect's and Housing Department, Fulham Borough Council. Salary N.J.C. Special scale £815/£1,100; A.P.T. II, £785/£910, or A.P.T. I, £630/£785, according to qualifications and experience. Details from Town Clerk, Town Hall, S.W.6. Closing date 19th October. 6037

ISLE OF MAN LOCAL GOVERNMENT BOARD
APPOINTMENT OF ASSISTANT ARCHITECT

Applications are invited for the above appointment in the Architect and Planning Officer's Department in the salary range of £850—£1,070, point of entry depending upon experience. A.P.T. Grades are not applicable to the Isle of Man.

Part removal expenses to the value of 60 per cent. for furniture and personal effects will be borne by the Board to the Island. The post carries a non-contributory pension.

Candidates should be Associates of the Royal Institute of British Architects with suitable office experience.

Applications, stating age, experience, details of present and former employment and names and addresses of two referees should be forwarded to the undersigned so as to reach him not later than Friday, 30th October, 1959.

W. H. KARRAN,
Secretary to the Isle of Man Local Government Board.

6, Mount Havelock,
Douglas,
Isle of Man. 6000

LANCASHIRE COUNTY COUNCIL

Applications are invited for the post of GROUP ARCHITECT, Scale "C" (£1,385—£1,620 per annum). Applicants should be experienced designers and have a sound working knowledge of modern techniques in building construction, cost planning and cost control. The successful candidate will be responsible for the development, design and construction of a large office block in Preston.

Application forms obtainable from the County Architect, P.O. Box 26, County Hall, Preston. Please quote reference A/AJ. 5992

DORSET COUNTY COUNCIL

ARCHITECTURAL ASSISTANT required in the County Architect's Department. Salary within A.P.T. Grade II (£765—£880 per annum).

Applicants should have passed the Intermediate R.I.B.A. Examination. Previous Local Government experience not essential.

Application forms from the Clerk, County Hall, Dorchester, to be returned by 22nd October, 1959. 6008

BURGH OF KILMARNOCK
BURGH ARCHITECT'S DEPARTMENT

Applications are invited for the following appointments:—

(*a*) SENIOR ASSISTANT ARCHITECT, qualified and experienced, on salary scale for Professional Assistants, £795—£1,075 per annum with placing on that scale up to the maximum according to experience. Council house available for letting if necessary.

(*b*) Experienced ARCHITECTURAL ASSISTANT, on Grade Executive IV, £805 × £20 to £865 per annum.

The posts are subject to N.J.C. conditions, Local Government Superannuation Acts and the passing of a medical examination.

Applications, giving full details of training and experience, along with copies of recent testimonials, should be lodged with the Burgh Architect, 64A, Bank Street, Kilmarnock, within ten days of the publication of this advertisement.

W. L. WALKER,
Town Clerk.

Council Chambers,
Kilmarnock.
September, 1959. 5808

CITY OF BIRMINGHAM
HOUSING MANAGEMENT DEPARTMENT
REINFORCED CONCRETE FENCING POSTS

The Housing Management Committee of the Birmingham Corporation invites tenders for the supply and delivery of 5 ft. 6 in. × 4 in. × 4 in. and 2 ft. 10 in. × 5 in. × 4 in. reinforced fencing posts to be supplied as required during the twelve months commencing 1st November, 1959. Forms of tender can be obtained from the undersigned and should be returned by the 19th October, 1959.

J. P. MACEY,
Housing Manager.

Bush House,
Broad Street,
Birmingham, 1. 5973

H.M. PRISON COMMISSION

DRAUGHTSMEN—both Architectural and Engineering—required (Men or Women). Salary (men) £550 at age 21, £760 at age 28, then to £875 plus £20—£25 London weighting. For women equal pay scheme applies.

Hours 42 per five-day week. Annual leave three weeks three days rising to four weeks two days after 10 years' service.

Qualifications — Architectural Draughtsmen. Recognised training with a good general knowledge of building construction and surveys, preferably up to Intermediate R.I.B.A. standard.

Engineering Draughtsmen. Should preferably have had educational training to Ordinary National Certificate in mechanical or electrical engineering course standard or the equivalent in heating and ventilating course.

Appointments unestablished in first instance with prospects of permanency.

Regulations and application forms from Establishment Officer, Prison Commission, Horseferry House, Dean Ryle Street, London, S.W.1, to be returned by 19th October, 1959. 5991

COUNTY COUNCIL OF ESSEX
COUNTY PLANNING DEPARTMENT

Applications invited for:—

(*a*) PLANNING ASSISTANT, A.P.T. II (£765—£880) at Colchester. This is a new post in the development control section of an important area office and applicants must have had experience in development control.

(*b*) PLANNING ASSISTANT, A.P.T. I (£610—£765) at Broomfield. This is a new post in the development control section at Headquarters. Duties will be mainly concerned with the administrative procedures of development control, although some technical knowledge is necessary or will need to be acquired in due course.

(*c*) DRAUGHTSMAN, Miscellaneous Division II-IV (£465—£650) at Broomfield. Applicants should be experienced cartographers and preference will be given to those who have been trained as architectural draughtsmen.

All reasonable facilities, including day release, will be given to the successful candidates to enable them to obtain Corporate Membership of the Town Planning Institute.

Five-day week; medical examination; superannuation.

Application forms obtainable from County Planning Adviser, Broomfield Place, Broomfield, Chelmsford, returnable by 31st October, 1959. 6065

COUNTY BOROUGH OF NORTHAMPTON

Applications are invited for the following appointments:—

(*a*) TEMPORARY TECHNICAL ASSISTANT, A.P.T. III (£880—£1,065) for Improvement Grants and surveys for Housing Committee work.

(*b*) TOWN PLANNING ASSISTANT, Special Grade (£785—£1,070).

Full particulars and application forms, returnable by 21st October, from Borough Architect & Town Planning Officer, Guildhall, Northampton.

C. E. VIVIAN ROWE,
Town Clerk.
6066

BEESTON AND STAPLEFORD URBAN DISTRICT COUNCIL
CHIEF ASSISTANT ARCHITECT

Applications are invited for the above appointment at a salary in accordance with A.P.T. Grade IV (£1,065/£1,220).

Candidates should be Associates of the R.I.B.A. Housing accommodation will be provided, if necessary.

The post advertised offers interesting work in connection with the Council's housing programme, swimming pool and other building work.

Applications, stating age, qualifications, with full details of training and experience, accompanied by the names of two referees, must be received by the Housing Architect, Town Hall, Beeston, Nottingham, not later than the 19th October, 1959.

H. D. JEFFRIES,
Clerk.
6067

Applications are invited for the following appointments:

(*a*) PLANNER (Executive grade III A). Salary up to $7.151 per annum.

(*b*) THREE PLANNING ASSISTANTS, IV (Executive grade I B). Salary up to $6,000 per annum.

The successful applicant for (*a*) will be required to take charge of one of two groups dealing with matters relating to the design of new residential and industrial areas, and development control. He will be required to supervise the group, prepare reports and work in conjunction with the research and development plan group.

The successful applicants for (*b*) will be required to assist the planner in charge of either the development plan and research group, or the design and development control groups, and to act on his behalf in his absence, in supervising technical staff.

Applicants for both (*a*) and (*b*) should be Associate Members of the Town Planning Institute, the Town Planning Institute of Canada, or the American Institute of Planners. Preference will be given to candidates holding additional qualifications in a related field.

Applications should be made to W. R. Brown, Director of Planning, City Hall, Edmonton, Alberta, Canada. 5986

COUNTY COUNCIL OF ANGUS

ASSISTANT ARCHITECTS and ARCHITECTURAL ASSISTANTS are required by the Department of the County Architect and Planning Officer. Duties will include work on new schools and other Council projects.

Commencing salaries will be within the following scales according to capabilities and experience:—

(*a*) ASSISTANT ARCHITECTS: Special scale (£795—£1,075) and car allowance.

(*b*) ARCHITECTURAL ASSISTANTS: £605—£795.

Applicants for post (*a*) should be Associates of the R.I.B.A., and for post (*b*) should have passed the Intermediate Examination of the R.I.B.A., or equivalent. Housing accommodation will be available in due course in appropriate cases.

Application forms may be obtained from the undersigned.

IAN A. MACKNIGHT,
County Clerk.

County Buildings,
Forfar.
24th September, 1959. 5969

NORTHERN POLYTECHNIC, HOLLOWAY, LONDON, N.7

The Governing Body invites immediate applications for appointment as HEAD OF THE DEPARTMENT OF ARCHITECTURE, SURVEYING, BUILDING AND INTERIOR DESIGN. The salary will be in accordance with the Burnham Scale for Heads of Departments—Grade V, £2,100 × £50—£2,250 plus London allowance. Duties to commence in April, 1960.

Apply for form of application and further particulars to the Clerk. 6015

CITY AND COUNTY OF BRISTOL
ARCHITECTS' COMMITTEE

Applications invited for following permanent staff appointments:—

(*a*) SENIOR ASSISTANT ARCHITECTS—Grade A.P.T. IV (£1,065 × £55 (1) × £50—£1,220 p.a.).

(*b*) SENIOR ASSISTANT ARCHITECTS—Special Scale (£785 × £40 (3) × £45 × £40 (3)—£1,070 p.a.).

(*c*) SENIOR QUANTITY SURVEYOR—Special Scale (£785 × £40 (3) × £45 × £40 (3)—£1,070 p.a.).

Appointments will be appropriate to professional experience and qualifications. Applicants for (*a*) must be Associates of the R.I.B.A. and have had considerable experience in design, construction and contract administration, preferably with a large Local Authority. Experience in Education and/or Housing Multi-storey work will be an advantage.

Applicants for (*b*) must have passed Parts I and II of the R.I.B.A. Final Examination.

Applicants for (*c*) must be Associate Members of the R.I.C.S. and have had experience in taking off quantities, site measurement, interim certificates and final accounts.

Housing accommodation available, if necessary, at an economic rent.

Details and application forms (returnable by 19th October) from City Architect, Council House, Bristol, 1. 6013

BOROUGH OF EDMONTON
BOROUGH ARCHITECT'S DEPARTMENT

ARCHITECTURAL ASSISTANT (TEMPORARY) required in connection with multi-storey flats and the proposed Civic Centre. Candidates should be appropriately qualified. Unique opportunity to gain valuable experience of unified control of building work in Direct Labour organisation. Salary £785 × £40—£1,070 plus London weighting according to age. Applications must be made on forms obtainable from the Town Clerk, Town Hall, Edmonton, and be delivered by the 23rd October, 1959. 6010

Architectural Appointments Vacant

4 lines or under, 9s. 6d.; each additional line, 2s. 6d. Box Number, including forwarding replies, 2s. extra

LLEWELLYN SMITH AND WATERS require Senior and Junior **ASSISTANTS** for a widely varied programme of work. Salary according to experience. Please write stating qualifications, experience and age to 103, Old Brompton Road, S.W.7. 4622

REQUIRED in Oxford office of W. H. Watkins, Gray & Partners, ASSISTANT to work on advanced Technical Laboratory. Apply in writing to 57, Catherine Place, S.W.1, or ring for appointment Vic 7761. 3966

EXPERIENCED ARCHITECTURAL ASSISTANTS required, one Qualified and one of at least Intermediate standard, for Branch Office, Birmingham, engaged on a varied and interesting programme of Commercial projects. The positions are pensionable and a five-day week is in operation. Applications, giving full particulars, to G. S. Hay, F.R.I.B.A., Chief Architect, Co-operative Wholesale Society Ltd., 1, Balloon Street, Manchester, 4. 4367

SEVERAL Senior and Intermediate ARCHITECTURAL ASSISTANTS are required for commercial projects including Hotel, Theatre and extensive development schemes of offices and light industry, etc., in London Architect's office. Holiday arrangements will be recognized. Five-day week. Salary according to experience. Telephone City 8811. 4151

SOUTH KENSINGTON Architects' Office require experienced Intermediate ASSISTANT with good ability in design. Apply: R. Mountford Pigott & Partners. KENsington 1242. 4448

ARCHITECTURAL ASSISTANT required from about Intermediate standard to recently qualified, for interesting and varied work in practice mainly concerned with commercial projects. Five-day week. Congenial working conditions. Salary by arrangement. Apply in writing giving full particulars, age, to J. Alfred Harper & Son, Union Chambers, 63, Temple Row, Birmingham. 5699

J. M. AUSTIN-SMITH & PARTNERS, 39, Sackville Street, London, W.1, have vacancies for qualified ARCHITECTURAL ASSISTANTS with office experience. Opportunities for designing and taking responsibility in running and supervising contracts. Salary according to age and experience, but in range of £800—£1,000. Please apply in own handwriting. 4834

SEELY AND PAGET require experienced and responsible **ASSISTANT** for Training Colleges and other varied work. Intermediate to Final standard preferred. Salary by arrangement. Write: 41, Cloth Fair, E.C.1, or telephone—MET. 8511. 5636

A SENIOR ARCHITECTURAL ASSISTANT required immediately. The applicant will work under the direction of the District Architect on the design, preparation of drawings, details, etc., for the Company's New Retail Stores and Extensions, and be responsible for his jobs from initial stages to completion. Apply stating age, experience and salary required to the District Architect, T. W. Woolworth & Co. Ltd., Architect Department, 47/49, King Street, Dudley, Worcestershire. Telephone: Dudley 55051. 5597

EXPERIENCED ASSISTANT required by Architect in East Sussex. Pleasant small office and congenial working conditions. Salary range £500-£750 according to ability. Box 5779.

KEEN, ARCHITECTURAL ASSISTANTS Final and Intermediate standards with desire for responsibility wanted immediately. Only good draughtsmen welcome. Site experience available, as well as drawing office. Five-day week. Details to Felix Walter, F.R.I.B.A., 4, Raymond Buildings, Gray's Inn, W.C.1, or phone HOLborn 0535/6. 5784

ARCHITECTURAL ASSISTANT, Inter. R.I.B.A. standard required. Good draughtsmanship essential. Apply in writing, giving details of training, experience and salary required to Vigers & Co., Chartered Surveyors, Architects, 4, Frederick's Place, Old Jewry, E.C.2. 5764

W. H. WATKINS, GRAY & PARTNERS require ASSISTANTS of Intermediate standard for interesting hospital work, salaries according to experience and capabilities, pension scheme in operation. Write or 'phone: 57, Catherine Place, S.W.1—VICtoria 7761. 5746

ARCHITECTURAL ASSISTANTS from R.I.B.A. Intermediate standard are required by firm engaged on school and church contracts in their Manchester and Nottingham Offices. Applicants should reply, stating qualifications, experience, age, salary, etc., to Reynolds & Scott, F./A.R.I.B.A., 9, Albert Square, Manchester 2. 5758

SENIOR ARCHITECTURAL ASSISTANT capable of making site surveys, preparing sketch plans, working drawings and specifications, and supervising work in progress. Applications stating age, experience, qualifications and salary required to R. E. Akerman, F.R.I.B.A., Chief Architect, United Dairies Ltd., 31 St. Petersburgh Place, W.2. 5760

ARCHITECTS AND ASSISTANTS required. Minimum Inter Standard. Very large programme commercial, industrial and residential work. Good salaries and bonus to right men. Five-day week. Box 5772.

RAMSEY, MURRAY, WHITE & WARD require a qualified ASSISTANT. Age 25-30. Salary according to experience. Apply in writing to the Secretary, 32, Wigmore Street, London, W.1. 5799

A KEEN ASSISTANT of Intermediate to Final standard, who would like to escape from London, required by C. F. Boniface, A.R.I.B.A., Bank Chambers, High Street, Egham, Surrey. 5798

SENIOR ARCHITECTURAL ASSISTANTS required in salary range £700—£1,000 to take control of varied and interesting jobs of all sizes. Experience in colour and design of interiors and fittings and good presentation draughtsmanship an advantage. Five day week, excellent working conditions and holidays. Please write giving full details of experience and qualifications to Deacon & Laing, 65 Goldrington Road, Bedford. 5817

BUSY practice, Bedford Row, W.C.1, requires ARCHITECTURAL ASSISTANT with 3-4 years' experience. Good draughtsman, surveys, working drawings, details, etc., exceptionally varied work. Tel. CHA. 7611. 5896

ARCHITECTURAL ASSISTANTS required by large Midlands Brewery Company. Please reply, giving details of qualifications, age, experience and salary required, to Box 5902.

ARCHITECTURAL ASSISTANT required age 25 to 45. Full qualifications not essential provided experienced and capable of working on own initiative to assist on speculative housing and flat schemes—excellent prospects, superannuation scheme available. Apply: Architectural Department, Sir Lindsay Parkinson & Co. Ltd., 6, Lambeth Road, S.E.1. 5789

EXPERIENCED ASSISTANT ARCHITECTS are required in the design office on work mainly in the domestic field, including the co-ordination of estate and plan design. There will be ample scope for initiative. Apply in writing, giving age, experience and salary required to Chief Architect, A. J. Wait & Co. Ltd., Wellington Crescent, New Malden, Surrey. 5829

RONALD WARD & PARTNERS have immediate vacancies for ASSISTANT ARCHITECTS with initiative and some experience, for interesting, commercial, industrial and civic projects. Salaries commensurate with ability. Apply, 29, Chesham Place, S.W.1. BELgravia 3361. 5638

QUALIFIED and INTERMEDIATE ARCHITECT'S ASSISTANTS required for work on a large office development in Morden and on flats. Five-day week. Salary according to experience and capability. Ring MUSeum 0298 for appointment, or write to A. Green, A.R.I.B.A., 23, Fitzroy Street, W.1. 5830

NEWCASTLE UPON TYNE.—ARCHITECTURAL ASSISTANT required to work on varied and large projects. Experienced and fully qualified. Reply, stating salary required, to Waring & Netts, 36, Jesmond Road, Newcastle upon Tyne, 2. 5891

QUALIFIED ARCHITECTURAL ASSISTANT required for Brewery Architect's Office. Largely licensed houses and hotels; previous experience in brewery work desirable but not essential. Full details, age and salary required, to the Architect, Thomas Ramsden & Son Ltd., Stone Trough Brewery, Halifax. 5893

ASSISTANTS of Intermediate and Final standard required for large and small educational jobs, some overseas: at first in London and later in Guildford office. Write to Frank Rutter, F.R.I.B.A., 2, Finchley Road, London, N.W.8. 5904

CHIEF ASSISTANT ARCHITECT required. Salary range £1,050—£1,200. Full details to Naylor, Sale & Widdows, St. Mary's Chambers, St. Mary's Gate, Derby. 5905

DIAMOND, HODGKINSON & PARTNERS require experienced SENIOR and JUNIOR ASSISTANTS of contemporary outlook for varied work, including Housing and Estate Development, Flats, Churches, Interiors and Industrial Design projects. Write, with details of age, experience and salary required, to 50, Baker Street, London, W.1. 5917

ENERGETIC ASSISTANT with good all round experience, required in small City office. The work is varied with a bias towards speculative housing development, and the future prospects are bright. Salary according to experience up to a maximum of £950 p.a. Write in first instance to Alan S. Raimes & Associates, 6, Holborn Viaduct, London, E.C.1. 5928

ASSISTANT—Intermediate to Final—required for country practice, salary according to experience. Write with experience, age and salary, to Forsyth Lawson, Cunningham & Partners, Banbury. 5934

ASSISTANTS required for busy Architect's City office: Laboratory and Industrial projects. Intermediate standard or above. Apply to: Secretary, Fairtlough and Morris, Temple Chambers, Temple Avenue, E.C.4. FLE. 6295. 5932

ARCHITECT'S ASSISTANTS required for busy office: varied practice including Industrial, Housing, etc. Write, stating experience and salary required, to Francis W. Keyworth, L.R.I.B.A., 31, Friar Lane, Leicester. 5884

HARRY S. FAIRHURST & SON have a vacancy for a SENIOR ARCHITECT in their Manchester Office. The work is interesting and varied including academic, scientific, commercial and domestic buildings. Applicants should be experienced and able to take responsibility. Please write, giving the usual details, to 55, Brown Street, Manchester, 2. 5943

GOLLINS, MELVIN, WARD & PARTNERS require an ARCHITECTURAL ASSISTANT for their Sheffield office. Write: 281, Glossop Road, Sheffield, 10, or telephone Sheffield 29922 for an appointment. 5944

EXPERIENCED ARCHITECTURAL ASSISTANTS required with a good sense of design and a sound knowledge of building construction. C. H. Elsom & Partners, 10, Lower Grosvenor Place, S.W.1. VIC. 4304. 5940

ARCHITECT'S ASSISTANT required urgently, in small office dealing with wide variety of Contracts. About Intermediate standard. Opportunity for capable assistant to gain valuable practical experience. Apply Bostock & Partners, Central Hall Buildings, Station Approach, Southall, Middlesex. 5936

ARCHITECT'S Office with modern approach to design requires ASSISTANTS of Intermediate and Final standard, London or Reading, for interesting and varied work. Salary £500 to £1,000 per annum according to experience. Apply Eric G. V. Hives & Sons, 46, Queen's Road, Reading. Telephone 55484/5. 5886

ARCHITECTURAL ASSISTANT at Final standard required by Buckinghamshire office. Interesting and varied work with scope for initiative and responsibility. State age, experience and salary required to Box 5871.

£1,000 starting salary is offered to a qualified and experienced ARCHITECTURAL ASSISTANT, capable of working with minimum supervision in a rapidly expanding small private practice. Write or telephone for an appointment to Walter F. Price, 23, Beaumont Street, Oxford. Tel. 49032. 5872

ARCHITECTURAL ASSISTANTS required by Messrs. Beard, Bennett & Wilkins. Applicants must be qualified, have good design ability and experience in administration of complete Contracts. Write to 101, Baker Street, London, W.1, giving particulars of experience and salary required. 5873

LONDON Brewery Company in S.W.14 area requires SENIOR ASSISTANT in Architect and Surveyors Department for work in connection with industrial and administrative buildings. Applicants, age not to exceed 45, must be well versed in the preparation of detail working drawings, possess a sound knowledge of building construction, surveying and specification writing. Successful candidate will be considered for permanency and pension scheme on completion of six months' probationary period. Five-day week, luncheon allowance and cost of living bonus at present in operation. Basic salary £700-£990 p.a. according to experience. Reply stating age, experience and past and present appointments in chronological order to Box 5874.

SMALL enthusiastic office requires keen and energetic ASSISTANT for varied work including churches, community buildings, etc. Pleasant working conditions, pension scheme, house available. Intermediate or Final standard, salary range £700 to £900. Apply Selby J. Clewer, F.R.I.B.A., Bournville Village Trust, Birmingham, 30. 5876

ARCHITECTURAL APPOINTMENTS. Several architectural vacancies exist for all grades to work on very interesting and important projects in London with a progressive private firm of architects. The salary range is from £500 to £1,500 per annum according to the applicant's ability. Ideal conditions include a five-day week with luncheon vouchers. *Write only* in the first instance to:—R.T.M., c/o Messrs. Norton Deith & Co., 14, Queen Victoria Street, E.C.4. 5852

High Fell

Westmorland green slate and ORTON SCAR limestone

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Technical literature including the leaflet awarded the R.I.B.A. Class I Certificate of Merit, 1958, will be gladly sent on request

LIMESTONE & GREEN SLATE SLAB CO.
(Westmorland) Ltd.
Appleby Road, Kendal
Telephone: Kendal 1246

QUALIFIED and unqualified ARCHITECTURAL ASSISTANTS required for interesting range of contemporary work. Please write stating age, experience and salary required, to Michael Lyell, A.R.I.B.A., A.A. (Hons.) Dipl., 16, Yeoman's Row, Brompton Road, S.W.3. 5879

RUSSELL DIPLOCK ASSOCIATES, Lewes, Sussex, are anxious to add to the staff someone of Intermediate standard, office trained or school trained, with some experience. Salary will be in the £400 to £650 range, and time off for study could be arranged for the former type. If interested please write to The Studio, East Street, Lewes, Sussex. 5881

ARCHITECTURAL ASSISTANT required for practice in Jersey. Applicants must be capable of running jobs with the minimum of supervision. Write stating experience and salary required to Box 5860.

TWELVE Intermediate and Final ASSISTANTS required immediately. Salary between £800 and £1,200 per annum. Ring PAD. 0915. 5948

COMPETENT and experienced ASSISTANT required in varied practice in Richmond, approaching Final standard and in the £800—£1,000 salary range. Write F. Greenwood, A.R.I.B.A., 18, The Green, Richmond, Surrey. 5951

BOOTH, LEDEBOER AND PINCKHEARD, 17-20, Mason's Yard, Duke Street, St. James's, S.W.1, require ASSISTANTS in salary range £750—£1,000 p.a. Tel. TRA. 1866. 5957

QUALIFIED or experienced ASSISTANTS required for progressive architect's office. Telephone Ilford 4747. 5958

SENIOR ASSISTANT ARCHITECT required to take charge of project. Apply Ronald Ward & Partners, 29, Chesham Place, S.W.1. BELgravia 3361. 5960

GEORGE, TREW & DUNN require a number of recently qualified ARCHITECTS for their new offices at 50, Eastbourne Terrace, London, W.2, to work on Hospitals, University projects and housing and other projects of all sizes. Please write stating experience, qualifications and salary required. 5962

SENIOR AND INTERMEDIATE ASSISTANTS required for busy expanding practice South London. Good prospects and salary. Work on hand includes housing estates, large blocks of flats and factories. Write giving full details of experience and salary required to Box 6071.

JELLICOE, BALLANTYNE & COLERIDGE require a SENIOR ARCHITECTURAL ASSISTANT. Salary according to experience. Apply in writing to the Secretary, 12 Gower Street, London, W.C.1. 6074

ST. ALBANS Architect requires Intermediate standard ASSISTANT with contemporary outlook for work on schools, industrial and commercial projects. High standard of draughtsmanship required. Write giving brief details of experience and salary required to Box 6075.

PETER BAREFOOT requires ASSISTANT immediately primarily for modern domestic and some industrial work at all stages of design. Final standard school trained man preferred, or at Intermediate level. Write 22 Thorofare, Ipswich. 6077

ARCHITECTURAL ASSISTANT required to work with Site Architect on Laboratory projects near Manchester. Intermediate standard or above. Interviews London or Manchester. Box 6080.

ELIE MAYORCAS requires Senior ASSISTANTS with minimum of three years' office experience in this country. Write, giving particulars of architectural education and experience, and salary required, to: 13, David Mews, Baker Street, W.1. 6081

QUALIFIED responsible ARCHITECT is required in the Western Hemisphere for a three-year post of considerable interest. This post may be extended by a further two years. It will involve considerable travel and may not be suitable for a man with a family commitment. Apply Box 6055.

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35 ☐	0507
31 ☐	0512
76 ☐	0521
130 ☐	0525
128 ☐	0796
41 ☐	0539
136 ☐	0541
42 ☐	0542
15 ☐	0545
17 ☐	0551
146 ☐	0839
44 ☐	0564
131 ☐	0574
92 ☐	0576
147 ☐	0581
156 ☐	0584
149 ☐	0585
96 ☐	0587
39 ☐	0597
145 ☐	0601
53 ☐	0607
16 ☐	0611
135 ☐	0614
162 ☐	0619
88 ☐	0831
162 ☐	0621
27 ☐	0746
162 ☐	0627
139 ☐	0629
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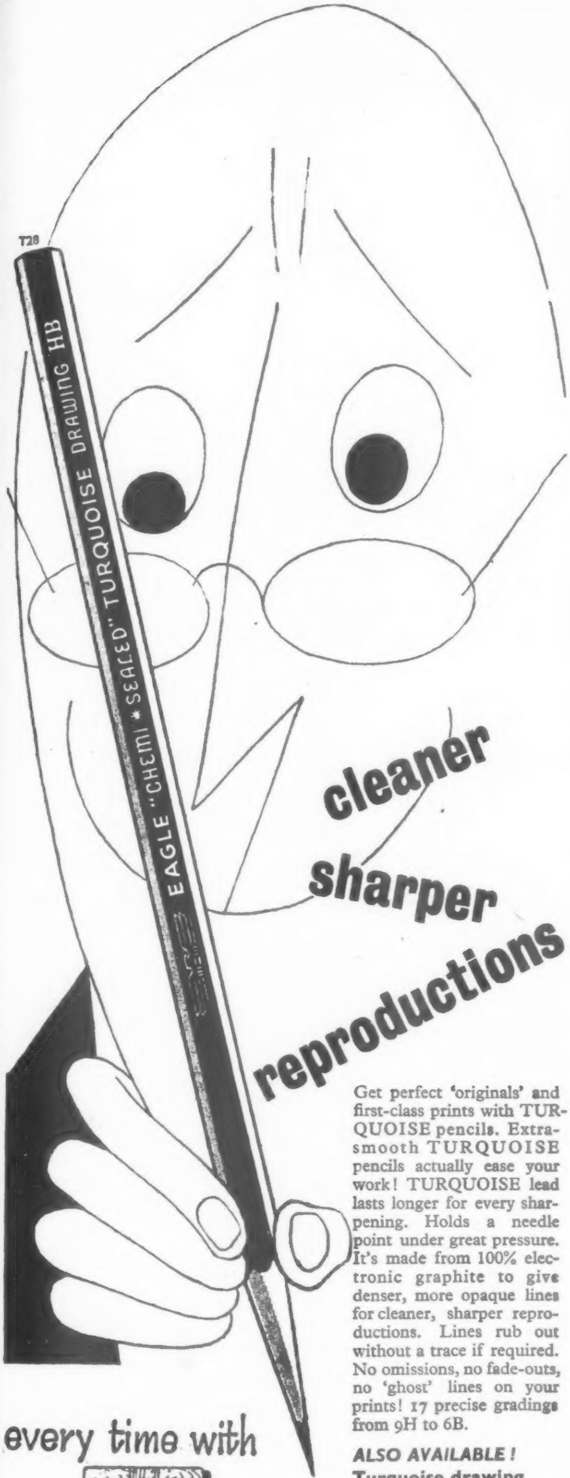

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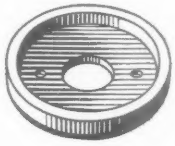
Timber Connectors

'TECO' Double-Bevelled Wedge Fit SPLIT RINGS

(*Pat. No.* 593945)
Manufactured to B.S.S. 1579: 1953, *Table* 1.

The improved Split-ring with double bevelled inside and outside faces, makes it easy to insert in pre-cut wedge shaped grooves without damage to timber and avoids the use of a ring spreader or excessive hammering. Available in **2½in.** and **4in.** internal diam. Special grooving tools also available. Suitable for all types of timber in light, medium and heavy structures.

'TECO' Heavy-Duty SHEAR PLATES



Manufactured to B.S.S. 1579: 1953, *Table* 2.

Inserted in pre-cut daps made by special dapping tools which are available for the purpose. 'TECO' **2⅝in.** diam. SHEAR PLATES provide heavy shear load capacity for use in large structures for connections between timber and steel, timber and concrete, or used back to back in demountable structures.

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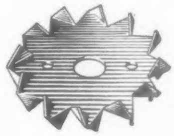

Manufactured to B.S.S. 1579: 1953, *Table* 3.

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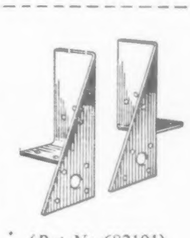

(*Pat. No.* 682101)

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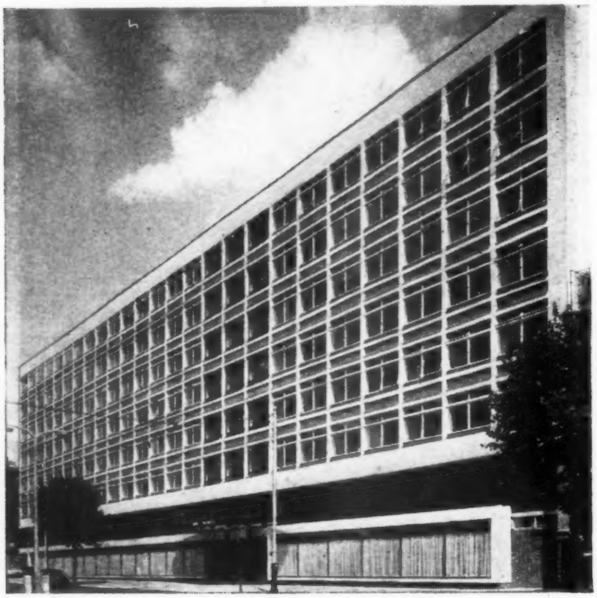
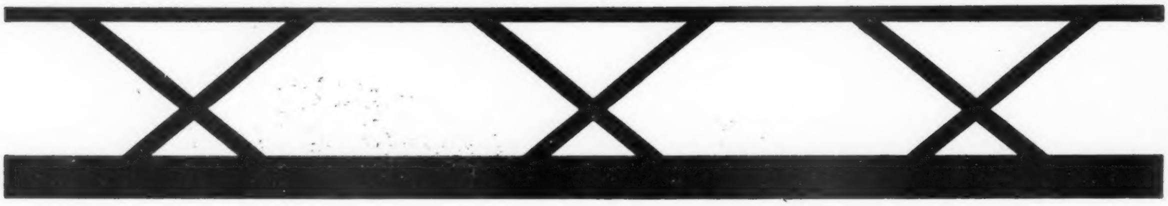


OMNIA Concrete Floors contributed to remarkable construction speed—one floor of 13,500 sq. ft. per seven days—in this major London office building.



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