The Architects' JOURNAL for January 23, 1958

THE ARCHITECTS' JOURNAL

standard contents

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

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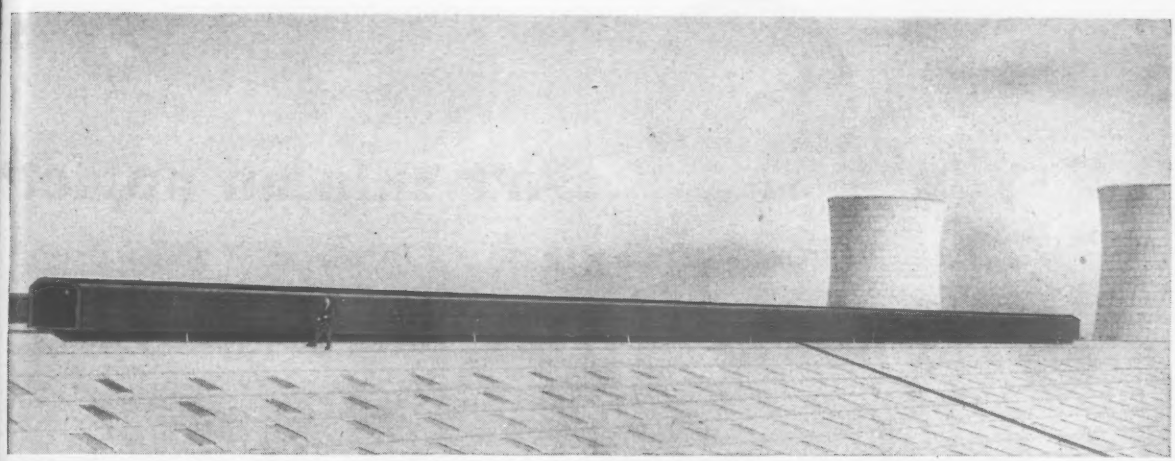
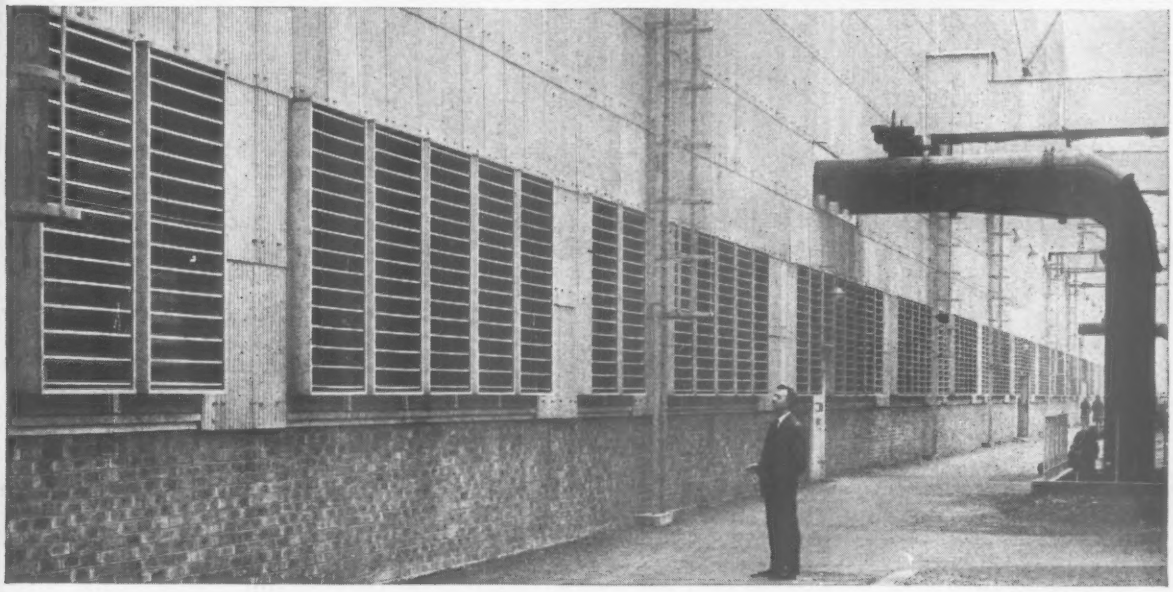
★ A glossary of abbreviations of Government Departments and Societies and Committees of all kinds, together with their full address and telephone numbers. The glossary is published in two parts—A to Ig one week, Ih to Z the next. In all cases where the town is not mentioned the word LONDON is implicit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

IHVE	Institution of Heating and Ventilating Engineers. 49, Cadogan Square.	Sloane 1601/3158
IIBDID	Incorporated Institute of British Decorators and Interior Designers. 100, Park Street, Grosvenor Square, W.1.	Mayfair 7086
ILA	Institute of Landscape Architects, 2, Guilford Place, W.C.1.	Holborn 0281
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 7179
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. 47, Victoria Street, S.W.1.	Abbey 6172
ISE	Institute of Structural Engineers. 11, Upper Belgrave Street, S.W.1.	Sloane 7128
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
LSPC	Lead Sheet and Pipe Council. Eagle House, Jermyn Street, S.W.1.	Whitehall 7264/4175
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.	Mayfair 9400
MOH	Ministry of Health. 23, Savile Row, W.1.	Regent 8411
MOHLG	Ministry of Housing and Local Government. Whitehall, S.W.1.	Whitehall 4300
MOLNS	Ministry of Labour and National Service. 8, St. James' Square, S.W.1.	Whitehall 6200
MOS	Ministry of Supply. Shell Mex House, 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. 9, Victoria Street, S.W.1.	Abbey 4813
NBR	National Buildings Record. 31, Chester Terrace, Regent's Park, N.W.1.	Welbeck 0619
NCBMP	National Council of Building Material Producers, 10, Storey's Gate, S.W.1.	Abbey5111
NEFMAI	National Employers Federation of the Mastic Asphalt 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 5721
RICS	Royal Institution of Chartered Surveyors. 12, Great George Street, S.W.1.	Whitehall 5322/9242
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, London, E.C.3.	Mansion House 3921
SIA	Society of Industrial Artists. 7, Woburn Square, London, 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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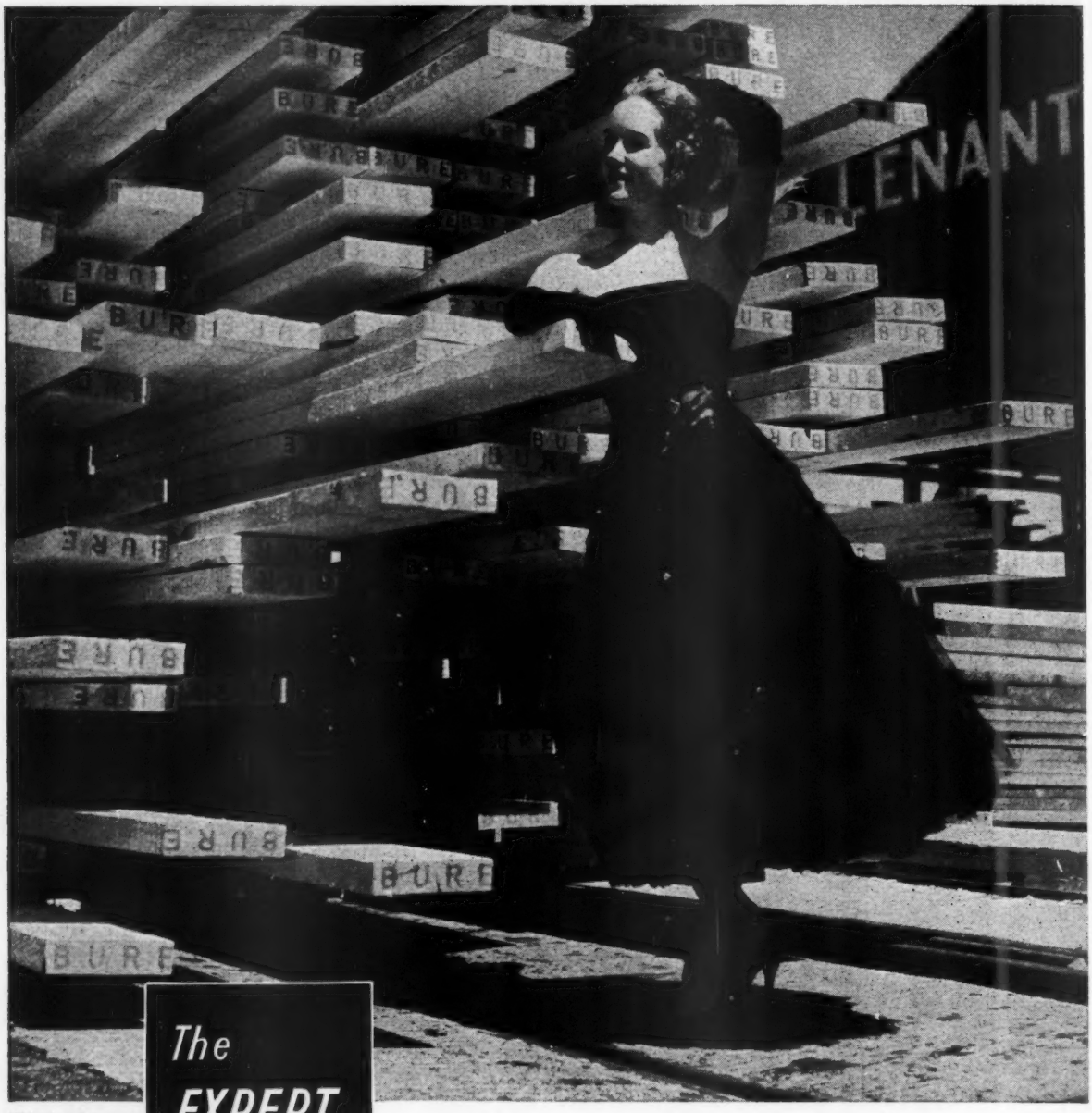

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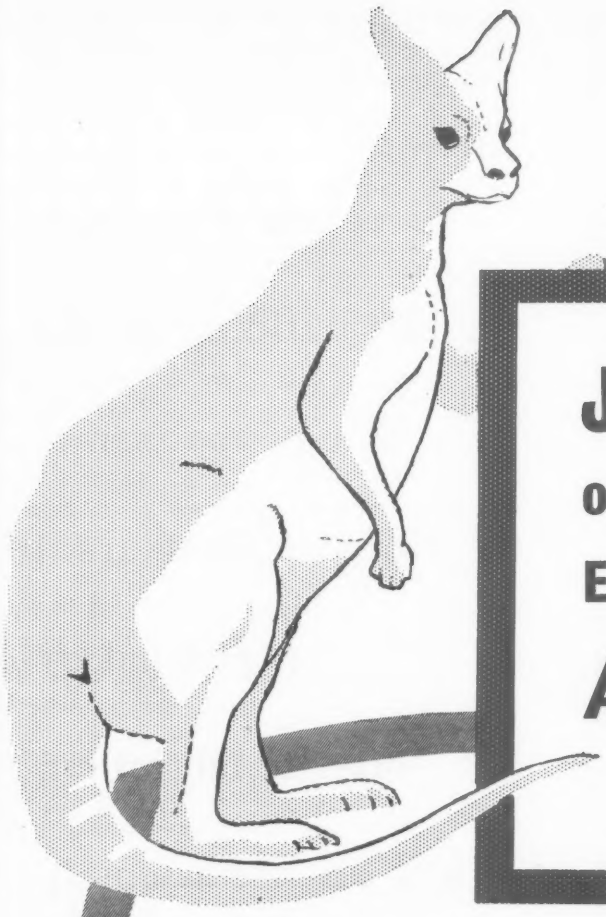

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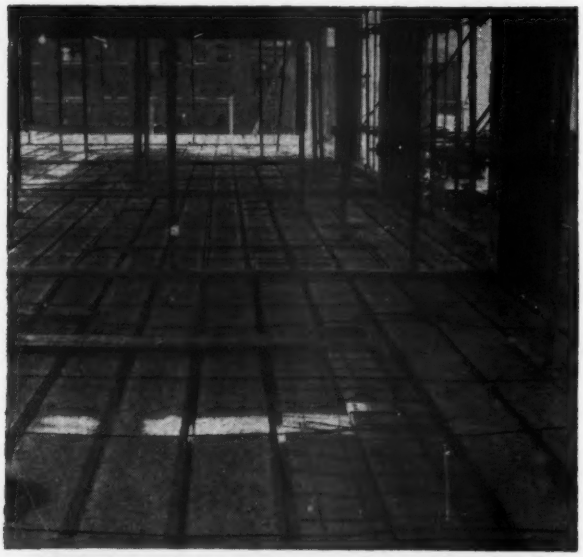

Erection of the new office building on the site of the former Holborn Restaurant expedited by off-site fabrication and on-site assembly

The new building is expected to be ready for occupation by the end of the year. It has a steel frame with BISON precast prestressed concrete plank suspended floors.

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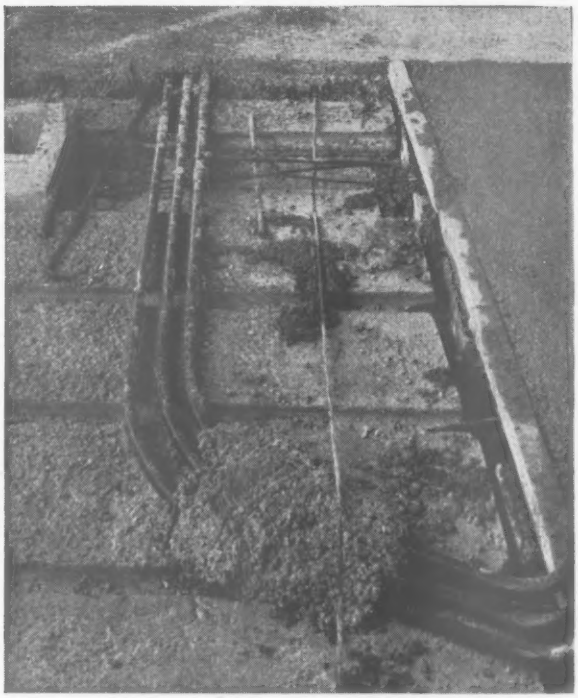
Furthermore, between the fixing of the prestressed precast concrete planks and the casting of the *in situ* concrete topping it was necessary to allow time for the electricians to install the electric conduit system. In addition, during the same period no less than 1,533 beams and stanchions were encased in concrete, the quantity of concrete used for this purpose being 22,591 cu. ft., i.e. well over 700 cu. ft. per week. Floor fixing and the steelwork encasement were finished in two months, between completion of the steelwork erection on May 22nd and July 19th. This performance would have been quite impossible if *in situ* concrete floors had been used because of the additional time required to erect the necessary formwork.



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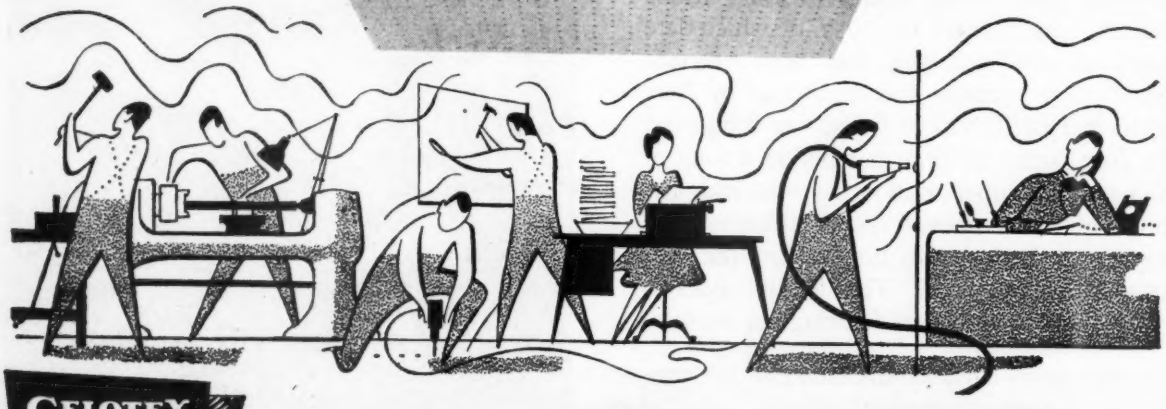

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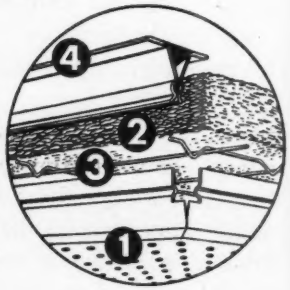

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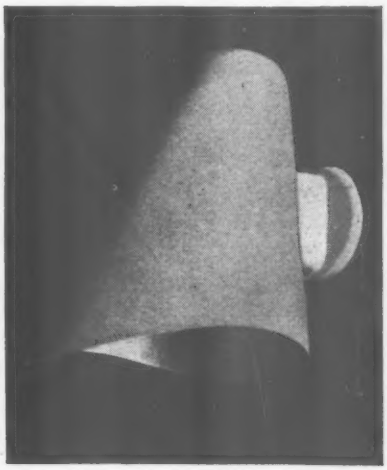

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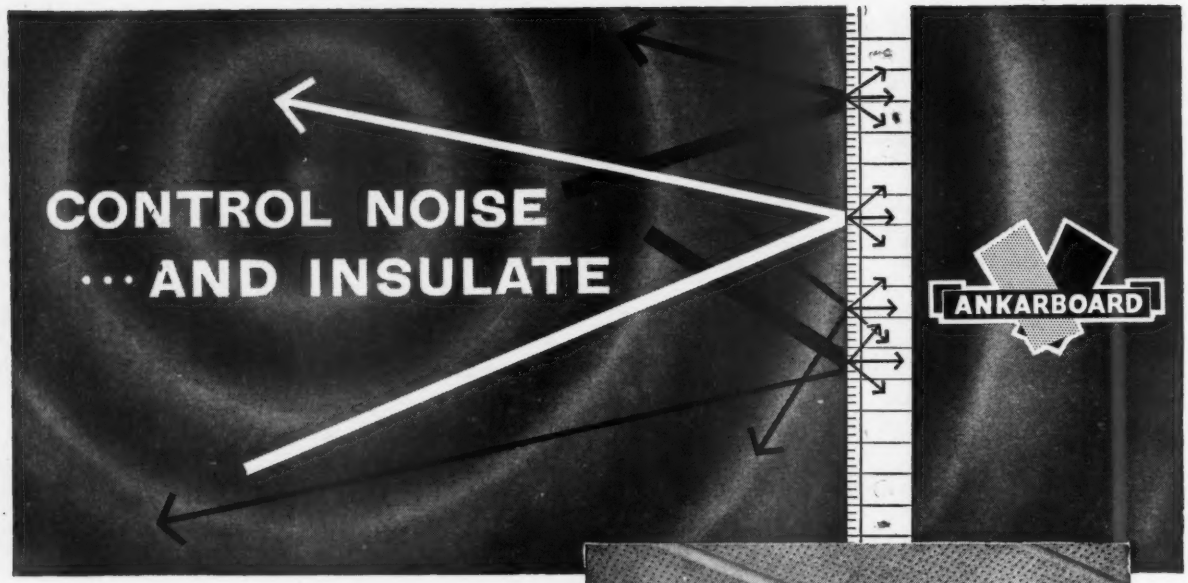

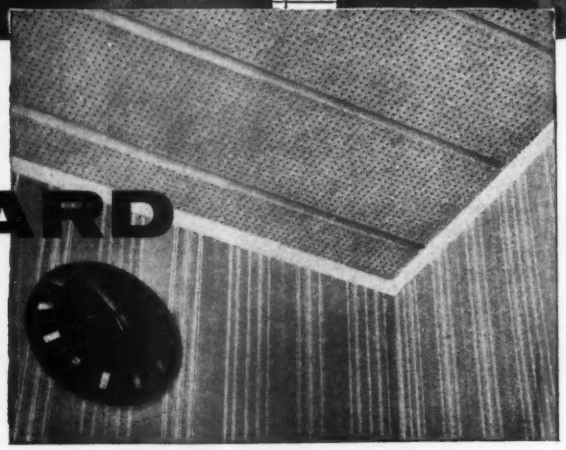

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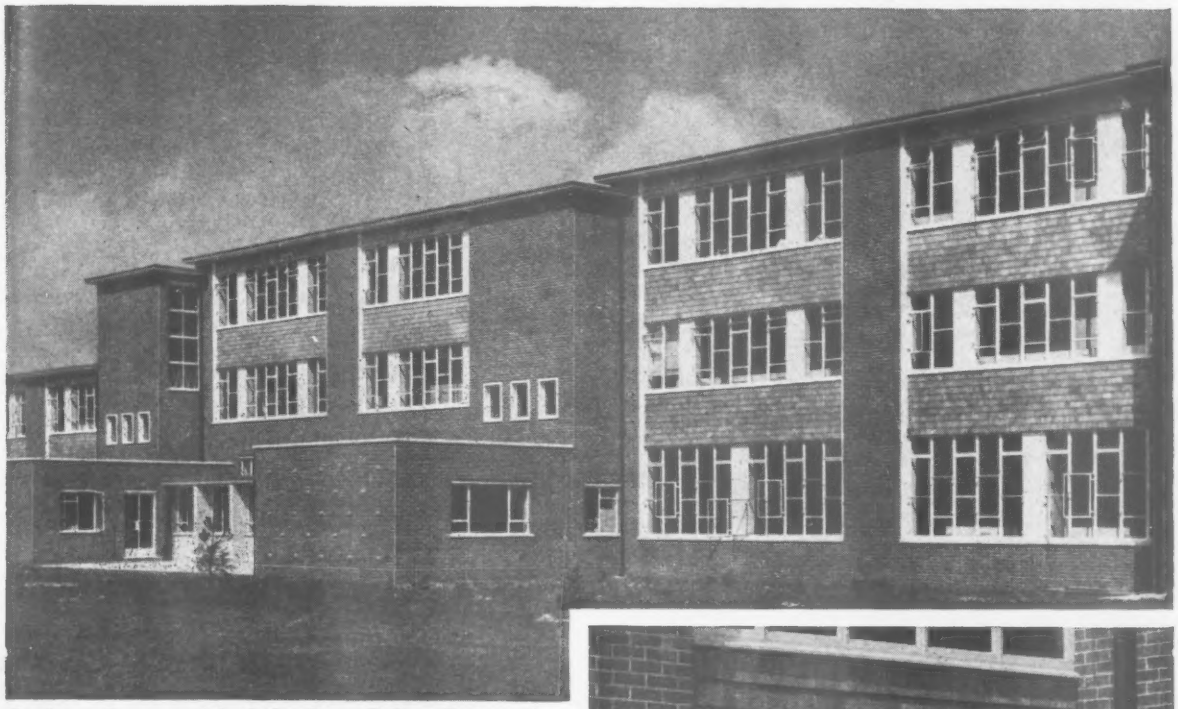

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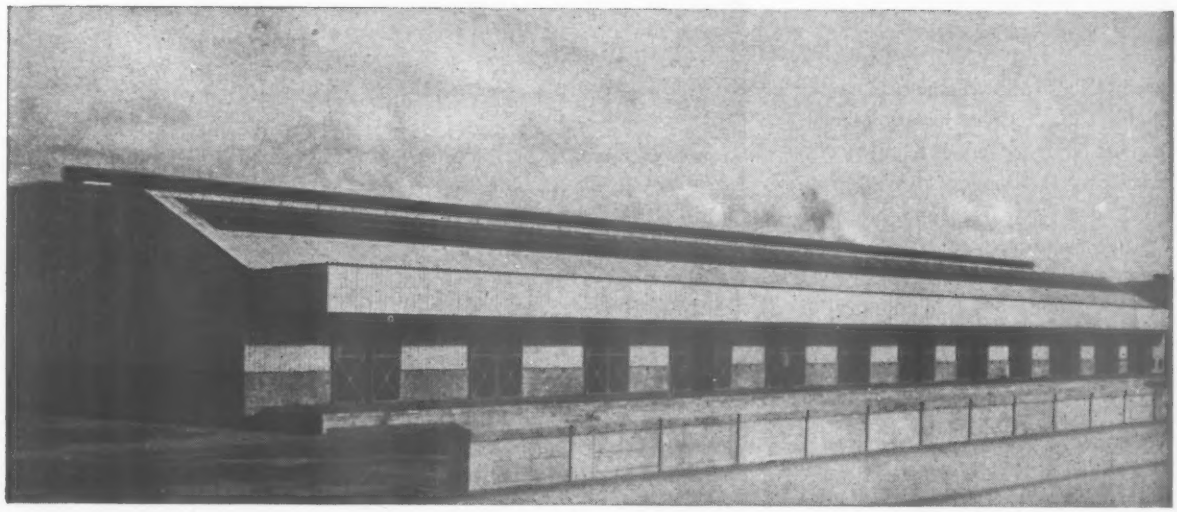

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Modern Doors for Modern Projects

'No Fines' houses at Half Hyde, Shephall Neighbourhood. Contractors: George Wimpey & Co., Ltd.; Photograph by kind permission of the Stevenage Development Corporation.

Standard Sizes:

6'6" x 2'9" 6'6" x 2'0"
6'6" x 2'6" 6'6" x 1'9"
6'6" x 2'3" 6'6" x 1'6"
6'0" x 2'0"
Finished thickness — 1.5/8"

Special Features:

- Uniform support of door facings, ensuring complete freedom from surface undulation.
- Much greater strength, with complete stability and rigidity.
- Considerable saving in weight.
- Dimensioned to size, ensuring instant readiness for use.

The selection of Hills DURADOR for so many projects of the Stevenage Development Corporation is another impressive tribute to the quality-with-economy which these fine interior flush doors offer.

301 houses at Half Hyde, constructed on the 'new-traditional' 'No Fines' method, are equipped with DURADOR.

DURADOR are also being fitted in the new dwellings at Long Meadow N.E. and Broom Barns.

DURADOR is the flush door with the exclusive 'Placarol' core and balanced West African plywood facings. It is generally accepted as the outstanding flush door at its price in quality and dependability. The 'Placarol' core, consisting of hundreds of wood spirals bonded in immovable unity with the plywood facings, is the most successful advance of its kind in flush door manufacture.

Available in three grades: A for painting; B for Staining and Varnishing; C with Oak faced plywood and matching edge strip.

Hills

There is a HILLS *Door for every building project: ask about our extensive range. All* HILLS *Doors have a 3-year guarantee of workmanship and materials.*

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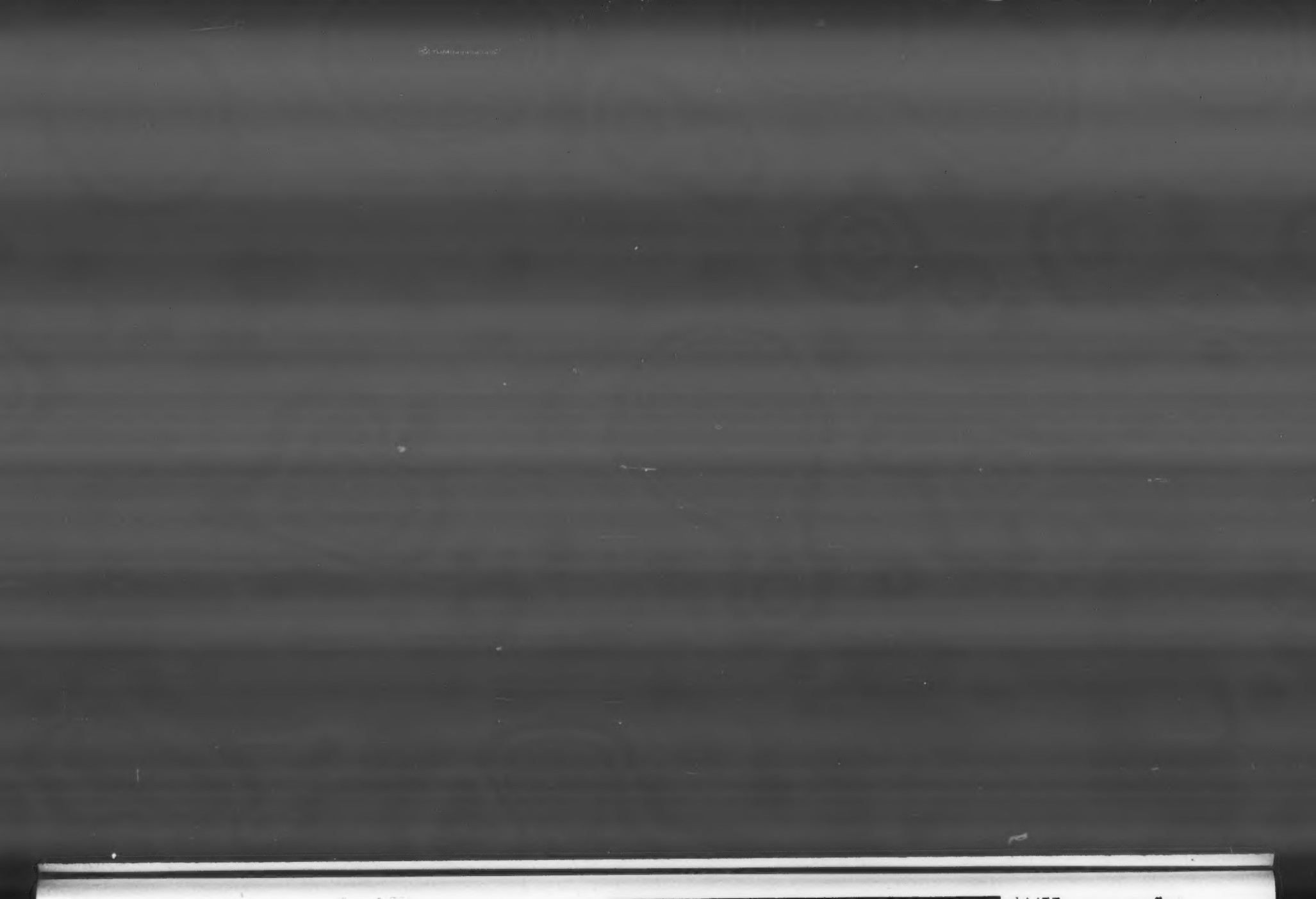

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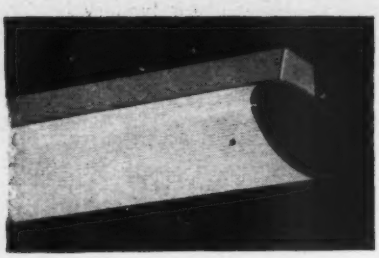
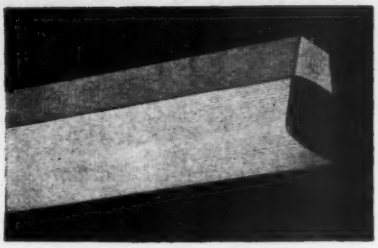
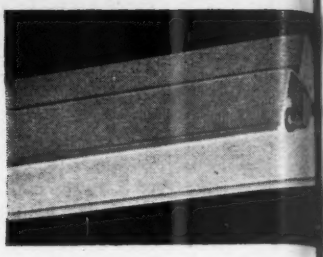
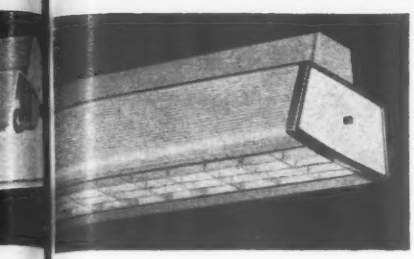


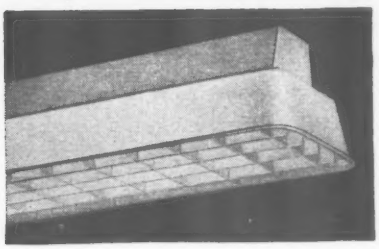


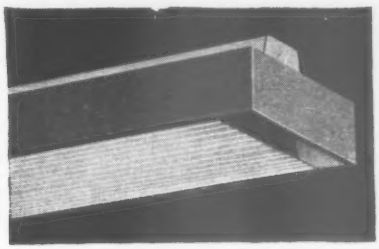


what's so new about fluorescent fitting

THE GENERAL ELECTRIC CO. LTD., MAGNET HOUSE, KINGSWAY, LONDON, W.C.2.







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Everything is new! *The '101 Range' is an entirely new range of contemporary styled industrial, commercial and decorative fluorescent fittings. The successful result, in fact, of team work between G.E.C. fittings designers and illuminating engineers. Competitively priced—outstandingly modern in conception! NEW also is the introduction of basic channels for single or twin tubes, 1½ ft. to 8 ft. which, with specially designed attachments, form an interchangeable system of great versatility with particularly simple installation and maintenance. It is important that you learn all about this exceptional range —the '101 Range'—of G.E.C. fluorescent fittings, so write for fully descriptive catalogue No. F 4068.*

new adaptability

The G.E.C. '101 Range' sets a *new standard* of adaptability. Using as a basis, channels of common cross section, industrial, commercial and decorative fittings are built without a multitude of small parts. Each is a soundly engineered fitting, of modern appearance and incorporates many aesthetic and mechanical refinements. Installation and maintenance are absolutely simple.

new reflectors

For the first time the industrial user can have vitreous enamelled closed end trough reflectors made from a single pressing, with well-rounded corners and without joints. They are therefore particularly easy to clean. New techniques enable them to be made lighter than previous types and therefore easier to handle and less susceptible to damage.

new 8 ft. tubes

Recessed double contact (R.D.C.) caps are fitted to OSRAM 8 ft. 125 w. tubes for use in the '101 Range'. This new cap design protects the tube ends and allows replacement by one person from one ladder position. Recessed double contact caps also provide firm, reliable support and location for these tubes without relying on contact pins or independent clips. This results in easier tube replacement after cleaning or maintenance. Unsightly shadows are reduced, as the new cap gives a smaller "dead region" at tube ends. Osram Guaranteed Tubes, with their freedom from early failures, are recommended for all G.E.C. lighting fittings.

G.E.C. range

Release date: 3rd February

fluorescent fittings

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For a better job every time–

Ease of cleaning, attractive colourful patterns make hard wearing WARERITE Plastics ideal for counters, shelves, table tops, kitchen fitments and other surfaces, in shops, showrooms, restaurants, hotels and bars.

The country-wide WARERITE Specialist Service provides prompt and expert fabrication and veneering of WARERITE Plastics.

In the A.B.C. Empire Restaurant, Victoria, S.W.1, WARERITE Birdseye Maple has been used for the flush doors, canopy, wall panelling, counter front and pillars.
Hygienic, easily cleaned and hard-wearing WARERITE Plastics need no painting and so reduce maintenance costs to a minimum.

Counter fitments: Sumerling & Co. Ltd.

Veneering and Fabrication: A WARERITE SPECIALIST.

The walls of the branch of Boots Pure Drug Co. Ltd., at King Edward Street, Hull, are panelled in WARERITE Veneered Plywood in Green Finaweave pattern. Stylised lion motifs designed by the architects in metallic foil were incorporated in the WARERITE. WARERITE Yellow Finaweave pattern was used for panelling the staircase.

Design: The Architects Dept., Boots Pure Drug Co. Ltd. Chief Architect, C. St. C. Oakes, F.R.I.B.A.

Contractors: Spooners (Hull) Ltd.

Veneering and Fabrication: A WARERITE SPECIALIST.

OFFICES UNDER WATER

Space-saving arrangement for Bowaters

The 'stalk' of Bowaters 143 foot high water tower at Northfleet accommodates, so far, six floors of office and storage space. The tank—which holds 200,000 gallons and serves the whole of the vast paper mill and provides water for the emergency sprinkler system—is carried on six reinforced concrete columns which are set back from the angles of the hexagonally planned base. The floor slabs are also reinforced concrete and carry the cladding—Williams & Williams 'Aluminex' Patent Glazing.

The whole exterior is anodized aluminium and glass. Aluminium glazing bars (and cover strips), aluminium purpose-made horizontal centre-hung windows, and aluminium faced 'Asbestolux' spandrel panels. The whole installation is designed to afford the maximum corrosion resistance in this heavy industrial atmosphere—and it is easily kept in new condition by periodical washing down, a cradle runway being incorporated in the underside of the tank.

'Aluminex' Patent Glazing was specified for three main reasons:

1. **Its low cost.**
2. **Its 'clean' exterior appearance.**
3. **The fact that the glazing bars can readily be supplied anodized.**

'Aluminex' is also used in the excitingly designed Transport Centre and is scheduled for the Machine House, due for completion later in 1958, which will house one of the largest paper-making machines in the world.

Water Tower: Bowaters United Kingdom Pulp and Paper Mills Limited, Thames Division, Northfleet, Kent.
Architects: Farmer and Dark, F/F.R.I.B.A.
Quantity Surveyors: E. C. Harris & Partners.
Contractors: Bierrum & Partners Limited.

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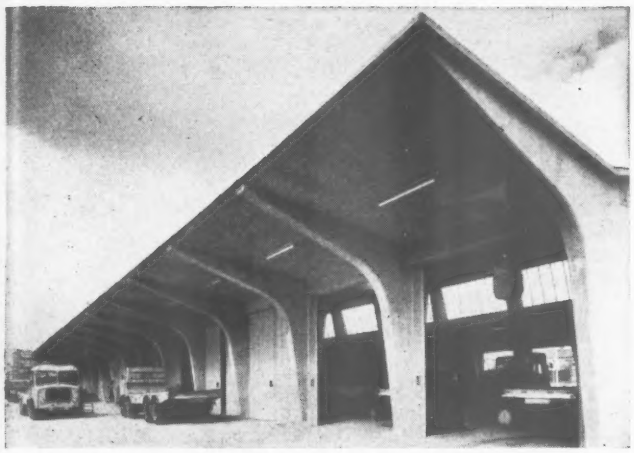
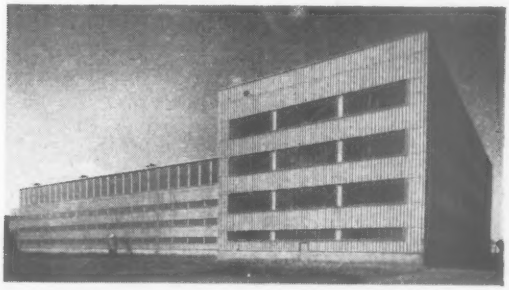
36 High Holborn, W.C.1 ADJOINING WILLIAMS HOUSE

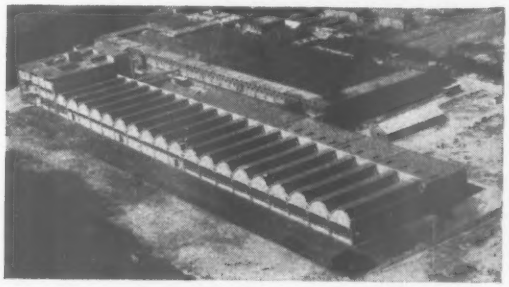


Transport Centre: Bowaters Services and Transport Limited.
Architects: Farmer and Dark, F/F.R.I.B.A.
Quantity Surveyors: E. C. Harris & Partners
Contractors: Higgs & Hill Ltd.

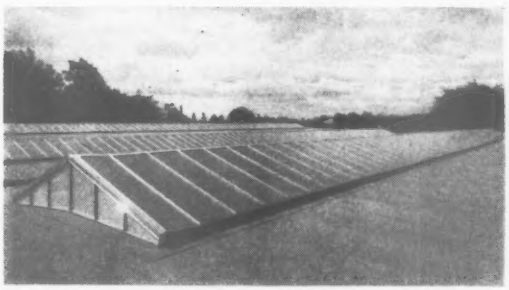
3 Typical applications of 'Aluminex'



1 Sidewall glazing at the new plant of Ferranti Ltd., Toronto.
Consulting Engineers: Byan, Mackay & MacFarlane



2 North light glazing at Scribbans-Kemp Bakeries Ltd., Grimbsy.
Architects: William Saunders & Partners.
Partner-in-charge: B. G. Gibson, L.R.I.B.A.



3 Purpose-made decklights at the Darlington College of Further Education.
Architect: E. A. Tornbohm, A.R.I.B.A., A.M.T.P.I., Darlington Borough Architect.

WALLSPAN
saves on a small building

'Wallspan' was specified for the cladding of the Romford printing works of Wilson & Whitworth Ltd. only after careful costing by the Architect. He calculated that 'Wallspan', because it would enable roof and floor construction to be carried on uninterrupted by the erection of external masonry walls, would be an economy even on a building as small as this. After a detailed post-mortem, so it proved to be: 'Wallspan' effected a saving in time and cost when compared with good quality traditional construction.

Another noteworthy feature of this contract is the unusual infilling panels of artificial stone.

New Office and Works for Wilson & Whitworth Ltd., Romford, Essex.
Architect: Messrs. J. W. Hammond, L/L.R.I.B.A.

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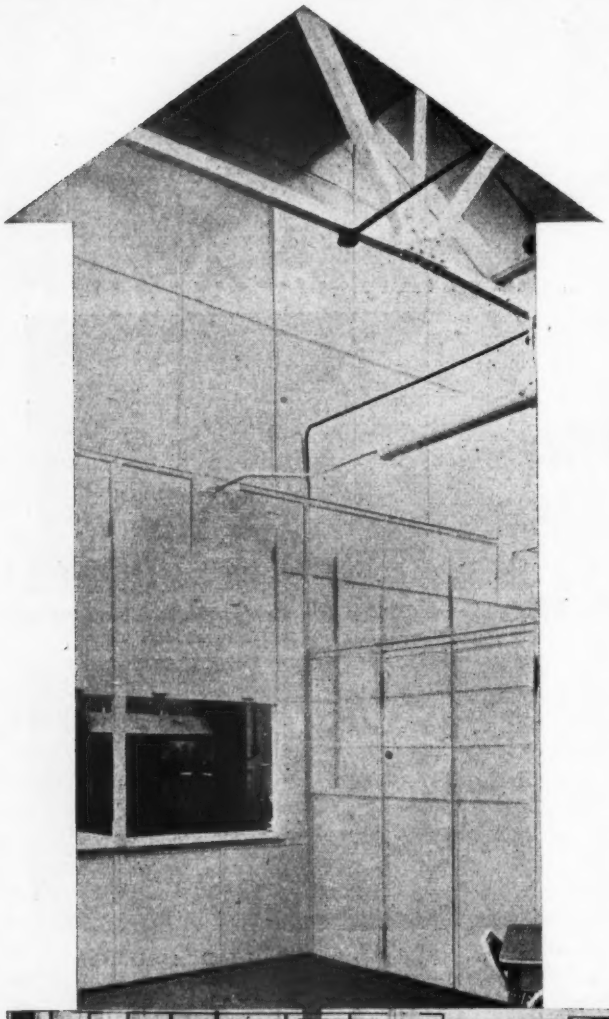

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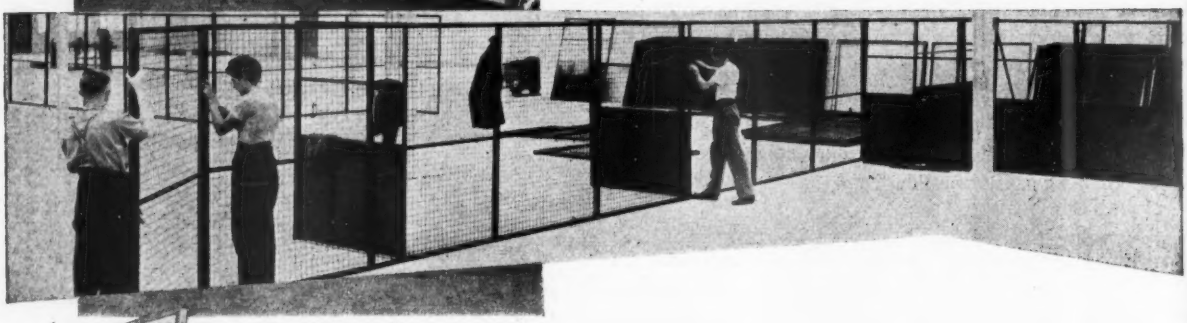

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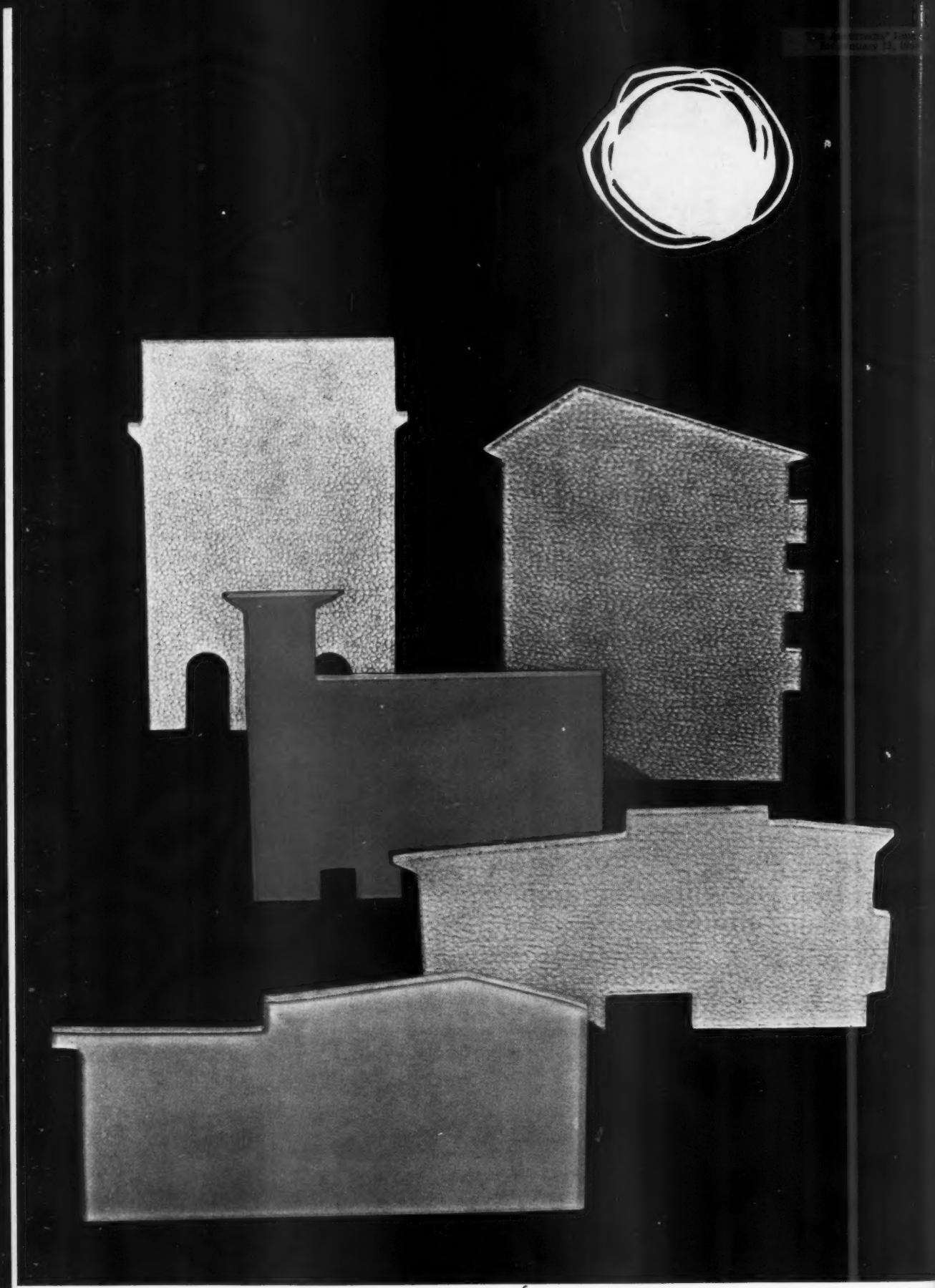

The colourful protective surface—**'MUROGLASS'** *and* **'ARMOURCLAD'** *Glass Cladding*

'ARMOURCLAD' *available in* 16 *colours,* 'MUROGLASS' *in* 9 *colours. For full details write to the manufacturers—*

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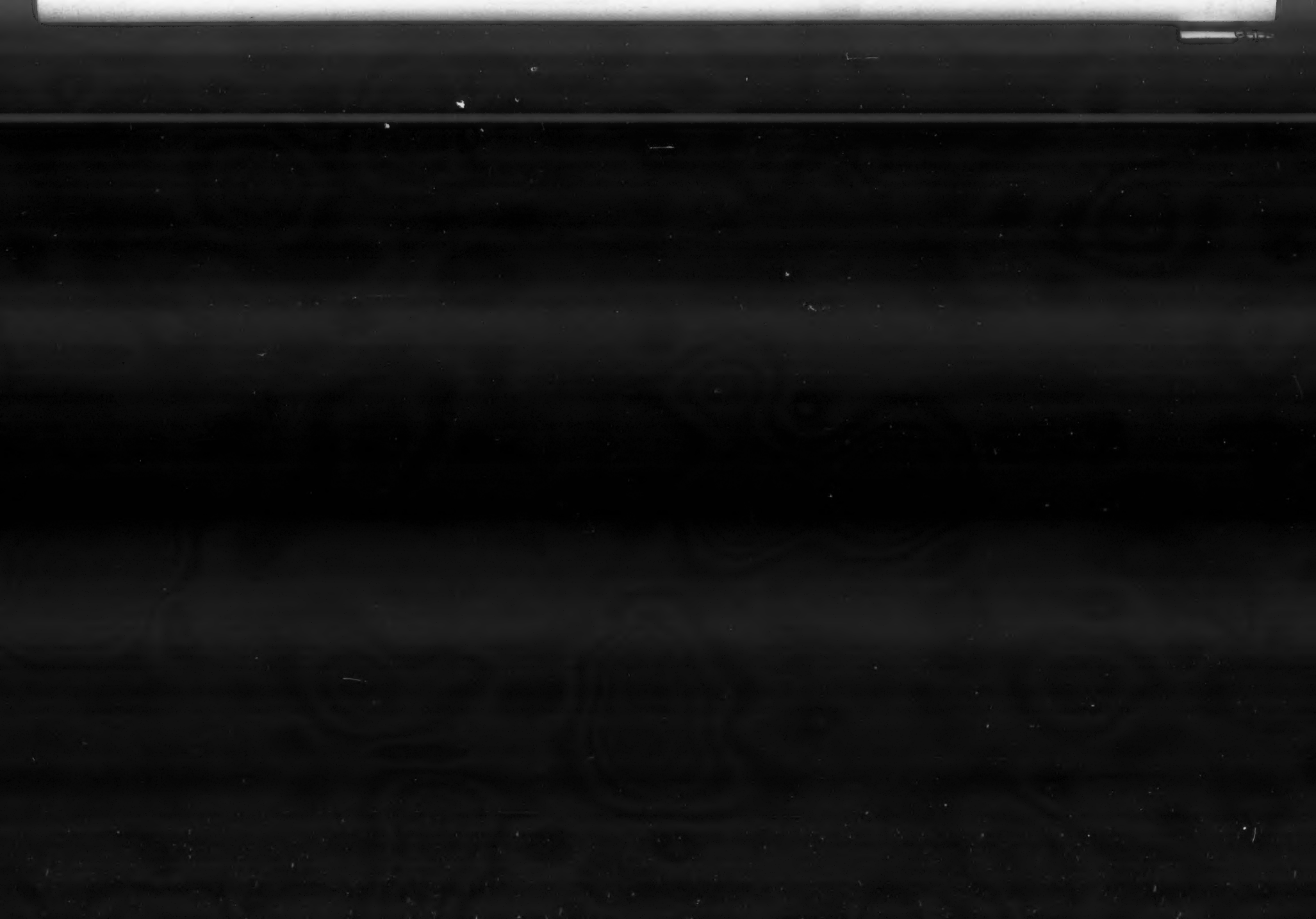

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HERE is the answer to all those in authority whose urgent needs for extra room are frustrated by delay and high cost. HALL'S wide span timber buildings are designed with a greater degree of prefabrication to save expensive site hours. These structures are so skilfully designed and well constructed that they will grace any site.

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HALL'S wide span buildings are available in standard single spans of 10, 12, 18, 24 and 30 ft. and in any lengths in units of 6 feet. Interior details are "made to measure" for individual needs. Constructed by craftsmen from selected timber, kiln dried and processed, they will last indefinitely.

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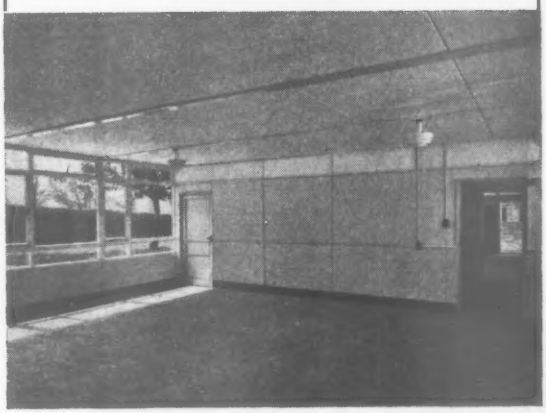

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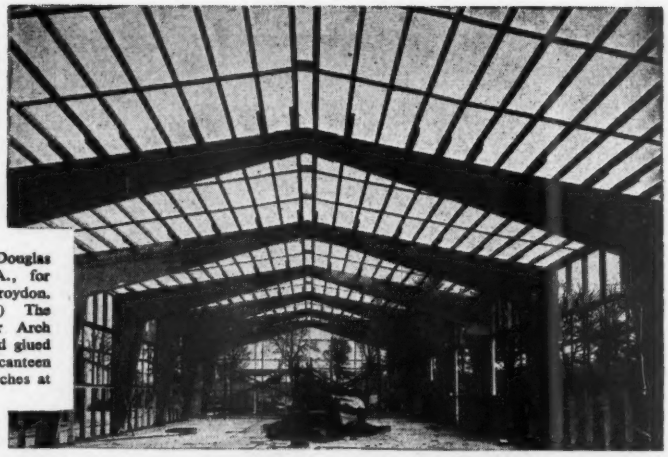
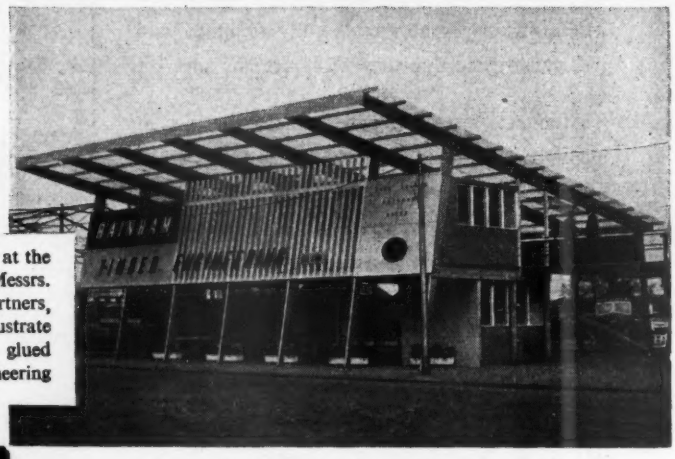


New canteen designed by Messrs. Douglas White and Furniss, A./A.R.I.B.A., for A. H. Hunt (Capacitors) Ltd., Croydon. (Contractors: R. W. Bowman Ltd.) The rigid frames are three-pin Tudor Arch design in stressed skin plywood and glued laminated timber construction. The canteen is 37ft. wide by 100ft. long with arches at 16ft. 8in. centres.

to the possibilities

R.T.E. glued laminated bowstring trusses of 60ft. span in new timber storage shed at Canning Town for W. W. Howard Bros. & Co. Ltd. (Consulting Engineers: Messrs. T. F. Burns & Partners. Contractors: Messrs. A. E. Symes Ltd.)

# of R.T.E. timber



This building, exhibited by us at the B.I.F., was designed by Messrs. Edward D. Mills & Partners, Chartered Architects, to illustrate the versatility of R.T.E. glued laminated timber as an engineering material.

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R.T.E. glued laminated timber can be built up to any section and length; can be curved, yet retains the strength of a straight member and with these advantages still keep the warmth and easy working properties of solid timber. It is a valuable new material that offers fresh scope to the Architect—we shall be glad to supply you with further information.

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Tib. 18

Birkenhead Technical College
Architects: Harold A. Dod & M. G. Gilling
F./F.R.I.B.A. (*Willink & Dod*)

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Birkenhead Technical College is a fine building

∴ Truscon Floors were used

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technical section

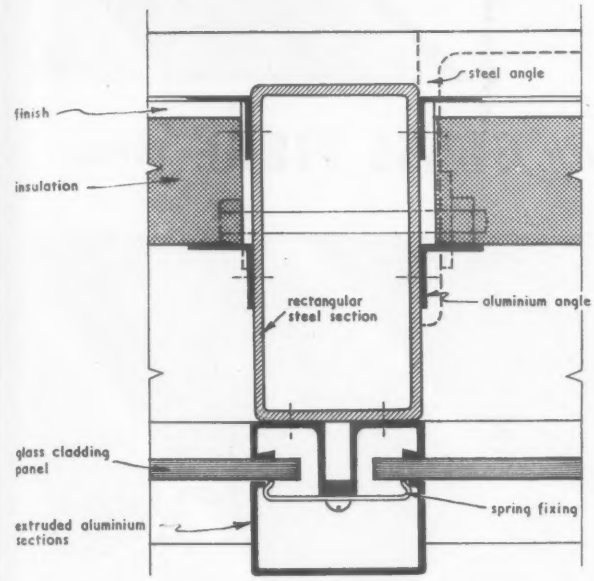
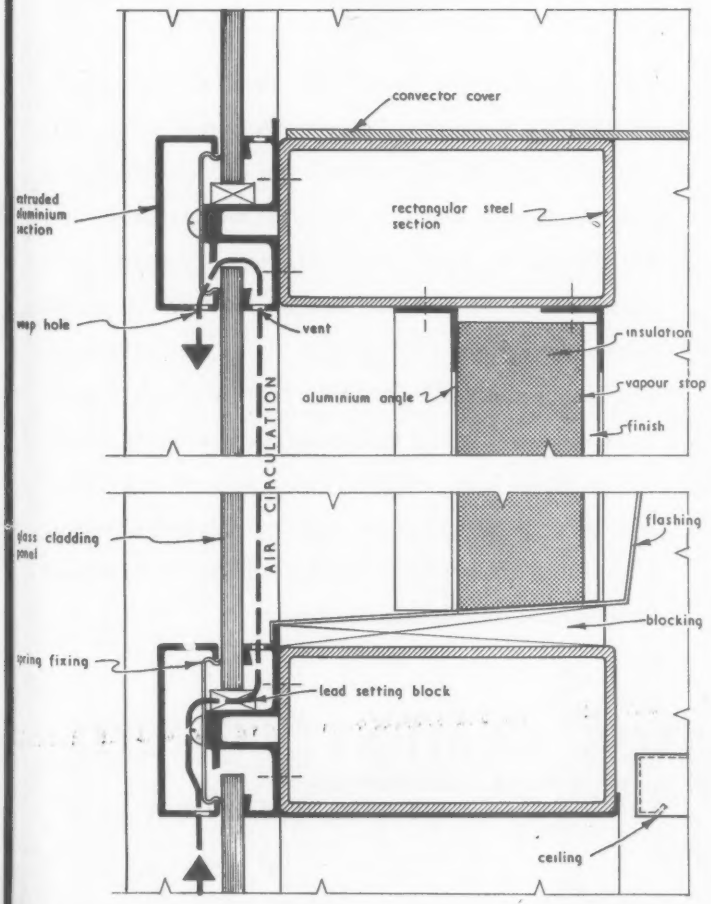


Fig. 7, sections through (above) mullion and (below) transoms of a recent American curtain wall system which makes no use of mastic or extrusions. Note the cover moulds which are "clipped" over spring fixings.



out again by the glazing bars and special flashings. Hills' curtain walling relies on an adaptation of this system, but the sprung capping strip exerts pressure against the glass by means of an extrusion which forms a weather seal. Should, however, any water penetrate, it is still conducted away by the shaped glazing bars. (See Fig. 6.)

A recent American system, using entirely "dry" glazing, without mastics or extrusions, has been developed. By means of weep and vent holes it caters for both condensation control and reduction of heat build-up in the cavity. (See Fig. 7.)

Open joints, especially for the bottom edge, have been used as glass claddings; they are really based on the patent glazing idea. For instance, in Handisyde and Taylor's Chiswell Street offices, the water has access into the cavity behind the glass, but cannot do damage because of the weathering and condensation flashing. (See Fig. 8.)

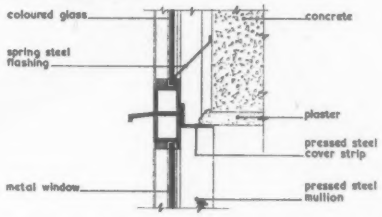
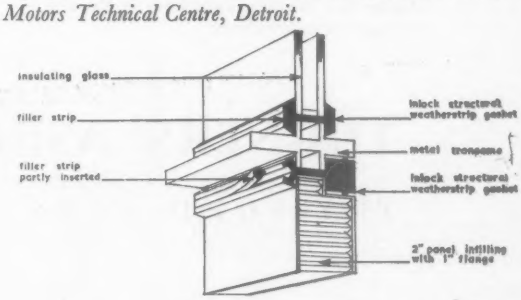


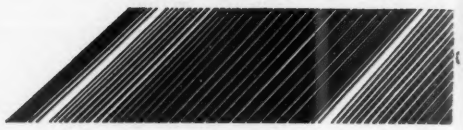
Fig. 8, glazing detail from offices in Chiswell Street (Architects, Handisyde & Taylor) in which flashing directs condensation outwards through gap at foot of glazing.

(*c*) EXTRUSIONS: Many of the jointing problems today troubling the building industry have been solved years ago in ships, railway coaches, buses, aircraft and cars by means of rubber and plastic extrusions. There has been some doubt in connection with the ageing properties of these, especially natural rubber, for the long life required in a building. However, the new synthetic rubbers and plastics, such as neoprene, p.v.c. and the butyl rubbers, seem to offer much better resistance although they are more costly.

The first large-scale use of car-type extrusions in a building was in Saarinen's General Motors Technical Centre, Detroit. These extrusions are now manufactured for building glazing and cladding by the Inland Division of G.M. They rely on pressure exerted by a bead "zipped" into a groove by special tools. (See Fig. 9.) Although radiused corners are normal in

Fig. 9, "zip-in" extrusion as used in Saarinen's General Motors Technical Centre, Detroit.





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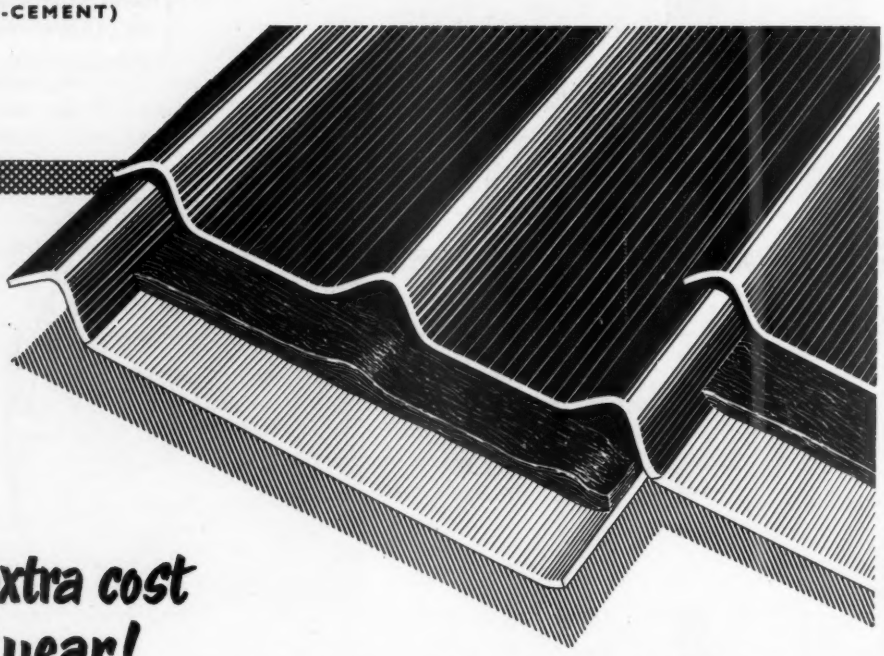
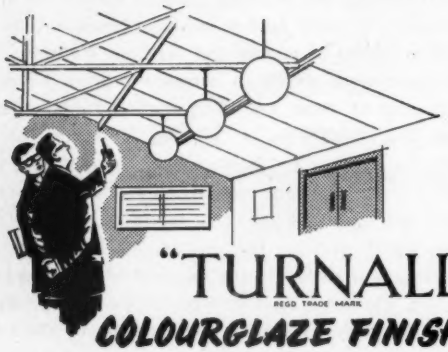
(ASBESTOS-CEMENT)

WITH GLASS FIBRE INFILL



Pays for the extra cost in the first year!



"TURNALL"
REGD TRADE MARK
COLOURGLAZE FINISH

"TURNALL" Combined Sheets are now available in an attractive range of works bonded finishes which cannot readily fade or wear (colour chart available on request). The flat inner lining can be chosen in a contrasting colour to the top corrugated outer sheet.

The development of a special Glass Fibre Infill for use with "TURNALL" Combined Sheets (Asbestos-Cement) has resulted in a double-skin insulated roof which constitutes the most economical form of insulated roof available. The introduction of the easily-fitted felted mat of rot-proof glass fibres between the double-skin cladding reduces the thermal transmittance from 0.57 to 0.35 B.t.u. / sq. ft. / hr. /°F—representing a fuel saving of no less than 1lb. of solid fuel for every 1,000 sq. ft. of roof area per hour of the heating season. (On an 18,000 hour period this saving amounts to a total of over £65.) In the case of new buildings this type of roofing enables the capital outlay for heating equipment to be reduced in addition to the subsequent saving.

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technical section

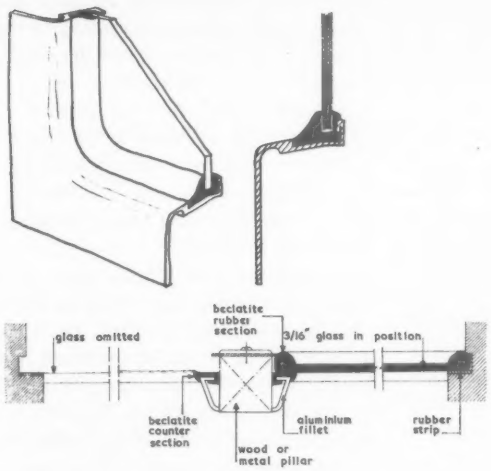
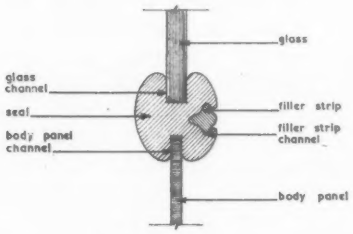


Fig. 10, three examples of British glazing extrusions. In the two examples above, the joint is closed by pressure against surrounding metal or glass; in the example below, the tight joint is formed by pressing a small "filler strip" into a preformed channel in a larger extrusion.



transport glazing, for right-angle panels a special moulded corner piece is produced, to avoid the leakage risk of mitred corners.

Several British extrusion glazing systems of a similar kind are available, but few have so far been used for buildings. Three types are shown in Fig. 10.

The possibilities of this type of extrusion, not only as a fixing method but also as a means of providing a vapour-proof edge to compound panels at the same time, are worth investigating. Another American extrusion, a simple "U" depends on pressure from the metal head, for weathertightness. (See Fig. 11.)

The future

If glass curtain walling continues to develop at the present rate, it will gradually be technically and architecturally refined so that it will be even more strictly a "skin"—capable of many specialized functions. Some recent technical developments both within and outside the industry, which seem to point in this direction are outlined below. Most are either experimental or limited to expensive optical or precision work at present—cost has rarely, however, been a final barrier where certain functions can only be performed by one material.

Before considering developments which are still at the experimental stage it might be as well to say something about those which are already within our grasp.

Reducing cost

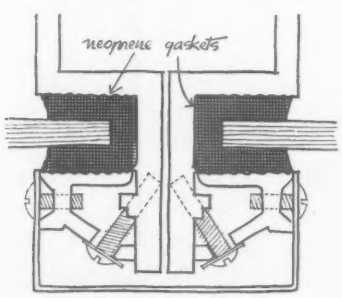
Everyone is agreed that curtain walling is more expensive than it ought to be. One way of cheapening it would be to agree on a measure of modular co-ordination. After all, curtain walling is just the kind of product which ought to lend itself to this. Recently an informal committee was set up by the main manufacturers of glass cladding panels under the ægis of BRS, with the object of proposing a limited range of standard size panels. They found, however, that though the large majority of curtain walls are designed on one of a few horizontal and vertical grid dimensions, it would be of no avail to standardize the panels until there was agreement between the framing manufacturers on the dimensions of the members which lie on the grid lines.

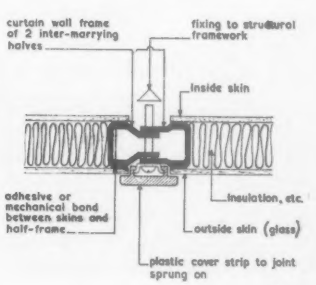
An alternative method of cutting cost which is being developed by some manufacturers involves incorporation of the framing within the panels. (See Fig. 12.) The panels would then be fixed direct to the structure and one whole stage in the erection of a curtain wall would be eliminated.

Incorporation of advertising

One adaptation of the glass cladding which is already feasible and is only waiting for the architect to exploit it, is the incorporation of lettering or designs (whether illuminated or not) behind the glass skin. Patterns could be permanently part of the glass as in the

Fig. 11 (below and below centre), detail of American fixing used at Idlewild Airport. The neoprene gaskets are fitted round the panels, the panels are moved into place, and pressure is provided by screwing inclined screws and thus tightening glazing beads. Fig. 12 (below right), a possible method for eliminating curtain wall framing.





technical section

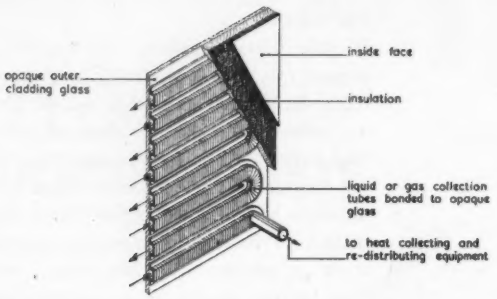
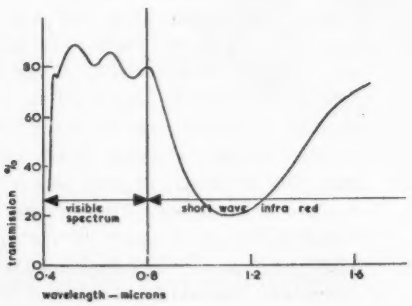


Fig. 13 (above), suggested construction of a glass solar-energy-collecting cladding panel. Fig. 14 (below), graph illustrating the energy transmission of a glass with selective spectral reflection. Note the high transmission in visible spectrum and low transmission of short wave infra-red energy (i.e., of heat).



painted and fire-toughened work of multi-colour "Armourclad" or by the use of overlapping and cut-out glass fibre screens in "Plyglass" panels; or they could be temporary and formed by the use of cut-outs and screens behind clear glass. This would have a double advantage in that the advertising would be better protected from the weather than the applied advertising which is now customary and would be brought more within the control of the designer of the building.

Heat and light

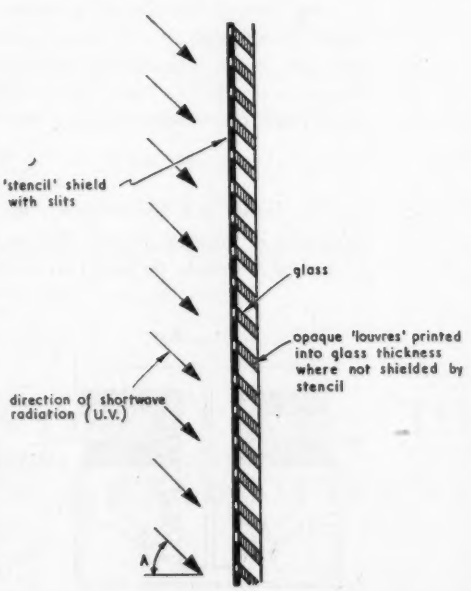
Of greater importance in the long run are developments which aim at improving the efficiency of glass as a filter for heat and light. Thus we may reasonably hope that it is only a matter of time before we find some means of drawing off the solar energy absorbed by the opaque panels and of using it for heating. The technical problem of incorporating a piping system within the glass or bonded to it (see Fig. 13) is difficult, but surely not insuperable.

Apart from this there are a number of technical developments in glass manufacture which should considerably affect its scope. One of these is a new *heat absorbing grey glass* which is now commercially available in America. As was explained in the first article in this series (AJ, November 7, 1956), heat absorbing glasses are normally blue-green and glare reducing glasses grey. This new product is claimed to do the job of both while having the less troublesome grey tint. The same firm is working on a *variable transmission* glass whose transmission of heat and light will be automatically adjusted according to the energy falling upon it. It is understood that the principle involves the use of a liquid sealed between the panes of glass with colour properties which are sensitive to light changes. The advantage of such a glass is that at times of extreme brightness or strong heat radiation from the sun, transmission would be reduced, and on duller days, when solar heat energy is wanted, transmission would be increased.

Heat resistant glasses resist heat by absorbing it: a more effective method would be to reflect it. A new technique is being evolved of "sputtering" interference layers of semi-transparent deposits into glass to give a *selective spectral reflection*. By this means it is possible to make a glass product which will be highly transparent to visible energy without coloration, but highly reflective of short-wave infra-red energy, *i.e.* heat without light (see graph in Fig. 14).

Lastly must be mentioned a method of forming *louvres within the thickness of the glass*. By including certain metallic compounds in a glass composition, the finished glass can be made sensitive to short-wave radiation (usually ultra violet). If irradiated, and subsequently re-heated, permanent colouration takes place in the body of the glass. A wide variety of colours, and also white opaque (opal) glass, can be thus produced. By shielding certain portions from the radiation, the image of the stencil can be permanently "printed" into the glass. An American company has already produced a glass with opal louvres or honeycombs photographed into its thickness and this seems to open up a field for a glass which incorporates its own sun-shading or *brise soleil*. By altering the slots in the stencil and the angle of radiation, a variety of louvres for different climates and orientations could be produced (Fig. 15).

Fig. 15, diagram showing formation of "louvres" in thickness of glass by short wave radiation.



CRITICISM

by J. M. Richards

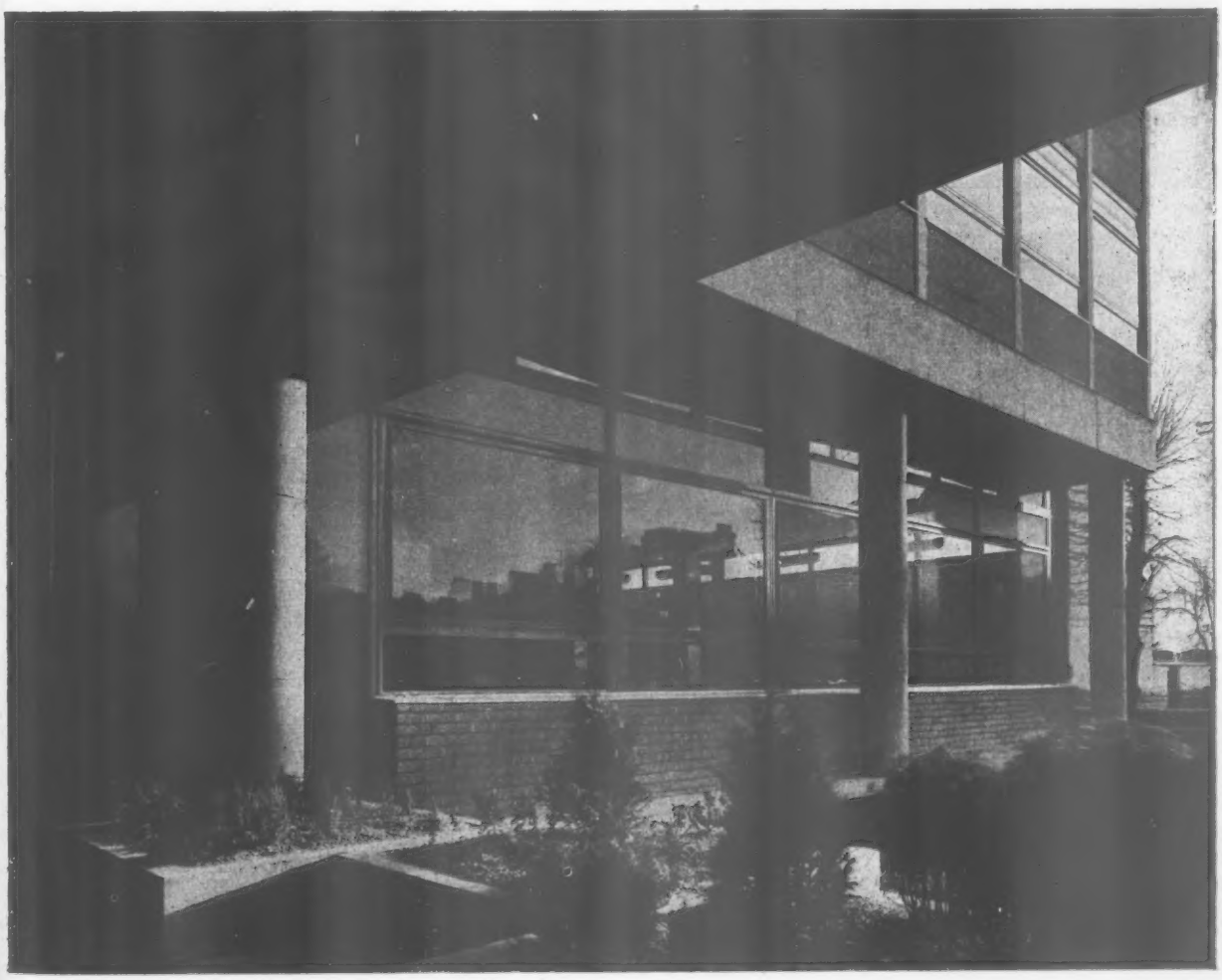
OFFICES for BRITISH RAILWAYS
at CAMBRIDGE
designed in the ARCHITECTS' DEPT.,
EASTERN REGION, BRITISH RAILWAYS

The quality of the architecture produced in the offices that serve our nationalized undertakings is extremely important to the future of British architecture generally. For this reason the office building near the station at Cambridge designed by the architects of British Railways (Eastern Region) and illustrated on pages 153-160 of this issue, is an encouraging phenomenon.

It is not only lively and well thought out as a design (and thus a refreshing contrast to the dreary buildings for which so many official and semi-official departments are responsible) but it faces up to some of the technical problems that are in the more alert architects' minds at the moment. For example, it was built under a negotiated contract, which has the advantage of allowing the architects to design from the start for the use of a constructional system in which a particular contractor specializes, and to work out the details in consultation with him on the drawing-board. And the architects have used such an opportunity to experiment (to my mind very successfully) with the use of the intergrid system—the contractor being Gilbert-Ash—for a multi-storey office building. The system has chiefly been used hitherto for schools, and one block of the secondary school at Worthing designed by the Ministry of Education's architects in 1954 is the only instance known to me of its use to a height of more than a couple of storeys. It employs prefabricated, prestressed concrete units and is, therefore, particularly well suited to buildings which invite planning on a standard module.

The Cambridge building is a four-storey office building required in connection with the new policy of decentralizing railway operation—and it was required at very short notice. It is something of a feat of

Corner of the main front, seen from beneath the entrance canopy. It shows the first floor slab, on which the intergrid superstructure stands, supported on concrete columns with the ground floor windows set back behind them.



The railwaymen's institute projecting forward from the main front of the building in the form of a single-storey wing. The picture shows the glazing taken down to floor level and the radiators behind: two points mentioned in this article.

organization (and also, I suppose, a tribute to the intergrid system) that the building was ready for occupation only ten months after handing over the site. The offices are the headquarters for the fairly large area administered from Cambridge. Incorporated in the building is an institute (that is, a club) for the railwaymen working in and around Cambridge station. The site is at the corner of Station Road and Tenison Road, at the far end from the station on an area of ground owned by the railways and occupied by sidings, hutments and old buildings of a miscellaneous kind, which it is to be hoped will gradually be tidied up. The station itself, with its wide arcaded front, is an unusually distinguished building and deserves a better approach than this.

Tenison Road is to be widened, so the new building has been well set back on this, its entrance, frontage and will eventually lose part of the grassed forecourt behind which it stands. The institute, which occupies about two thirds of the ground-floor area and is brought forward as a single-storey projecting wing, is completely separated internally from the offices, having its only entrance at the side of the building. The first thing to be noted about the design is the clear differentiation between the two forms of construction employed; for the prefabricated system begins only on the first floor. The intergrid frame rests on a first-floor concrete slab, itself supported on *in-situ* concrete columns using cylindrical pipes as permanent shuttering. These also serve for vertical drainage. The use of a different system for the ground floor was determined, I believe, by the need for larger uninterrupted floor-areas in the institute than the intergrid system (which has a module of 80 in.) provides, and by uncertainty about the suitability of the system for a four-storey structure. It would be interesting to learn from the architects whether they now have any doubts about going up four storeys or even higher with this system, because by planning the institute a little differently and treating it wholly, instead of partly, as a separate single-storey wing they could in fact, I should think, have given it the necessary floor area while using intergrid for the ground-floor offices as well.

I should add that if this had been done the building would have been much less interesting; the change from the flat facades, with alternating windows and wall panels, of the upper storeys, to the boldly modelled lower floor with its large windows over a brick base, recessed behind freestanding columns (see my first photograph), is what gives the building its character; so in asking this question I am more interested in the architects' experience of intergrid as a system than in criticizing their use of it here, which seems to have been very intelligent. In any case, I imagine there are practical advantages in using it only from the first floor up, such as the fact that there is a dry, level platform to build it on. It is at the point of contact with the ground that prefabricated systems are most difficult to deal with.

I have already made it clear that I think the facade treatment of the building very successful. The windows are hardwood, which gives them substance and definition, avoiding the somewhat meagre effect when metal windows are combined with the slender structural members, and the absence of recession, typical of constructional systems like this. The architects have used two colours of concrete: a light grey for facing the first floor edge-beam, the fascia along the top and the slim vertical members, and a darker grey for the infill panels below the windows. My only, very small, criticism is that the darker grey is not dark enough; that is, that there is not enough difference between the two.

Some critics may feel that the canopy and doorway (shown in the close-up view on page 154) give unnecessary emphasis to the entrance to what is only a smallish office building, but I believe the original plan was for the institute to be reached through the same entrance hall. If the reason for the change was to make it less awkward for railwaymen to use the institute on coming off duty in their working clothes, it still seems odd that there is no physical connection whatever between offices and institute. Does no one from the office building have occasion to enter the institute? If so, they must go out of the building, round the corner and in again.

Both the porch and the single-storey wing of the institute are nicely detailed, with a substantial use of

hardwood that gives a good strong base to the building. I am a little disturbed by the radiators that stand at the foot of each window along the front of this wing (photograph on facing page). I suppose the architects are satisfied of their necessity—the building is heated throughout by convected hot air and there is a large circulating unit only just across the institute floor—but if they are necessary why are they painted silver so that they catch the eye both inside and out? I can understand the temptation to take clear glass right down to the floor, but might not some other treatment of the lower part of the windows have been preferable, apart from screening the radiators, in a room designed for crowds of people, in order to avoid breakable panes of glass at foot-level?

I have mentioned the effective expression that has been given to the fact that the constructional system is different above and below the first-floor slab. At the back of the building (see my third photograph, below), where there is a recessed staircase window in the form of a continuous vertical hardwood screen, the architects have thought it right to preserve the line of this first-floor slab (or, rather, its edge-beam) by continuing its across the face of the recess, and have done the same with the fascia unit at the top. I think this device is justified visually, though purists may condemn it because the span of beam across the window is non-functional.

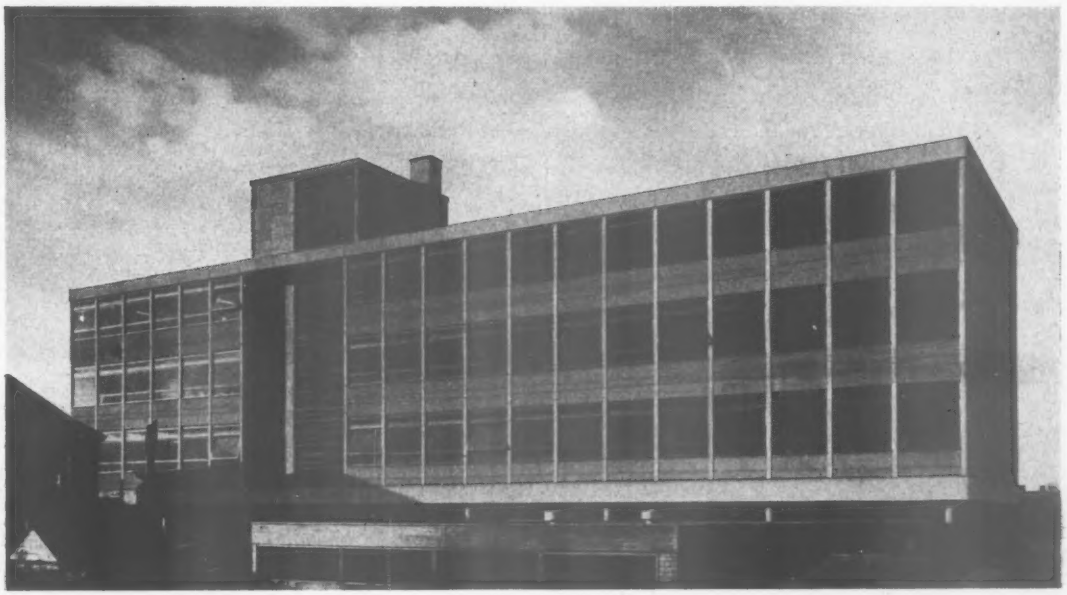
The staircase well, which is of *in-situ* concrete, is continued above roof-level to form a room for tanks and lift-machinery, which is satisfactory enough from this side because the various planes and angles are visibly related to the geometry of the main structure, but the same tank-room is much less happy when seen from the Tenison Road side—see page 153. It appears unrelated to the building, and this has been aggravated by facing it with weather-boarding painted mauve below a trio of windows, with the result that the little structure looks like a contractor's hut that has been left behind. It continues to surprise me how many excellently designed buildings are marred by the, admittedly difficult, design problems set by roof-structures not being solved.

Inside, the office-building has a straightforward centre-corridor plan with well-lighted, cleanly shaped rooms, designed for full flexibility in use; that is, all partitions, including those along the corridors, are movable. They are timber framed, with glazed or timber panels and have a good appearance and pleasant colour. Their finish is not always as precise as it should be—nor is the joinery in some other parts of the building—which is in some places a matter of design, in some of craftsmanship.

The corridors are handsomely wide and the entrance hall is a particularly agreeable space. The now familiar device of continuing an external brick wall into the building with a sheet of glass butting against it (photograph on page 154) is effectively used here. The detailing is simple but well thought out and proportioned, and the only criticism I have is that the staircase balustrade (seen in the photograph on page 158) has a timber handrail supported only by stainless steel uprights, which are spaced so far apart that although no doubt there is no actual danger of falling through, one does not feel protected enough.

The interior of the institute is less satisfactory than that of the office building, for several reasons. The sequence of spaces does not seem to be at all well arranged. A rather poky entrance leads into the two main rooms which are separated by a sliding-folding screen. These contain columns which have no visible relationship with the rooms' proportions or wall treatments (in contrast to the offices, where partitions and wall and window modules coincide neatly) and the first room, intended for lectures, actually has a row of three columns, one a thin circular one, the next

The rear of the Cambridge railway offices, showing the eaves fascia and the first-floor edge beam carried across the staircase window—a point discussed in this article; also the staircase continued upwards to form a tank-room.



a fat circular one and the next a thin square one—which is not quite architecture. These rooms are given some character by their two-level ceiling, which is quite interestingly handled, though will the narrow clerestory windows, with their deep external overhang, not be unusually difficult to clean?

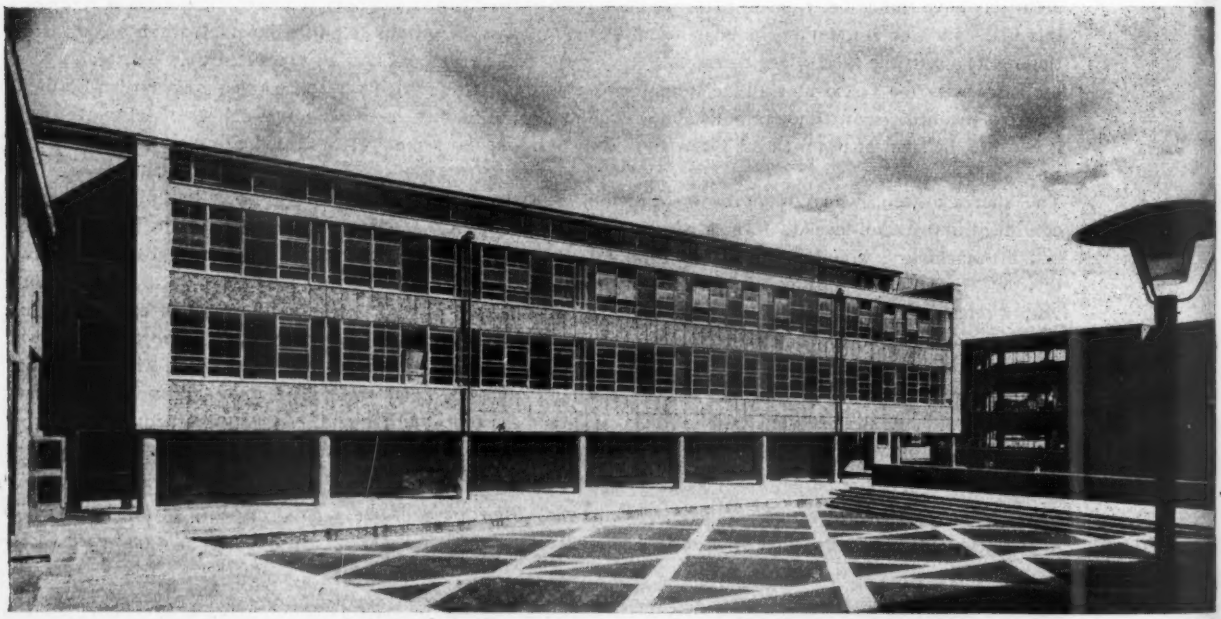
Also opening off the poky entrance is the bar, which during much of the time will surely be the most-used room in the place. Could it not have been given a more welcoming character, as well as more space for overflow, by making it a recess off the main room instead of walling it in as a separate brick box?

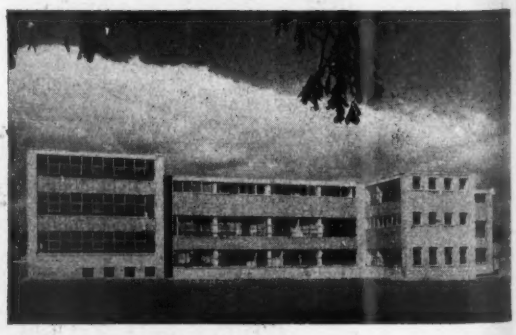
These criticisms may be unfair in view of the changes in the requirements with which I believe the architects were confronted during the course of the job, but the critic can only comment on what he sees and leave the architect to explain how it came about.

The finishing materials inside the institute are on the grim side, but they will have to stand up to rough wear and it was right to err on the side of simplicity. But there is little excuse for an end brick wall having an untidy pattern of electric conduit-pipes and junction boxes sprawling all over it. If, as I understand, this is because the electrical installations in a railway building don't come under the control of the architects, then there seems to be something alarmingly wrong with the co-ordination between departments in an industry whose efficiency surely depends a great deal on proper co-ordination.

I must follow these criticisms with a final word of praise for the building as a whole. If the enterprising approach to problems of design and technique that has produced it was shown more often by the engineers and architects responsible for British Railways' modernization programme, there would be a better chance of the word modernization meaning what it ought to.

EXTENSIONS TO WANDSWORTH SCHOOL, SUTHERLAND GROVE, S.W.18





Extensions to Wandsworth school, above and right, designed for the LCC by Hening and Chitty, were recently opened. The consultants were, structural engineering, R. T. James and Partners; electrical engineering, J. Rawlinson, Chief Engineer, LCC; heating and mechanical engineering, G. H. Buckle and Partners; landscaping, L. A. Huddert, Chief Officer, LCC Parks Department. The original school buildings, erected in 1928, were placed in a corner of the site, away from the public road, leaving space for two football pitches. It has not been possible to retain these football pitches, although reasonable recreation space had to be provided for 2,200 boys. The relative merits of a very high block, to leave more of the site open, were considered, but a maximum of four storeys was finally chosen so that the school buildings should not overwhelm the two-storey suburban housing around the site. The total number of places in the new building, which contains 35 classrooms, 11 laboratories and 18 workshops, is 1,620 in 120,000 sq. ft. The actual net cost on tender was £368,866 (additional costs £16,420), which gives an actual net cost per place of £228.

building illustrated

OFFICES

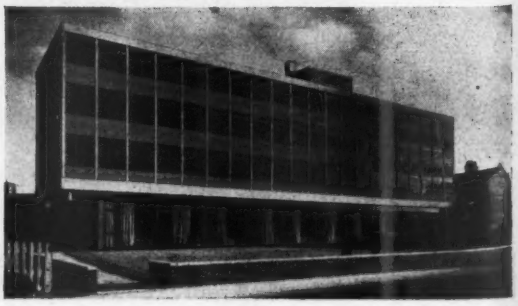
in TENISON ROAD, CAMBRIDGE, for the AREA TRAFFIC MANAGER, EASTERN REGION, BRITISH RAILWAYS designed by H. H. POWELL, architect to the Eastern Region, under the general direction of A. K. TENIS, chief civil engineer; R. T. WALTERS, principal assistant architect; A. J. FAGG, T. R. BURFIELD, G. W. EDMANDS, S. G. ADUTT, design team; quantity surveyors NEWBERRY and WYATT; consultants THE PRESTRESSED CONCRETE CO. LTD.

Great Eastern House, near the Cambridge railway station, is the new headquarters for the Traffic Manager, who administers an area stretching from Hunstanton in the north, Ketton in the west, Newport, Essex, in the south and Bury St. Edmunds in the east. The offices have been built as part of the decentralization policy of British Railways, and replace a number of obsolete and unsightly wooden huts. The construction above first floor level is in a patented system of prefabricated reinforced concrete, so far only used for schools. The building contains, on the ground floor, accommodation for the Railway Institute, a social club which is entirely separate from the administrative offices. These offices are discussed in an article by J. M. Richards on pages 149-152.

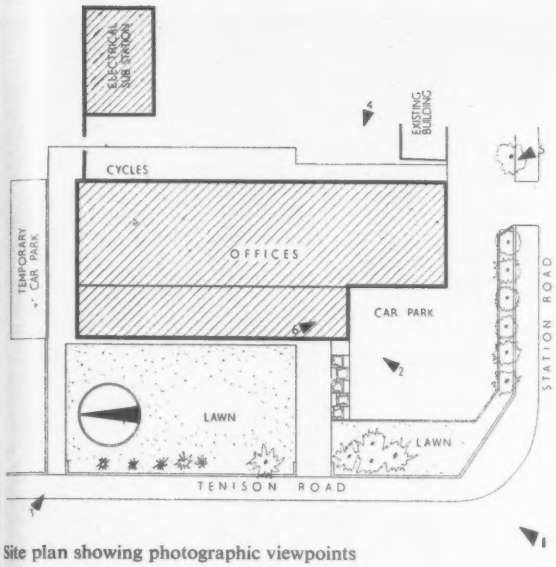
Viewpoint 1: *from the south-west, at the junction of Tenison Road and Station Road.*

building illustrated

Viewpoint 2 (above): the west facade from the car park. In the foreground is the covered entrance porch and, left, the floor to ceiling windows of the recreation room and lecture room in the Railway Institute. Viewpoint 3 (right): from the north-west. On the left is the pedestrian entrance to the Railway Institute, or social club, which is quite separate from the administrative offices.



analysis



Site plan showing photographic viewpoints

CLIENT'S REQUIREMENTS

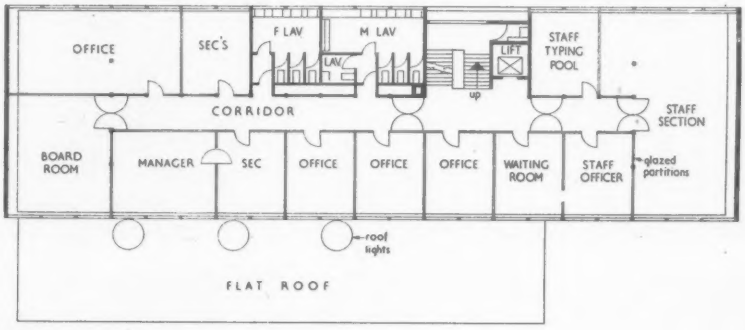
To provide offices for the Traffic Manager of the Cambridge area and his staff, and premises for the Railway Institute. The new building replaces a number of obsolescent and unsightly huts in the vicinity of the railway station.

PLANNING AIMS

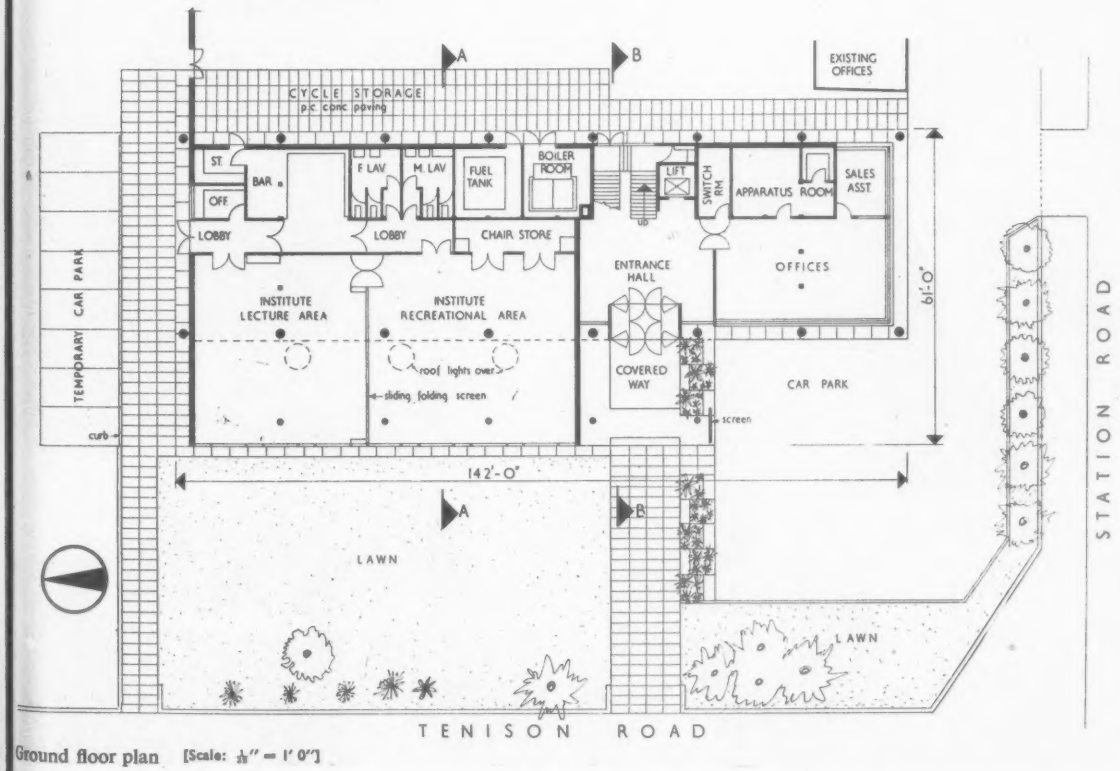
The building is situated at the corner of Tenison Road and Station Road and is set back to allow for the future widening of Tenison Road. The offices generally face east and west.

Although it forms a single 4-storey block, the building is divided functionally, structurally and aesthetically into two parts.

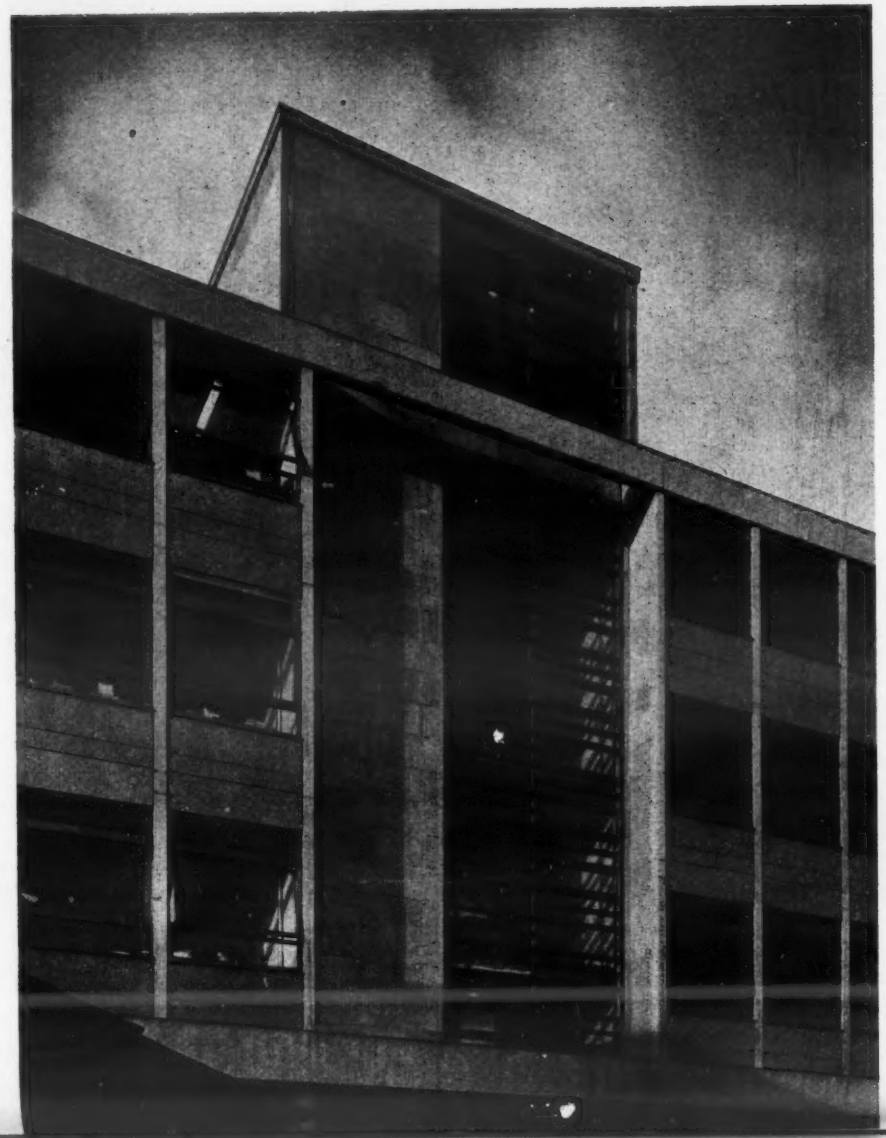
The ground floor contains the entrance hall, enquiry desk, service rooms, some office space and the Institute. The Institute has a separate entrance and consists of a large area suitable for meetings, lectures and social events with a bar and other facilities. The ground floor is of "wet and heavy" construction with an *in-situ* reinforced concrete frame and first floor slab and with brick walls which



Typical upper floor plan

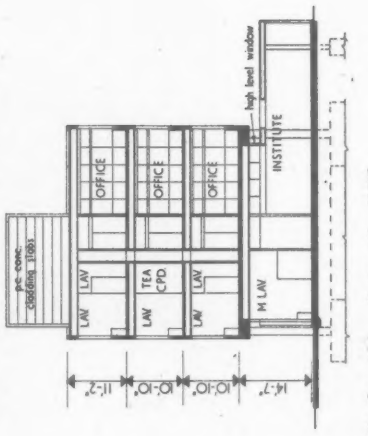


Ground floor plan [Scale: $\frac{1}{16}$" = 1' 0"]



Viewpoint 4 (opposite page, left): the tall staircase window on the east facade and above it the tank and lift motor room. This

Viewpoint 4 (opposite page, left): the tall staircase window on the east facade and above it the tank and lift motor room. This purpose-made window, which contains fixed and opening lights, is framed in utile hardwood. Viewpoint 5 (opposite page, right): the south facade. Cladding, above first floor level on all facades, is of precast concrete panels with exposed aggregate finish. Windows are framed in hardwood and the 11-in. cavity plinth is faced with Bedford grey-brown bricks. Viewpoint 6 (right): the covered entrance porch. The glazed entrance doors are framed in utile and the flower boxes are of precast concrete.



Section A-A [Scale: 1/8" = 1'0"]

mostly pass behind the columns leaving them free standing. The institute area projects at the front of the building and its roof is continued to form a deep canopy over the front entrance.

The three upper floors are all devoted to offices and are of dry construction using the " Intergrid " system. The precast pre-stressed concrete frame rests on the *in-situ* first floor slab and the external walls are faced with precast concrete panels with exposed aggregate finish and hardwood framed windows. Each floor is an open area divided by demountable glazed timber partitions on a 3-ft. 4-in. grid. The vertical link consists of a lift and stairs at the rear of the building with a perforated hardwood screen which runs right up the rear elevation of the building and forms an illuminated " back cloth " to the entrance hall. External works include areas of grass and shrubs, car park, cycle store and an electricity sub-station at the rear of the building.

price per sq. ft. (based on estimated final contract price)	s	d
preliminaries and insurances	5	7

Work below ground floor level — 2 4½

Reinforced concrete pier bases and floor slab.

Frame or load-bearing element

Prefabricated, prestressed concrete frame above first floor. — 14 1

Remainder of *in-situ* concrete structure — 9 10½

In-situ r.c. frame to first floor. " Intergrid " construction above.

External walls — 9½

Ground floor: 11-in. cavity brickwork with Bedford grey-brown facings.

Upper floors: Precast concrete exposed aggregate panels backed by plastered hollow tile inner skin on flank walls, insulated low-pressure hot water convection panels on long walls (cost of convection panels in " heating installation ").

ratio: $\frac{\text{solid wall}}{\text{floor area}} = \frac{0{\cdot}09}{1}$

Windows — 6 6½

Utile hardwood including staircase screen. Satin chrome friction pivots. Anodized aluminium lever handles to budget locks.

ratio: $\frac{\text{windows}}{\text{floor area}} = \frac{0{\cdot}27}{1}$

External doors — 6½

Hardwood, utile.

ratio: $\frac{\text{doors}}{\text{floor area}} = \frac{0{\cdot}03}{1}$

Upper floors

Cost included in " Frame or load-bearing element" above.

1st floor, *in-situ* r.c.

2nd and 3rd floors, " Intergrid," each 5,460 sq. ft.

Staircases

Cost included in " frame or load-bearing element."

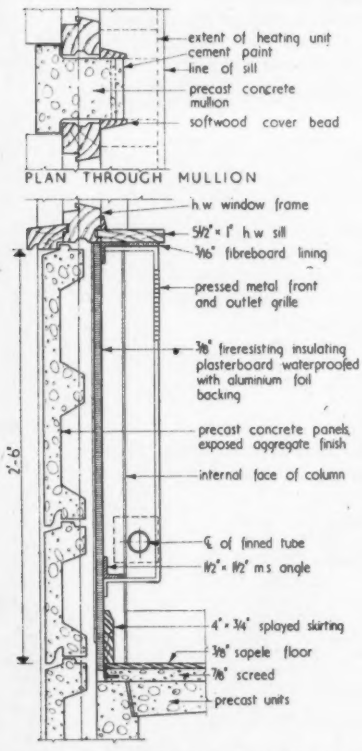
No. of staircases: 1. *In-situ* concrete. Black terrazzo finish.

Width: 5 ft.

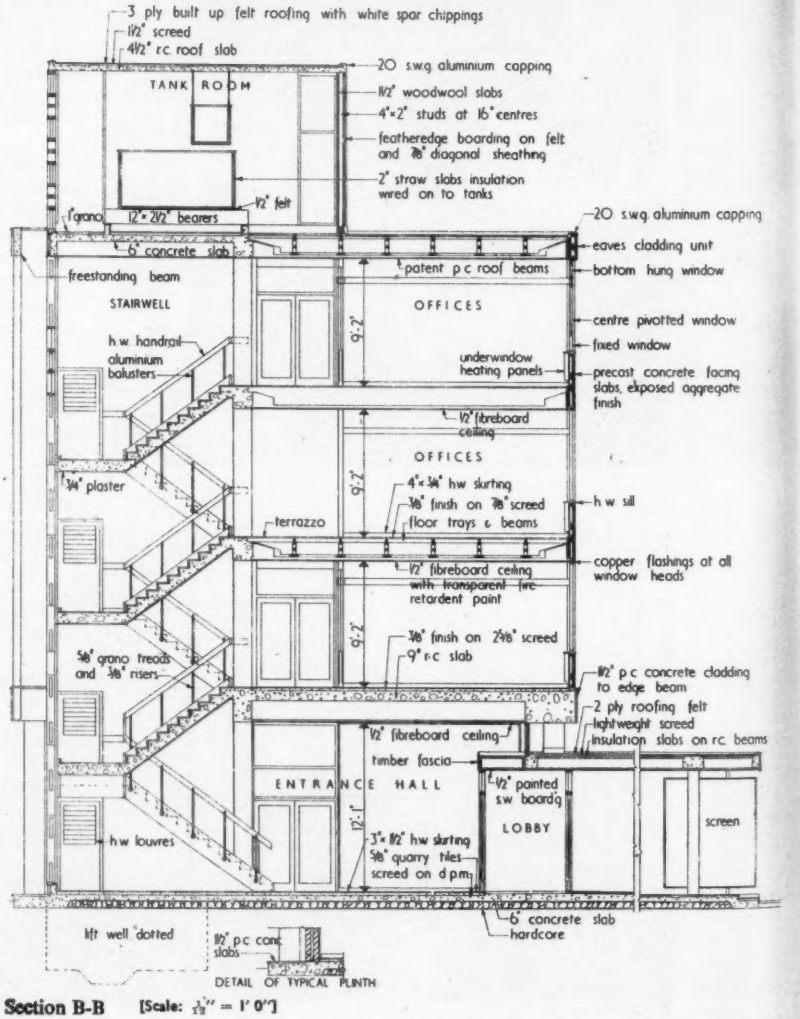
Total rise: 36 ft. 3 in.

building illustrated

The entrance hall and inquiry desk. The staircase is in-situ concrete with a terrazzo finish.



Plan and section of external wall and heating unit [Scale: 1" = 1' 0"]



Section B-B [Scale: 1/8" = 1' 0"]

The board-room at the north-west corner of the first floor. Below sill level are heating units containing finned copper tubes served from an oil-fired boiler.

A typical executive office. The desk is designed by the architects and the demountable glazed partition is framed in hardwood and plywood faced.

A typical upper floor corridor and staircase landing. Daylight for internal corridors on upper floors is obtained through the glazed office partitions on the east and west sides of the block.

analysis

Roof construction — s d

Cost included in " frame or load-bearing element."
Type of roof: " Intergrid " to main block. R.c. beams and wood wool slabs to projecting part of ground floor.

Roof lights — 1½

3 roof lights, total area 105 sq. ft. Cast glass.

Glazing — 1 5½

⅜-in. cast glass in internal partitions (see below).
¼-in. polished plate to large ground floor windows.
32-oz. clear glass to main external windows.

Total of structural elements — 32 10½

PARTITIONS

Internal partitions — 4 6¾

Partition :	Glazed timber	Hollow clay block	Precast concrete
Area in sq. ft.:	6,850	4,958	450

Internal doors — 11½

No. of single: 51.
No. of double: 12.
West African mahogany veneered skeleton cored or utile framed glazed.
Doors to lavatory lobbies have glazed sidelights.

Ironmongery — 7½

Anodised aluminium lever handles, kicking plates, push plates, overhead closers and shoe springs.

Fittings — 1 11¾

Bar counter, shelving and lighting canopy.
Removable staging and sliding folding screen.
Curtains and curtain track to social club.

Total of partitions and fittings — 8 1½

FINISHES

Floor finishes — 4 9½

Type of finish:	Wood parquet tiles	Blue quarry tiles	Red quarry tiles
Area in sq. ft.:	18,468	1,242	1,710
Price per sq. yd.	30s. 5d.	40s.	27s.

Wall finishes — 1 7¾

Fairfaced brick to social club and entrance hall areas.
Plastic glaze to lavatories.
Cement render to service rooms.
Remainder plastered and painted.

Ceiling finishes — 3 4¾

Class I fireproofed insulation board.
Softwood boarding painted to underside of entrance canopy.

Roof finishes — 11

Type of finish:	3 layer bituminous felt over main roof	2 layer bituminous felt over single-storey area
Area in sq. ft.:	5,562	2,286

Decorations — 1 6½

Windows externally—clear synthetic varnish.
Internal demountable partitions, clear gum varnish.
Other areas generally painted.

Total of finishes — 12 3½

analysis

SERVICES

	s	d
External plumbing		3
Aluminium flashings. Aluminium and cast-iron rainwater pipes, all inside building.		
Hot and cold water installation	2	0½
Oil-fired boiler. Galvanised tube and fittings generally. Hot water from a calorifier. Internal temp. 65° in offices.		
Sanitary fittings		8¾

Fitting:	Sinks	Lavatory basins	W.c.s	Urinals
No:	5	32	26	14

Heating and ventilation	6	5
Two oil-fired boilers, low-pressure hot-water distribution (see above). Heating mains in Class " B " black tubing. Perimeter heating to offices, copper tubing with aluminium fins. Cost includes wall convection heating panels. Internal temperatures: 65° to offices. Air change, natural.		
Gas installation		
None.		
Electrical installation	2	1
Fluorescent lighting fittings generally. Ring main for socket outlets.		

Type of point:	Lighting	Switch	Power
Number of points:	345	72	30

Lifts		1½
6-8 person passenger lift with high-level motor room. (Element price for this item includes builder's work only.)		
Total of services	11	7½
Drainage	1	2½
Separate system. Waste system in building in copper with cast-iron main stacks.		
Other elements not shown above	1	7½
Telephone ducts, including for operational control on second floor. Lightning conductor.		

Shillings per sq. ft. of floor area:

£85,256 (net cost excluding external works) = 75 8

22,535 sq. ft. (floor area measured inside external walls)

COST SUMMARY

Ground floor area: 6,156 sq. ft.
Total floor area: 22,535 sq. ft.
Type of contract: negotiated.
Work began: February, 1957.
Work finished: November, 1957.
Estimated final contract price of foundations, superstructure, installations and finishes: £85,256.
Estimated final contract price of ancillary buildings: £7,894.
Estimated total: £93,150.

COST COMMENTS

It should be noted that in this analysis the cost per sq. ft. of floor area would have been greater still had the office block been analysed separately without the large open areas on the ground floor, and if the cost of lift gear and motors had been included.

Certain elements call for comment:

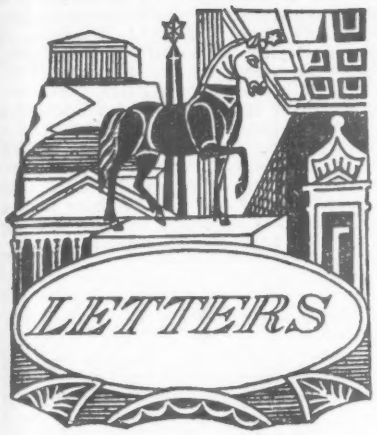
" Preliminaries " bear a greater proportion of the total cost than might be expected. This may be due to plant found necessary to hoist the prefabricated frame into position, or to the speed of erection, but in any event would have had the architect's agreement as part of the negotiated contract.

" External walls": The choice of the solid external wall panels (at 9¾d. per sq. ft. of floor area with a ratio of 0·09) indicates a cost of construction and external finish amounting to £4 1s. per sq. yd. of wall $\left(\frac{9{\cdot}75\text{d.}}{{\cdot}09}.\right)$

" Windows " at 6s. 0¼d. per sq. ft. of floor area are affected by the inclusion of the perforated hardwood screen. The unit cost of this element amounts to $\frac{72{\cdot}25\text{d.}}{0{\cdot}27}$ or 22s. 4d. per sq. ft. of window and this figure gives some clue to the probable cost of the screen. " Fittings": This element refers almost exclusively to the social club. " Ceilings " at 3s. 4¾d. per sq. ft. of floor area consists in the main of Class I fire-proofed insulation board. It would appear therefore to require an expensive system of suspension with this form of construction.

CONTRACTORS

General contractor: Gilbert-Ash Ltd. *Sub-contractors: Wood block flooring (Alufloor):* Bennets Wood Flooring Ltd. *Electrical installation:* Bectice Ltd. *Felt roofing; tanking and lining:* Cambridge Asphalte Co., Ltd. *Plumbing installation:* T. R. Freeman & Son Ltd. *Lightning conductor installation:* J. W. Gray & Son Ltd. *Terrazzo paving:* Jaconello Ltd. *Glazing:* Mustill Wallis & Co., Ltd. *Quarry tiling:* Parkinsons (Wall Tiling) Ltd. *Suspended ceilings:* J. A. R. Robertson. *Painting:* Arnold Sharrocks Ltd. *Plastering and screeding:* W. A. Telling Ltd. *Heating installation:* Weatherfoil Ltd. *Cement glaze:* Regent Surfaces Co., Ltd. *Aluminium balusters:* Amalcraft Ltd. *Founder and smith:* Broads Ltd. & Clark Hunt & Co., Ltd. *Sanitary ware:* John Bolding & Sons, Ltd. *Cement and lime:* Cement Marketing Co. *Window frames:* Davis Ridley & Co., Ltd.; *Aggregates:* M. Dickerson Ltd. *Fletton bricks:* Erith & Co., Ltd. *Facing bricks:* S. A. Hunter Ltd. *Fibre ducting:* Key Engineering Co., Ltd. *Hollow clay; partition blocks:* London Brick Co., Ltd. *Precast lavatory partitions:* Mono-Concrete Ltd. *General builders merchants:* Cyril Ridgeon, Rogers & Jackson. *Ironmongery:* Alfred G. Roberts, Ltd. *Electric " Barrywald " incinerators in women's lavatories:* Saniguard Appliances Ltd. *Joinery:* W. E. Stromeyer Ltd. *Sanitary fittings:* Stitsons Ltd. *Dome lights:* R. Seddon & Sons Ltd. *Artificial stone coping:* Tidnams Ltd. *Rubber link matting:* Tyre Products. *Cannel reinforcement slabs:* Thermacoust Ltd. *Rod reinforcement:* Twisteel (GKN) Ltd. *S/G pipes, bricks, etc.:* Travis & Arnow Ltd. *Paving slabs:* Wettern Bros. *Metal cycle shelters:* Alfred A. Odoni & Co., Ltd. *Lighting fittings (a) Fluorescent (to all offices, corridors, social club and entrance hall):* Falk, Stadelmann & Co., Ltd. *(b) Filament (lavatories, lobbies, stores, cleaners' cupboards, cistern room):* G.E.C. Ltd. *(c) Filament (boiler room):* Benjamin Electric Ltd. *(d) Filament (fuel store):* Wardle Engineering Co. Ltd. *(e) Filament (entrance and bar canopy):* Troughton & Young Ltd. *(f) Filament (staircase):* Courtney Pope Ltd. *Metal rolling grilles to bar:* Haskins.



Hampstead Competition

SIR,—The unanimous decision of the Hampstead Borough Planning Committee to recommend the Council to appoint Basil Spence as architect for their Town Hall suggests, in the words of *The Times*, that "they favour a contemporary design."

The committee's chief reason for appointing an architect direct rather than holding an open competition is "the risk that the design chosen by the assessor might not be suitable for the Borough" and further "an advantage of direct appointment is that the architect can be given an indication of the type of building that the Council have in mind and could consult the Council and its officers as points emerge during preparation of the plans. This is particularly valuable in our view."

By appointing Basil Spence as the assessor and by providing a programme and an adequate set of conditions (as would be demanded by the RIBA in any event) the fears of the Hampstead Planning Committee might be dispelled. I find it hard to believe that they would not find one design suitable for the Borough among the many entries that this competition would be sure to attract.

R. D. BUTTERELL.

London.

Pier Luigi Nervi

SIR,—In my review I assumed that Nervi's project for the huge exhibition hall in Paris was that which was adopted and is now under construction.

I have just received the Journal of the *Société des Ing. Civils de France* and learn from it that three steel schemes and three independent concrete schemes were submitted for these works; Nervi's was one of the latter and was not adopted. The successful scheme, which has nothing in common with that of Nervi, save its dimensions, was prepared by M. Esquillan, the author of the 340-ft. span concrete shell hangars at Marignane; construction is well under way and the roof is about half finished.

On re-reading the text, my original assumption still seems pardonable, but I feel that I owe this apology to my good friend, M. Esquillan.

A. J. HARRIS.

London.

Too Many Journals ?

SIR,—We, the undersigned architects, in the department of Architecture and Planning at the Basildon Development Corporation, appreciate the value of a number of different architectural journals and believe that healthy competition between them has a salutary effect on them all. However, when the effect of this competitive spirit is to produce a crop of almost identical illustrated reviews of the same building in the same month, we feel justified in expressing our exasperation to the different editors.

In December, 1957, the TUC Memorial Building was reviewed in *The Architect & Building News*, THE ARCHITECTS' JOURNAL and *The Architectural Review* among other journals. It can easily be seen that all three journals must have used identical descriptive notes as paragraph after paragraph are identical in wording with only the most minor editorial changes. *The Architectural Review* and THE ARCHITECTS' JOURNAL also used the same blocks of the plans and sections through the building, and the identical photographs used in THE ARCHITECTS' JOURNAL are to be found in *The Review* with a few more added.

It is conceded that some buildings may be of sufficient significance to warrant special treatment in the architectural Press, but surely the profession would benefit if at least some of the journals concluded a "gentleman's agreement," taking it in turns to devote a special issue to an important building. In this way we might be spared the repetition which is as insulting as it is wasteful and might at least have one really full treatment with critique, construction and credit titles.

ANTHONY GOSS, DENNIS R. HANCE, FRANCIS V. BUTCHER, E. GREENWOOD, W. H. DAVIES, R. A. SHAW, P. A. LEMAR.

Basildon.

[The Editors reply: It is only in rare and exceptional cases that THE ARCHITECTS' JOURNAL and *The Architectural Review* use either the same blocks or the same text. In the publication of buildings the JOURNAL habitually publishes a full and exclusive cost analysis and description together with original photographs: a cost analysis of the TUC building was not, unfortunately, available. The writers of this letter are really objecting to the existence of more than one architectural paper. Since competition is healthier than monopoly, we do not wish to see the demise of our competitors; it is for the public to decide which they will buy. The writers do not, presumably, object to the duplication of reports in the daily Press; so why ask for a single publication of a building?]

Study Bedrooms

SIR,—I should like to refer to the letter from C. G. Stillman (AJ, December 12) about the size of study bedrooms in Training College hostels.

It is true that the Ministry approved study bedrooms of 160 sq. ft. for the Maria Grey Training College and of 120 sq. ft. for the second college quoted. It is also true that at the times when these projects were approved (1953 and 1955 respectively), the Ministry's views were undecided about the best size for study bedrooms. Since then it has been possible to take stock of various experiments which local authorities and voluntary bodies have carried out and to publish certain conclusions. These are contained in Building Bulletin No. 15, which was published in February last. This recommended that study bedrooms of at least 140 sq. ft. should be provided out of a total (not allowing for common rooms and dining facilities) of 200 or 220 sq. ft. depending, respectively, upon whether the design is in two-storey terraces or multi-storey blocks.

A. POTT.

London.

Sweet Uses Of Advertisement

SIR,—I am most reluctant to disagree with my friend Tatton-Brown but against two sentences in his review of *Workplace for Learning* (AJ, December 26)—a trade subsidised book—I must protest. He writes: "Fact and fiction are often so subtly fused that it is difficult to distinguish one from the other. And when the result is a work of art it is pointless to try." This seems to be most unprincipled. All advertising is a conspiracy against society, but must we completely succumb when the conspiracy degenerates even further, into the confidence trick. Tatton-Brown also refers to "prestige publicity." This revolting expression is, presumably, what Sheridan might have called "the puff pompous." In any case it is something that I would regard as fraudulent until I had proof that it was not.

R. FURNEAUX JORDAN.

London.

A Good Eye . . .

SIR,—ASTRAGAL has a good eye. I have known it for long on the side of contemporary building. I know it now on the side of historical architecture as well. The Piranesi etching in the new edition of my *European Architecture* represents indeed the Basilica of Maxentius and I should have said so in the caption. But Piranesi calls it the Tablinum of the Golden House of Nero and, to make confusion worse confounded, adds that "volgarmente" the building is known as the Temple of Peace. In this he is right. Serlio, for instance, gives it that name.

NIKOLAUS PEVSNER.

London.

. . . but a Thick Head

SIR,—ASTRAGAL (AJ, Nov. 28) accuses the TCPA of "showing a distressing ignorance of the architect's job and some muddled thinking." With respect I suggest that before he writes on this subject again, he stops to think himself and sorts out some of his own muddled thinking.

I am neither a housing manager nor an architect but I have been employed in Local Government for some years and have also lived in various local authority houses. From practical experience, therefore (which ASTRAGAL appears to lack), I am well aware of the shortcomings which lack of co-operation on the part of architects, has produced in the past. He states that "the architect's responsibility to his client is to find an economic, functional and æsthetically satisfying answer to his needs" and goes on to say that "more often than not, the client ultimately comes to realize that what he needs and wants are the same thing, and ends a satisfied man."

May I point out that in the case of local authority housing, the housing manager virtually *is* the client (if he is doing his job properly). What happens when the client does not end a satisfied man? From my experience, in the majority of cases he has a long way to go yet. Moving thousands of people to new housing estates is a social experiment, which is being paid for by the taxpayer and ratepayer, and must be made to work for the wellbeing, benefit and happiness of all concerned. From personal experience I can say that stupid errors of detailed design and layout are being repeated all too frequently, making many schemes only acceptable when they could have been the ultimate.

If layout and design is to progress to the mutual benefit of all concerned then much more co-operation and mutual respect is needed between architects, town planners and housing managers. If this co-operation is not achieved and one section continues to go its own sweet way, oblivious to the rights and merits of others, then money wasting, useless, irritating, unnecessary and unwarrantable mistakes will continue to be made, and L.A. housing will fall far short of providing an "economic, functional and æsthetically satisfying answer," to the problem which now faces us.

M. L. HARLEY.

London.

Elevational Control

SIR,—I must say I applaud the letter from Dennis Berry (AJ, December 26). I have been waiting for some time for the explosion to take place over the quite incredible situation (to quote Dennis Berry) which an architect finds himself in due to the present planning "set-up." I absolutely agree the RIBA should tackle this matter. I, for one, would be very pleased to supply some "Case Histories" for the consideration of any committee formed.

G. L. THOMPSON.

Selby.

SIR,—Dennis Berry has performed a public service in revealing this case of obstructionism on the part of a local planning authority. Such practices can only bewilder and antagonize an applicant, and it is difficult to see how the public can benefit from this. I suspect, however, that this is an example of inefficient administration, rather than the deliberate delaying tactics as suggested by Mr. Berry. I have followed the recent correspondence in your columns on elevational control with considerable interest, and would like to make some comments from the viewpoint of a planner employed by a local authority.

Firstly, so long as the present system of democratic local government operates in this country, the ultimate decisions will be taken by lay committees assisted by the advice of their technical officers. The important question then becomes the quality of this technical advice, and so long as this includes that of a qualified architect of integrity, there can surely be little question of the rejection of good designs on the grounds of elevational control. It should be remembered that most committees entertain great confidence in their officers and almost invariably accept their recommendations on technical matters.

I must draw attention to the quality of the designs which are submitted for planning approval by architects—incidentally these are in the minority. A few are of high standard, many are of decent appearance, but others are uninspired or downright hamfisted. If it is a truism to say that good designs are produced by good architects, then from my experience there are still far too many practising at the present moment whose standards are not of the highest. Anybody who has dealt with the flood of applications annually received in a planning office will realize the necessity for elevational control.

Uninspired designs often stem from the taste and requirements of the architect's client. For instance, many commercial developers seem to desire nothing more than acres of lettable floor space wrapped in "safe" brick envelopes. These are all too often expressed in shopping streets of monstrous uniformity. The enlightened civic authority will often be driven to negotiate with architect or developer in an attempt to persuade them to break away from the usual sterotyped solution.

Finally, I would reiterate the well-known cliché that good townscape can only be produced by fruitful co-operation between planning authority and architect. I suggest that much greater liaison at sketch plan stage is one method of achieving this. The informal exchange of ideas, or "briefing" on the planning authority's views, before the architect has taken his scheme very far would often avoid misunderstandings and ensure speedy approval being granted.

JOHN R. HERBERT.

Fareham.

Byelaw Confusion

SIR,—Your recent correspondents have given examples of local authority obstruction of town planning applications. Your readers may be interested in a case arising from a Building Byelaw application that we have recently made. This is in respect of a house which is over 2,000 ft. super, the walls of which are 11 in. cavity, the inner skin being a 4½ in. lightweight concrete insulation block.

The local authority had advised us that this wall is not in accordance with the building byelaws, because the house cannot be termed a "small house" as defined by the byelaws. They have referred us to the rule in the Third Schedule which states that the crushing strength of blocks must be not less than 1,500 lb. per sq. in. In reply we pointed out that the particular byelaw in question stipulates that the construction is to be based on the relevant recommendations of the British Standards Code of Practice 111, and that the rules mentioned in the Third Schedule are, in the words of the byelaw "deemed to be sufficient." We were furthermore prepared to submit detailed calculations showing that the walls did in fact comply with the British Standards Code. The Authority, however, has maintained that the Third Schedule rule *must* be adhered to.

In order to facilitate the progress of the job our client may, therefore, have to accept an internal skin of sufficient strength but of a far inferior insulation value.

At a time when the industry's efforts are directed towards the question of building and administrative costs and standards of thermal insulation it is deplorable that an authority can insist on such grave misinterpretation of its own byelaws. If, however, they are correct in their interpretation it would appear that the use of lightweight concrete insulation blocks is prohibited in any building which has any floor exceeding 1,000 ft. super in area, because, as far as we know, there does not exist a high thermal insulation block which will satisfy these requirements.

Surely an architect can expect that, where an authority has based its byelaws on those of the 1953 Model Byelaws, a general unanimity of interpretation should exist.

One of your correspondents made an admirable suggestion that the RIBA should set up a standing committee to investigate matters of this nature. Such a committee would prove of immense value to the profession if it were also to function in an advisory capacity, available for consultation by members of the RIBA.

ALEXANDER FLINDER.

London.

[The Editors reply: This adds yet another instance of local authority intransigence to those described by previous correspondents—notably David Stern (AJ, December 6), H. H. Bayley (December 19) and Dennis Berry (December 26). Mr. Flinder and Mr. Berry both ask that the RIBA "do something about it." So far as we know they are doing something about one aspect of it, namely costs. Part of the RIBA Cost Research Committee's terms of reference were matters arising from the Norwich Conference of 1956 and one of those matters was the effect of delays in town planning and other approvals on building costs.]

"Electricity In Building"

SIR,—As one of Mr. Osborne's technical advisers to come under the lash of your reviewer's pen (December 26) I really must break silence on this occasion, if only because the author may himself feel disinclined so to do.

In the first place the above book was reviewed under the heading "Electrical Installation Text-book" despite the author's introductory statement that "This book is in no sense of the word a text book." The reviewer then made the following remarkable criticisms: that a fuse is not described until Chapter 4; that voltage drop could have been ignored; that nothing need have been said concerning glare except that it is a common fact of experience; and that heat loss calculations would have been better omitted. Most remarkable of all is the reviewer's intrusion of his own views on the provision desirable for electric wiring, and his dismissal of the author's plea for early consideration of this as "silly." I have yet, in fact, to read anything as silly as the following remark in the review: ". . . the finding of space for rising mains is not of itself critical and the place for them cannot be decided until it is known where the greatest load is required."

Had Mr. Osborne written his book on lines acceptable to the reviewer there would indeed have been occasion for criticism for much that is useful and necessary would have been omitted.

The fact that I had some small hand in this book need not prevent me from suggesting that a book review has a greater purpose than to give expression to the reviewer's own prejudices, and merits little attention when the items selected for stricture have so little relation to the value and content of the book as a whole.

W. ROBINSON.

London.

[The Technical Editor replies: Though there is some doubt about what is or is not a "textbook," it seemed reasonable to classify this book as such despite the author's disclaimer, if only because it is clearly intended to instruct. Careful reading of the review will make it clear that the reviewer (who is a practising electrical consultant specializing in electrical installations in buildings) did not write or imply that "nothing need have been said concerning glare except that it is a common fact of experience": he *did* make the other "remarkable criticisms" (though with qualifications not explained in Mr. Robinson's letter) and stands by these. There was, however, an editorial rewriting of the paragraph on the space for rising mains which alters the reviewer's original sense and which justifies Mr. Robinson's criticism. The reviewer's original version made the point that the finding of space for rising mains is not critical at the *earliest* stage but that space can only (and must) be found at an intermediate stage, *i.e.* when it is known where the greatest load is required.]

TOKYO

Circular school

A correspondent examines the claims made for a circular teaching block in a girls' school in Tokyo.

The "Circular School House" was designed by Kanao Sakamoto for the Fujimi Girls' High School in Tokyo. Built in reinforced concrete, it is 25 metres in diameter giving 491 sq. metres on the ground, first and second floors and 95 sq. metres on the third floor—a total floor space of 1,568 sq. metres or approximately 16,900 sq. ft. The block has 15 classrooms and caters for "from 600 to 900 children."

The designers of this unusual school claim many educational, economic and environmental advantages for its uncompromising shape. They have made a comparative study by arranging the same accommodation in a rectangular block and claim the following rather startling advantages for the circular block:

1. The overall area is reduced by 17 per cent, the quantity of concrete by 38 per cent, steel by 30 per cent, external wall area by 45 per cent, and the cost is reduced by 47 per cent.
2. Smaller distance between rooms, therefore lower percentage of total area is wasted on circulation and less time is spent in walking.
3. The quantity and quality of natural lighting is improved.
4. Ventilation is improved.
5. Acoustics are improved; "they are the same as in a music hall."
6. All rooms have a secondary fire escape route—by verandah to escape stairs.
7. Distance between teacher and pupil is smaller than in a rectangular classroom.

We may perhaps be forgiven if, with several hundred postwar schools under our belt, we choose to regard this effort as rather immature. An examination of the facts and the photographs does little to remove this feeling. Taking the claims in order:

1. The circular school plan is compared with a particularly banal rectangular plan in which circulation area is getting on for 50 per cent of the total! We must presume that the case has not been weighted by using uneconomic spans, etc., in the rectangular block, but even so it is difficult to believe that using the same techniques such a phenomenal reduction in cost can be achieved with a fundamentally more difficult shape. It is possible, of course, that the external walls are a very expensive item and that the reduction of 45 per cent in these coupled with the reduction in total volume of the building is responsible for a large reduction in the total cost of the building. This must be offset to some extent by the special formwork and reinforcement necessary for the circular plan, but again the overall quantity of both steel and concrete is very considerably less. A cost analysis would be very revealing, since it would probably show up an entirely different pattern of costs than the one to which we are accustomed.

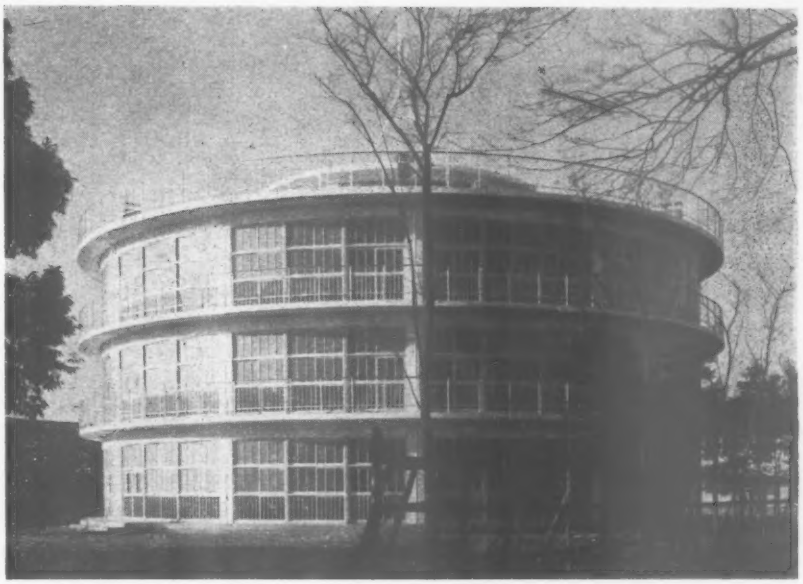
2. The proportion of space used for circulation in both plans is high—very high in the rectangular one. As for walking about a school, this never did anyone any harm and the view held by a few educationalists that the two or three minutes spent between lessons is wasted will hardly be accepted by the schoolboy.

3. Quantity of light no doubt is slightly greater in the circular block, but pupils sit with their backs to the only source. The light diffusion is probably considerable, but the chalkboard is placed in the darkest part of the room and has no supplementary artificial light. The teacher must face a window which must be a source of severe glare and her pupils must appear in permanent silhouette. How she is expected to cope with up to 60 secondary schoolchildren under these circumstances is difficult to imagine.

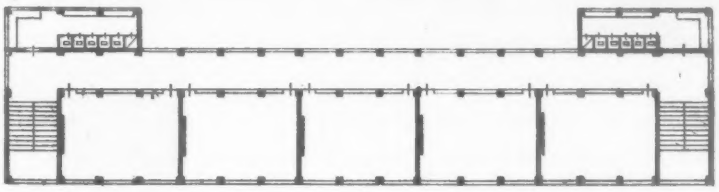
4. There is no direct cross ventilation in either scheme and it appears unlikely from the drawings that ventilation in the circular building would be better than in the rectangular building.

5. "Acoustics" in small classrooms with normal finishes (which should, of course, include some absorbent surfaces) do not normally present any difficulty. "Acoustic" shapes are not called for.

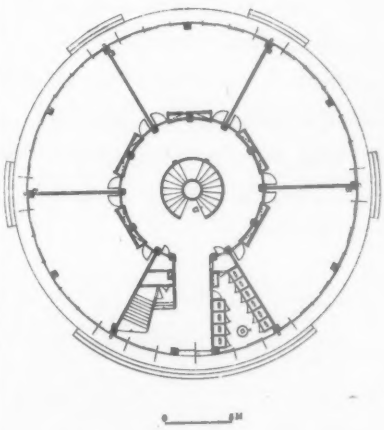
7. The "teaching space," i.e., the area between the chalkboard and the front row of children, is about the same in both schemes. The distance between the furthest child and the chalkboard in the circular block is slightly less than in the rectangular. But because of the wedge shape, the further the distance from the chalkboard, the more children can be accommodated. This cancels the advantage to some extent. Viewing angles to the chalkboard are worse for some pupils in the circular block.



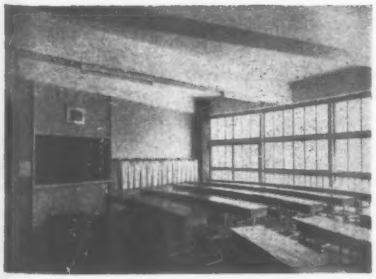
General view. Detailing is assured and crisp. Standard windows are not curved on plan.



The rectangular plan above, with the same accommodation, formed the basis for a comparative study in costs and quantities.

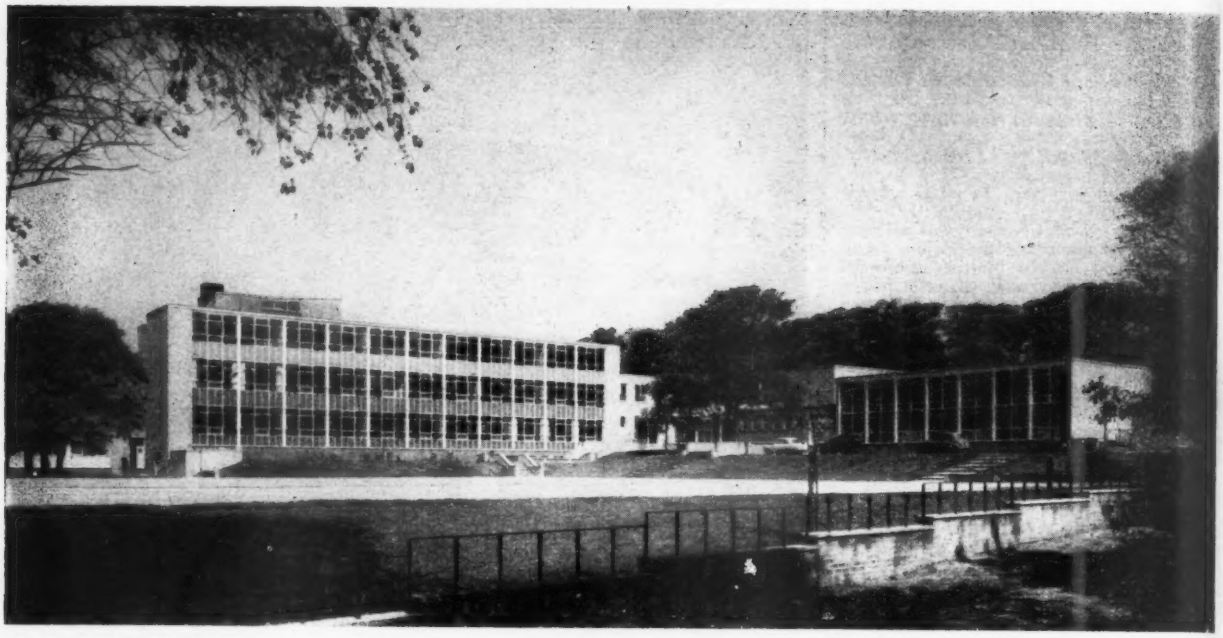


Ground floor plan.



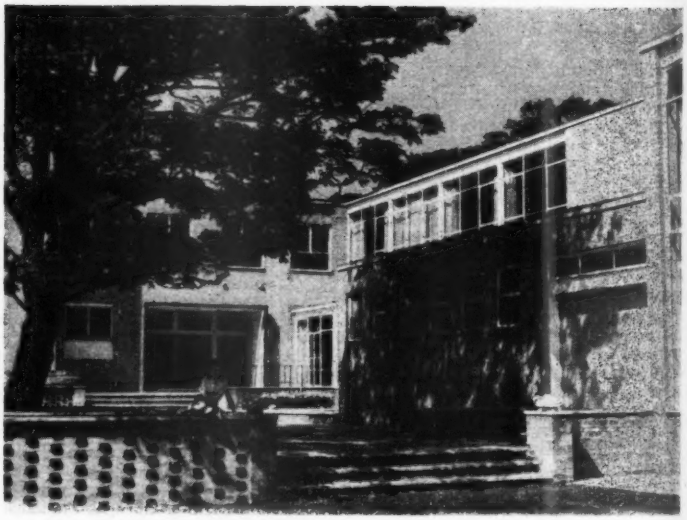
Standard classroom from the teaching area, arranged for about 60 children. Floor area about 700 sq. ft., or 12-18 sq. ft. per pupil, roughly the same as the minimum accepted in this country (480 sq. ft. for 30 children).

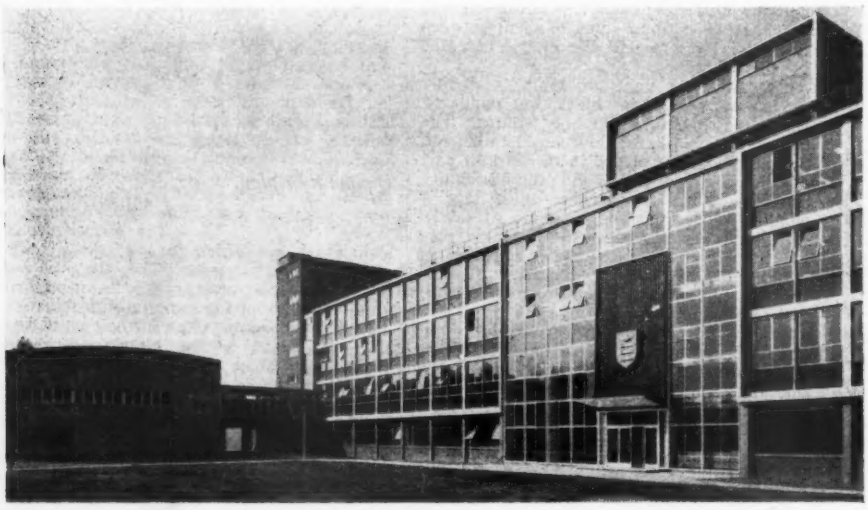
BUILDINGS IN THE NEWS



Secondary school in Liverpool.

Above, a view from the south of New Heys High School for girls in Allerton Road, Liverpool, designed by Herbert Thearle (assistant architect, K. W. Paterson, assistant, E. C. Power), in collaboration with Dr. Ronald Bradbury, City Architect and Director of Housing. Quantity surveyor J. Youdan Briggs. On the left is the three-storey classroom and laboratory block, centre, the assembly hall and dining room, which are divided by sliding folding doors, and right, the gymnasium. Right, the main entrance and west facade of the assembly hall and gymnasium wing. Patterned brickwork has been used externally and wall tiling and plywood panelling internally. Contract price: £159,000. General Contractors: J. Jones & Sons (Woolton) Ltd.



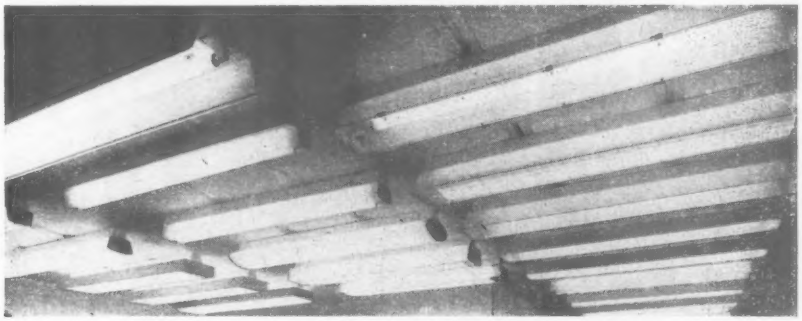


Technical college at Acton

The first phase in the building of the Brunel College of Technology at Acton was opened recently by the Minister of Education. The accommodation includes laboratories and lecture rooms for advanced courses in chemistry, metallurgy, biology, mathematics, physics and management, and equipment for specialist courses in nuclear physics and engineering. It was designed by the architect's department of Middlesex County Council, county architect, C. G. Stillman.

THE INDUSTRY

Brian Grant describes two new refrigerators, a gas fire and new fluorescent light fittings.



The GEC "101" range of fluorescent light fittings.

New refrigerators

Electrolux have recently announced two new models, one of 3¾ cu. ft. at £74 11s. (model L.37) and the other of 7·6 cu. ft. at £153 6s. (model L.76) (see illustration): both prices including purchase tax. Model L.37 costs only £11 11s. more than the 2·4 cu. ft. model and seems better value for money, although, of course, small refrigerators are always relatively more expensive than the larger ones. This model has a storage compartment for up to seven average size frozen food packets, and the shelves in the door are adjustable to take different sizes of bottle. The larger model is on much the same lines, with storage for 16 frozen food packets as well as five ice-cube trays.

As usual with Electrolux, all the models in the range can be operated by electricity or mains gas, and most of them can also be arranged for use with bottled gas, at an increased price, or by paraffin, which is cheaper (about £30 less on the large model) though, of course, it lacks the advantage of thermostatic control. At a recent Press demonstration where the new models were announced, I noticed that the whole range (bar L.76) had plastic door pulls, which seemed a bad idea, as I assumed they would be hard and brittle and liable to snap off. Invited to tear one of the handles off, I found them to be comparatively flexible nylon mouldings, and I could lift the whole of the front of the L.37 model without the handle bending very much, so, presumably, the handles are perfectly all right in use. (*Electrolux Ltd.*, 155, *Regent Street, London, W.*1.)

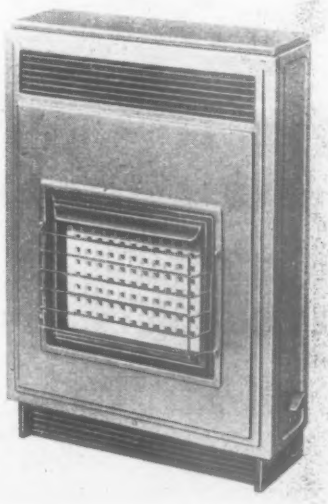
New gas fire

The illustration on the right shows Bratt Colbran's new Kingsbury fire, which has been designed to emit radiant and convected heat in approximately equal proportions. This has been achieved by using a new type of one-piece radiant, behind which is a large two-stage heat exchanger to provide the warmed air which emerges through the louvres at the top of the fire. When the gas tap is turned on the burners are automatically lighted by a built-in battery-operated Newbridge gas pistol. Gas consumption is 32 cu. ft. an hour, and this works out at about 4d. with gas at 2s. per therm: the manufacturers suggest that this should be cheaper than a solid fuel fire, particularly as the gas can be turned down when the room is warmed up. (*Bratt Colbran Ltd., Lancelot Road, Wembley, Middlesex.*)

Lighting fittings

A new range of fluorescent fittings known as the "101" has just been introduced by the GEC. A variety of fittings for industrial, commercial and decorative use is provided, all based on a rigid channel section to which complete assemblies are attached. The channels can be fixed direct to the ceiling, suspended, or used with a special under-access trunking system in large installations. Reflectors in stove or vitreous enamel are produced as well as Perspex, louvred or glass diffusers of several different types, in lengths of 4, 5 and, for some types, 8 ft. The assembly of all the fittings is quite simple and maintenance costs should be kept low. (*The General Electric Co. Ltd., Magnet House, Kingsway, London, W.C.*2.)

Below left, the Electrolux model L.76 refrigerator, below right, the Bratt Colbran Kingsbury fire.



New research building Longbenton, for Thomas Hedley & Co. Ltd. Newcastle-upon-Tyne

Architect: Derek R. L. Wallace, M.B.E., D.F.C., M.Inst.R.A., F. Boreham, Son & Wallace, Registered Architects, 4a, Bloomsbury Square, LONDON, W.C.1.

General Contractors: John Laing & Son Ltd.

Consulting Engineers: Bylander & Waddell, 26 Old Burlington Street, LONDON, W.1.

'PUDLO' Brand cement waterproofer was specified in the retaining walls and floor of the Boiler Room in the new Research Building at Longbenton, for Messrs. Thomas Hedley & Co., Limited, of Newcastle-upon-Tyne, the famous makers of the well-known products Tide, Daz, Fairy Soap, Gleem, etc. The composition of waterproofed cement was as follows:– Vibrated Reinforced Concrete composed of 1 cwt. cement to 2½ cubic feet of fine aggregate and 5 cubic feet of coarse aggregate, maximum nominal size ¾". 'PUDLO' Brand waterproofer was included at the rate of 5 lbs. to 1 cwt. of cement.

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technical section

9 CONSTRUCTION: DETAILS
the glass curtain wall, 4

In his first three articles* our author, Thomas A. Markus, treated the functional performance of the glass curtain wall and considered in turn how efficient it can be as a filter for heat, light and sound and as a barrier against the spread of fire. In this concluding article he considers the problems which stem from the realising of the glass curtain. Taking first the problem of erection, he points out that the first cost of a wall depends to a large extent on its being fixable from the inside and that this is too often made impossible by the back-up wall requirement. After discussing cleaning, maintenance, and protection against falling glass he describes current methods of avoiding damage by condensation and then passes to the all-important problem of the joint. Here, after describing the latest developments in mastics and in the use of open joints of the patent glazing type, he gives his opinion that the future lies chiefly with extrusions of the kind used increasingly for buildings in America and long used for transport everywhere. He concludes his series of articles by noting a number of developments which are on foot and which, if properly exploited, might make the glass curtain at once cheaper and a better " architectural filter " than it now is; among these being a technique for " printing " louvres in the thickness of the glass and the possibility of incorporating tubes behind opaque panels for the collection of solar energy.

Erection, cleaning, maintenance and safety

It is now a commonplace to insist on the desirability of a curtain wall in which the window glass and infilling panels at least, if not the curtain wall framing, can be fixed from inside to avoid the necessity for scaffolding and cradles. Several types of window are available in which this is possible and the advantage of using them is borne out by the fact that glazing contractors may increase labour charges by 50 to 75 per cent. for glazing at heights from cradles or ladders. For the opaque portions difficulties are caused by the floor thickness or edge beam or by the necessity for a solid back-up wall—the latter can, however, be erected after the external panel has been fixed, but still makes internal maintenance or replacement at a later date impossible. In schools, where the fire resistance regulations are less severe, various removable internal panels have been used.

The external skin glass texture should be chosen

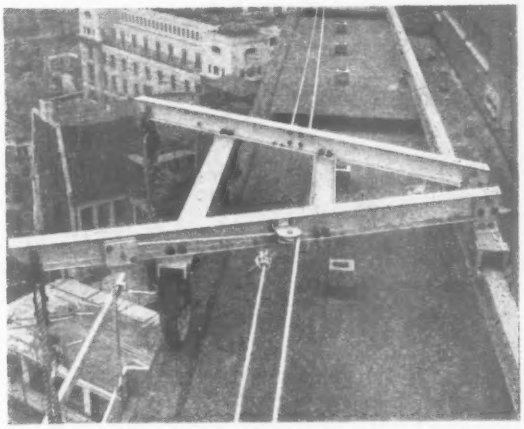
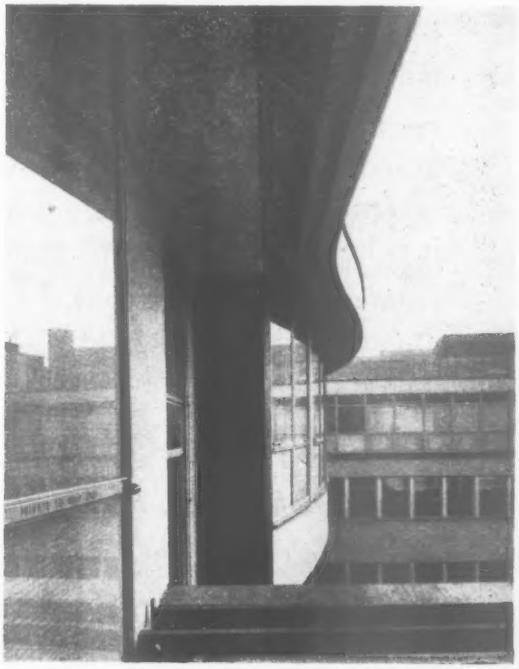


Fig. 1, two versions of a travelling cradle gantry. Above, with a pair of moving davits running on a rail, set back at some distance from the roof edge. Below, an under-eave gantry on the TUC Memorial Building (David Aberdeen and Partners, architects).



* Previous articles in this series appeared on November 7, November 21 and December 12, 1957

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For Cleaning, the side-arm can be released by a responsible person, when the casement will turn inside out, where it is held fast by an automatic catch.

Finish: hot-dip galvanized, despatched unpainted.

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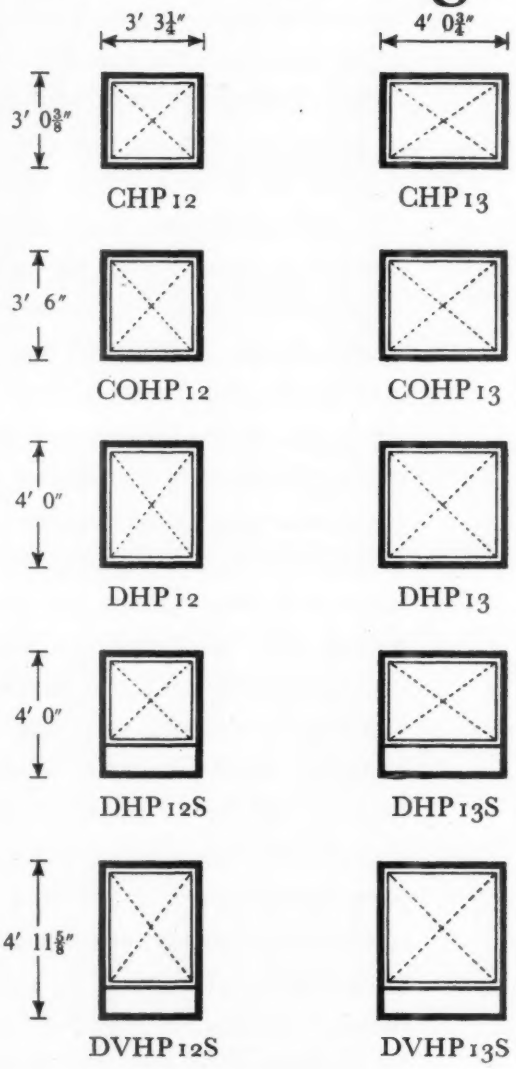

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technical section

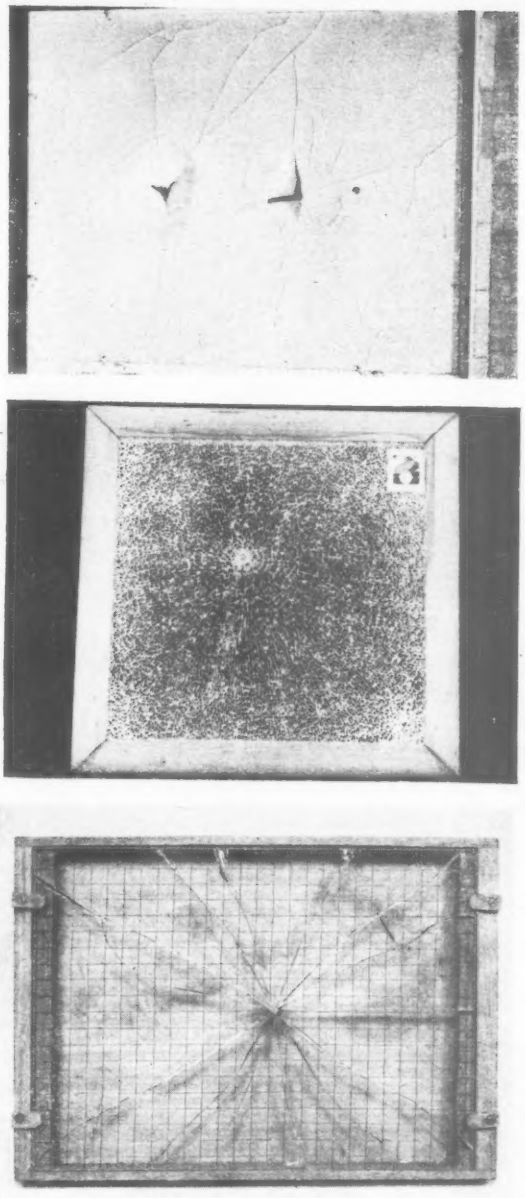


Fig. 2, photographs showing impact breaks of three different reinforced glass surfaces. Top, ¼-in. rough cast glass with layer of material glued to the back. Centre, Armourplate glass. Note characteristic "small dice" fragments with harmless edges. Above, wired glass.

according to the degree of cleaning and maintenance that has been designed for. In a building such as Lever House, where cleaning is more or less continuously going on, a smooth glass (sheet or plate) looks extremely sophisticated. This has been called the "motor car" approach to cladding—the recognition of the clad building as an industrial product, where weathering has no place, which needs first-class maintenance to retain its polished appearance. This implies efficiently designed overhead rails, cradles and hoists, and a running cost item which has to be added to the capital cost of the structure as part of the price to be paid for this type of architecture. (See Fig. 1.)

Where cleaning is to be done less frequently the texture of the glass should be such that it retains as little dirt as possible, and all its surfaces will be rain washed, yet sufficiently pronounced to hide a good deal of dirt deposition. Cast, Cathedral and Pinhead Morocco seem to be suitable for this. Glasses with more pronounced directional patterns are likely to become streaky.

For the solution of these cleaning problems, both in the mechanics employed, the type of detergents and cleaners, and the best use of labour, the building industry has a considerable amount to learn from the shipbuilding and transport industries where these are traditional problems. Fully automatic cleaning devices, moving vertically between the mullions are available and have been used in Skidmore, Owings and Merrill's new Heinz food research building. Any such device, whether automatic or not, if it rests against the mullions or panels may easily cause damage. In one New York building the weight of the cradle guided on the mullions squeezed out the mastic.

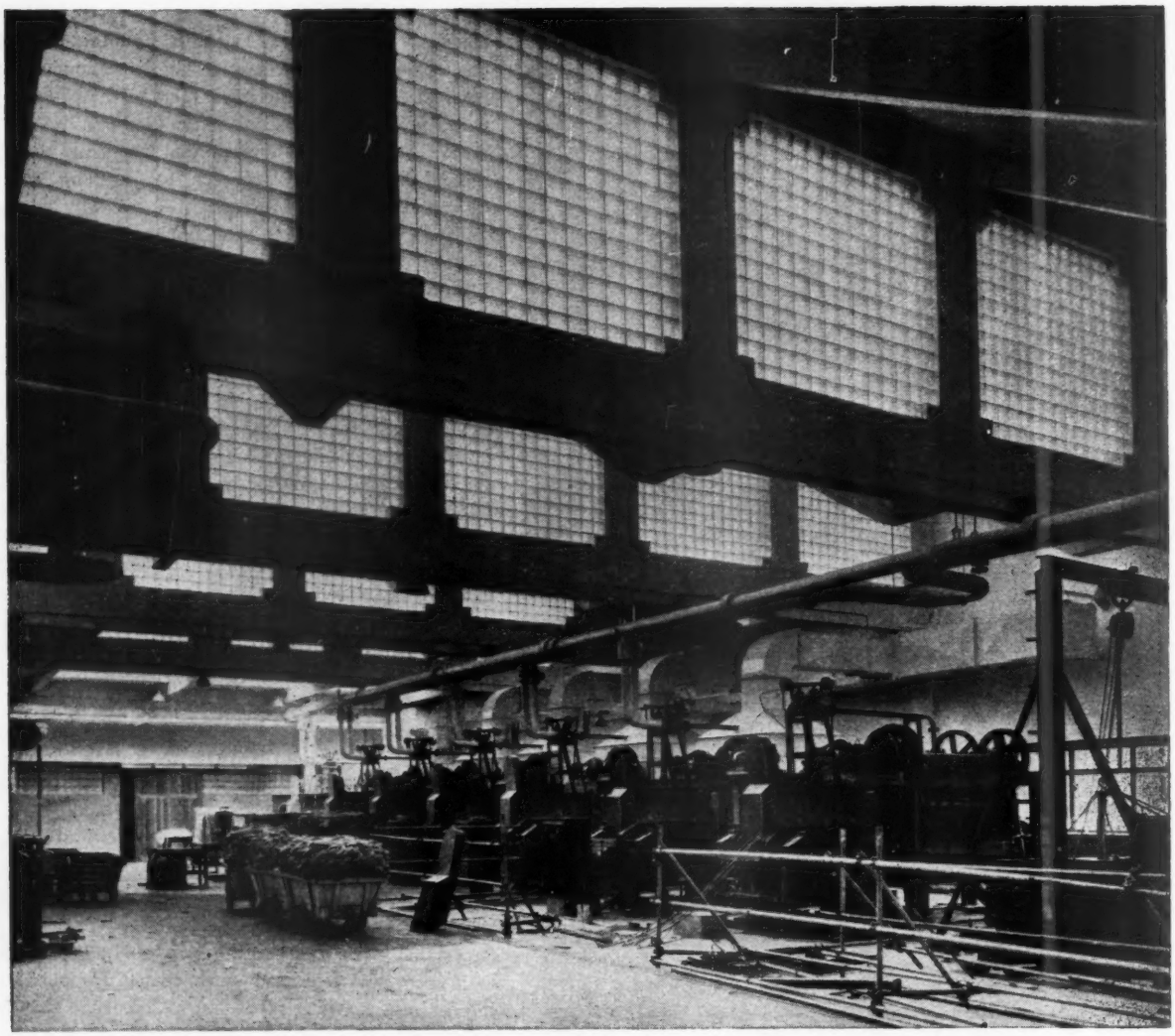
The usefulness of long arm hinged and pivoted windows must be questioned; it is often still necessary to stand on internal or external window sills and even from this position 2 ft. 6 in. seems to be the maximum reach for effective cleaning and, of course, these windows still do not solve the problem of the intermediate spandrel panel although this may require less frequent cleaning.

Occasionally designers are anxious about the danger of broken glass from a damaged panel dropping and causing injury. The risk of impact breakage may be serious in such places as a wall facing a school playground. (See Fig. 2.) Several solutions are possible.

1. The backing of an opaque glass with a cheap cotton net or hessian, fixed by a water- and heat-resistant adhesive. It is important that the adhesive should remain somewhat elastic, so as not to embrittle the net to such an extent that it breaks along the glass cracks.
2. Use of toughened glass, such as "Armourclad" which has much greater strength, and if it is broken breaks into the characteristic "dices"—harmless cubes with no sharp edges.
3. The use of a translucent wired glass separated by a cavity from the back-up wall. As explained in the second article in this series, the use of wired glass requires special precautions.
4. The use of certain "Plyglass" and "Vitroslab" panels in which the glass fibre interlayer is fixed to the back of the outer pane of glass.

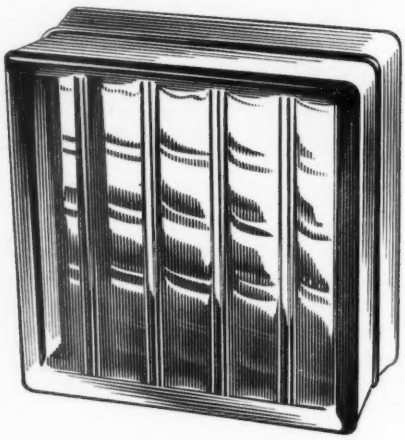
Condensation

The amount of water vapour in the air (partial vapour pressure) is normally higher inside a building than outside. The difference may be marked in a heated building during cold weather. The internal vapour will condense on contact with a cold surface which has



THERE IS NO LIMIT . . . to the applications of Pilkington's "Insulight" Hollow Glass Blocks. Here, the Glass Blocks are providing thermal insulation with consequent absence of condensation, in addition to an even distribution of natural light. They are shown fixed in the North Lights of the mercerising room of J. & P. Coats Ltd., Paisley.

Wherever "Insulight" Hollow Glass Blocks are used they give substantial benefits—bringing light into the interior while providing effective heat and sound insulation. They also add to the appearance of a building.



'INSULIGHT' HOLLOW GLASS BLOCKS

For further information on the use of glass in building, consult the Technical Sales and Service Department at St. Helens, Lancs. Telephone: St. Helens 4001; or Selwyn House, Cleveland Row, St. James's, London, S.W.1. Telephone: Whitehall 5672-6. Supplies are available through the usual trade channels.

PILKINGTON BROTHERS LIMITED, ST. HELENS, LANCS.

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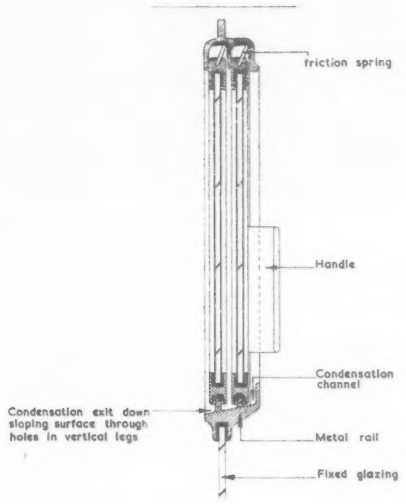


Fig. 3, section through typical coach sliding window showing condensation channel and tubes.

a temperature equal to or lower than the dewpoint temperature of the vapour.

Condensation on windows is not only annoying in that it stops clear vision, but is damaging to paint, metal and wood unless means for its collection and escape are provided. It is surprising that in spite of the general practice of providing condensation grooves or channels and weep holes or tubes in railway carriages and transport windows there are still few metal or wood windows in buildings which cater for this (Fig. 3). Where clear vision is important the cost of double glazing may be justified (apart from the insulation economics). A hermetically sealed unit will contain dry air so that internal condensation will also form only under extreme conditions—even then, the quantity of vapour being small and having to be distributed over a large area, it may not be visible.

Condensation in the thickness of the cladding panel may occur if the vapour which tends to travel from inside out meets the cold impermeable inside surface of the outer glass skin. To prevent damage to insulation, discoloration, corrosion, breaking down of adhesive joints and damage to non-permanent colour surfaces four main precautions are possible (see Fig. 4):

(*i*) Provide a ventilated cavity immediately behind the outer impervious skin, to reduce partial vapour pressure and prevent condensation.

(*ii*) Allow the condensed moisture to escape by means of channels, weep holes or tubes—these will also assist in transferring vapour from the cavity to the outside.

(*iii*) Provide an impervious vapour barrier as near as possible to the warm side of the panel, and vapour-proof seals to the edges of the sandwich. Unless this is absolutely effective, (*i*) or (*ii*) should be provided.

(*iv*) Use an insulating material for the outer impermeable skin—*e.g.*, a sealed glass unit with an air space.

In making these provisions two points should be noted. First, any ventilation or weep openings must be designed so that wind-driven rain travelling up the façade will not cause damage. B.R.S. have suggested that a vertical upstand at least 2 in. high should be inserted behind the weep hole. Second, in tropical humid climates, where air conditioning is used, vapour will tend to travel from the outside inwards, and the problem is reversed. The internal panel, say plasterboard, may be the cold surface on which the vapour condenses.

Several glass-fronted sandwich panels incorporate a colouring layer behind an outer glass in a hermetically sealed cavity. If this seal, which usually relies on a mastic or adhesive, breaks down, the moisture will enter the panel and this has resulted in discoloration. For such products it is essential to avoid contact between the edge seal and any internal condensation as well as to protect it from external moisture.

The joint

It has become a truism that a curtain wall stands or falls on the merits of its joints. Their function is complex and many experimental techniques are being used which attempt to solve all the problems; a brief analysis of these problems will help in making the right choice. The curtain wall frame is not specifically included in the discussion.

(*i*) The joint between panel and frame must be and remain resistant to the entry of water, or it must allow water both to enter and to escape. For some types of sandwich panel, where breakdown of the edge seal will result in discoloration from moisture, very high performance is required in this respect. The joint must cater for the large quantities of water flowing down the face of any imperviously clad building, or for wind-driven water flowing upwards.

(*ii*) In the joint several different materials will meet, and they must be allowed to move in relationship to each other due to thermal, moisture and mechanical causes, without breakdown of the weatherseal or mechanical stress on each other.

(*iii*) The joint must have sufficient mechanical rigidity to retain the panel safely under high wind loads.

(*iv*) The jointing materials may be required to withstand the action of fire for a limited period.

(*v*) A standard jointing system should cater for production tolerances in the components used and for irregularities in the frames (sag, twist, out-of-squareness).

(*vi*) The joint should be simple to assemble or form on site, if possible without the use of specialists; it should be free of maintenance or easy to maintain; it should be easy to dismantle for the replacement or repair of panels.

In glass curtain walls three methods have so far been used:

"Wet" jointing by means of mastics and caulking compounds.

"Dry" jointing as in patent glazing.

"Dry" jointing by means of extrusions and gaskets.

(*a*) MASTICS: Most of the current curtain walling techniques, using both opaque glass and other infill panels, rely on mastics to make a weather seal. Whilst

technical section

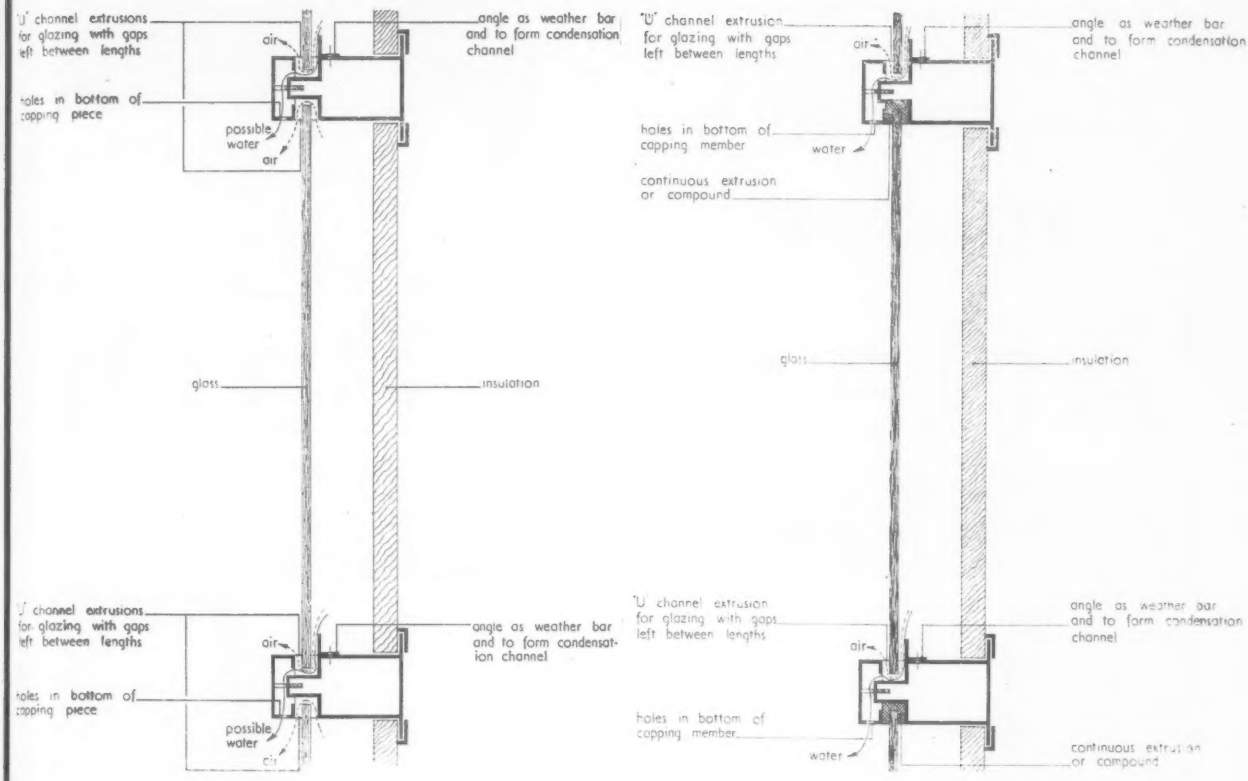
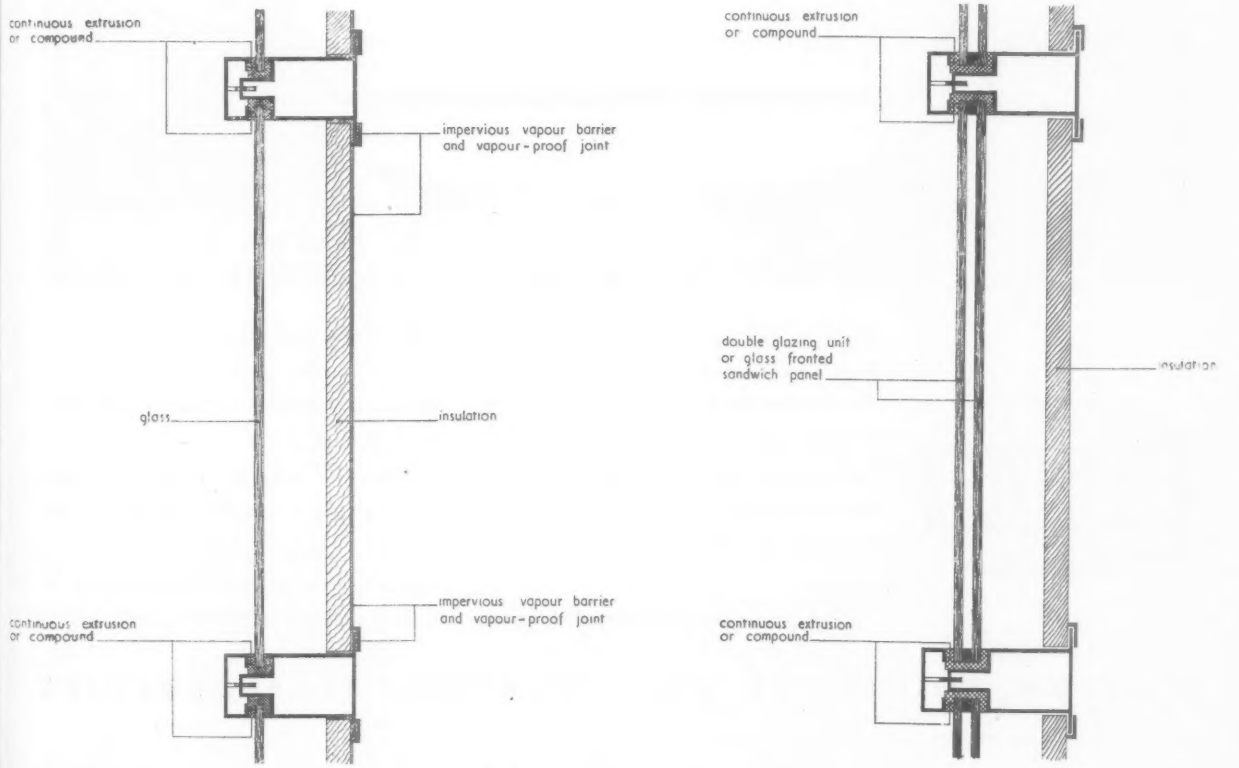


Fig. 4, four methods of preventing 'damage' to cladding panels by condensation. Above left, by allowing top and bottom ventilation. Above right, by providing drainage at the foot of the panel. Below left, by adding an impervious vapour barrier (with vapour-proof joint) on the warm side. Below right, by using an insulated outer skin.



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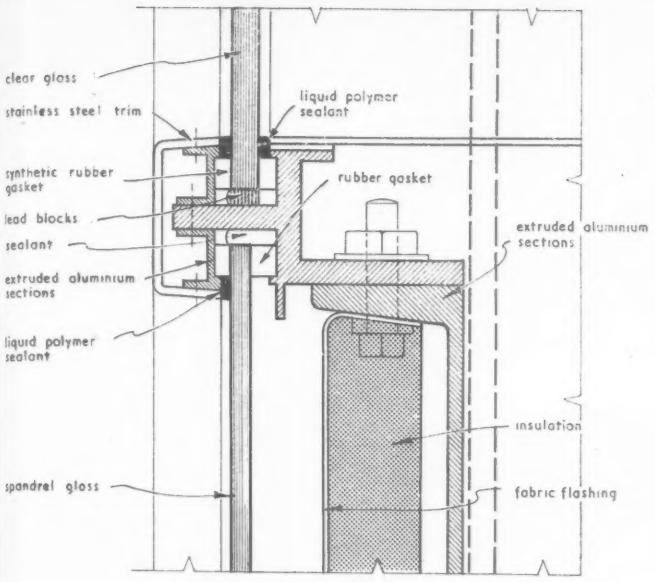


Fig. 5, typical American detail, showing the use of "Thiokol" ("liquid polymer") sealant in conjunction with a synthetic rubber gasket.

great steps forward have been made in recent years in the formulation of non-hardening compounds, this field is still probably the least satisfactory one for the architect in the whole curtain walling industry. First, there is no British Standard for these mastics, to define either composition or performance, although preliminary discussions towards bringing out such a standard have begun. Second, methods of test are difficult; few reliable weathering tests exist and outdoor exposure tests may take years. Third, the most reliable tests, and the past history of these materials, suggest that their life has to be measured in terms of 10-15 years. The somewhat pessimistic view taken of these materials in BRS Digests 98 and 99 therefore seems justified.

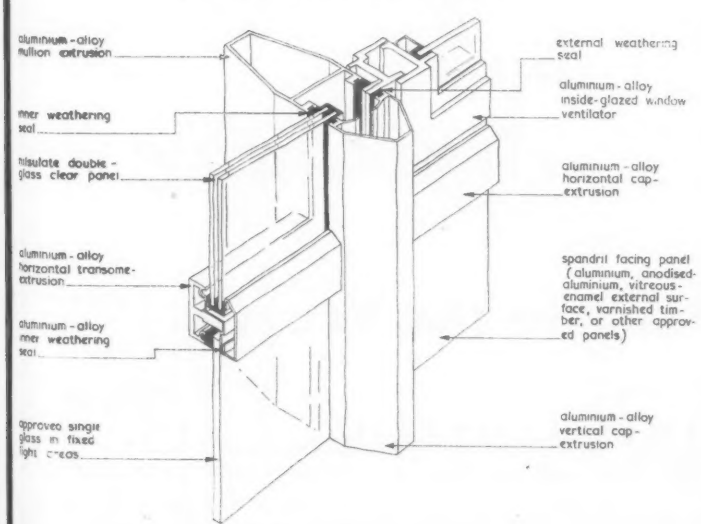
The mastic, which is generally unprotected by paint, must retain a watertight seal in spite of various hazards. These are tabulated below, with appropriate required properties.

Problems or hazards	*Required properties*
Water—in large quantities on a tall, impermeable facade.	Resistance to water erosion and absorption.
Heat—perhaps up to 85° C.	Resistance to hardening, shrinkage, cracking, separation of constituents, oxidation, polymerisation and slumping. Formation of surface skin permissible.
Shear—caused by differential thermal movement at joint.	Retention of elasticity under repeated stretching and compressing. Resistance to shear, both in body and at surfaces adhering to adjacent materials.
Mechanical load—due to wind load on panels.	Sufficient rigidity not be displaced or squeezed out.
Ageing—light, ultra violet, ozone atmospheric attack, sea spray.	Resistance to ageing caused by all these, without hardening, cracking or decomposition.
Painting—	Where this is to be done, the mastic must not discolour the paint.
Storage—	Reasonably long "pot" life, without separation or sedimentation.
Application—	Different balance between softness—for ease of working, and stiffness—for ease of handling, required for gun and hand applied mastics. Must be maintained during winter and summer temperatures.
Maintenance—	Should repair or replacement be necessary, the defective mastic must be easily removable and replacement limited to a small quantity at weathering surface of joint only.

It may be impossible to find any one compound which performs well in all these respects. Many manufacturers are therefore proposing details in which one compound, with the narrowest possible exposed surface area, is used only for weathering and is the first line of defence. Behind this, and not exposed to the weather, may be another compound, or rubber or plastic extrusion, which is both a cushion between the frame and panel and also acts as a second line of defence against water penetration (Fig. 5).

Such an approach also makes possible the use of the new synthetic compounds which are too expensive to be used in large quantities. The best known of these materials, the polysulphide ("Thiokol") compounds have become widely known in the USA and are now available in this country. One early well-known example is Frank Lloyd Wright's Johnson Wax Building, where the Pyrex tubes are now sealed with this material. It is normally supplied in two parts—a base polymer and an accelerator—which are mixed on site; it is usable for about 6 hours subsequently. The resulting material is flexible and rubbery with a shining surface; it has excellent adhesion to glass, metal and wood, and seems to age well. Other synthetic compounds, such as those based on neoprene and butyl rubber, also hold excellent promise.

Fig. 6, detail of Hills patent glazing.



(*b*) VERTICAL PATENT GLAZING: This technique, whilst highly developed here, is little known in the USA. Its success lies in the absence of "wet" site labour or perishable jointing compounds. Since the direct metal to glass seal is never waterproof, the water is admitted through the joint and channelled

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technical section

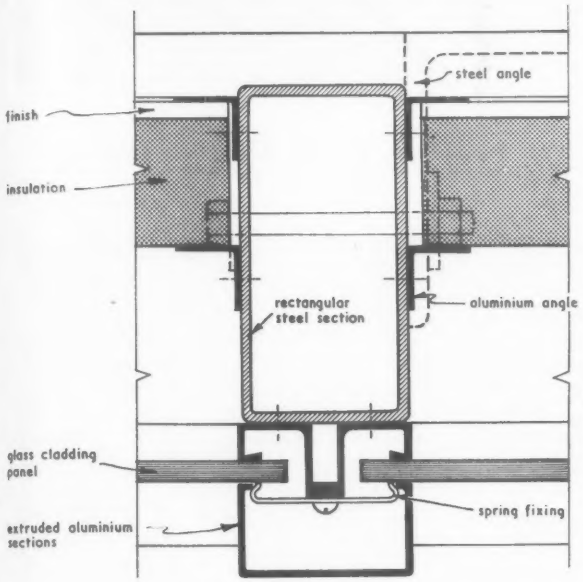
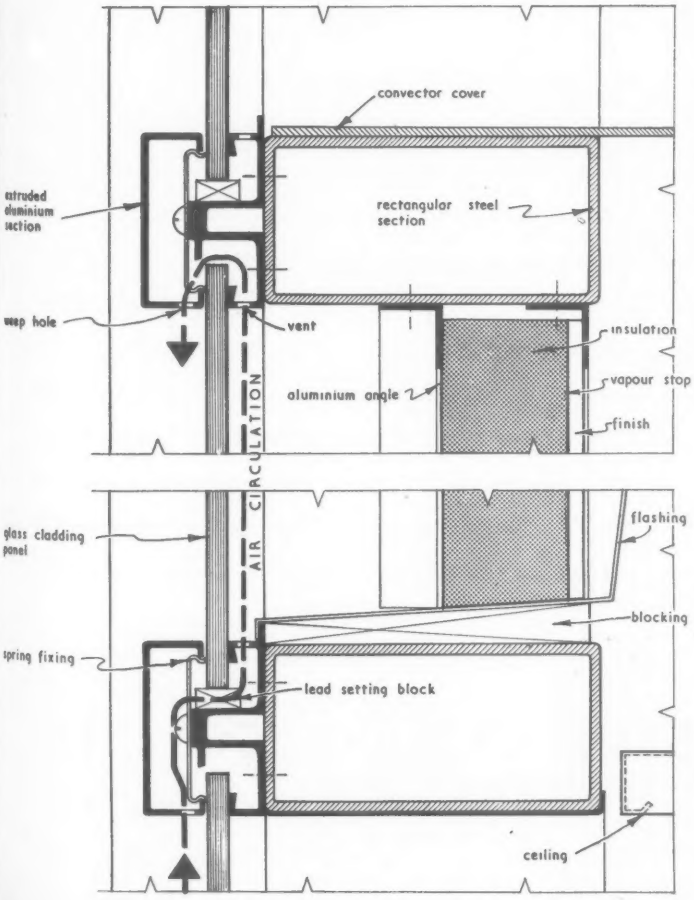


Fig. 7, sections through (above) mullion and (below) transoms of a recent American curtain wall system which makes no use of mastic or extrusions. Note the cover moulds which are "clipped" over spring fixings.



out again by the glazing bars and special flashings. Hills' curtain walling relies on an adaptation of this system, but the sprung capping strip exerts pressure against the glass by means of an extrusion which forms a weather seal. Should, however, any water penetrate, it is still conducted away by the shaped glazing bars. (See Fig. 6.)

A recent American system, using entirely "dry" glazing, without mastics or extrusions, has been developed. By means of weep and vent holes it caters for both condensation control and reduction of heat build-up in the cavity. (See Fig. 7.)

Open joints, especially for the bottom edge, have been used as glass claddings; they are really based on the patent glazing idea. For instance, in Handisyde and Taylor's Chiswell Street offices, the water has access into the cavity behind the glass, but cannot do damage because of the weathering and condensation flashing. (See Fig. 8.)

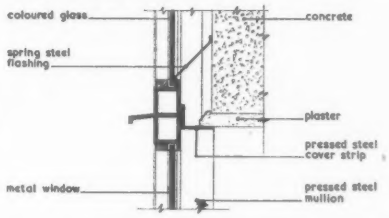
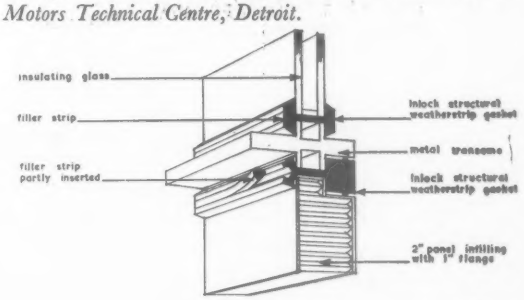


Fig. 8, glazing detail from offices in Chiswell Street (Architects, Handisyde & Taylor) in which flashing directs condensation outwards through gap at foot of glazing.

(*c*) EXTRUSIONS: Many of the jointing problems today troubling the building industry have been solved years ago in ships, railway coaches, buses, aircraft and cars by means of rubber and plastic extrusions. There has been some doubt in connection with the ageing properties of these, especially natural rubber, for the long life required in a building. However, the new synthetic rubbers and plastics, such as neoprene, p.v.c. and the butyl rubbers, seem to offer much better resistance although they are more costly.

The first large-scale use of car-type extrusions in a building was in Saarinen's General Motors Technical Centre, Detroit. These extrusions are now manufactured for building glazing and cladding by the Inland Division of G.M. They rely on pressure exerted by a bead "zipped" into a groove by special tools. (See Fig. 9.) Although radiused corners are normal in

Fig. 9, "zip-in" extrusion as used in Saarinen's General Motors Technical Centre, Detroit.



E

technical section

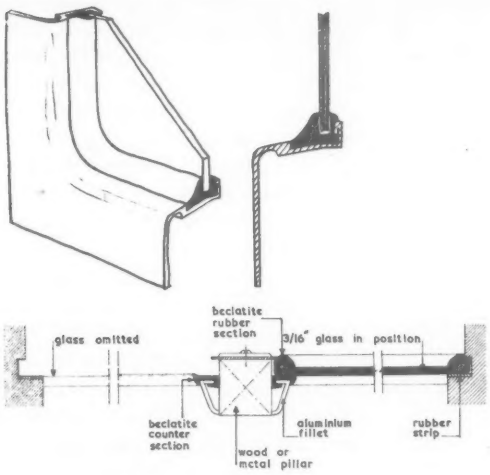
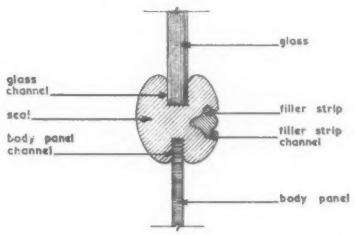


Fig. 10, three examples of British glazing extrusions. In the two examples above, the joint is closed by pressure against surrounding metal or glass; in the example below, the tight joint is formed by pressing a small "filler strip" into a preformed channel in a larger extrusion.



transport glazing, for right-angle panels a special moulded corner piece is produced, to avoid the leakage risk of mitred corners.

Several British extrusion glazing systems of a similar kind are available, but few have so far been used for buildings. Three types are shown in Fig. 10.

The possibilities of this type of extrusion, not only as a fixing method but also as a means of providing a vapour-proof edge to compound panels at the same time, are worth investigating. Another American extrusion, a simple "U" depends on pressure from the metal head, for weathertightness. (See Fig. 11.)

The future

If glass curtain walling continues to develop at the present rate, it will gradually be technically and architecturally refined so that it will be even more strictly a "skin"—capable of many specialized functions. Some recent technical developments both within and outside the industry, which seem to point in this direction are outlined below. Most are either experimental or limited to expensive optical or precision work at present—cost has rarely, however, been a final barrier where certain functions can only be performed by one material.

Before considering developments which are still at the experimental stage it might be as well to say something about those which are already within our grasp.

Reducing cost

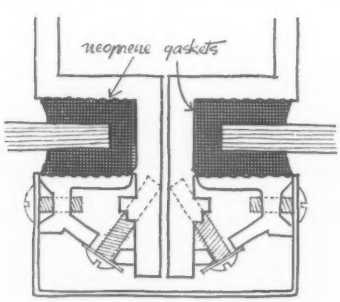
Everyone is agreed that curtain walling is more expensive than it ought to be. One way of cheapening it would be to agree on a measure of modular co-ordination. After all, curtain walling is just the kind of product which ought to lend itself to this. Recently an informal committee was set up by the main manufacturers of glass cladding panels under the ægis of BRS, with the object of proposing a limited range of standard size panels. They found, however, that though the large majority of curtain walls are designed on one of a few horizontal and vertical grid dimensions, it would be of no avail to standardize the panels until there was agreement between the framing manufacturers on the dimensions of the members which lie on the grid lines.

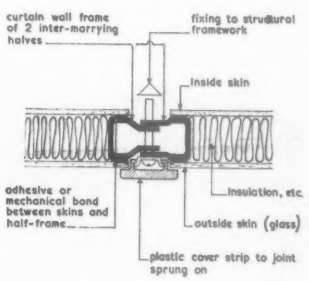
An alternative method of cutting cost which is being developed by some manufacturers involves incorporation of the framing within the panels. (See Fig. 12.) The panels would then be fixed direct to the structure and one whole stage in the erection of a curtain wall would be eliminated.

Incorporation of advertising

One adaptation of the glass cladding which is already feasible and is only waiting for the architect to exploit it, is the incorporation of lettering or designs (whether illuminated or not) behind the glass skin. Patterns could be permanently part of the glass as in the

Fig. 11 (below and below centre), detail of American fixing used at Idlewild Airport. The neoprene gaskets are fitted round the panels, the panels are moved into place, and pressure is provided by screwing inclined screws and thus tightening glazing beads. Fig. 12 (below right), a possible method for eliminating curtain wall framing.





technical section

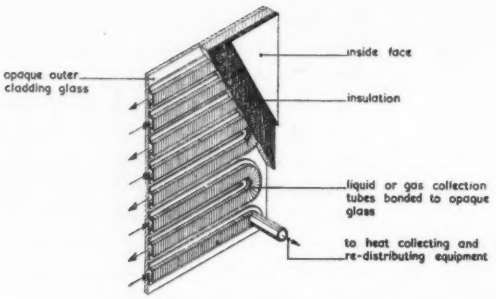
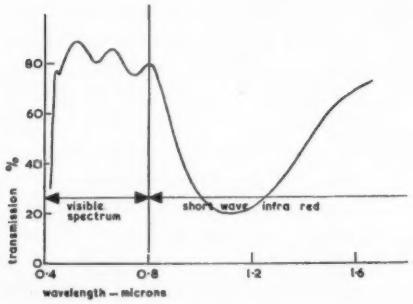


Fig. 13 (above), suggested construction of a glass solar-energy-collecting cladding panel. Fig. 14 (below), graph illustrating the energy transmission of a glass with selective spectral reflection. Note the high transmission in visible spectrum and low transmission of short wave infra-red energy (i.e., of heat).



painted and fire-toughened work of multi-colour "Armourclad" or by the use of overlapping and cut-out glass fibre screens in "Plyglass" panels; or they could be temporary and formed by the use of cut-outs and screens behind clear glass. This would have a double advantage in that the advertising would be better protected from the weather than the applied advertising which is now customary and would be brought more within the control of the designer of the building.

Heat and light

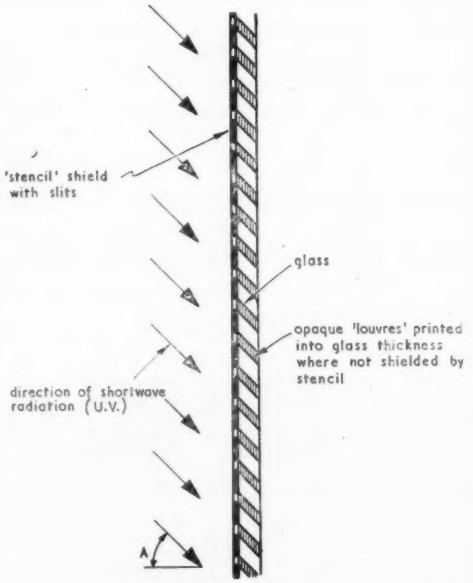
Of greater importance in the long run are developments which aim at improving the efficiency of glass as a filter for heat and light. Thus we may reasonably hope that it is only a matter of time before we find some means of drawing off the solar energy absorbed by the opaque panels and of using it for heating. The technical problem of incorporating a piping system within the glass or bonded to it (see Fig. 13) is difficult, but surely not insuperable.

Apart from this there are a number of technical developments in glass manufacture which should considerably affect its scope. One of these is a new *heat absorbing grey glass* which is now commercially available in America. As was explained in the first article in this series (AJ, November 7, 1956), heat absorbing glasses are normally blue-green and glare reducing glasses grey. This new product is claimed to do the job of both while having the less troublesome grey tint. The same firm is working on a *variable transmission* glass whose transmission of heat and light will be automatically adjusted according to the energy falling upon it. It is understood that the principle involves the use of a liquid sealed between the panes of glass with colour properties which are sensitive to light changes. The advantage of such a glass is that at times of extreme brightness or strong heat radiation from the sun, transmission would be reduced, and on duller days, when solar heat energy is wanted, transmission would be increased.

Heat resistant glasses resist heat by absorbing it: a more effective method would be to reflect it. A new technique is being evolved of "sputtering" interference layers of semi-transparent deposits into glass to give a *selective spectral reflection.* By this means it is possible to make a glass product which will be highly transparent to visible energy without coloration, but highly reflective of short-wave infra-red energy, *i.e.* heat without light (see graph in Fig. 14).

Lastly must be mentioned a method of forming *louvres within the thickness of the glass.* By including certain metallic compounds in a glass composition, the finished glass can be made sensitive to short-wave radiation (usually ultra violet). If irradiated, and subsequently re-heated, permanent colouration takes place in the body of the glass. A wide variety of colours, and also white opaque (opal) glass, can be thus produced. By shielding certain portions from the radiation, the image of the stencil can be permanently "printed" into the glass. An American company has already produced a glass with opal louvres or honeycombs photographed into its thickness and this seems to open up a field for a glass which incorporates its own sun-shading or *brise soleil.* By altering the slots in the stencil and the angle of radiation, a variety of louvres for different climates and orientations could be produced (Fig. 15).

Fig. 15, diagram showing formation of "louvres" in thickness of glass by short wave radiation.



CRITICISM

by J. M. Richards

OFFICES for BRITISH RAILWAYS
at CAMBRIDGE
designed in the ARCHITECTS' DEPT.,
EASTERN REGION, BRITISH RAILWAYS

The quality of the architecture produced in the offices that serve our nationalized undertakings is extremely important to the future of British architecture generally. For this reason the office building near the station at Cambridge designed by the architects of British Railways (Eastern Region) and illustrated on pages 153-160 of this issue, is an encouraging phenomenon.

It is not only lively and well thought out as a design (and thus a refreshing contrast to the dreary buildings for which so many official and semi-official departments are responsible) but it faces up to some of the technical problems that are in the more alert architects' minds at the moment. For example, it was built under a negotiated contract, which has the advantage of allowing the architects to design from the start for the use of a constructional system in which a particular contractor specializes, and to work out the details in consultation with him on the drawing-board. And the architects have used such an opportunity to experiment (to my mind very successfully) with the use of the intergrid system—the contractor being Gilbert-Ash—for a multi-storey office building. The system has chiefly been used hitherto for schools, and one block of the secondary school at Worthing designed by the Ministry of Education's architects in 1954 is the only instance known to me of its use to a height of more than a couple of storeys. It employs prefabricated, prestressed concrete units and is, therefore, particularly well suited to buildings which invite planning on a standard module.

The Cambridge building is a four-storey office building required in connection with the new policy of decentralizing railway operation—and it was required at very short notice. It is something of a feat of

Corner of the main front, seen from beneath the entrance canopy. It shows the first floor slab, on which the intergrid superstructure stands, supported on concrete columns with the ground floor windows set back behind them.

The railwaymen's institute projecting forward from the main front of the building in the form of a single-storey wing. The picture shows the glazing taken down to floor level and the radiators behind: two points mentioned in this article.

organization (and also, I suppose, a tribute to the intergrid system) that the building was ready for occupation only ten months after handing over the site. The offices are the headquarters for the fairly large area administered from Cambridge. Incorporated in the building is an institute (that is, a club) for the railwaymen working in and around Cambridge station. The site is at the corner of Station Road and Tenison Road, at the far end from the station on an area of ground owned by the railways and occupied by sidings, hutments and old buildings of a miscellaneous kind, which it is to be hoped will gradually be tidied up. The station itself, with its wide arcaded front, is an unusually distinguished building and deserves a better approach than this.

Tenison Road is to be widened, so the new building has been well set back on this, its entrance, frontage and will eventually lose part of the grassed forecourt behind which it stands. The institute, which occupies about two thirds of the ground-floor area and is brought forward as a single-storey projecting wing, is completely separated internally from the offices, having its only entrance at the side of the building. The first thing to be noted about the design is the clear differentiation between the two forms of construction employed; for the prefabricated system begins only on the first floor. The intergrid frame rests on a first-floor concrete slab, itself supported on *in-situ* concrete columns using cylindrical pipes as permanent shuttering. These also serve for vertical drainage. The use of a different system for the ground floor was determined, I believe, by the need for larger uninterrupted floor-areas in the institute than the intergrid system (which has a module of 80 in.) provides, and by uncertainty about the suitability of the system for a four-storey structure. It would be interesting to learn from the architects whether they now have any doubts about going up four storeys or even higher with this system, because by planning the institute a little differently and treating it wholly, instead of partly, as a separate single-storey wing they could in fact, I should think, have given it the necessary floor area while using intergrid for the ground-floor offices as well.

I should add that if this had been done the building would have been much less interesting; the change from the flat facades, with alternating windows and wall panels, of the upper storeys, to the boldly modelled lower floor with its large windows over a brick base, recessed behind freestanding columns (see my first photograph), is what gives the building its character; so in asking this question I am more interested in the architects' experience of intergrid as a system than in criticizing their use of it here, which seems to have been very intelligent. In any case, I imagine there are practical advantages in using it only from the first floor up, such as the fact that there is a dry, level platform to build it on. It is at the point of contact with the ground that prefabricated systems are most difficult to deal with.

I have already made it clear that I think the facade treatment of the building very successful. The windows are hardwood, which gives them substance and definition, avoiding the somewhat meagre effect when metal windows are combined with the slender structural members, and the absence of recession, typical of constructional systems like this. The architects have used two colours of concrete: a light grey for facing the first floor edge-beam, the fascia along the top and the slim vertical members, and a darker grey for the infill panels below the windows. My only, very small, criticism is that the darker grey is not dark enough: that is, that there is not enough difference between the two.

Some critics may feel that the canopy and doorway (shown in the close-up view on page 154) give unnecessary emphasis to the entrance to what is only a smallish office building, but I believe the original plan was for the institute to be reached through the same entrance hall. If the reason for the change was to make it less awkward for railwaymen to use the institute on coming off duty in their working clothes, it still seems odd that there is no physical connection whatever between offices and institute. Does no one from the office building have occasion to enter the institute? If so, they must go out of the building, round the corner and in again.

Both the porch and the single-storey wing of the institute are nicely detailed, with a substantial use of

hardwood that gives a good strong base to the building. I am a little disturbed by the radiators that stand at the foot of each window along the front of this wing (photograph on facing page). I suppose the architects are satisfied of their necessity—the building is heated throughout by convected hot air and there is a large circulating unit only just across the institute floor—but if they are necessary why are they painted silver so that they catch the eye both inside and out? I can understand the temptation to take clear glass right down to the floor, but might not some other treatment of the lower part of the windows have been preferable, apart from screening the radiators, in a room designed for crowds of people, in order to avoid breakable panes of glass at foot-level?

I have mentioned the effective expression that has been given to the fact that the constructional system is different above and below the first-floor slab. At the back of the building (see my third photograph, below), where there is a recessed staircase window in the form of a continuous vertical hardwood screen, the architects have thought it right to preserve the line of this first-floor slab (or, rather, its edge-beam) by continuing its across the face of the recess, and have done the same with the fascia unit at the top. I think this device is justified visually, though purists may condemn it because the span of beam across the window is non-functional.

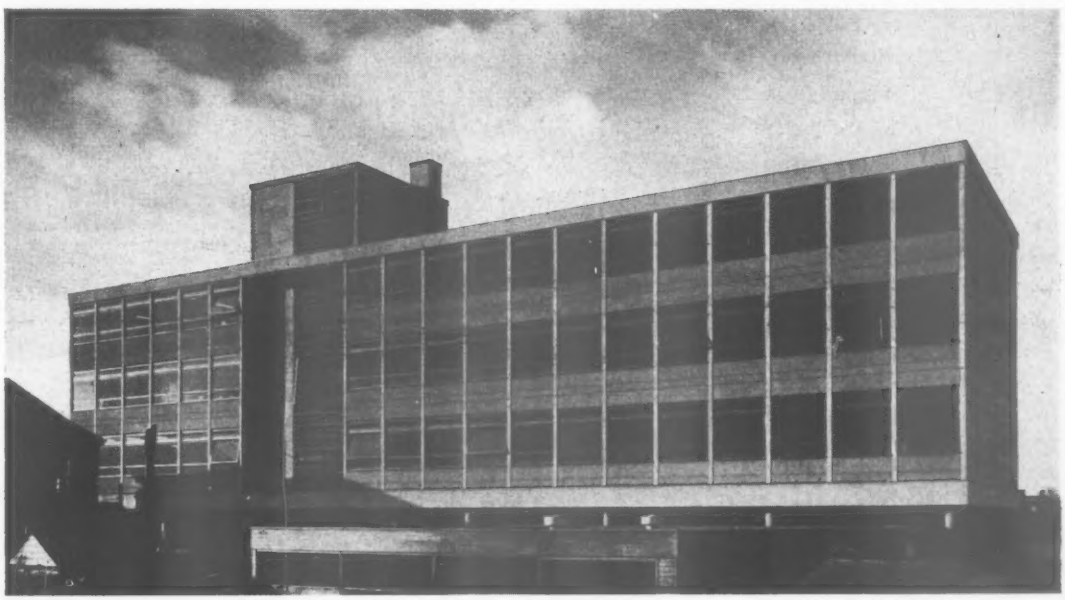
The staircase well, which is of *in-situ* concrete, is continued above roof-level to form a room for tanks and lift-machinery, which is satisfactory enough from this side because the various planes and angles are visibly related to the geometry of the main structure, but the same tank-room is much less happy when seen from the Tenison Road side—see page 153. It appears unrelated to the building, and this has been aggravated by facing it with weather-boarding painted mauve below a trio of windows, with the result that the little structure looks like a contractor's hut, that has been left behind. It continues to surprise me how many excellently designed buildings are marred by the, admittedly difficult, design problems set by roof-structures not being solved.

Inside, the office-building has a straightforward centre-corridor plan with well-lighted, cleanly shaped rooms, designed for full flexibility in use; that is, all partitions, including those along the corridors, are movable. They are timber framed, with glazed or timber panels and have a good appearance and pleasant colour. Their finish is not always as precise as it should be—nor is the joinery in some other parts of the building—which is in some places a matter of design, in some of craftsmanship.

The corridors are handsomely wide and the entrance hall is a particularly agreeable space. The now familiar device of continuing an external brick wall into the building with a sheet of glass butting against it (photograph on page 154) is effectively used here. The detailing is simple but well thought out and proportioned, and the only criticism I have is that the staircase balustrade (seen in the photograph on page 158) has a timber handrail supported only by stainless steel uprights, which are spaced so far apart that although no doubt there is no actual danger of falling through, one does not feel protected enough.

The interior of the institute is less satisfactory than that of the office building, for several reasons. The sequence of spaces does not seem to be at all well arranged. A rather poky entrance leads into the two main rooms which are separated by a sliding-folding screen. These contain columns which have no visible relationship with the rooms' proportions or wall treatments (in contrast to the offices, where partitions and wall and window modules coincide neatly) and the first room, intended for lectures, actually has a row of three columns, one a thin circular one, the next

The rear of the Cambridge railway offices, showing the eaves fascia and the first-floor edge beam carried across the staircase window—a point discussed in this article; also the staircase continued upwards to form a tank-room.



a fat circular one and the next a thin square one—which is not quite architecture. These rooms are given some character by their two-level ceiling, which is quite interestingly handled, though will the narrow clerestory windows, with their deep external overhang, not be unusually difficult to clean?

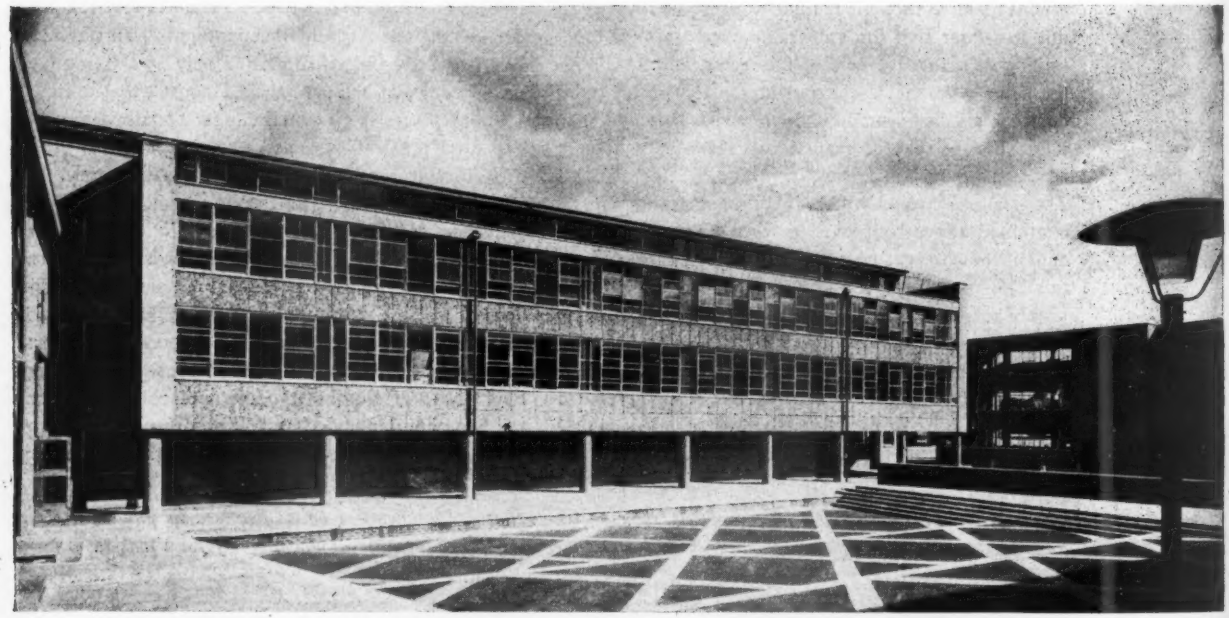
Also opening off the poky entrance is the bar, which during much of the time will surely be the most-used room in the place. Could it not have been given a more welcoming character, as well as more space for overflow, by making it a recess off the main room instead of walling it in as a separate brick box?

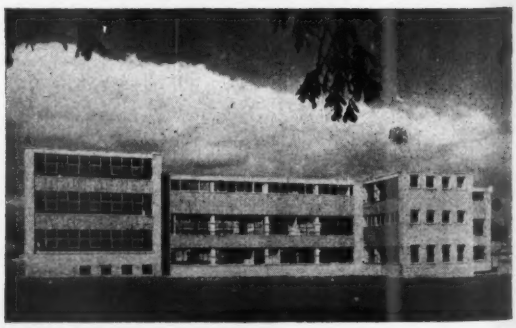
These criticisms may be unfair in view of the changes in the requirements with which I believe the architects were confronted during the course of the job, but the critic can only comment on what he sees and leave the architect to explain how it came about.

The finishing materials inside the institute are on the grim side, but they will have to stand up to rough wear and it was right to err on the side of simplicity. But there is little excuse for an end brick wall having an untidy pattern of electric conduit-pipes and junction boxes sprawling all over it. If, as I understand, this is because the electrical installations in a railway building don't come under the control of the architects, then there seems to be something alarmingly wrong with the co-ordination between departments in an industry whose efficiency surely depends a great deal on proper co-ordination.

I must follow these criticisms with a final word of praise for the building as a whole. If the enterprising approach to problems of design and technique that has produced it was shown more often by the engineers and architects responsible for British Railways' modernization programme, there would be a better chance of the word modernization meaning what it ought to.

EXTENSIONS TO WANDSWORTH SCHOOL, SUTHERLAND GROVE, S.W.18





Extensions to Wandsworth school, above and right, designed for the LCC by Hening and Chitty, were recently opened. The consultants were, structural engineering, R. T. James and Partners; electrical engineering, J. Rawlinson, Chief Engineer, LCC; heating and mechanical engineering, G. H. Buckle and Partners; landscaping, L. A. Huddert, Chief Officer, LCC Parks Department. The original school buildings, erected in 1928, were placed in a corner of the site, away from the public road, leaving space for two football pitches. It has not been possible to retain these football pitches, although reasonable recreation space had to be provided for 2,200 boys. The relative merits of a very high block, to leave more of the site open, were considered, but a maximum of four storeys was finally chosen so that the school buildings should not overwhelm the two-storey suburban housing around the site. The total number of places in the new building, which contains 35 classrooms, 11 laboratories and 18 workshops, is 1,620 in 120,000 sq. ft. The actual net cost on tender was £368,866 (additional costs £16,420), which gives an actual net cost per place of £228.

OFFICES

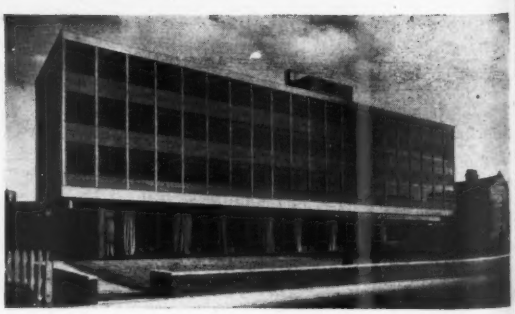
in TENISON ROAD, CAMBRIDGE, for the AREA TRAFFIC MANAGER, EASTERN REGION, BRITISH RAILWAYS designed by H. H. POWELL, architect to the Eastern Region, under the general direction of A. K. TENIS, chief civil engineer; R. T. WALTERS, principal assistant architect; A. J. FAGG, T. R. BURFIELD, G. W. EDMANDS, S. G. ADUTT, design team; quantity surveyors NEWBERRY and WYATT; consultants THE PRESTRESSED CONCRETE CO. LTD.

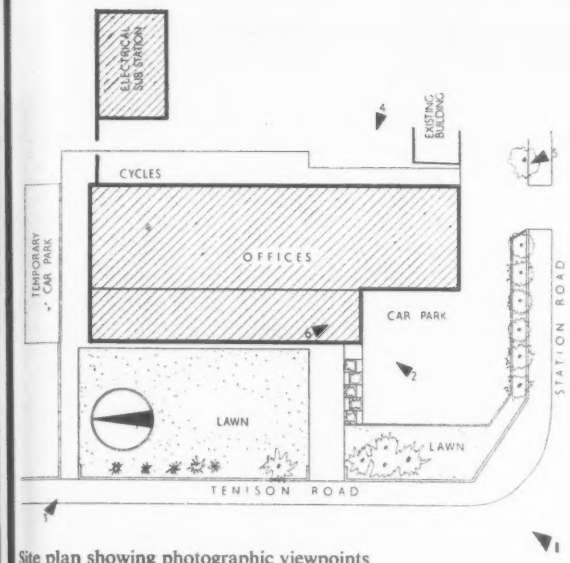
Great Eastern House, near the Cambridge railway station, is the new headquarters for the Traffic Manager, who administers an area stretching from Hunstanton in the north, Ketton in the west, Newport, Essex, in the south and Bury St. Edmunds in the east. The offices have been built as part of the decentralization policy of British Railways, and replace a number of obsolete and unsightly wooden huts. The construction above first floor level is in a patented system of prefabricated reinforced concrete, so far only used for schools. The building contains, on the ground floor, accommodation for the Railway Institute, a social club which is entirely separate from the administrative offices. These offices are discussed in an article by J. M. Richards on pages 149-152.

Viewpoint 1: *from the south-west, at the junction of Tenison Road and Station Road.*

building illustrated

Viewpoint 2 (*above*): *the west facade from the car park. In the foreground is the covered entrance porch and, left, the floor to ceiling windows of the recreation room and lecture room in the Railway Institute. Viewpoint* 3 (*right*): *from the north-west. On the left is the pedestrian entrance to the Railway Institute, or social club, which is quite separate from the administrative offices.*





Site plan showing photographic viewpoints

analysis

CLIENT'S REQUIREMENTS

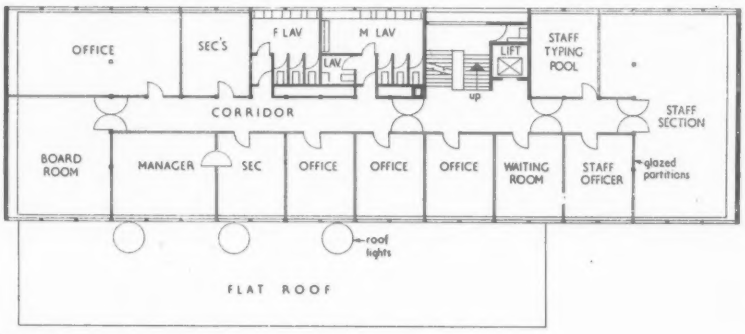
To provide offices for the Traffic Manager of the Cambridge area and his staff, and premises for the Railway Institute. The new building replaces a number of obsolescent and unsightly huts in the vicinity of the railway station.

PLANNING AIMS

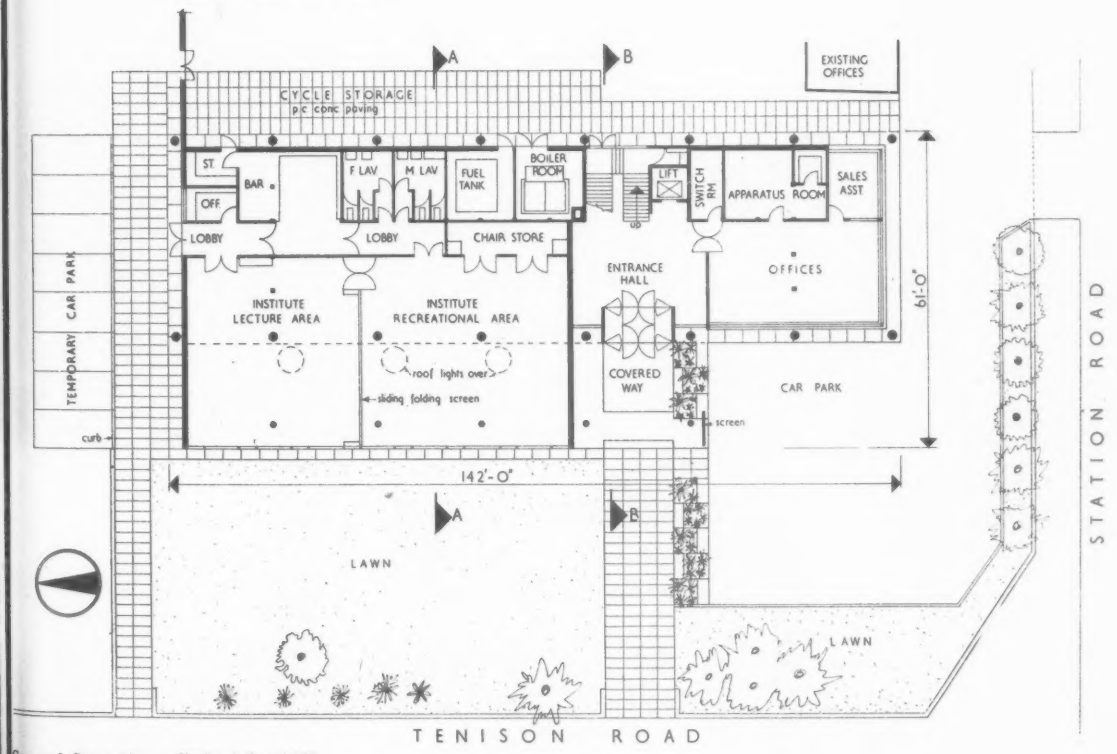
The building is situated at the corner of Tenison Road and Station Road and is set back to allow for the future widening of Tenison Road. The offices generally face east and west.

Although it forms a single 4-storey block, the building is divided functionally, structurally and aesthetically into two parts.

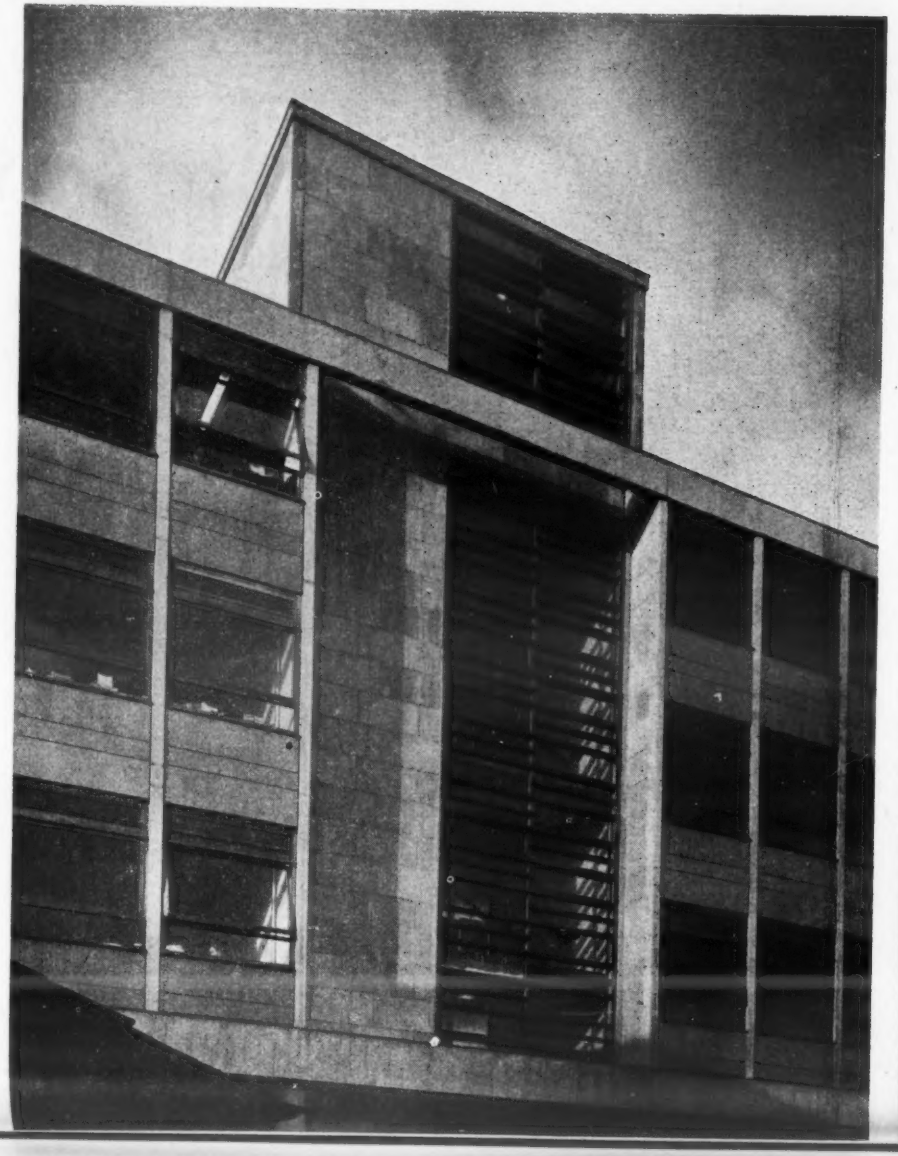
The ground floor contains the entrance hall, enquiry desk, service rooms, some office space and the Institute. The Institute has a separate entrance and consists of a large area suitable for meetings, lectures and social events with a bar and other facilities. The ground floor is of " wet and heavy " construction with an *in-situ* reinforced concrete frame and first floor slab and with brick walls which

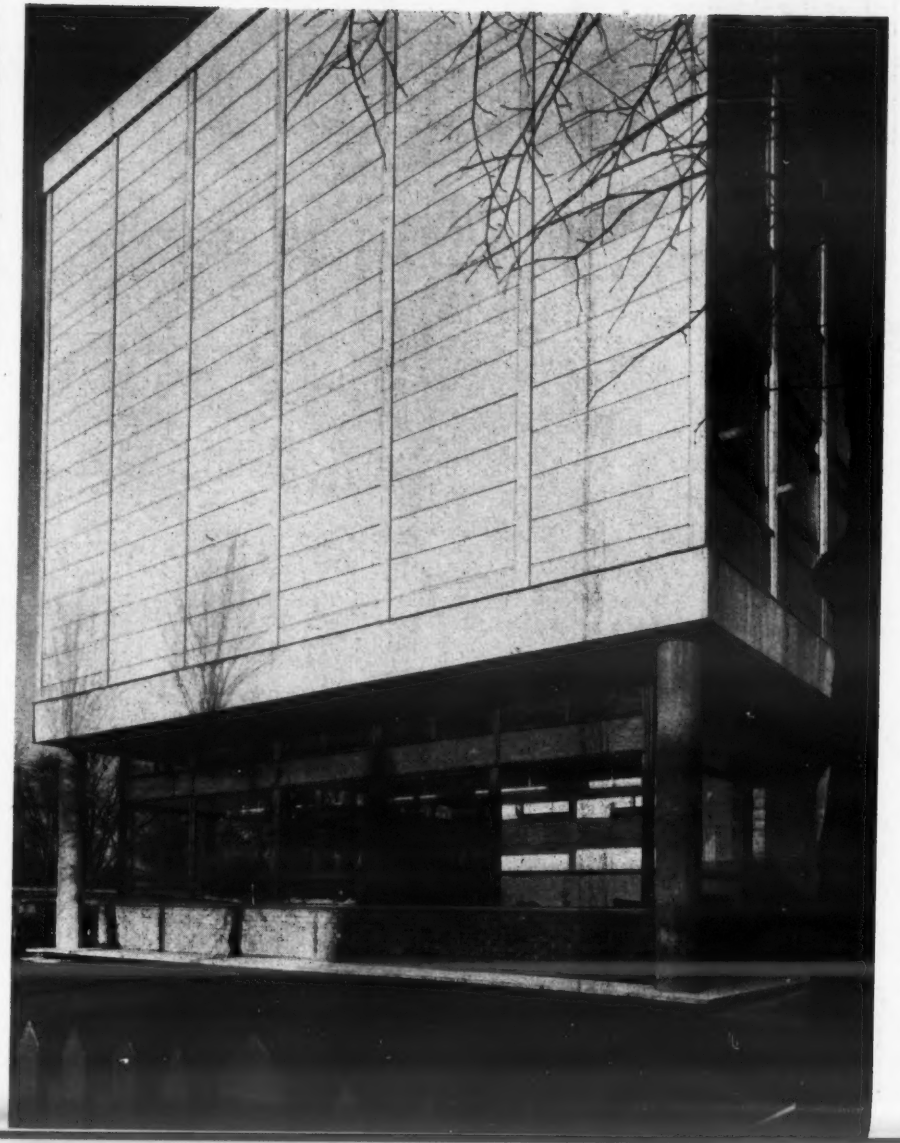


Typical upper floor plan



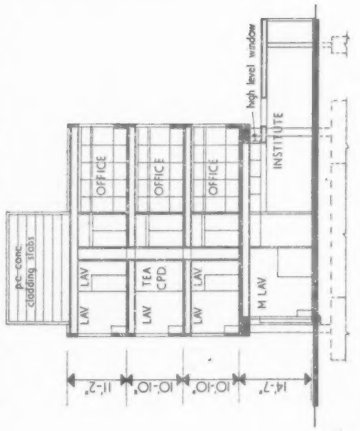
Ground floor plan [Scale: $\frac{1}{32}$" = 1' 0"]





Viewpoint 4 (opposite page, left): the tall staircase window on

Viewpoint 4 (opposite page, left): the tall staircase window on the east facade and above it the tank and lift motor room. This purpose-made window, which contains fixed and opening lights, is framed in utile hardwood. Viewpoint 5 (opposite page, right): the south facade. Cladding, above first floor level on all facades, is of precast concrete panels with exposed aggregate finish. Windows are framed in hardwood and the 11-in. cavity plinth is faced with Bedford grey-brown bricks. Viewpoint 6 (right): the covered entrance porch. The glazed entrance doors are framed in utile and the flower boxes are of precast concrete.



Section A-A [Scale: ½" = 1' 0"]

analysis

mostly pass behind the columns leaving them free standing. The institute area projects at the front of the building and its roof is continued to form a deep canopy over the front entrance.

The three upper floors are all devoted to offices and are of dry construction using the " Intergrid " system. The precast pre-stressed concrete frame rests on the *in-situ* first floor slab and the external walls are faced with precast concrete panels with exposed aggregate finish and hardwood framed windows. Each floor is an open area divided by demountable glazed timber partitions on a 3-ft. 4-in. grid. The vertical link consists of a lift and stairs at the rear of the building with a perforated hardwood screen which runs right up the rear elevation of the building and forms an illuminated " back cloth " to the entrance hall. External works include areas of grass and shrubs, car park, cycle store and an electricity sub-station at the rear of the building.

price per sq. ft. (based on estimated final contract price) — s 5, d 7
preliminaries and insurances

Work below ground floor level — 2 4½
Reinforced concrete pier bases and floor slab.

Frame or load-bearing element
Prefabricated, prestressed concrete frame above first floor. — 14 1
Remainder of *in-situ* concrete structure — 9 10½
In-situ r.c. frame to first floor. " Intergrid " construction above.

External walls — 9½
Ground floor: 11-in. cavity brickwork with Bedford grey-brown facings.
Upper floors: Precast concrete exposed aggregate panels backed by plastered hollow tile inner skin on flank walls, insulated low-pressure hot water convection panels on long walls (cost of convection panels in " heating installation ").

ratio: $\frac{\text{solid wall}}{\text{floor area}} = \frac{0{\cdot}09}{1}$

Windows — 6 0½
Utile hardwood including staircase screen. Satin chrome friction pivots. Anodized aluminium lever handles to budget locks.

ratio: $\frac{\text{windows}}{\text{floor area}} = \frac{0{\cdot}27}{1}$

External doors — 6½
Hardwood, utile.

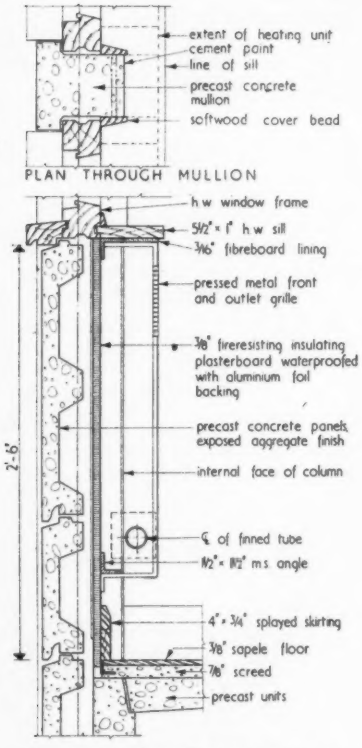
ratio: $\frac{\text{doors}}{\text{floor area}} = \frac{0{\cdot}03}{1}$

Upper floors
Cost included in " Frame or load-bearing element" above.
1st floor, *in-situ* r.c.
2nd and 3rd floors, " Intergrid," each 5,460 sq. ft.

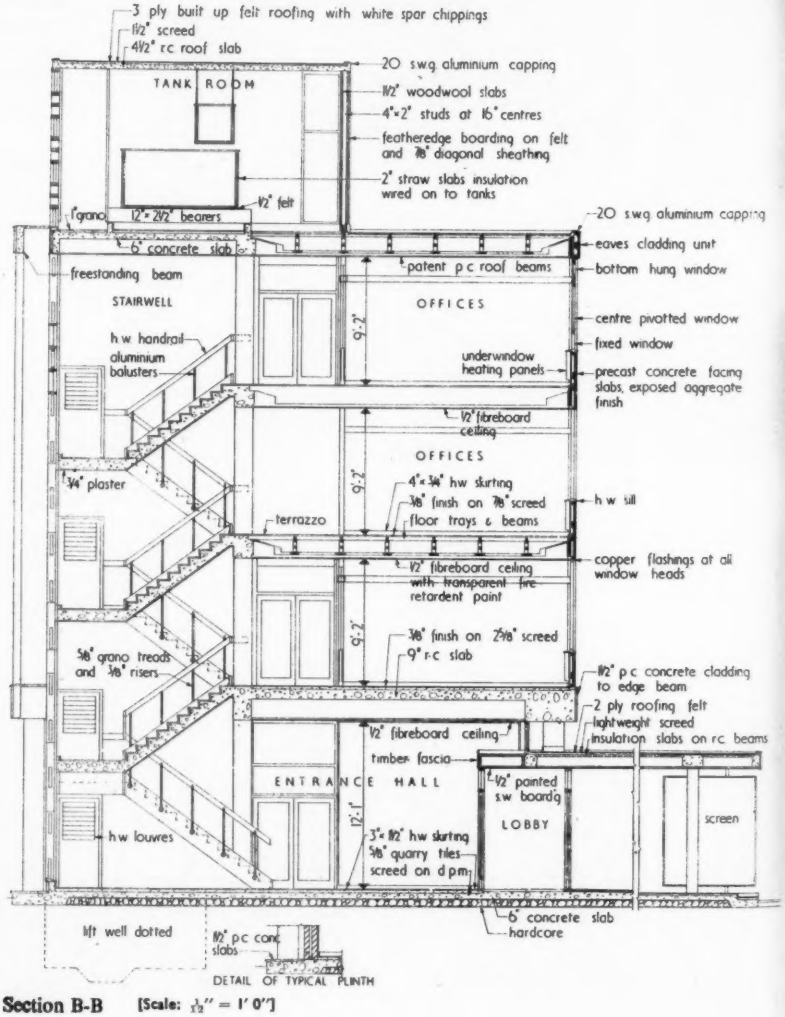
Staircases
Cost included in " frame or load-bearing element."
No. of staircases: 1. *In-situ* concrete. Black terrazzo finish.
Width: 5 ft.
Total rise: 36 ft. 3 in.

building illustrated

The entrance hall and inquiry desk. The staircase is in-situ concrete with a terrazzo finish.



Plan and section of external wall and heating unit [Scale: 1" = 1' 0"]



Section B-B [Scale: 1/12" = 1' 0"]

The board-room at the north-west corner of the first floor. Below sill level are heating units containing finned copper tubes served from an oil-fired boiler.

A typical executive office. The desk is designed by the architects and the demountable glazed partition is framed in hardwood and plywood faced.

A typical upper floor corridor and staircase landing. Daylight for internal corridors on upper floors is obtained through the glazed office partitions on the east and west sides of the block.

analysis

	s	d
Roof construction		
Cost included in " frame or load-bearing element." Type of roof: " Intergrid " to main block. R.c. beams and wood wool slabs to projecting part of ground floor.		
Roof lights		1¼
3 roof lights, total area 105 sq. ft. Cast glass.		
Glazing	1	5½
$\frac{3}{16}$-in. cast glass in internal partitions (see below). ¼-in. polished plate to large ground floor windows. 32-oz. clear glass to main external windows.		
Total of structural elements	32	10½

PARTITIONS

Internal partitions				4	6¾
Partition :	Glazed timber	Hollow clay block	Precast concrete		
Area in sq. ft.:	6,850	4,958	450		
Internal doors					11¼
No. of single: 51. No. of double: 12. West African mahogany veneered skeleton cored or utile framed glazed. Doors to lavatory lobbies have glazed sidelights.					
Ironmongery					7½
Anodised aluminium lever handles, kicking plates, push plates, overhead closers and shoe springs.					
Fittings				1	11¾
Bar counter, shelving and lighting canopy. Removable staging and sliding/folding screen. Curtains and curtain track to social club.					
Total of partitions and fittings				8	1¼

FINISHES

Floor finishes				4	9¼
Type of finish:	Wood parquet tiles	Blue quarry tiles	Red quarry tiles		
Area in sq. ft.:	18,468	1,242	1,710		
Price per sq. yd.	30s. 5d.	40s.	27s.		
Wall finishes				1	7¾
Fairfaced brick to social club and entrance hall areas. Plastic glaze to lavatories. Cement render to service rooms. Remainder plastered and painted.					
Ceiling finishes				3	4¾
Class I fireproofed insulation board. Softwood boarding painted to underside of entrance canopy.					
Roof finishes					11
Type of finish:	3 layer bituminous felt over main roof	2 layer bituminous felt over single-storey area			
Area in sq. ft.:	5,562	2,286			
Decorations				1	6½
Windows externally—clear synthetic varnish. Internal demountable partitions, clear gum varnish. Other areas generally painted.					
Total of finishes				12	3¼

analysis

SERVICES

	s	d
External plumbing		3
Aluminium flashings. Aluminium and cast-iron rainwater pipes, all inside building.		
Hot and cold water installation	2	0½
Oil-fired boiler. Galvanised tube and fittings generally. Hot water from a calorifier. Internal temp. 65° in offices.		
Sanitary fittings		8¾

Fitting:	Sinks	Lavatory basins	W.c.s	Urinals
No:	5	32	26	14

Heating and ventilation	6	5
Two oil-fired boilers, low-pressure hot-water distribution (see above). Heating mains in Class " B " black tubing. Perimeter heating to offices, copper tubing with aluminium fins. Cost includes wall convection heating panels. Internal temperatures: 65° to offices. Air change, natural.		
Gas installation		
None.		
Electrical installation	2	1
Fluorescent lighting fittings generally. Ring main for socket outlets.		

Type of point:	Lighting	Switch	Power
Number of points:	345	72	30

Lifts		1½
6-8 person passenger lift with high-level motor room. (Element price for this item includes builder's work only.)		
Total of services	11	7½
Drainage	1	2½
Separate system. Waste system in building in copper with cast-iron main stacks.		
Other elements not shown above	1	7½
Telephone ducts, including for operational control on second floor. Lightning conductor.		
Shillings per sq. ft. of floor area:		
£85,256 (net cost excluding external works) / 22,535 sq. ft. (floor area measured inside external walls)	= 75	8

COST SUMMARY

Ground floor area: 6,156 sq. ft.
Total floor area: 22,535 sq. ft.
Type of contract: negotiated.
Work began: February, 1957.
Work finished: November, 1957.
Estimated final contract price of foundations, superstructure, installations and finishes: £85,256.
Estimated final contract price of ancillary buildings: £7,894.
Estimated total: £93,150.

COST COMMENTS

It should be noted that in this analysis the cost per sq. ft. of floor area would have been greater still had the office block been analysed separately without the large open areas on the ground floor, and if the cost of lift gear and motors had been included.

Certain elements call for comment:

" Preliminaries " bear a greater proportion of the total cost than might be expected. This may be due to plant found necessary to hoist the prefabricated frame into position, or to the speed of erection, but in any event would have had the architect's agreement as part of the negotiated contract.

" External walls": The choice of the solid external wall panels (at 9¾d. per sq. ft. of floor area with a ratio of 0·09) indicates a cost of construction and external finish amounting to £4 1s. per sq. yd. of wall $\left(\frac{9{\cdot}75\text{d.}}{{\cdot}09}.\right)$

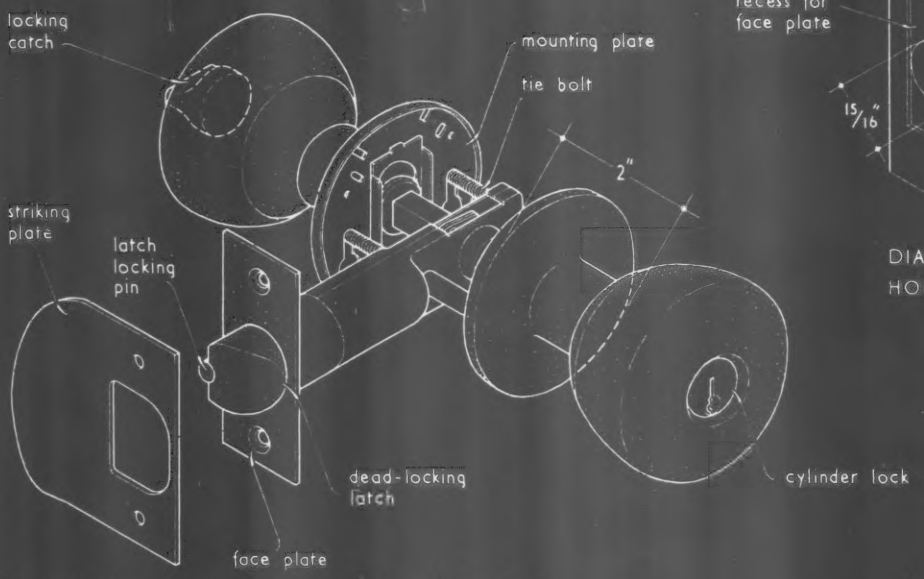
" Windows " at 6s. 0¼d. per sq. ft. of floor area are affected by the inclusion of the perforated hardwood screen. The unit cost of this element amounts to $\frac{72{\cdot}25\text{d.}}{0{\cdot}27}$ or 22s. 4d. per sq. ft. of window and this figure gives some clue to the probable cost of the screen. " Fittings": This element refers almost exclusively to the social club. " Ceilings " at 3s. 4¾d. per sq. ft. of floor area consists in the main of Class I fire-proofed insulation board. It would appear therefore to require an expensive system of suspension with this form of construction.

CONTRACTORS

General contractor: Gilbert-Ash Ltd. *Sub-contractors: Wood block flooring (Alufloor):* Bennets Wood Flooring Ltd. *Electrical installation:* Bectice Ltd. *Felt roofing; tanking and lining:* Cambridge Asphalte Co., Ltd. *Plumbing installation:* T. R. Freeman & Son Ltd. *Lightning conductor installation:* J. W. Gray & Son Ltd. *Terrazzo paving:* Jaconello Ltd. *Glazing:* Mustill Wallis & Co., Ltd. *Quarry tiling:* Parkinsons (Wall Tiling) Ltd. *Suspended ceilings:* J. A. R. Robertson. *Painting:* Arnold Sharrocks Ltd. *Plastering and screeding:* W. A. Telling Ltd. *Heating installation:* Weatherfoil Ltd. *Cement glaze:* Regent Surfaces Co., Ltd. *Aluminium balusters:* Amalcraft Ltd. *Founder and smith:* Broads Ltd. & Clark Hunt & Co., Ltd. *Sanitary ware:* John Bolding & Sons, Ltd. *Cement and lime:* Cement Marketing Co. *Window frames:* Davis Ridley & Co., Ltd.; *Aggregates:* M. Dickerson Ltd. *Fletton bricks:* Erith & Co., Ltd. *Facing bricks:* S. A. Hunter Ltd. *Fibre ducting:* Key Engineering Co., Ltd. *Hollow clay; partition blocks:* London Brick Co., Ltd. *Precast lavatory partitions:* Mono-Concrete Ltd. *General builders merchants:* Cyril Ridgeon, Rogers & Jackson. *Ironmongery:* Alfred G. Roberts, Ltd. *Electric " Barrywald " incinerators in women's lavatories:* Saniguard Appliances Ltd. *Joinery:* W. E. Stromeyer Ltd. *Sanitary fittings:* Stitsons Ltd. *Dome lights:* R. Seddon & Sons Ltd. *Artificial stone coping:* Tidnams Ltd. *Rubber link matting:* Tyre Products. *Cannel reinforcement slabs:* Thermacoust Ltd. *Rod reinforcement:* Twisteel (GKN) Ltd. *S/G pipes, bricks, etc.:* Travis & Arnold Ltd. *Paving slabs:* Wettern Bros. *Metal cycle shelters:* Alfred A. Odoni & Co., Ltd. *Lighting fittings (a) Fluorescent (to all offices, corridors, social club and entrance hall):* Falk, Stadelmann & Co., Ltd. *(b) Filament (lavatories, lobbies, stores, cleaners' cupboards, cistern room):* G.E.C. Ltd. *(c) Filament (boiler room):* Benjamin Electric Ltd. *(d) Filament (fuel store):* Wardle Engineering Co. Ltd. *(e) Filament (entrance and bar canopy):* Troughton & Young Ltd. *(f) Filament (staircase):* Courtney Pope Ltd. *Metal rolling grilles to bar:* Haskins.

FITTINGS | DOORS | LOCKS

The Architects' Journal Library of Information Sheets 655. Editor: Cotterell Butler, A.R.I.B.A.



ISOMETRIC VIEW OF TYPICAL LOCK (NO. 600).

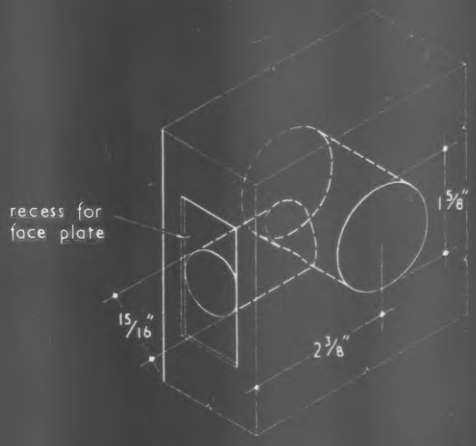
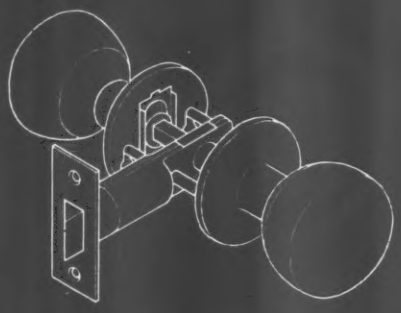
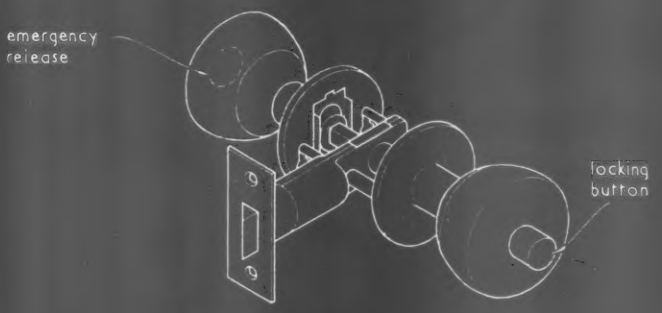


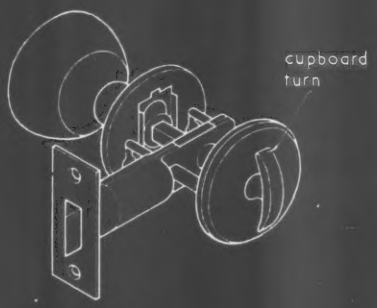
DIAGRAM SHOWING FIXING HOLES IN DOOR



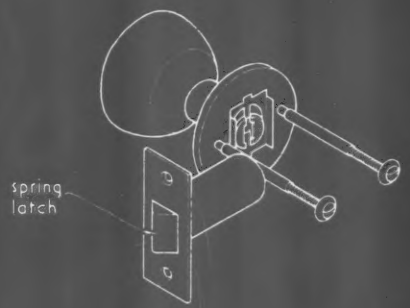
NO. 100. (mortise latch)



NO. 200. (for bedrooms, bathrooms etc.)



NO. 50. (for cupboards etc.)



NO. 100D. (for cupboards etc.)

NO. 100D. (single dummy handle)

TYPICAL ALTERNATIVE TYPES.

44.J3 ·DEXTER· DOOR FURNITURE

This Sheet describes the Dexter range of door furniture which consists of matching sets of furniture for all applications. The drawings on the face of the Sheet show typical examples from the range.

General

Model No. 600: This is a deadlocking mortise latch. It has a cylinder lock incorporated in the external door knob as shown in the drawing at the top of the face of the Sheet. In the centre of the internal knob there is a locking catch which, when turned to the locking position, locks the outer knob so that the door can only be opened from the outside by means of the key. The latch locking pin engages in the striking plate when the door is closed and is held flush with the face plate. In this position it locks the latch making it impossible for the latch to be levered back from the outside.

Model No. 680: This is as No. 600 but designed for hotel bedrooms with automatic lock and no locking catch on the inside. The door is opened by the key on the outside and turning the knob.

Model No. 100: This model is a mortise latch with plain knobs.

Model No. 200: This is a mortise latch for use in bedrooms, bathrooms, etc., with a simple locking button in the internal knob. When the button is depressed the door is locked and can only be opened by turning the inside knob. In the external knob there is a simple key-operated emergency release.
Other types are available for cupboards, etc., as shown on the lower face of the Sheet.

Construction

The interior construction of all types is steel with an external casing of solid brass.

Fixing

Two holes are drilled in the door, as shown in the diagram on the face of the Sheet, to fix any latching set. The manufacturer supplies a template which may be folded round the door, at the required height, to fix the positions of the holes. Alternatively a metal guide is available which clamps on the door and gives the positions for drilling. The latch hole, $\frac{15}{16}$ in. dia., should be bored 3 in. deep, and the cross hole, $1\frac{5}{8}$ in. dia., is bored right through the door.
The recess should be made for the face plate so that it fits flush with the edge of the door and the latch unit placed in position. The door knob, with the tie bolts attached, is inserted into the cross hole, with the connecting bar through the latch unit, and the mounting plate placed over the heads of the tie bolts which are then tightened. It is essential that both of these units are correctly positioned and they are labelled accordingly. It is not necessary to cut the bolts or the connecting bar as the locks are suitable for fixing to doors $1\frac{3}{8}$ in. thick to $1\frac{3}{4}$ in. thick.
The rose then snaps on over the mounting plate, a notch in the rose engaging in a wire spring on the plate. The other knob is then placed in position. It is pushed in and turned slightly till it snaps in and engages in the latch mechanism.
The striking plate is positioned on the door jamb and the recess cut for the latch.

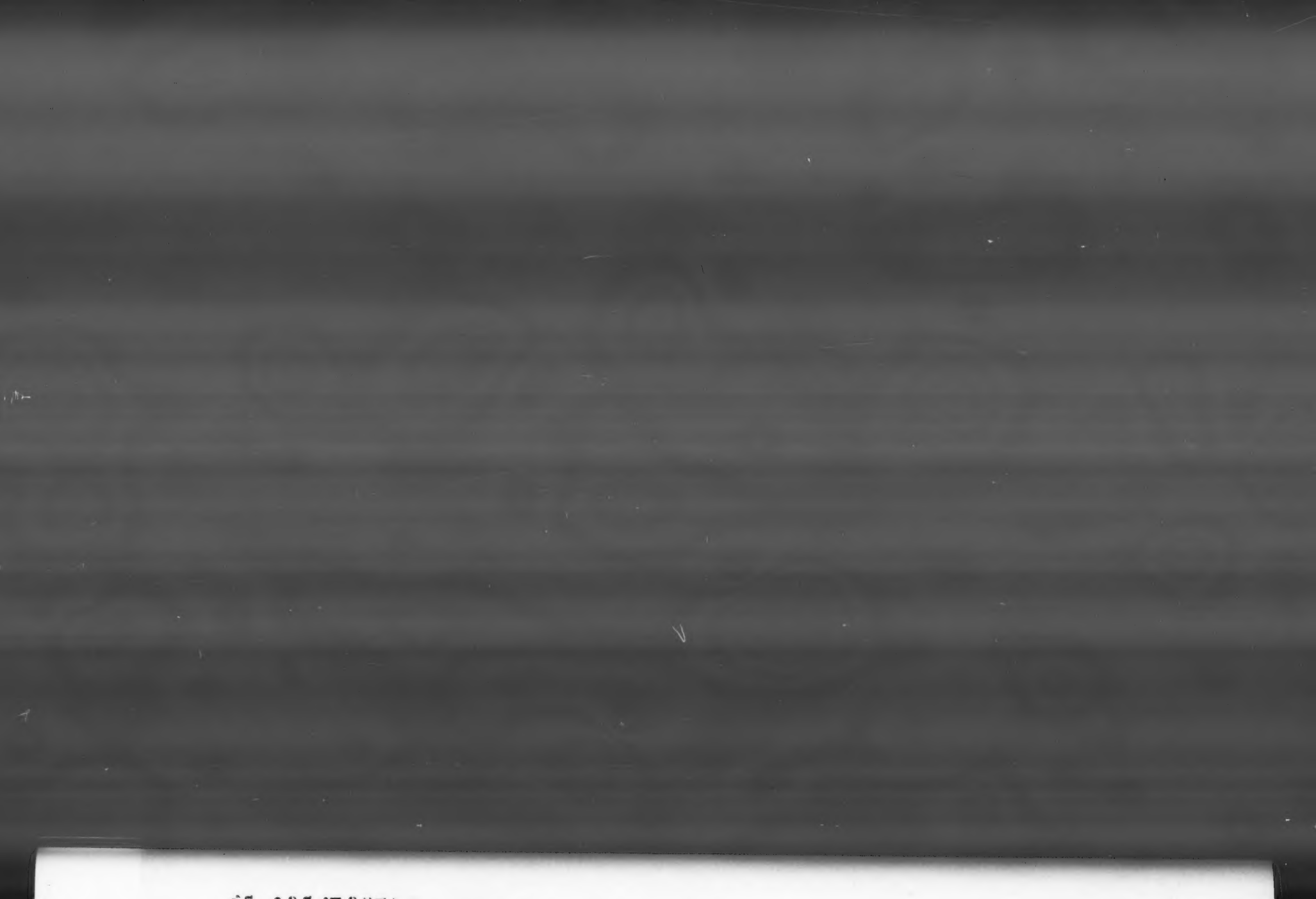
Finish

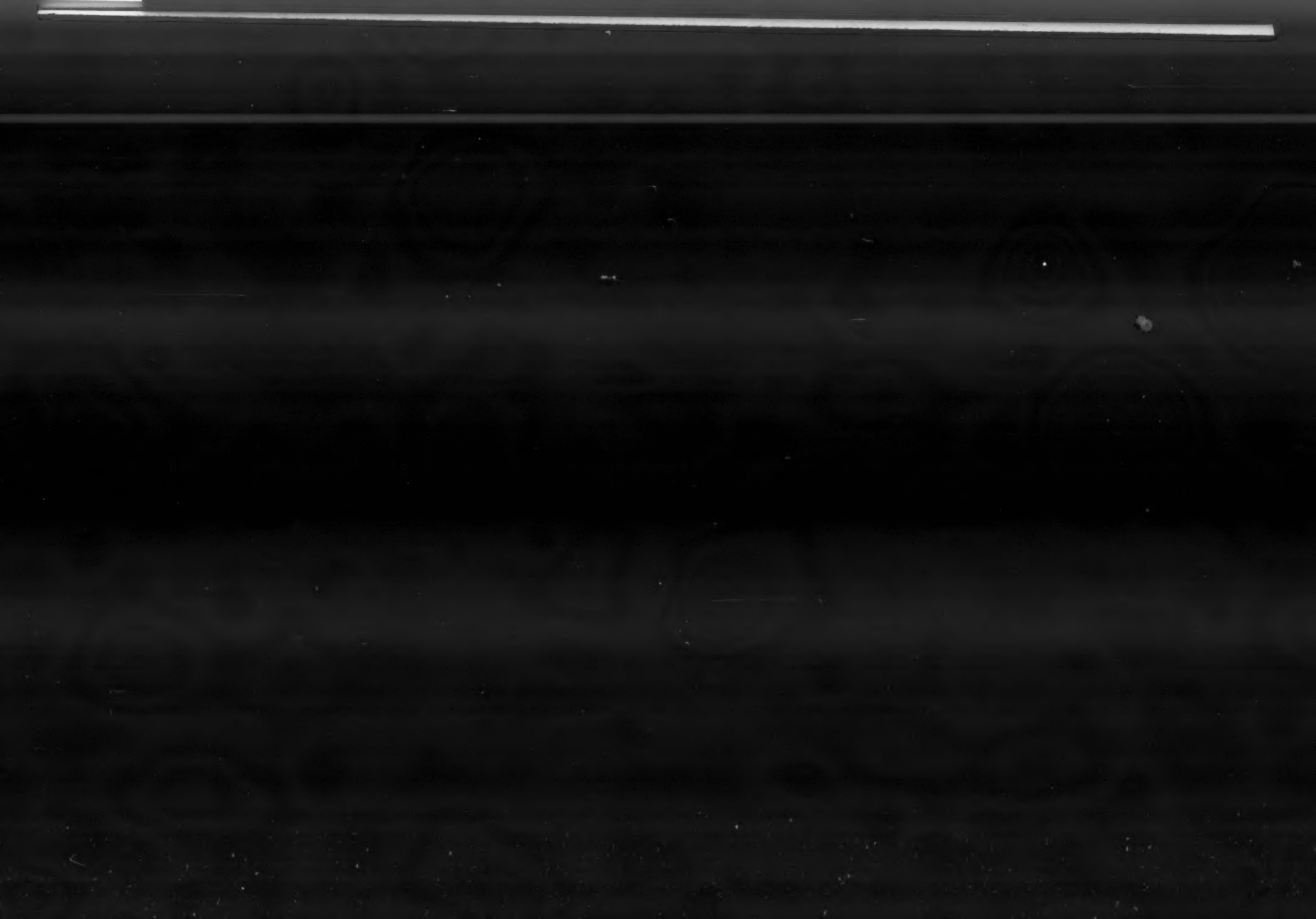
All visible parts of the furniture are polished brass or they may be bronze, chrome etc. as required.

Further Information

All locks are suitable for master or grandmaster keying.
The manufacturer maintains a technical advisory service available to answer questions dealing with this subject generally.

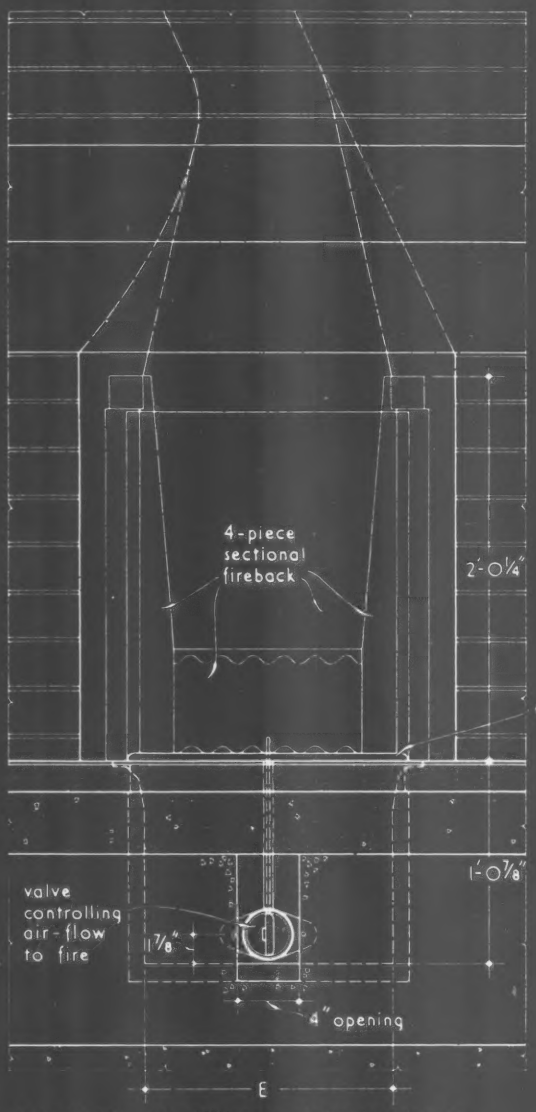
Compiled from information supplied by:
Walter Lawrence & Son Ltd. for Dexter Lock Company, U.S.A.
Address: Sawbridgeworth, Herts.
Telephone: Sawbridgeworth 2171.



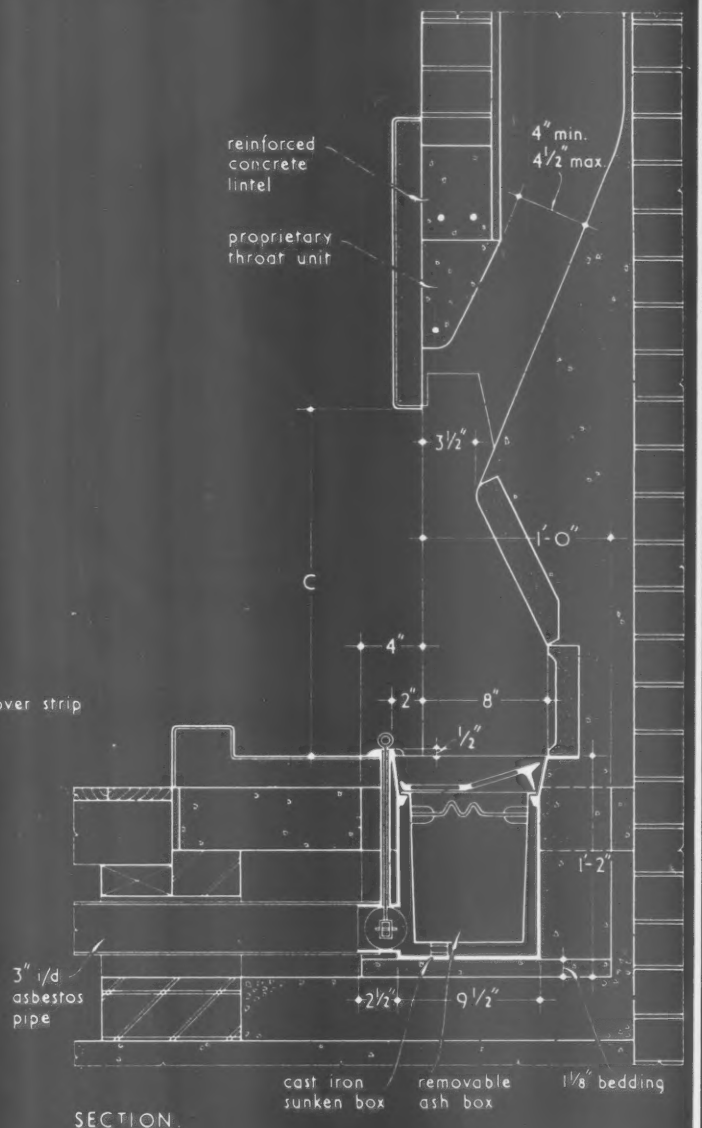


SPACE HEATING | UNITS | SOLID FUEL

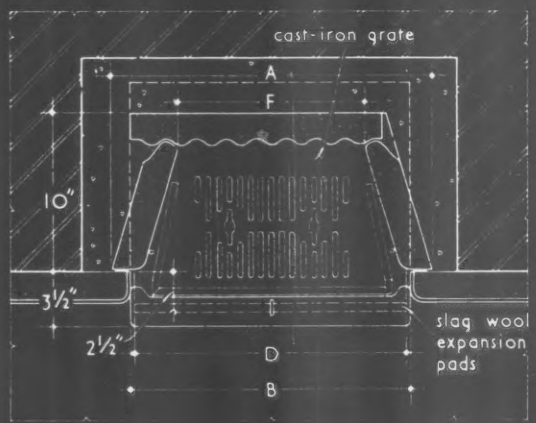
The Architects' Journal Library of Information Sheets 656. Editor: Cotterell Butler, A.R.I.B.A.



ELEVATION OF TYPICAL INSTALLATION.



SECTION.



PLAN.

size of fire	A	B	C max	C min.	hearth cutout, D	E	F
1'-2"	1'-3½"	1'-1⅞"	1'-10"	1'-6"	1'-1½"	10⅞"	8"
1'-4"	1'-6½"	1'-3⅞"	1'-10"	1'-6"	1'-3½"	1'-1¼"	10"
1'-6"	1'-8½"	1'-5⅞"	1'-10"	1'-6"	1'-5½"	1'-3¾"	1'-0"
1'-8"	1'-11"	1'-7⅞"	1'-10"	1'-6"	1'-7½"	1'-3¾"	1'-2½"
1'-10"	2'-1¼"	1'-9⅞"	1'-8"	1'-6"	1'-9½"	1'-3¾"	1'-3½"
2'-0"	2'-3¼"	1'-11⅞"	1'-3"	1'-6"	1'-11½"	1'-3¾"	1'-6½"

TABLE OF DIMENSIONS.

29.B1 ·BAXI· FIRE

This Sheet describes the Baxi fire for solid fuel heating. The drawings on the face show the construction of the standard fire and how it is installed. It may be adapted for convection heating and fixing to a back boiler. Other models available include a side-inlet fire to simplify fitting to solid floors, a deep ashpit type to hold several months' ash and a coke model: all are designed for smokeless fuels. All models may be fitted to existing fireplaces and further details are obtainable from the manufacturer.

Principle

The primary air for combustion is drawn from outside the building or under the floor, through a valve which gives complete control of combustion. The valve is operated by turning a small ring at the front of the grate.

Components

Fire-grate and sunken box: These are of cast iron. The sunken ashpit box, with a spigot at the front, is a one-piece casting, which eliminates uncontrolled draughts to the fire. A front cover strip masks the joint between the front of the grate and the hearth.

Removable ashbox: This is in pressed steel and requires emptying once or twice a week.

Fireback and side-cheeks: Two types are available: one has the normal firebrick side-cheek in one piece and the fireback in two, as shown in the drawings on the face of the Sheet. The other has back and cheeks built up from special 6 in. by 3 in. by 1¼ in. fireclay bricks, bullnosed on the front end of the cheeks.

Sizes and Capacities

The sizes of fire available and critical dimensions are given in the table on the face of the Sheet. As a general guide to their heating capacities, the 16 in. fire will heat a room up to 2,000 cu. ft. and the 18 in. fire up to 2,500 cu. ft. If the room is of irregular shape, heating by convection is recommended.

Ventilation

A Baxi fire will not work if there is an excessive air inlet to the room, such as a constantly open or badly fitting door, another flue, an open staircase, etc.

Hollow floor: Where there is a good flow of air under the floor it is recommended that the 2-ft. length of asbestos pipe from the fire be fitted to project through the fender wall under the hearth, making sure that the end of the pipe is unobstructed. All ventilators must be examined to see that they are open and unobstructed. All dividing walls and walls supporting joists must have access holes large enough for entry, and unless there is a good circulation of air throughout, more ventilators should be provided.

Solid floor: The vent pipe from the fire should be connected by a 4-in. internal diameter pipe with no sharp bends to a ventilator preferably in the wall facing the prevailing wind. Fixing with solid floors is simplified by the use of the side-inlet fire. (See introductory paragraph of Sheet.)

Fireplace

The Baxi fire can be fitted to most types of fireplace, but the height of the fire opening from hearth level should not exceed 1 ft. 10 in. Where a new fireplace is being provided it is advisable to have it supplied with the hearth already cut out to take the front of the Baxi fire.

Where an existing fireplace is used, the hearth can be cut to take the Baxi fire, and where the opening is greater than 1 ft. 10 in. the manufacturer can supply a raised fire or a canopy.

Provision for Ashpit Box and Vent Pipe

A hole must be provided beneath the hearth extending 1 ft. 0 in. back from the back of the fire surround and 4 in. forward, as shown in the drawing on the face of the Sheet, and 1 ft. 2 in. deep from the top of the hearth. The width of the hole should be the same as the fire opening. From the centre of this hole a channel 4 in. wide by 1 ft. 2 in. deep must be provided to accommodate the vent pipe; in the case of a hollow floor it must extend through the fender wall. The hole in the hearth should extend forward 2½ in. from the back of the surround and be ½ in. less in width than the nominal width of the fire.

Fitting the Fire

Before fitting the fire all woodwork must be trimmed back to comply with local byelaws and must in no case be less than 9 in. from the fire. Where there is any doubt the local authority should be consulted. The fire basket and ashpit box are set in the hole bedded on a mixture of two parts gravel or broken brick to two of sand and one of lime, well mixed with water. The underside of the front cover strip should be at hearth level and the damper tube and rod in position. The joint between the basket and ashpit box is sealed with plastic fire cement and also that between the spigot and vent pipe. The hearth is then fitted, and the fire levelled to it, so that the top of the basket lines with the hearth. The bedding mixture is also used for filling in around the ashpit box and basket. Before this is completed the two slag wool pads, as shown on the drawing on the face of the Sheet, are placed in position. The pads are left in position to allow for expansion of the fire.

Fireback and cheeks: Building up solid behind the sectional fireback is recommended, with sloping back to flue as shown in the drawing on the face of the Sheet. Where the fireclay bricks are used these may be adapted to the design of the fireplace and flue throating; they should be fixed with fireclay or plastic cement and all joints pointed.

Finishes

The front cover strip is available in black, cream, light fawn or dark fawn vitreous enamel finish; copper, pewter or old silver lustre finish; armour bright or polished chrome metallic finish.

Compiled from information supplied by:

Richard Baxendale & Sons Ltd.

Address: Chorley, Lancs.
Telephone: Chorley 2808 (3 lines).

working detail

BALUSTRADE: OFFICES IN LONDON W.C.1

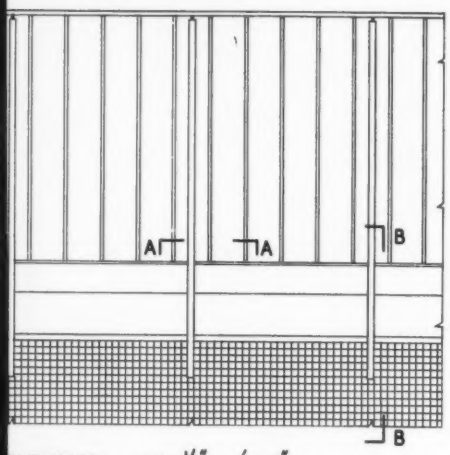
David Aberdeen, architect

The point to notice about this balustrade is the complete dissociation of the steel from the structure to avoid all risk of damage or disfigurement by rusting. The balusters and top and bottom rail are of bright drawn steel, welded and painted, and are secret-screwed to the bronze handrail and bronze uprights.

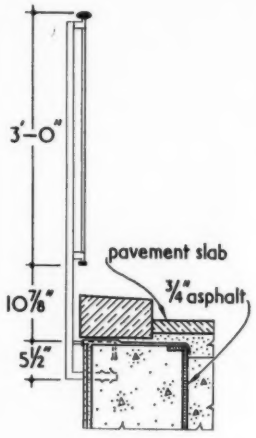
working detail

BALUSTRADE: OFFICES IN LONDON W.C.1

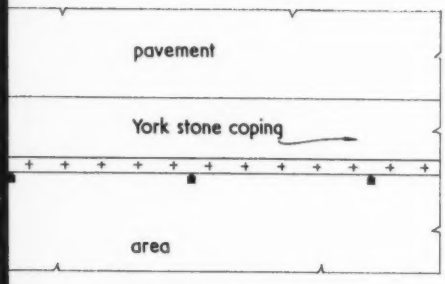
David Aberdeen, architect



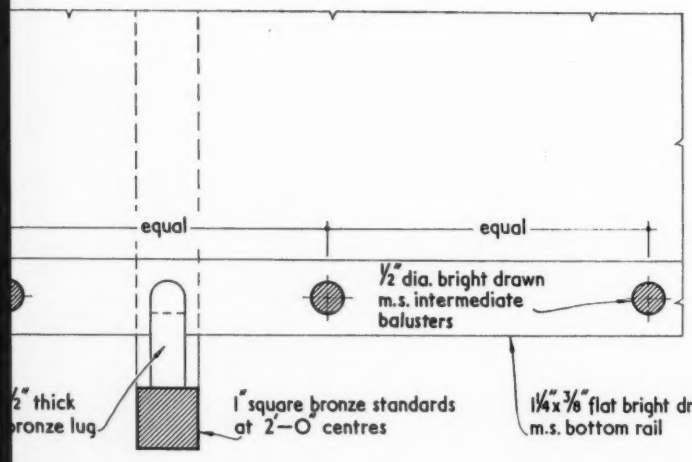
ELEVATION. scale ½" = 1'–0"



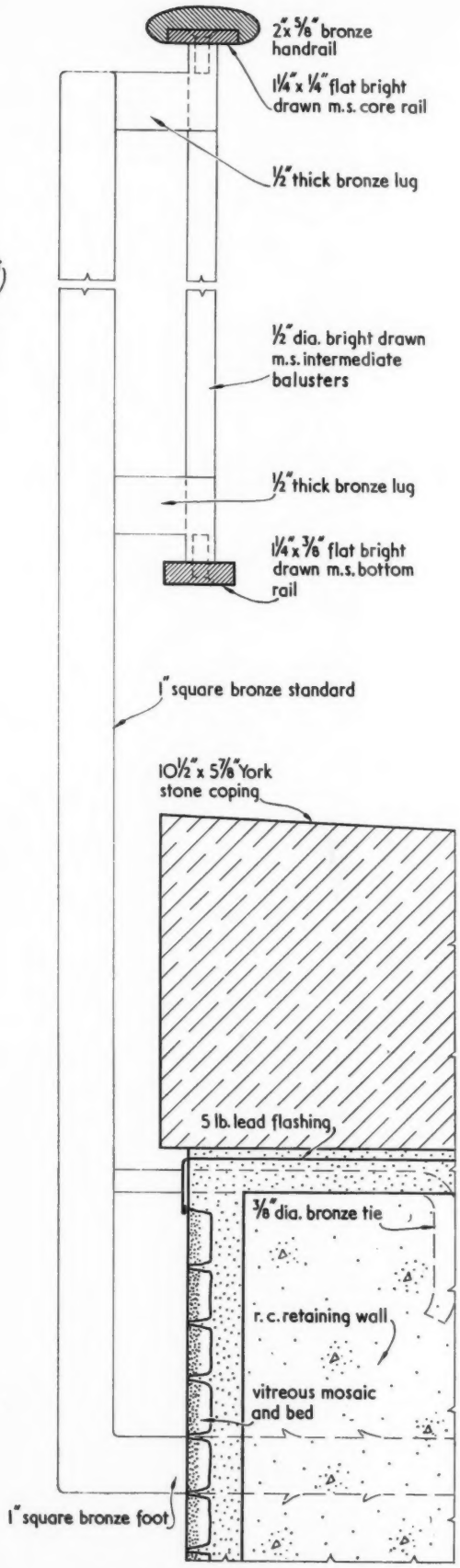
SECTION.



PLAN. scale ½" = 1'–0"



PLAN AT A–A. scale ⅜ full size

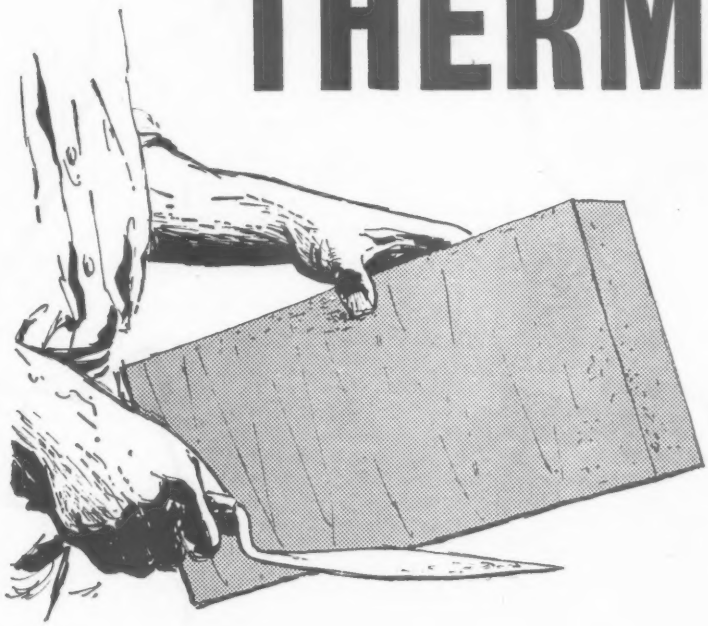


SECTION B–B. scale ⅜ full size

In order to meet the increasing demand...

another factory is being built for

THERMALITE



Strategically placed to serve the Midlands and the North the new factory will increase output and speed site delivery to all parts of Great Britain.

The steadily increasing demand for Thermalite-Ytong Insulating Building Blocks both for industrial buildings and for domestic architecture is a direct confirmation of the established position that this unique material has achieved.

THERMALITE-YTONG

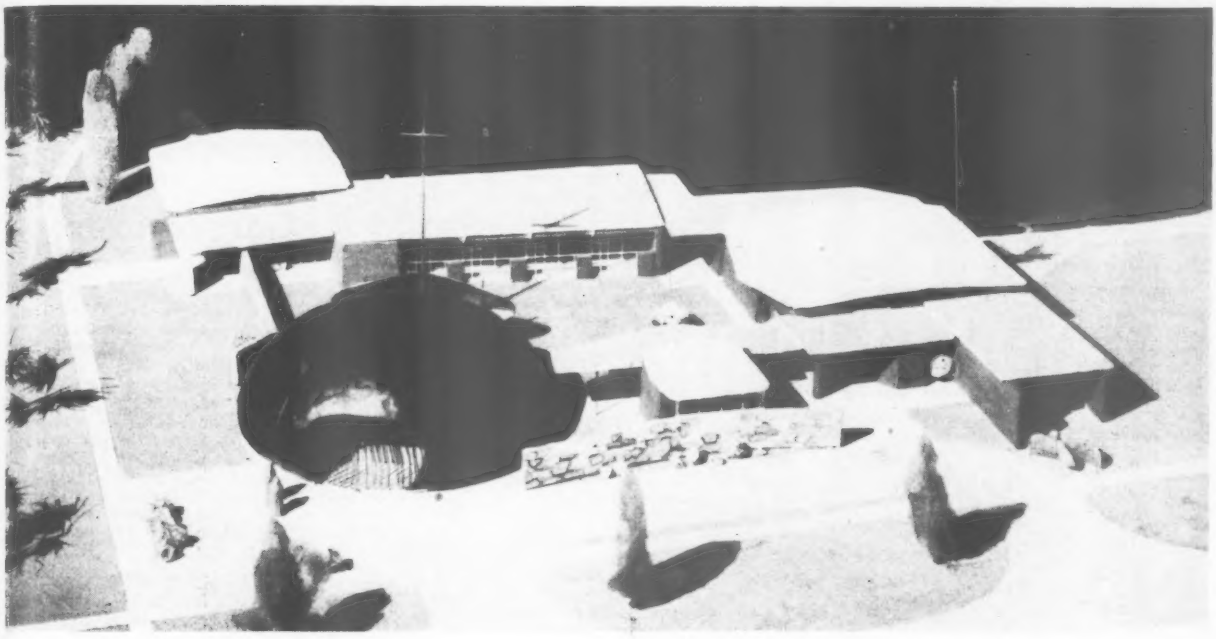
Load bearing insulating building blocks

Thermal insulation
Load bearing
High speed of laying
Light weight
Workability
Direct fixing
Fire resistance
Reduces the risk of condensation

For further details and technical data apply to

THERMALITE LIMITED
Shepherds House Lane, Earley, Reading, Berkshire Telephone: Reading 62694.

CHURCH IN CANBERRA, AUSTRALIA



The group of buildings illustrated in the model photograph, above, is designed by Robert G. Warren, and is now under construction in Canberra. The chapel, left foreground, is circular in plan and oval in cross section and will seat 200 people. Other buildings include a recreation hall with committee rooms, kitchen, etc., and a kindergarten and senior Sunday school, with hobby rooms and a library. The buildings are sited around a central courtyard, in which there will be a 50-ft. high aluminium cross, with external reredos.

INFORMATION CENTRE

INDEX FOR 1957

An alphabetical index covering Information Centre items and special articles published in the Technical Section during the twelve months ended December 31, 1957, is being prepared. Readers who wish to have a copy—it is free of charge—should complete the form below and post it to the Technical Editor, THE ARCHITECTS' JOURNAL, *not later than March 3, 1958. This form will not be acknowledged.*

Please send me the Information Centre Index for 1957 :

Name .....

(Block letters)

.....

Address.....

(Block letters)

.....

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AJ 23.1.58

Announcements

PROFESSIONAL

Duncan Thomson, L.R.I.B.A., has taken over the practice of the late J. S. Thomson, F.R.I.B.A., and his address is 49, Wimbledon Hill Road, London, S.W.19 (telephone Wimbledon 3437 and 0194).

E. Wamsley Lewis, F.R.I.B.A., has moved to 12, Frederick Place (2nd floor), St. Thomas Street, Weymouth (telephone Weymouth 992).

The postal address of Cambridgeshire County Council County Planning Department is now Gloucester Street, Castle Hill, Cambridge. The telephone number (Cambridge 58214) remains the same.

Banks, Wood & Partners, quantity surveyors, have moved to 5-15, Cromer Street, Grays Inn Road, London, W.C.1 (telephone Terminus 7171-3), where they will be pleased to receive trade catalogues, etc.

R. J. H. Minty, F.R.I.B.A., F.I.A.A., has moved to 20, Eccleston Street, London, S.W.1 (telephone Sloane 7603).

H. Benson Ansell, A.R.I.B.A., has been appointed Deputy County Architect (Administration) of the West Riding of Yorkshire, and his address is now c/o West Riding County Architect's Department, Bishopgarth, Westfield Road, Wakefield, Yorks.

Howard Kelly, F.R.I.B.A., has taken into partnership John J. Atkinson, A.R.I.B.A., and the firm will in future be known as Howard Kelly & Partners, 11, Duke Street, Manchester Square, London, W.1 (telephone Welbeck 3995).

J. Granger-Taylor, A.R.I.B.A., has moved his office to 18, St. Mary Abbots Terrace, London, W.14 (telephone Western 4994).

Geoffrey Ellis and Charles M. Rhodes, A/A.I.Q.S., have taken into partnership Mr. R. J. Everson, A.I.Q.S., L.I.O.B., and the firm will in future be known as Ellis, Rhodes & Everson. The address and telephone number remain unchanged.

Corrections

We learn from James Halstead Ltd., the makers of "Ejecta" Polysterene wall tiles (referred to in the JOURNAL of December 26), that the statement that they can be used for floors is incorrect. The tiles are, in fact, precision moulded (dimensions are therefore accurate), non-crazing, non-fading, and easily applied to any sound, dry, flat surface of almost any type of material. They can also be used on works which are already surfaced with glazed tile. Prices to the builder are from 25s. to 28s. per yard, and when bought in bulk packs the adhesive costs are about 2s. per square yard for normal installations.

The sketches of Gollins, Melvin, Ward and Partners' proposals for Sheffield University, published in the JOURNAL of January 9, on page 67, were by H. Prine and P. Guest. We regret the mis-spelling of Mr. Prine's name.

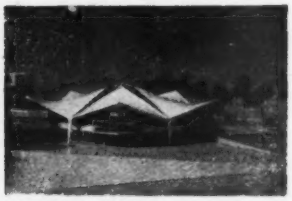
G. A. Jellicoe asked us to say that he is the life president of the International Federation of Landscape Architects, and not of the Institute of Landscape Architects, as stated in last week's JOURNAL.

ar

Preview

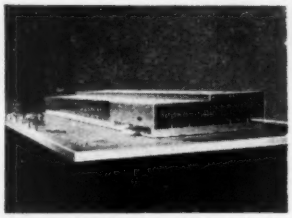
January Architectural Review

Each New Year, the Review devotes an entire special issue to a survey of what the leading architectural offices in Britain have in hand on the first day of the year.



Assembly Hall of a girls' comprehensive school at Southwark. Architects, Chamberlin, Powell and Bon.

The view presented by *Preview* is an extremely varied one; the buildings it covers range from a pub to a synagogue, by way of schools, universities, colleges, hostels, hospitals, factories, office blocks, churches, airports, planning schemes, housing layouts, a market and a seaside pavilion; and the offices and architects responsible for these projects-in-progress read like a directory of the country's top talent (as indeed they are)—the L.C.C., the Ministry of Works, ACP, T. P. Bennett and Sons, Bridgewater and Shepheard, James Cubitt and Partners, Llewelyn Davies, Easton and Robertson, Frederick Gibberd, Erno Goldfinger, Gollins Melvin and Ward, Sir William Holford, Arthur Ling, Sir Leslie Martin—and so on down the alphabet to Yorke, Rosenberg and Mardall.



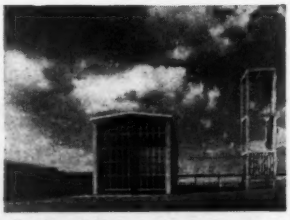
Factory at Wokingham. Architects, Yorke, Rosenberg and Mardall.

The reflection in *Preview's* mirror may prove flattering or alarming, but even where there appear to be grounds for satisfaction at the design of the buildings themselves, the environments into which they are being fitted still leave much to be desired, and though this is beyond the architect's control, it is not exempt from the watchful eye of the *Counter Attack Bureau*, whose month by month vigilance will be maintained even in this special issue.

Churches
Adam & Berkeley
Lettering

February Architectural Review

The variety and scope of the buildings illustrated, and subjects discussed, in the February issue will be catholic, even for the Review. *Three Churches* around Coventry by Basil Spence will show what the imaginative use of a modicum of rationalisation can do even for a church building programme; the spectacular *Teatro de los Insurgentes*, designed by Alejandre Prieto exhibits Latin-American design at its most exuberant and effective; while Erno Goldfinger's precise *Office block in Albemarle Street* is the kind of building our cities sorely need. Historical studies will re-examine aspects of eighteenth-century architecture: *Bishop Berkeley's* contributions to architectural theory will be the subject of an article by Marcus Whiffen, while a sheaf of papers on *Robert Adam* by various hands will include some unknown Clérisseau drawings from Russia. Gordon Cullen will complete his set of townscape studies for Bristol University with an analysis of *Trowbridge*, and Jacqueline Tyrrwhitt will examine the planning of *Fatehpur Sikri*, the ideal city of Akbar the Great, somewhat in the manner of Sir Hugh Casson's memorable studies of Peking. In *Skill*, John Sharp will complete his survey of methods and materials in *Architectural Lettering*, *Design Review* will continue to note worthwhile new products and equipment.



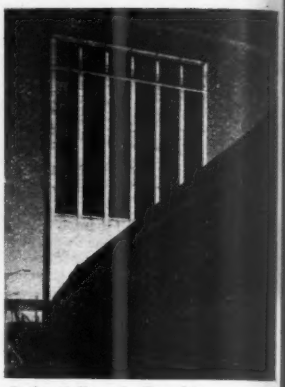
Church at Bell Green, Coventry, by Basil Spence & Partners.

Offices Albemarle Street, W.1 by Erno Goldfinger.

Milford Haven
Lamp-Standards
Achthamar

March Architectural Review

The impending ruination—or transfiguration — of Pembrokeshire, by the proposed industrialisation of the Milford Haven area, will be the subject of an important *Counter-Attack* article by Ian Nairn in the March issue of the Review, while another *Outrage* problem of a more wide-spread (though no less acute) interest, will be surveyed by Peter Witworth —the design of street-lighting standards—in a special article in *Skill*. Among buildings of interest to be described and illustrated in the same issue, the most outstanding will be two industrial groups; further additions to the distinguished work already done for the *Technicolor Laboratories* by Gooday and Noble, and a complete set of *Pithead Buildings in Fifeshire* by Egon Riss, who has captured something of that sense of technological drama that has been missing from so much recent English industrial buildings. In complete contrast will be a *Week-end House* on the seashore at West Wittering by Wells Coates and Michael Lyell, and new *Showrooms for Troughton and Young* by Hulme Chadwick. A travelogue by three recent voyagers in Turkey will document and illustrate the extraordinary sculptured church at *Achthamar*, and two historical articles will explore the frontier between architecture and technology in the early nineteenth century, W. J. Sparrow writing on the ingenious and adventurous *Count Rumford*, inventor, man of action, and landscape architect, and Mary Eldridge examining the impact of plate glass in ever-larger sheets upon the design of urban *Shop-Fronts*.



Rothes Colliery, by Egon Riss.

Carvings at Achthamar.

CLASSIFIED ADVERTISEMENTS

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

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

Public and Official Announcements

30s. per inch; each additional line, 2s. 6d.

QUANTITY SURVEYING ASSISTANTS required by Air Ministry Works Directorate in London and Provinces. Grade and commencing salary based on not less than three or five years' previous experience under Quantity Surveyor or Building Contractor. Approved full time study will count towards five years period. Normally technical qualifications in Builders quantities or building, *e.g.* C. & G. final or O.N.C. or proof to equivalent standard. Duties include abstracting and billing, site measurement and preparation of estimates. Commencing salary and grading according to age, qualifications and experience on salary ranges £545 at age 25 rising to £745 or £995 at age 26 rising to £870. Salaries somewhat lower in Provinces. Five-day week, three weeks' leave a year. Appointments carry liability for service anywhere U.K. or overseas. Applicants normally should be natural born British subjects. Write stating age, qualifications and previous appointments including type of work done, to Manager, Professional and Executive Register, Ministry of Labour and National Service, Atlantic House, Farringdon Street, E.C.4, quoting PE.105/745. No original testimonials should be sent. Only applicants selected for interview will be advised. Opportunities may occur for competing for pensionable posts: promotion prospects. 8423

SURREY COUNTY COUNCIL

Applications invited for following appointments:—

1. ASSISTANT ARCHITECT GRADE IV, £1,025—£1,175 p.a. plus £30 p.a. London Allowance. Must be A.R.I.B.A.

2. ARCHITECTURAL ASSISTANT GRADE II, £725—£845 p.a. plus L.A. up to £30 p.a. Must be of good general training, pref. given those who have passed Inter. R.I.B.A.

Full details, present salary and 3 copy testimonials to County Architect, County Hall, Kingston, as soon as possible. 8348

BUCKS COUNTY COUNCIL

Applications are invited for the appointment of ASSISTANT ARCHITECTS in the County Architect's Department on the following grades:—

A.P.T. Grade V (£1,175×£50 (3)—£1,325).
A.P.T. Grade IV (£1,025×£50 (3)—£1,175).
Special Scale (£750×£40 (7)—£1,030).

The appointments are superannuable and subject to medical examination.

A weekly allowance of 25s. and return fare home once every two months may be paid for six months to newly appointed married officers of the Council unable to find accommodation.

Applications, on forms provided, must be returned by 31st January, 1958.

F. B. POOLEY,
County Architect.

County Offices, Aylesbury. 8460

COUNTY BOROUGH OF ROTHERHAM
ARCHITECTURAL ASSISTANTS

Architectural Assistants are required for established posts in Grade I (£575—£725) and in Special Grade (£750—£1,030), the grade and commencing salary to be according to applicant's qualifications and experience.

Housing accommodation will be available, if necessary, for the higher grade appointments.

Applications, stating age, qualifications and experience, with the names of two referees, to be delivered to the Borough Engineer, Municipal Offices, Rotherham, not later than Tuesday, 4th February, 1958.

JOHN S. WALL,
Town Clerk.

Municipal Offices, Rotherham.
4th January, 1958. 8462

CITY OF BRADFORD EDUCATION COMMITTEE
REGIONAL COLLEGE OF ART, BRADFORD
Principal: F. T. COLCLOUGH, A.T.D., F.R.S.A.
LECTURER IN ARCHITECTURE

A full-time Lecturer is required to take charge of the part-time course leading to the R.I.B.A. Final Examinations and to teach full-time art students including those studying Display. Applicants, who should be registered Architects, must be Associates of the Royal Institute of British Architects.

Salary in accordance with the Burnham Technical Scale for Lecturers.

Successful applicants for the above post will be required to take up their appointment as soon as possible but in any event not later than September next.

Application forms and further particulars may be obtained from the Director of Education, Town Hall, Bradford, and completed forms should be returned within two weeks of the appearance of this advertisement.

A. SPALDING,
Director of Education.
8537

WARWICKSHIRE COUNTY COUNCIL
ARCHITECT'S DEPARTMENT

Applications are invited for the following appointments. In both cases the commencing salary can be in accordance with ability and experience.

(*a*) ASSISTANT ARCHITECTS (salary scale: £750×£40—£1,030).
(*b*) ARCHITECTURAL ASSISTANTS—
(i) Grade A.P.T. I (£575—£725).
(ii) Grade A.P.T. II (£725—£845).

Applicants for (*a*) must be Members of the Royal Institute of British Architects, or 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.

Applicants for (*b*) must have passed the Intermediate examination of the Royal Institute of British Architects. The successful applicants will be eligible for upgrading when they have qualified.

The appointments are on the established staff and are subject to the Scheme and Conditions of Service of the National Joint Council for Local Authorities, and the Local Government Superannuation Acts, 1937-1953. Successful candidates will be required to pass a medical examination.

Applications are to be on forms which 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.
January, 1958. 8461

The Liverpool Regional Hospital Board invite applications for the following permanent, pensionable appointments to the staff of the Regional Architect, T. Noel Mitchell, B.Arch., F.R.I.B.A.

SENIOR ASSISTANT QUANTITY SURVEYOR, £1,010 p.a. to £1,195 p.a.

Candidates must hold Corporate Membership of the Royal Institution of Chartered Surveyors, and must have had considerable experience in all the duties of a Quantity Surveyor.

ASSISTANT ARCHITECT
£700 p.a. to £1,015 p.a.
(starting salary dependent on age and experience).

Candidates must be Registered Architects having passed the requisite examinations.

Applications stating post applied for, age, qualifications, experience, present appointment and salary, previous appointments and names and addresses of three referees (two technical) to me by 3rd February, 1958.

VINCENT COLLINGE,
Secretary to the Board.

19, James Street,
Liverpool, 2. 8539

LONDON ELECTRICITY BOARD
GENERAL ASSISTANT QUANTITY SURVEYOR

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

Applicants should have had working up experience in a Quantity Surveyor's office and will work under the direction of a Chartered Quantity Surveyor.

Pending determination as to the grading and salary applicable to the post within the National Joint Board agreement, the provisional minimum salary will be £590 per annum rising to £725 per annum, inclusive of London Allowance.

Application forms obtainable from Personnel Officer, 46, New Broad Street, London, E.C.2, to be returned completed by 31st January, 1958. Please quote ref. PER/2425/A. 8538

BOROUGH OF WOOD GREEN
ARCHITECTURAL ASSISTANT

The Council invite applications for the post of ARCHITECTURAL ASSISTANT on the permanent establishment of the Borough Engineer's Department within the Special Scale for Architectural Assistants (£750 to £1,030), plus the appropriate London weighting allowance, the commencing salary being fixed in relation to the experience of the successful applicant.

Applicants must be fully qualified Architects and have had experience in the preparation of plans, drawings and other details associated with Local Authority work, including Housing Schemes.

The appointment is subject to the Local Government Superannuation Acts and to medical examination.

Applications, on forms obtainable from the undersigned, must be returned to me not later than Saturday, 8th February, 1958.

A. BARNETT,
Town Clerk.

Town Hall,
Wood Green, N.22. 8536

COUNTY COUNCIL OF ESSEX

Required on the established staff:—

(*a*) ASSISTANT ARCHITECTS in Special Grade, salaries not exceeding £1,030.
(*b*) ARCHITECTURAL ASSISTANTS, Grade I, salaries not exceeding £725.

Candidates for appointments (*a*) must have passed Parts I and II of R.I.B.A. Final and for (*b*) R.I.B.A. Intermediate Examination.

Commencing salary in each case according to qualifications and experience.

The appointments offer opportunities for design and supervision on a variety of buildings—colleges, libraries, schools, police and fire stations and health buildings—and successful candidates will have much responsibility within the group system.

Application forms from H. Conolly, C.B.E., F.R.I.B.A., County Architect, County Hall, Chelmsford (state post for which form is required), to be returned with copies of three testimonials by 7th February, 1958.

Canvassing disqualifies. 8552

CITY OF COVENTRY
ARCHITECTURAL & PLANNING DEPT.

Vacancies for QUALIFIED ARCHITECT-PLANNERS and for QUALIFIED ARCHITECTS to work on immediate further Development of the Central and Cathedral areas of the City, comprising New Swimming Bath to International standards, Central College Art & Technology, Central Library, Dance Hall, Multi-storey Car Parking, Law Courts, High-Income Group Flats, Students Hostel. Also there is continuing work on Comprehensive and Residential Schools and Housing Development.

Salary—Special Grade £750—£1,030. Applicants must possess a high degree of design ability and experience of working drawings. Appointments will be made within grade according to experience.

Housing Accommodation in approved cases. Interest-free loan for removal expenses.

Details and application forms (state for which post) from City Architect, Bull Yard, Coventry, returnable within 10 days publication. 8568

COUNTY BOROUGH OF SMETHWICK
BOROUGH ENGINEER & SURVEYOR'S DEPARTMENT

Applications from persons suitably qualified are invited for the following appointments—

2 SENIOR ASSISTANT ARCHITECTS,
Salary £1,025—£1,175 (APT IV) per annum.

The commencing salary for each of the above appointments will be according to the qualifications and experience of the successful applicants.

The posts are subject to the provisions of the National Scheme of Conditions of Service: the Local Government Superanuation Acts 1937-53: the passing of a medical examination and to termination by one month's notice on either side.

Forms of application may be obtained from the Borough Engineer & Surveyor, Council House, Smethwick, and should be returned, in envelopes suitably endorsed, not later than 7th February, 1958.

E. L. TWYCROSS,
Town Clerk.

Council House,
Smethwick, 40.
January, 1958. 8569

TEMA DEVELOPMENT CORPORATION
GHANA

Applications are invited for the post of CHIEF ENGINEER. Consolidated salary £2,360 per annum. Candidates, who must be graduates (B.Sc. (Eng.) or other recognised engineering degree) and /or Associate Members of the Institution of Civil Engineers or of the Institute of Municipal Engineers, should have had at least five years' experience since qualifying and considerable municipal experience or experience in New Town Development.

The duties will comprise the supervision of the Corporation's Engineering Department, dealing with all engineering matters relating to the building of a new town including the designing of roads, sewers, surface water drainage, water supply, etc., and their construction and maintenance, both by contract and direct labour.

Appointments will normally be on contract for two tours of 18-24 months each in the first instance. Candidates will be required to join the Corporation's Provident Fund by making a contribution of 7½% of salary to it against the Corporation's contribution of 17½%.

For further particulars and application form write, stating age, qualifications and experience to the Director of Recruitment, Ghana High Commissioner's Office, 13, Belgrave Square, London, S.W.1. Closing date for applications 21st February, 1958. 8527

HACKNEY BOROUGH COUNCIL invite applications for the appointment of JUNIOR ARCHITECTURAL ASSISTANT in the Borough Engineer & Surveyor's Dept. The salary will be within A.P.T. Grade I (£575—£725 p.a.) and London weighting allowance will also be payable. Candidates must have had a good architectural training and must be at least Probationers of the R.I.B.A., with several years' experience in an architect's office. The appointment is a temporary one but is expected to be for a minimum period of two years. Written applications to be addressed to the Borough Engineer & Surveyor, Town Hall, Hackney, E.8, by not later than 9 a.m. on 8th February, 1958. 8549

HERTFORDSHIRE COUNTY COUNCIL
COUNTY ARCHITECT'S DEPARTMENT

Applications invited for the following:—

ASSISTANT ARCHITECT, Special Class Grade, £750—£1,030.

ASSISTANT QUANTITY SURVEYOR, Special Class Grade, £750—£1,030.

WORKER UP. Salary Grade £560 × £30—£800 p.a.

Previous Local Government experience not essential. Applications giving full particulars of training, experience, and qualifications, with names of two referees, to County Architect, County Hall, Hertford, by 3rd February, 1958. 8565

SHEFFIELD REGIONAL HOSPITAL BOARD

Applications are invited for two posts of ASSISTANT ARCHITECT in the Architectural Division of the Board's Headquarters. Applicants must be Registered Architects and have passed the requisite examinations. Salary £700—£1,015. The appointments are subject to the Whitley Council terms and conditions of service, to the National Health Service (Superannuation) Regulations, and to one month's notice on either side. Applications, together with the names of three referees, should be sent to the Secretary to the Board, Fulwood House, Old Fulwood Road, Sheffield, 10, by 8th February, 1958 8551

FAREHAM URBAN DISTRICT COUNCIL
Require JUNIOR ARCHITECTURAL ASSISTANT (Temporary) in Engineer and Surveyor's Department for work on low-cost housing schemes and miscellaneous buildings. Salary within Higher General Division (£230 × £30—£560) commencing point in accordance with age and experience. Appointment subject to Local Government Superannuation Acts, N.J.C. Scheme of Conditions of Service and medical examination.
Applications, giving age, G.C.E. subjects, full details of experience and names of two referees, to me by 31st January, 1958.

B. W. RANDS,
Clerk to the Council.

"Merton,"
5, Grove Road,
Fareham, Hants. 8555

COUNTY BOROUGH OF WALLASEY
Applications from appropriately qualified persons are invited for the following positions in the office of the Borough Architect :—
(a) ARCHITECTURAL ASSISTANTS, Grade A.P.T. II (£725—£845).
(b) ARCHITECTURAL ASSISTANTS, Grade A.P.T. I (£575—£725).
(c) ASSISTANT QUANTITY SURVEYOR, Grade A.P.T. III (£845—£1,025).
(d) ASSISTANT QUANTITY SURVEYOR, Grade A.P.T. I (£575—£725).
Forms of Application and Conditions of Appointment may be obtained from the Borough Architect, Town Hall, Wallasey, to whom they should be returned by 27th January, 1958.

A. G. HARRISON,
Town Clerk.
8554

BEESTON AND STAPLEFORD URBAN DISTRICT COUNCIL
JUNIOR ARCHITECTURAL ASSISTANT
Grade I (£575—£725)
Applications are invited for the above appointment, with commencing salary within the scale according to qualifications and experience.
Applications, naming two referees, to the Surveyor, Town Hall, Beeston, Nottingham, by 4th February, 1958.

H. D. JEFFRIES,
Clerk of the Council.
8563

LEEDS COLLEGE OF ART
SCHOOL OF ARCHITECTURE AND TOWN PLANNING
ARTHUR LOUIS AARON V.C. SCHOLARSHIP
The Management Committee invite applications for this Scholarship of £250, open to past or present students, who, at the time of taking up the award hold the Diploma in Architecture of the School. The Scholarship is awarded for travel and study in Architecture.
Applications should reach the Clerk to the Leeds School of Architecture and Town Planning, 43a Woodhouse Lane, Leeds 2, from whom further details may be obtained by the 18th February, 1958.

GEORGE TAYLOR,
Chief Education Officer.
Education Department,
Leeds, 1. 8535

COUNTY BOROUGH OF SOUTHAMPTON
requires under N.J.C. conditions of service:
(a) ARCHITECTURAL ASSISTANT, Grade A.P.T.II £725/£845.
(b) ARCHITECTURAL ASSISTANT, Grade A.P.T.I £575/£725.
Applicants must possess the appropriate qualifications and experience for special classes of officers under N.J.C. conditions of service.
Apply on application forms obtainable from the Borough Engineer and Surveyor, Civic Centre, Southampton, by not later than Monday, 10th February, 1958. 8567

THE UNIVERSITY OF LIVERPOOL
Applications are invited for a Leverhulme Post-graduate Fellowship for research in architecture or town-planning in the School of Architecture or the Department of Civic Design. The Fellowship will be tenable for one year at a value of £500, but may be renewed for a second year at a value of £550.
Applications, three copies, stating age, qualifications and experience, proposed field of research (which may be of a historical, literary or technical nature), the names of two referees, and enclosing photographs of work, should be received not later than 1st March, 1958, by the Registrar, from whom further particulars may be obtained. Candidates with suitable qualifications, undertaking approved research, may be eligible for the degree of M.A. or M.Arch. 8530

Vacancies exist for DRAUGHTSMAN (Arch. & Civ. Engr.) in the War Department at DARLINGTON and GEDLING (NOTTS).
Candidates must have at least three years' Architectural Training experience in an Architect's office and be of Intermediate R.I.B.A. standard. Salary ranges from £510 at age 21, rising by annual increments to £820. Maximum entry pay (age 28) £714. Applications giving full particulars of qualifications and experience, etc., to be addressed to CRE, Northern Counties, DARLINGTON; or CRE Nottingham, GEDLING, Notts., according to choice of locality. 8531

MANCHESTER CORPORATION TRANSPORT DEPARTMENT. Qualified ENGINEERING ASSISTANT required for Building and Civil Engineering Construction and Maintenance Salary £750/£1,030. Forms and details from General Manager, 55, Piccadilly, Manchester, 1, returnable by 12th February, 1958. 8524

PERTH AND KINROSS JOINT COUNTY COUNCIL require ARCHITECTURAL ASSISTANTS (2) for work on New Schools. The appointments will be within Grades A. & P. V/V(a)/VI (£765—£935). Applicants should hold the A.R.I.B.A. qualification or equivalent. Consideration will be given to housing requirements. Particulars of appointment and forms of application from the County Clerk, P.O. Box 15, County Offices, York Place, Perth. Applications to be lodged by 8th February, 1958. 8566

BOROUGH OF WIDNES
BOROUGH ARCHITECT'S DEPARTMENT
ARCHITECTURAL ASSISTANT
Applications invited from registered Architects with A.R.I.B.A. qualifications. Salary within Special Grade (£750 × £40 to £1,030) according to qualifications and experience. Housing accommodation if needed.
N.J.C. Conditions. Superannuation scheme. Applications quoting two referees to Borough Architect, Brendan House, Widnes Road, Widnes, by 4th February, 1958. Canvassing disqualifies.

FRANK HOWARTH,
Town Clerk.
Town Hall,
Widnes.
15th January, 1958. 8575

COUNTY BOROUGH OF DARLINGTON
BOROUGH ARCHITECT'S DEPARTMENT
Applications are invited for the appointment of an ASSISTANT ARCHITECT. Salary in accordance with the Special Grade of N.J.C. Scales (£750—£1,030) starting at £950 p.a.
The department has a large programme including Secondary and Primary Schools, Housing and Municipal Offices. Preference will be given to candidates experienced in this class of work, and who are members of the R.I.B.A.
Housing accommodation will be made available, if required.
Applications giving full particulars of age, qualifications, present appointment with salary, previous appointments with dates, and the name and address of three referees to be received by E. A. Tornbohm, A.R.I.B.A, A.M.T.P.I., Borough Architect, Central Buildings, Darlington, not later than first post on Tuesday the 28th January, 1958.

H. HOPKINS,
Town Clerk.
8574

WELSH COLLEGE OF ADVANCED TECHNOLOGY
Principal: A. HARVEY, Ph.D., B.Sc., F.Inst.P.
Applications are invited for the post of ASSISTANT LECTURER and STUDIO INSTRUCTOR in the Welsh School of Architecture, a department of the College. Candidates should have been trained in a recognised School of Architecture, be Associates of the R.I.B.A., and have had at least two years' practical professional experience.
The salary will be in accordance with the new Burnham Technical Scale for Assistants, Grade B, £650 × £25—£1,025 (men), plus allowances for degree (or degree equivalent) and training. Allowance will be made in placing on the scale for previous teaching or professional experience.
Further particulars and forms of application may be obtained from the Principal of the Welsh College of Advanced Technology, Cathays Park, Cardiff, to whom completed application forms should be returned, if possible, by 15th February.

ROBERT E. PRESSWOOD,
Clerk to the Governors.
January, 1958. 8573

HEMEL HEMPSTEAD DEVELOPMENT CORPORATION
Applications invited for the following:
SENIOR ARCHITECT (Vacancy No. 96). Salary scale £915—£994 p.a.
Applicants should have passed Final R.I.B.A. examination. Experience in design and execution of housing, neighbourhood shops or industrial buildings desirable.
ASSISTANT ARCHITECT (Vacancy No. 97). Salary scale £543—£625 p.a.
Applicants should have passed Intermediate R.I.B.A. examination and have general architectural experience.
Starting salary in each case according to qualifications and experience.
Conditions of service similar to those in Local Government. Housing accommodation available.
Applications, endorsed with appropriate vacancy number, giving age, education, qualifications and experience and names of two referees, should reach General Manager, Westbrook Hay, Hemel Hempstead, by 31st January, 1958. 8529

HER MAJESTY'S OVERSEAS CIVIL SERVICE
BUILDING SURVEYOR, PUBLIC WORKS DEPARTMENT, HONG KONG
To examine and approve plans submitted by private architects to ensure compliance with the Buildings Ordinance and to administer that ordinance under the Chief Building Surveyor.
Pensionable appointment. Salary £1,245 to £2,178 15s. p.a., plus cost of living allowance. Quarters, if available, at low rent. Free passages for the officer and his family to a total cost of five adult fares. Generous leave. Low income tax.
Candidates must be A.R.I.B.A. or A.R.I.C.S. (Building) with at least one year's post qualification experience, and under 45.
Write Director of Recruitment, Colonial Office, London, S.W.1, giving briefly age, qualifications and experience, quoting BCD. 112/51/02. 8532

HAMMERSMITH
ARCHITECTURAL ASSISTANTS A.P.T. III (£845/£1,025 p.a. plus London weighting). A general knowledge of design of public buildings and housing an advantage. Application forms, returnable by February 1, from Town Clerk, Town Hall, Hammersmith. 8523

UNIVERSITY OF BIRMINGHAM
CLERK OF WORKS
A Clerk of Works is required for buildings due to start shortly as part of the University Development Plan. Salary will be within range of £800—£1,000, according to qualifications and experience. Option of pension benefits. Applications, together with copies of three recent testimonials, should be forwarded to the Secretary, The University, Edgbaston, Birmingham, 15, not later than 31st January, 1958. 8472

LONDON COUNTY COUNCIL
ARCHITECT'S DEPARTMENT
ARCHITECTURAL ASSISTANT required in the Historic Buildings Section for work on applications and notices under Section 30 of the Town and Country Planning Act, 1947. Experience in town and country planning desirable. Salary up to £860 according to experience and qualifications.
Full particulars and application form, returnable by 8th February, from the Architect (AR/EK/1/58), The County Hall, S.E.1. (1) 8550

DENBIGHSHIRE COUNTY COUNCIL
COUNTY ARCHITECT'S DEPARTMENT, WREXHAM
HEATING ENGINEERING ASSISTANT required for preparing, under supervision, schemes, working drawings and specifications. Preference will be given to Graduate or Associate Members of the Institute of Heating and Ventilating Engineers. Commencing salary will be within the scale £750 to £1,030 per annum according to the qualifications and experience of the successful candidate. Application forms may be obtained from me. Completed application forms to be returned to me by 8th February, 1958.

W. E. BUFTON,
Clerk of the County Council.
County Offices, Ruthin. 8577

METROPOLITAN BOROUGH OF BATTERSEA
Applications are invited for the appointment of ASSISTANT BUILDING SURVEYORS to the permanent staff in General and A.P.T. II Grades. Salaries from £500 to £845 per annum, plus London weighting (£30 per annum age 26 and over).
The commencing salary will in all cases be according to qualifications and experience. Preference will be given to students or probationers of the Royal Institution of Chartered Surveyors (Building Sub-division).
The appointments are subject to the Local Government Superannuation Acts 1937-53.
Further particulars and forms of application obtainable from the Borough Engineer and Surveyor, Town Hall, S.W.11. Closing date 8th February. 8528

AYCLIFFE DEVELOPMENT CORPORATION
ARCHITECTURAL ASSISTANT
Applications are invited for the above post from persons who have had at least three years' varied experience. Preference will be given to applicants who are approaching the Final standard of the R.I.B.A. Salary in accordance with Grade A.P.T. IV of the New Towns Whitley Council Scale, namely £728 to £907 per annum.
Appointment subject to N.J.C. Conditions, superannuation, medical examination, and one month's notice, in writing, on either side.
Housing accommodation will be made available if required.
Applications stating age, qualifications, and experience together with the names of two referees, to arrive not later than 31st January, 1958.

A. V. WILLIAMS,
General Manager.
Newton Aycliffe,
Nr. Darlington,
Co. Durham. 8526

BOROUGH OF GILLINGHAM
APPOINTMENT OF ARCHITECTURAL STAFF
BOROUGH ENGINEER'S DEPARTMENT
Applications are invited for the undermentioned appointments.
Two SENIOR ASSISTANT ARCHITECTS. Special Scale £750—£1,030.
Commencing salaries of persons appointed according to qualifications and experience. Applicants to be A.R.I.B.A. and should have experience of housing and school work.
The posts are superannuable and the National Conditions of Service will apply.
Application forms may be obtained from The Borough Engineer, Municipal Buildings, Gillingham, Kent. Closing date first post Tuesday, 28th January, 1958.

FRANK HILL,
Town Clerk.
Municipal Buildings,
Gillingham, Kent.
23rd January, 1958. 8525

METROPOLITAN BOROUGH OF LEWISHAM
TEMPORARY SURVEYING ASSISTANT
Applications are invited for the above appointment, primarily for the surveying of building sites. Salary between £760 and £1,060 per annum according to qualifications and experience. Full particulars and form of application from Town Clerk, (Dept. H), Lewisham Town Hall, Catford, S.E.6. Closing date 3rd February, 1958. 8533

Tenders Invited

6 lines or under, 15s.; each additional line, 2s. 6d.

CITY OF BIRMINGHAM HOUSING-MANAGEMENT DEPARTMENT
CLEFT CHESTNUT FENCING

The Housing Management Committee of the Birmingham Corporation invites tenders for the supply and delivery of approximately 100,000 yards of 3 ft. cleft chestnut fencing, 20,000 yards of 3 ft. 6 in. cleft chestnut fencing and 40,000 4 ft. 6 in. stakes, to be supplied during the twelve months commencing 1st April, 1958.

The attention of persons submitting tenders is drawn to the following points:—

(1) Delivery will be required in 12 equal monthly instalments but deliveries can, if it suits the supplier, be made in advance.

(2) Tenders may be accepted for quantities less than the total amount specified but such tenders must not be for less than 20,000 yards of fencing and 6,000 stakes.

Forms of tender can be obtained from the under-signed at Bush House, Broad Street (corner of Cumberland Street), Birmingham 1, and should be returned by the 14th February, 1958.

J. F. MACEY,
Housing Manager.
8534

Architectural Appointments Vacant

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

HARRY S. FAIRHURST & SON have a vacancy in Manchester for an experienced ASSISTANT. Please apply in writing to 56, Brown Street, 2, giving details of experience and qualifications. First class draughtsmanship is an important consideration for this appointment. 8406

CO-OPERATIVE WHOLESALE SOCIETY LTD. ARCHITECT'S DEPARTMENT, MANCHESTER

APPLICATIONS are invited for the appointment of ASSISTANT ARCHITECTS with experience of work on commercial and industrial projects, capable of preparing working drawings from preliminary details. Five-day week in operation. Applications stating age, experience, qualifications and salary required to G. S. Hay, A.R.I.B.A., Chief Architect, Manchester 4. 8276

ARCHITECTURAL ASSISTANT required by London firm engaged mainly on factory, warehouse and office developments. Salary £800 to £900. Apply Box 8359.

WOKING ASSISTANT required for general practice. Intermediate or Associate standard. Office experience essential. Particulars to H. A. Whitburn & Son, 12 Broadway, Woking 810. 8376

OPPORTUNITY for advancement occurs for Single Young Man of Intermediate or better standard as SECOND ASSISTANT in country Practice.—Reply to Box 8413.

BUSY office in Kensington requires ARCHITECTURAL ASSISTANT approaching Intermediate, with 3/4 years office experience, good draughtsman and sound knowledge of construction essential for work on Licensed premises. Apply: Mayell, Webb & Hart. Telephone: FRE 8596. 8576

NATIONAL COAL BOARD—N.W. DIVISION
DIVISIONAL HEADQUARTERS

(*a*) ARCHITECT GRADE II—
Salary Scale £815×£30—£1,125 p.a.

Applicants must be Associate Members of the R.I.B.A. with working knowledge of contemporary design and construction and experienced in the completion on their own initiative of sketch plans followed by working drawings for varying categories of work.

(*b*) ARCHITECTURAL ASSISTANT GRADE I—
Salary Scale £715×£25—£850 p.a.

Applicants must have experience in the preparation of working drawings and details, and be capable of making accurate site surveys. A good standard of draughtsmanship is required and applicants must have passed the R.I.B.A. Intermediate Examination.

(*c*) QUANTITY SURVEYOR'S ASSISTANT GRADE I—
Salary Scale £715×£25—£850 p.a.

Applicants, who must have passed the R.I.C.S. Intermediate Examination, should be capable of working up and billing in all trades and of carrying out site measurement and taking off minor schemes and sections under supervision together with preparation of final accounts.

Applications stating age, education, qualifications, experience, present employment and salary to the Divisional Chief Staff Officer, 40, Portland Street, Manchester, 1, within 14 days. 8561

ROBERT MATTHEW & JOHNSON-MARSHALL require ARCHITECTURAL STAFF in their Edinburgh office for work on redevelopment schemes, large hospital projects, and a wide variety of University, Power Station, School and Office buildings. Salaries up to £1,350 with placing according to experience. Applications should be marked 'Confidential' and addressed to 31, Regent Terrace, Edinburgh, 7. 8498

WILL any ASSISTANT who prefers to work in a small private office and is interested in the preservation of important historic buildings please apply to L. H. Bond & R. W. Read, 44, Castlegate, Grantham. 8389

ARCHITECTURAL ASSISTANT (A.R.I.B.A.) required on the Architect's Staff of a large Industrial Group near Birmingham. Good prospects of long-term employment for experienced and capable man. Reply stating age, qualifications, experience and approximate salary to Box 8452.

ARCHITECT required by Property Development Company. Applicants must be fully experienced in all phases of commercial development including Town Planning & War Damage matters. Highest salary will be paid according to ability. Apply in confidence with full details, Box 8478.

ASSISTANT JUNIOR required, any age up to and including Intermediate standard for South-West London office. Reply with full particulars and salary required to Box 8479.

ARCHITECTS with large programme of Multiple Store Reconstruction and Shopfitting require (*a*) SENIOR ARCHITECTURAL ASSISTANT with good office experience and (*b*) SHOPFITTING DESIGNER DRAUGHTSMAN experienced in first class work. Commencing salaries £750—£900 according to experience. Stephenson, Gillis & Partners, 2, Saville Chambers, North Street, Newcastle-upon-Tyne. 8480

ARCHITECTURAL DRAUGHTSMAN required for Technical Department of Company manufacturing prefabricated timber structures. Sound knowledge of planning, modern construction and design technique an advantage. Keen man of good all-round ability preferred. Post is permanent and pensionable. Write giving details of age, experience, and salary required. Box 8476.

INTERMEDIATE standard ARCHITECTURAL ASSISTANTS required immediately for busy and varied Private Practice in Gravesend and Rochester, Kent—previous office experience essential. Apply stating experience, age, and salary required to George E. Clay & Partners, A.A.R.I.B.A., 198, Parrock Street, Gravesend, Kent. 8504

WESTON SUPER MARE. JUNIOR ARCHITECTURAL ASSISTANTS required. Intermediate standard. Minimum three years' experience. Interview London or Weston super Mare. Apply full particulars: R. H. Gallannaugh, L.R.I.B.A., 54, Queen Anne Street, London, W.1. 8508

CLIFFORD TEE & GALE require JUNIOR and SENIOR ASSISTANTS with drawing office experience for industrial and commercial work in the Birmingham area. Five-day week. Apply to Mr. R. G. Cox. F.R.I.B.A., 43, Frederick Road, Birmingham. Edgbaston 3676. 8506

ASSISTANT able to develop working drawings from sketch designs and to take complete control of small jobs required in small south-west country practice. Starting salary about £400 according to ability. Enthusiasm and reliability preferred before experience. Accommodation available for suitable applicant. Applicants requiring temporary employment would be considered. Write giving fullest possible particulars to Alec H. Jay, M.A., B.Arch., A.R.I.B.A., Victoria Place, Kingsbridge, Devon. 8570

CENTRAL London Architects have vacancies for three POST-INTERMEDIATE ASSISTANTS. London office experience desirable. Five-day week. Lewis Solomon, Kave & Partners, Thavies Inn House, Holborn Circus, E.C.1. 8557

EXPERIENCED ARCHITECTURAL ASSISTANT required immediately in small London Office, good draughtsman, experience in office and shop fitting design and detailing an advantage. Apply giving experience and salary required. Gale Heath & Co., 15, New Bridge Street, London, E.C.4. Telephone FLE 1651. 8571

ARCHITECTURAL ASSISTANT (senior preferred) required for design office in Hull of Myton, Ltd. (a member of the Taylor Woodrow Group). Excellent prospects for the right man or woman. Pension scheme in operation.—Replies marked "Application." to Myton, Ltd., 169, Clough Road, Hull. Tel. 42277. 8510

ARCHITECTURAL ASSISTANT, Intermediate grade, required, with office experience, ability in design, and good knowledge of construction. Interesting and varied work in pleasant offices. Good salary; 5-day week; pension fund.—For full particulars apply Chief Architect, Bournville Village Trust, Estate Office, Weoley Park Road, Birmingham, 29. 8509

SENIOR ARCHITECTURAL ASSISTANT required at once, salary £800—£1,000, with a view to partnership for qualified man.—Write, giving age and experience, Box 8511.

YOUNG qualified ARCHITECT, with at least 3 years' office experience, required. Enthusiastic and hard worker.—Write, stating age, qualifications, experience, and salary required, to Chief Architect, Granada Theatres, Ltd., 149, Regent Street, London, W.1. 8512

SENIOR ASSISTANT ARCHITECT, 30 to 40 years old, required in Architect's Department of Consulting Engineers. Applicants should be capable of good design and sound construction, and preferably qualified or near-qualified members of the R.I.B.A. Salary £800—£900 per annum.—Application forms may be obtained from Personnel Dept., Sir Bruce White, Wolfe Barry & Partners, 1, Lygon Place, Grosvenor Gardens, S.W.1. Tel. Sloane 0431. 8542

ARCHITECTURAL ASSISTANTS required in office of Leonard J. Multon & Partner, F.F.R.I.B.A. Work embraces Industrial and Office Buildings, Flats, Schools and Hospital projects. Salary Scale £600 to £1,000, according to qualifications and experience. Write, giving full details, to 6, Greenfield Crescent, Edgbaston, Birmingham, 15. 8513

DONALD ROWSWELL requires capable ASSISTANT, of Finals standard, for small rapidly expanding practice in Croydon.—Apply, stating experience, qualifications and salary required, to "Ravenswood," Coombe Lane, Croydon, or telephone ADDiscombe 5458. 8540

QUALIFIED ARCHITECT and ASSISTANT ARCHITECT required for Windhoek, South West Africa.—Write for further details quoting OSS.83/4, to O.T.S., 5, Welldon Crescent, Harrow, Middlesex. 8541

ASSISTANTS required for busy London office engaged in industrial and commercial work. Applicants should be of Intermediate to Final standard, with 3 years' minimum office experience. 5-day week; luncheon voucher scheme; salary by arrangement.—Please apply to: Eric Firmin & Partners, Thavies Inn House, 5, Holborn Circus, London, E.C.1. 8514

ARCHITECTURAL ASSISTANTS. — George Wimpey & Co., Ltd., have vacancies for ARCHITECTURAL ASSISTANTS of suitable experience in the Architect's Department of their Midland Regional office.—Write for Application Form to George Wimpey & Co., Ltd., Building and Civil Engineering Contractors, Chester Road, Birmingham, 24. 8543

ATOMIC ENERGY RESEARCH ESTABLISHMENT, HARWELL,
requires a
Leading
ARCHITECTURAL ASSISTANT

to prepare Surveys (including levelling), Sketch Schemes, Working Drawings and Details, for minor works and adaptations, some of a complex and novel nature.

Applicants should be of Intermediate R.I.B.A. standard, and have had several years' experience in the architectural field.

Salary: £880—£1,060.

Housing, superannuation, and excellent conditions.

Send post card to Recruitment Officer (994Y/119), A.E.R.E., Didcot, Berks., for application form. 8516

CAWOOD WHARTON & CO., LTD., require a TECHNICAL REPRESENTATIVE, in Scotland, for their Lightweight Roofing Department. Applications will be considered from:—

(*a*) Qualified ARCHITECTS, well known to their colleagues in the area, who wish to utilise their professional knowledge in the commercial field and believe that they have the necessary personal qualifications; or

(*b*) Experienced REPRESENTATIVES who possess a proven connection amongst Architects in the area and a sufficient general knowledge of Building to enable them to assimilate Product Training.

Applications for an interview, at which full details of the appointment (which will be pensionable) will be given, must include age, present salary, and a summary of experience.—Staff Manager, Cawood Wharton & Co., Ltd., Southlands, Harrogate. 8515

W. S. ATKINS & PARTNERS require ARCHITECTURAL ASSISTANTS, who are interested in working on large industrial projects such as atomic power stations.—Applications, stating experience, qualifications and salary required, to Personnel Manager, 158, Victoria Street, S.W.1. 8559

ANGRY YOUNG (but expanding) PRACTICE desperate for qualified ASSISTANTS to work on non-valid schemes (luxury flats, anti-Thorneycroft office block, etc.). At least 2 years' post-grad. experience, including flats. Must be very good at everything.—Ring TRA. 4944. 8562

ARCHITECTURAL ASSISTANT, of Intermediate or near Final R.I.B.A. standard, required by a Birmingham Brewery to work on a varied and interesting programme. Experience in Industrial Building design desirable. Pension Scheme, Canteen, Sports Grounds, and other amenities available.—Write, stating age and previous experience, to Staff Manager, Mitchells & Butlers, Ltd., Cape Hill Brewery, Birmingham. 8560

ARCHITECTURAL ASSISTANTS, Intermediate and Final standard, required for Coventry and London offices. Excellent opportunities in varied practice covering wide area. Good salaries, closely related to capabilities, and reviewed annually. Pension Scheme available. 5-day week. House available in Coventry if required. Travelling expenses to applicants selected for interview.—W. S. Hattrell & Partners, 1, Queens Road, Coventry—60668 and 14, Hanover Square, London, W.1. Mayfair 4992. 8558

ARCHITECTURAL ASSISTANTS, approaching final standard, required in busy Birmingham office. Excellent prospects and salaries for men with initiative.—Box 8559.

Architectural Appointments Wanted

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

A.R.I.B.A., wide experience, seeks responsible position. Salary £1,200 p.a. Box 8499.

ASSOCIATE school trained, with 4 years' varied experience, requires post in South East Kent area.—R. J. Pryer, "Little Yockletts," Waltham, Canterbury. 8519

QUALIFIED ARCHITECT and STRUCTURAL ENGINEER, 21 years' experience, requires live active work. No personalities. Industrial, brewery work, commercial. U.K. or Central Africa.—Box 8517.

INTERMEDIATE standard ARCHITECTURAL ASSISTANT, 5 years' experience, desires part-time post (3 days a week) in West Riding area.—Box 8518.

FINAL taken December, age 28, married, 13 years London and provincial, experience requires responsible post in provinces. Modern outlook preferred. Present salary £800.—Box 8553.

STUDENT, R.I.B.A., with part Final and thorough experience, seeks senior appointment with prospects. Interested in interior design and colour. Box 8481.

Other Appointments Vacant

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

SHOP FITTINGS. Applications requested for position (in Scotland) of SHOP FITTINGS SUPERVISOR, conversant all aspects of Shop Fitting Work including details, Costing, and with outstanding ability in Contemporary Design, Lay-out and Presentation. Box 8354.

THE Manufacturers of "CieL" Prefabricated Steel Structures and "Middlesex" Prefabricated Timber Buildings require SALES MANAGER (preferably age 35/45), with imagination, initiative and vision, to organise and develop their already established and rapidly expanding home and overseas sales. Successful sales experience in prefabrication or allied industry would be an advantage, as would an extensive knowledge of overseas markets. Remuneration and progress commensurate with the importance of this top appointment awaits the right man with ambition, personality and character.—Application in writing to the Secretary, J. E. Lesser & Sons, Ltd., Green Lane, Hounslow, Middlesex. 8545

CO-OPERATIVE WHOLESALE SOCIETY, LTD., Architect's Department, Bristol. Applications are invited for the appointment of a SHOPFITTING DESIGNER, with experience in Shop Fronts, Equipment, and Shop Interior Layouts. Applicants should be capable also of preparing specifications and constructional details of fittings, and fixtures, working in conjunction with and under the supervision of Senior Architectural Staff. The post is pensionable, subject to medical examination. 5-day week in operation.—Applications, giving age, details of experience and salary required, to the Branch Architect, C.W.S., Ltd., Broad Quay, Bristol, 1. 8544

DISPLAY ARTIST.—Harrison Gibsons, of Ilford, leaders in design and merchandising methods in the country, require an all-round Artist, capable of visualising promotional and shop fitting schemes, carrying out rough working drawings, and with a leaning towards the practical. A man with experience in stand fitting or exhibition work would be ideal. There are first class working conditions, and what is more important the opportunity to put into practice those ideas which frequently die on the drawing board.—Write, giving details of experience and salary required, to Personnel Manager, Harrison Gibsons, High Road, Ilford. 8522

Other Appointments Wanted

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

INTERIOR DESIGNER (28) with architectural background and wide experience seeks position with West End architect or interior decorator. Box 8572.

Services Offered

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

"DON" ARCHITECTURAL MODEL MAKERS. We offer the highest grade work with speed and reliability.—Please 'Phone Erith 3843 or Hastings 1366. 1673

BILLS OF QUANTITIES, Specifications, Schedules, etc., typed and duplicated. Quality and accuracy guaranteed. Speedy and economical service. Prompt despatch by registered post.—Josephine Sammons, 52, Brunswick Road, Hove, Sussex. Tel.: Hove 70051. 7791

THE SITE SURVEY COMPANY,
Blackheath, S.E.3. Tel.: LEE Green 7444-5.
Fully equipped to undertake urgent Engineering and Architectural surveys in any part of the country and abroad. Specialists in ½ in. scale detailed surveys for extensive city development areas. 1890

ARCHITECT wishes to do part-time work for London Architects, in or out of their office. A.R.I.B.A.—Box 8319.

ARCHITECTURAL, Reinforced Concrete and Steel design and detailing work required. Over 30 Assistants available. MUS. 8753. 5146

WORKING DRAWINGS AND DETAILS undertaken by experienced architectural assistants of Intermediate to Finals. Any amount of work can be handled. 8s. 6d. per hour. BRI 9318.—Box 8430.

SITE Surveys and Surveys of Buildings prepared at short notice anywhere in Britain. MUSeum 8753. 3103

A.R.I.B.A., with own practice, seeks sub-let work (Working Drawings, etc.) from Architects in Beds., Bucks., Herts. or London area.—Box 8520.

CO. DURHAM Architect offers part or entire service to other Architects in area and adjoining counties. No project too large or too small.—Box 8521.

FINAL standard, 13 years' experience, all stages of job, seeks free-lance or temporary appointment. Based Enfield.—Box 8564.

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

STEEL-FRAMED INDUSTRIAL BUILDINGS for Factories, Workshops, Storage, Garages, now in Stock. These are NOT Hangars. 100 ft. × 30 ft. 40 ft. and 50 ft. Single Spans. 200 ft. × 45 ft. 50 ft. and 60 ft. Single Spans. 275 ft. × 90 ft. 135 ft. and 185 ft. Double and Treble Spans. Other sizes also available. Complete Works carried out. Macks Structures (B'ham) Ltd., Belvedere Works, Feltham, Middx. Feltham 5761/2/3. 8546

Miscellaneous

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

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