THE ARCHITECTS' JOURNAL

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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 Ie 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. Eagle House, Jermyn Street, S.W.1.	Whitehall 7264/4175
LMBA	London Master Builders' Association. 47, Bedford Square, W.C.1.	Museum 3891
LSPC	Lead Sheet and Pipe Council. Eagle House, Jermyn Street, S.W.1.	Whitehall 7264/4175
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

4
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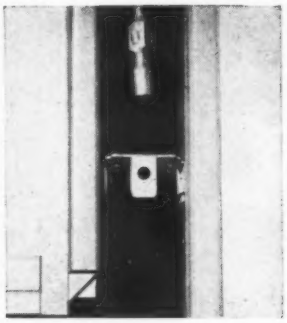
st

8
nc
fir

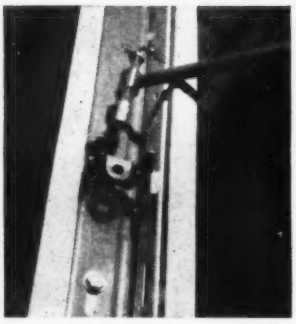
Roften Modular Partitioning is as easy as this to put up — or rearrange

1 Two steel sole plates for each unit of partitioning are screwed to the floor with wood screws.

2 The 40" wide, modular units are bolted to the sole plates. All units are interchangeable.

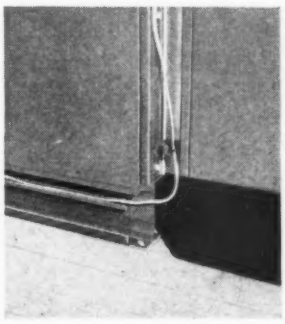


3 Five link plates, at 15" centres, drop into ready pressed out pockets and fix each unit to the next.

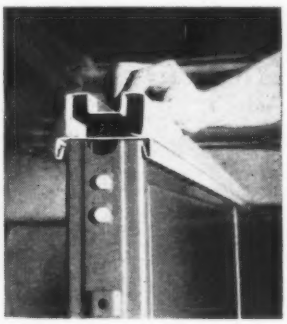


4 Link plates are also used for 3-way fixing — but in this case they are finally bolted in for extra strength.

5 The 40" wide modular door frame, linked in with the rest of the system, is firmly anchored at the foot by a cleat.



6 Electric wiring runs down between partitioning units and along specially provided channels at the bottom.



7 A head channel, cold rolled like all Roften Modular Partitioning sections, finishes off the top of the free-standing screening.

8 Pilasters are clipped on to the notches of the link plates to finish off the joins between units.

9 Skirting is clipped on to the bottom of each unit. Plinths cover the joins in between.

10 Four rubber-buffered glazing beads clip in. Special beads are available for double glazing.

11 Any type of 32 oz. glass slips into the opening, followed by the second set of four glazing beads.

The partitioning installation is now finished. Although it is easy to rearrange, Roften Modular Partitioning is permanent in appearance, all joins are flush, there are no uncovered bolts or screw heads. 13 standard colours are available, and contrasting schemes can be easily arranged at no extra cost. Roften Modular Partitioning will give your client quiet, warm, well laid out *offices — of sumptuous appearance.*

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The panelling of Roften Modular Partitioning units consists of a double skin of 20 B.G. pressed steel. Each skin is backed by ½" insulating board and there is a 1" dead air space in between.

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WILLIAMS HOUSE, 37/39 HIGH HOLBORN, LONDON, W.C.1. Holborn 9861.

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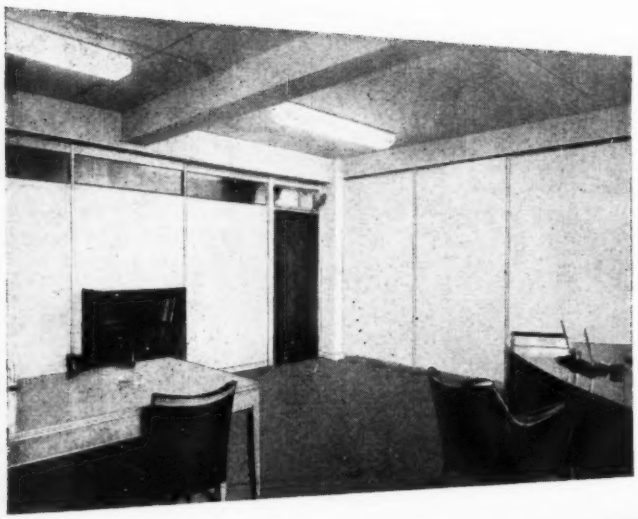
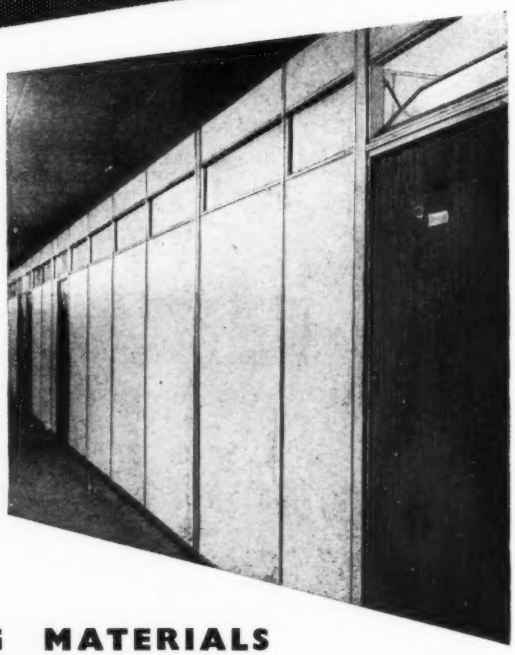


Say Compactom Ltd.

Nowadays, more often than not, partitions are required to do a double job—of dividing a given area and, at the same time, providing the highest possible degree of thermal and acoustic insulation. In these cases Compactom Ltd., use a partition with a "Glinex" core (an inert material composed of flax shives amalgamated with synthetic resins) sandwiched between hardboard faces. The result is not only structurally sound and pleasing in appearance, but effects an improvement in working conditions all year round.

Most "Glinex" panels in their natural state can be supplied in 5 standard sizes, 10 thicknesses and 5 densities. In addition, panels of standard thicknesses and varying densities can be bonded together to meet specific requirements, thus offering a wide range of applications. They can be faced with wood veneers, asbestos-cement, hardboard, aluminium, plastic and other materials. The higher densities can be left in their natural state.



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A 2¼" 'Glinex' core with hardboard facings. *

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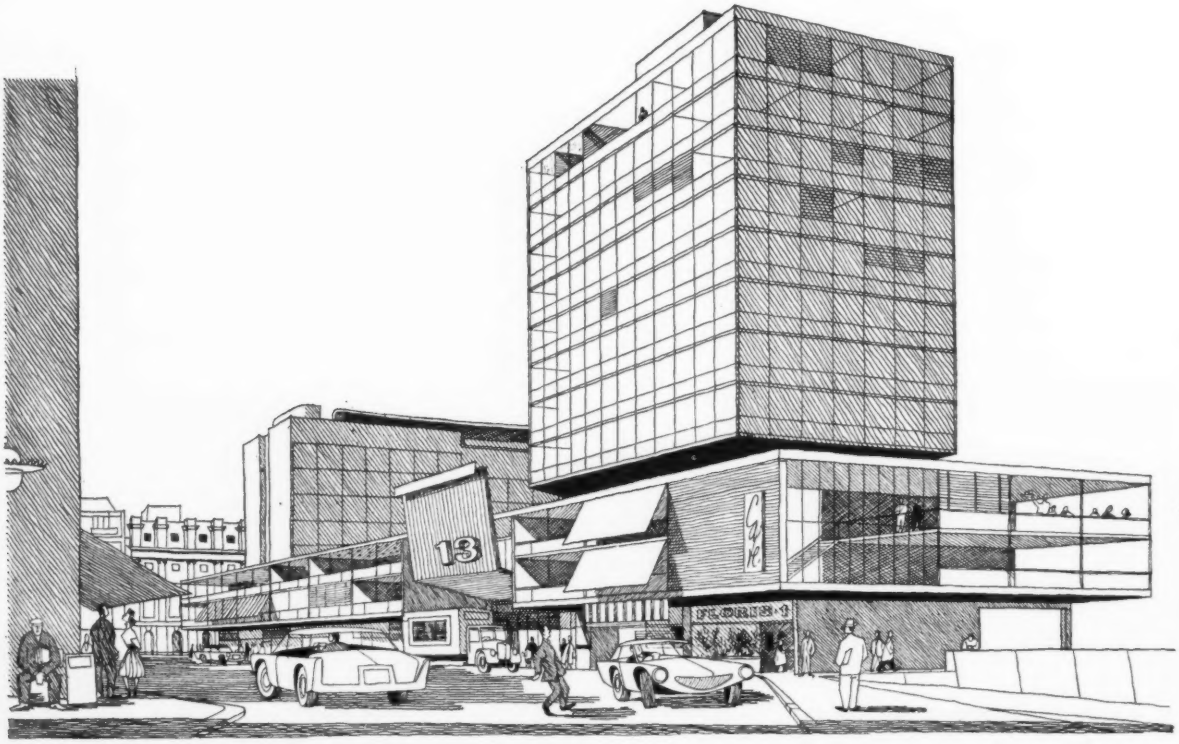

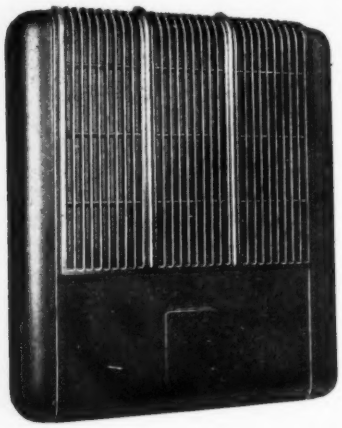

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weatherproof lighting fittings

The "BEAUFORT" Lantern available in two sizes for post top mounting, and two sizes for wall mounting, each providing a choice of seven different forms for Street Lighting or decorative Outdoor Lighting.

from the FALKS range of decorative Outdoor Lanterns

VICEROY

White opal lipless glass 9" diameter with aluminium metal work, finished in blue grey stove enamel, for use with 100/150 watt Lamp, which may be removed through the aperture in the glass-ware.

TYRONE

The spun aluminium reflector for 100/150 watt Lamp is bright etched inside and blue grey stove enamel outside, as is the aluminium alloy bracket and support quadrant.

LONSDALE

An opal glass diameter 7" surmounted by an aluminium reflector supported on a ½" mild steel bracket with spun aluminium back plate, all finished in blue grey stove enamel, apart from the inside of the reflector which is off white stove enamel. This fitting is intended for use with a 75/100 watt Lamp.

Designed by R. F. Steward, A.S.I.A. of FALKS

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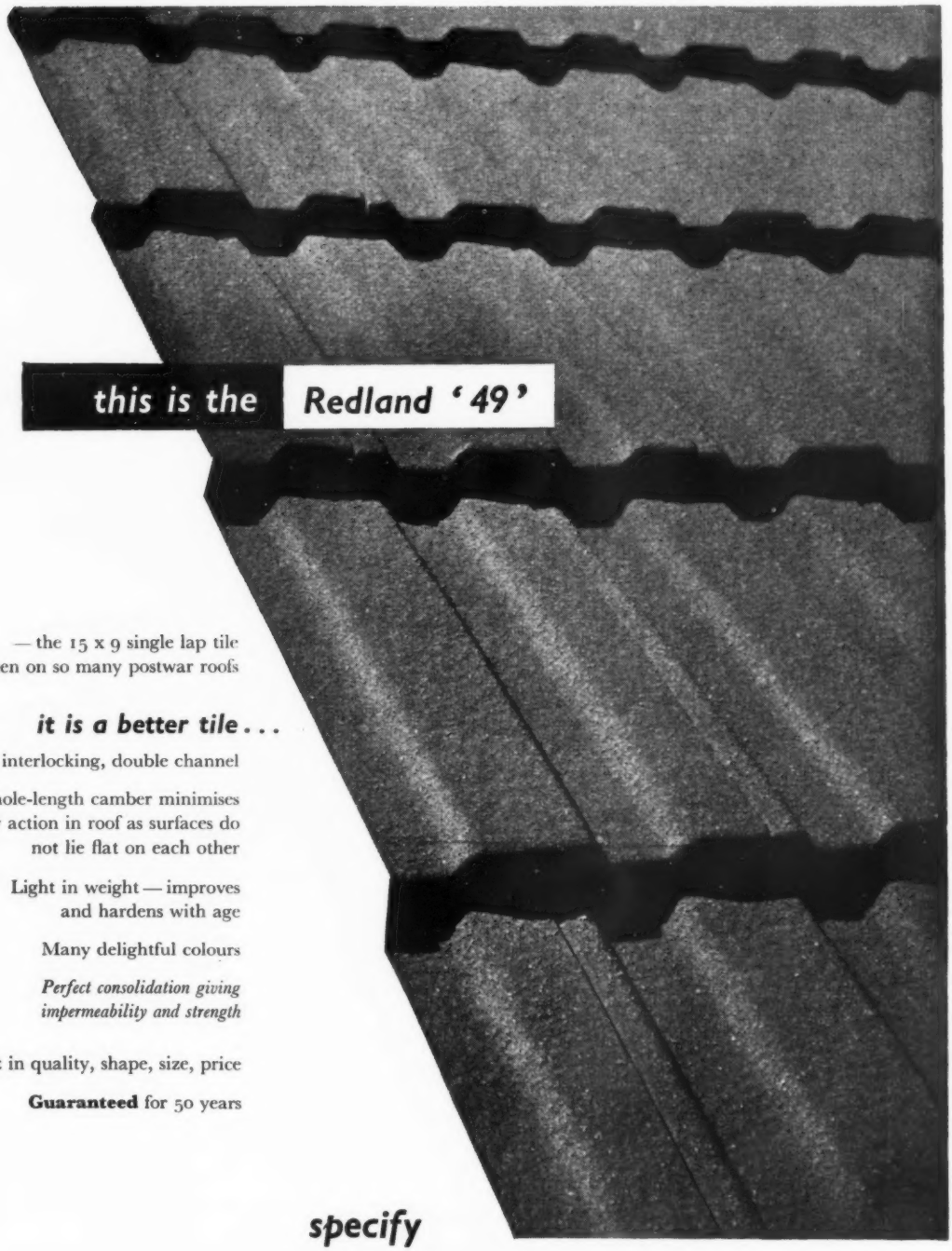

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— the 15 x 9 single lap tile seen on so many postwar roofs

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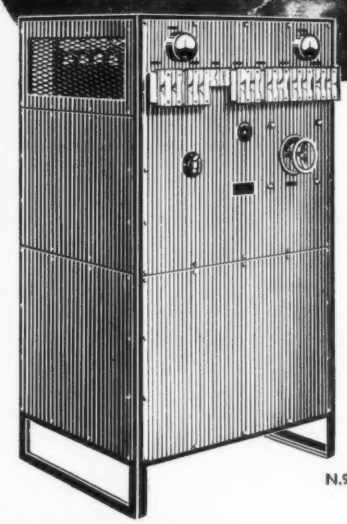
YOU CAN BE CERTAIN TOO that Nife-Neverfayle Emergency Lighting Equipment will never let you down. *Whenever needed*, these reliable units will instantly, automatically spring into action. That is the special advantage of the Nife Steel Alkaline Battery—it never deteriorates, even after long periods of inactivity. Nife-Neverfayle units occupy only one-third of the space required by conventional equipment, and, as they can be installed adjacent to other equipment, a separate battery room is not needed — a point worth remembering when planning new buildings. Maintenance costs are negligible—after years of trouble-free service you will realise just how economical your Nife-Neverfayle equipment has been.



N.91

NIFE-NEVERFAYLE

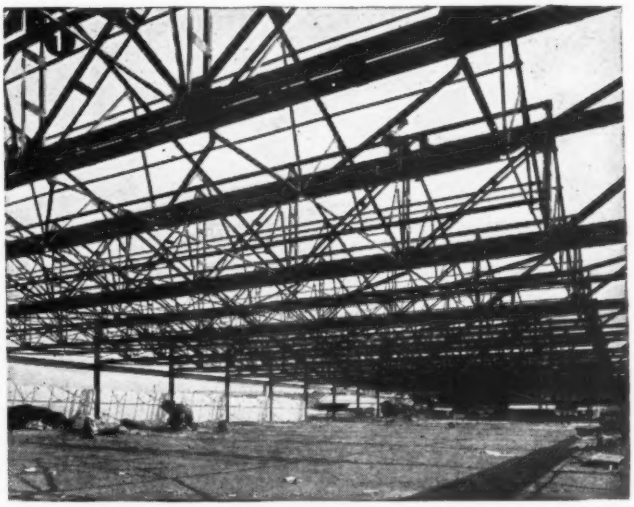
THE EMERGENCY LIGHTING EQUIPMENT WITH THE **STEEL** ALKALINE BATTERY

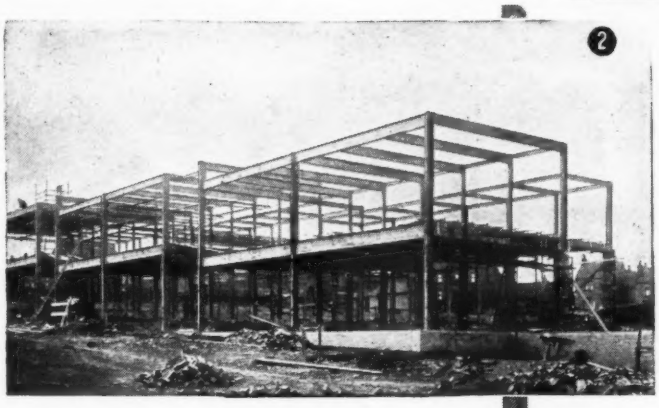
NIFE BATTERIES · REDDITCH · WORCESTERSHIRE

Design

Fabrication

Erection



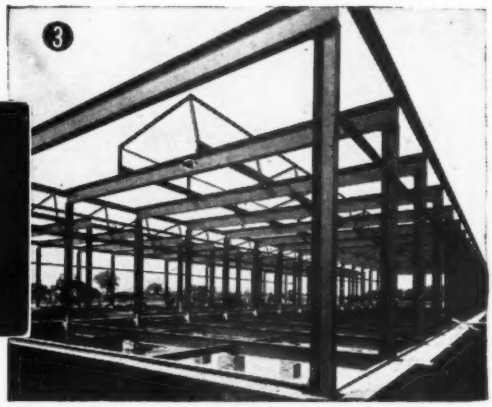


1 New factory building for Messrs. William Cooke & Co. Ltd. of Rotherham. 300 ft. x 120 ft. span.

2 The County Primary School, Crosland Moor, Huddersfield.

3 College of Further Education, Grimsby, in course of erection. Stage 1.

4 The completed College. Stage 1.



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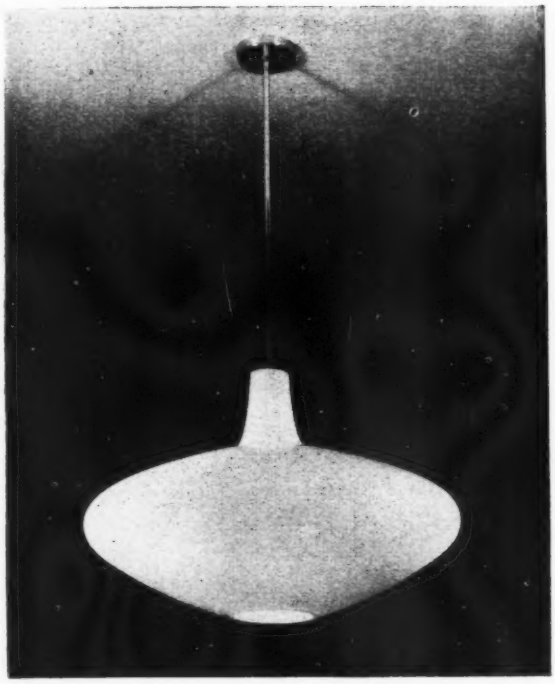
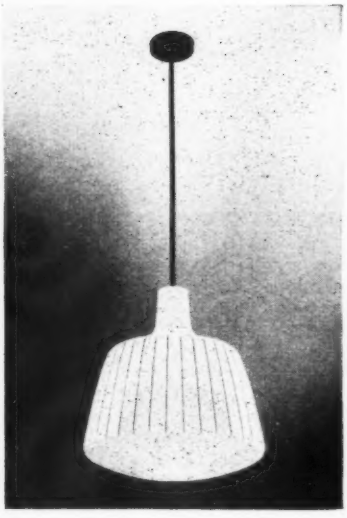
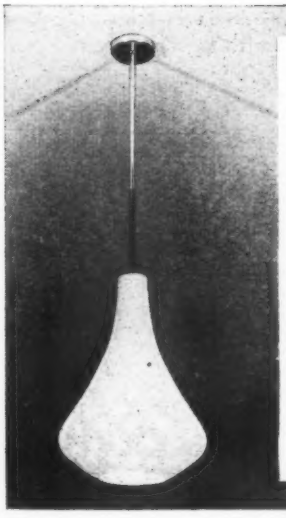


interesting new fittings

in decorated glassware





Top **A.521**
White flashed opal glass, satin finished 20 in. diameter.

Left **A.535**
Obscured glass with alternate mauve and white spirals 12 in. diameter.

Centre **A.528**
White flashed opal with alternate black and yellow lines 12½ in. diameter.

Right **A.547**
White flashed opal with bubble decoration 10¼ in. diameter.

Normal overall length supplied 3 ft.

These new designs by Troughton & Young are the latest additions to the MONDOLITE range of lighting fittings and consist of four basic shapes available in plain flashed opal glass, plus a selection of decorative effects. All glassware is open at the bottom to allow re-lamping, and to prevent the accumulation of dust and insects. Lamp size up to 200 watt. The glassware is easily removed for cleaning without the aid of tools. Suspensions are available in satin black or polished brass.

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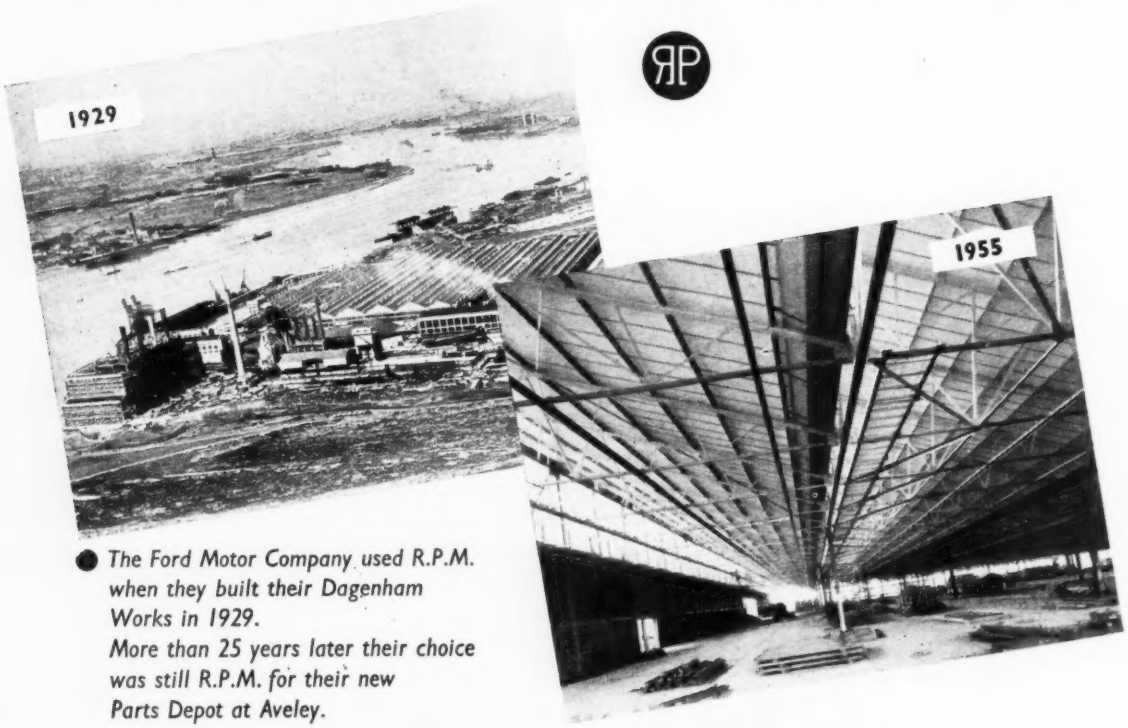

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is used by the Leaders of Industry the world over

The Fire test at Uxbridge demonstrated a well-established truth.
Bitumen can be ignited if its temperature is raised above 550°F ***but it does not support its own combustion*** *— it must be fed by heat from sources outside itself if it is to remain alight.*

Robertson Protected Metal Sheets have a 35 years record of outstanding service in Britain. Their durability has been proved in every kind of industry.

Three specifications are now available—R.P.M.; Galbestos and Galbestos coated-one-side and these three specifications cater effectively for varying corrosion and fire hazards.

Robertson Protected Metals have a Certificate from the Fire Research Organisation which rates them as having negligible flame spread in external exposure and more than two hours resistance to fire penetration.

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PM 1

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Thousands of tons are used annually in the construction of factories, hospitals, schools, offices, flats and houses throughout the country.

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(weighs approximately 4.0 lb. sq. ft.)
for roof-decking,
wall-linings, etc.

Stramit roof-decking has superb sound-reduction, fire-resistance and thermal-insulation values (the U-value of Stramit with felt weathering is 0.24 without ceiling).

Weights of Stramit roofs are low. The deck, above the framing, plus felting weighs from 52 to 55 lb. per square yard (i.e. only 6 lb. per sq. ft.). This permits calculated allowances of only 15 lb. for snow and wind.

Costs, too, are low. A felted Stramit roof costs from only 27 6 to 30 - per square yard, supplied and fixed.

Stock sizes: 4 ft. wide x 6, 8, 9, 10 and 12 ft. long. Special sizes (made to order): Any width up to 4 ft. and any length (greater or less than 12 ft.).

Remember

STRAMIT ROOF-DECKING

. . . permits all-dry construction

. . . weighs only 6 lb. per sq. ft. (including felt)

. . . has a U-value of 0.24, without ceiling

. . . costs (including felt; delivery and fixing) less than 30 - per sq. yd.

. . . will resist penetration by fire from the outside for a minimum of two hours. Some Stramit slabs have a Class 1 spread of flame rating in the B.S. 476 1953 Test.

Also available .

Standard Quality (weighs approximately 3.8 lb. sq.ft.) for ceilings, partitioning, factory screens, etc.

Low-Density Quality (weighs approximately 3.2 lb. sq. ft.) for non-load-bearing thermal insulation.

Stramit Slabs can be supplied with facings of asbestos-felt, hardboard, metal or fabric.

Available from leading merchants

STRAMIT
—THE TWO-INCH THICK
BUILDING SLABS

A TYPICAL CASE HISTORY

Shown above is part of the damage caused by a fire which raged for some hours at a school in Saffron Walden, Essex. The Stramit roof (seen intact and unburnt amidst fractured brickwork, charred woodwork and damaged steel trusses) limited the fire to the Chemistry Laboratory. And the Stramit roof-decking wasn't even asbestos lined. If it had collapsed, sparks and lighted fragments would have set fire to adjacent buildings. But the roof didn't collapse, for Stramit defies fire!

THE ARCHITECTS' JOURNAL
(Supplement) October 10, 1957

STRAMIT ROOF-DECKING

DEFIES FIRE!

IT'S A FACT! There's not a single case on record of Stramit aggravating a fire. And on many occasions Stramit *has actually resisted the passage of fire.* Even when it's under a bituminous covering, Stramit roof-decking keeps fire at bay.

Why is this? Because Stramit has high insulation properties. Even when subject to fierce flames for long periods, Stramit stands firm. It carbonises slowly and the carbon forms an effective coating that resists the spread of fire. Stramit roof-decking is available with an asbestos-felt facing which gives it a Class I rating (surface of very-low flame spread B.S. 476 (1953) Surface Spread of Flame Test) in cases where specially high demands are made on the ceiling.

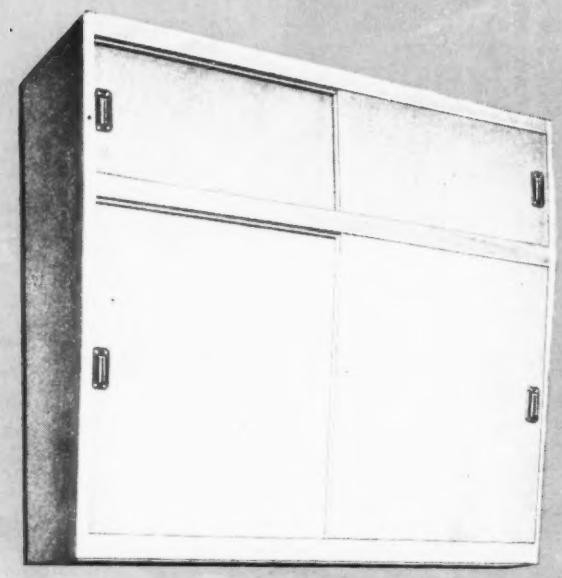
FACTS prove it. A Stramit slab without joints under asbestos-based bituminous felt covering (as defined in B.S. 747, 2A and 1E) was tested at the Fire Research Station, Boreham Wood, Herts, to discover whether it afforded 'adequate protection against the penetration of fire into a building roofed in this way' as required by Bye-Law 49. It resisted penetration for a considerably longer period than some other roof constructions already acceptable under Bye-Law 49. And even after this prolonged test, *lasting two hours,* the felted Stramit didn't flame.

Report F.R.O. S.I. No. 725 available on request.

FACTS show that Stramit resists an oxy-acetylene flame of 5,000°F (which would melt iron in seconds) for long periods. As soon as the flame is removed, the glow disappears from the Stramit slab, which doesn't even smoulder, curi or distort.

FACTS show that the spread of flame on Stramit roofs with a finish of organic-based felt is approximately the same as for a similar amount of organic-based felt on a *two-inch concrete roof.*

STRAMIT BOARDS LTD, COWLEY PEACHEY, UXBRIDGE, MIDDLESEX
Phone: West Drayton 3751



- Kingston improved 'Scandinavian' Kitchen Fitments will ease the problem of planning restricted kitchen space.
- They have been developed as a result of considerable experience in the manufacture of first quality joinery and create a perfect blend of contemporary design and traditional craftsmanship.
- They have a large cubic capacity of storage space.
- Space saving sliding doors are incorporated in both floor and wall units.
- The wall units have a receding front providing maximum access to the working top of the floor units.

Illustrated brochure on request.

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New Design

SCANDINAVIAN KITCHEN FITMENTS

offer these advantages

- **Framing:** Flush plywood ends on stout framing, the plywood being applied under pressure using Urea Resin adhesive.
- **Doors:** All doors are of ¾" solid blockboard with blemish free flush faces. They have solid tongued runners at the base and hardwood guides at the top.
- **Shelves:** The floor unit shelves consist of a framing, jointed at angles, covered on one face with plywood, glued and pinned securely in position.
  The wall unit shelf is of solid timber.
- **Drawers:** These consist of solid 1" parana pine fronts dovetailed to solid timber sides and back. The drawer bottom is of 5 mm. plywood which is grooved into the front.

KINGSTON ARCHITECTURAL CRAFTSMEN LTD., MINSTER WORKS, HULL

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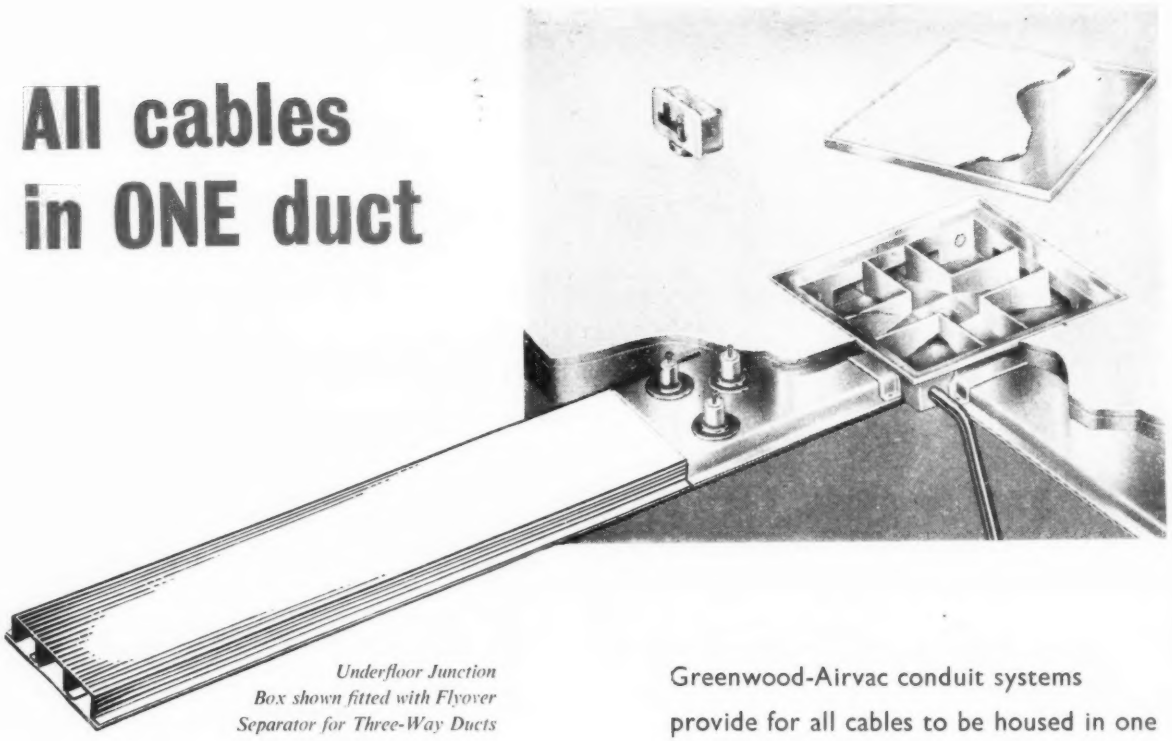

Underfloor Junction Box shown fitted with Flyover Separator for Three-Way Ducts

Greenwood-Airvac conduit systems provide for all cables to be housed in one duct with adequate screening between telephone and power cables. The unique construction of the underfloor system enables it to be laid where necessary in only $1\frac{1}{2}$" of screed, and for applications where underfloor fitting is impracticable, a skirting system is readily available. Please write or telephone for the publication 'Greenwood-Airvac Conduit Systems' or call to see the demonstration layout in the Beacon House showroom.

Walbrook House, Cannon Street, E.C.4

Arch:— Henry Tanner Esq.
Cont:—F. G. Minter Ltd.
El. Cont:— Berkeley Electrical Eng. Co. Ltd.

Photograph by courtesy of "The City Press"
Another Greenwood-Airvac Conduit underfloor installation

THE BUILDING EXHIBITION 1957 Olympia, London November 13-27

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APPROVED BY THE FIRE OFFICES COMMITTEE

Model 1301 Universal (Royal Navy) Extinguisher. . FOC Ref. NO. 104/6 for Class A fire risks (*fires involving wood, paper, textiles and other carbonaceous substances*).

Model 1400 Air Foam Extinguisher..... FOC Ref. NO. 104/3 for Class B fire risks (*fires on petrol, greases, oils, paraffin, white spirit and diesel oil*).

Model 1003 Auto (CTC) Extinguisher.....FOC Ref. NO. 104/5 for Class C fire risks (*minor electrical risks and small petrol fires*).

Model 2003 Auto (Chloro-Flash) Extinguisher.....FOC Ref. NO. 104/7 for Class B & C fire risks (*extra-hazardous fires involving spirits, alcohols, organic solvents and electrical equipment*).

Model 1604 Dry Powder Extinguisher.....FOC Ref. NO. 104/8 for class B & C fire risks (*inflammable liquids of every type—unless they are shielded—and all electrical risks*).

All these models comply with British Standard specifications, where these exist. No British standards exist for chlorobromomethane extinguishers or double-action nozzles like that of the Universal extinguisher. But special FOC approval has been given to these Nu-Swift features because of their increased efficiency.

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(British Standard Code of Practice C.P. 402.401 (1951) is published on behalf of the Council for Codes of Practice for Buildings by the British Standards Institution.)
Universal (Royal Navy) Extinguisher Model 1301 for .. Class A fires
Air Foam Extinguisher Model 1400 .. .. .. Class B fires

ACCEPTED BY THE LONDON COUNTY COUNCIL

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Nu-Swift extinguishers are the only ones on the market to combine these essential advantages.

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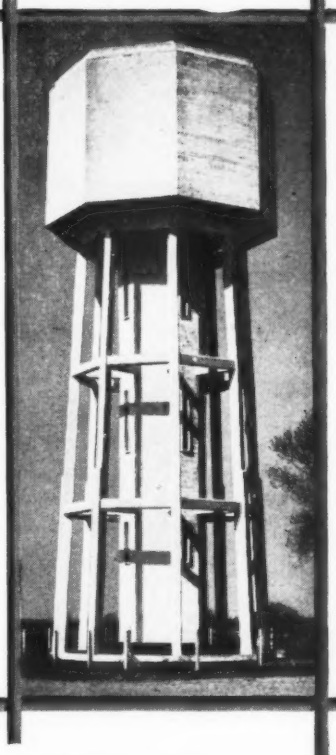
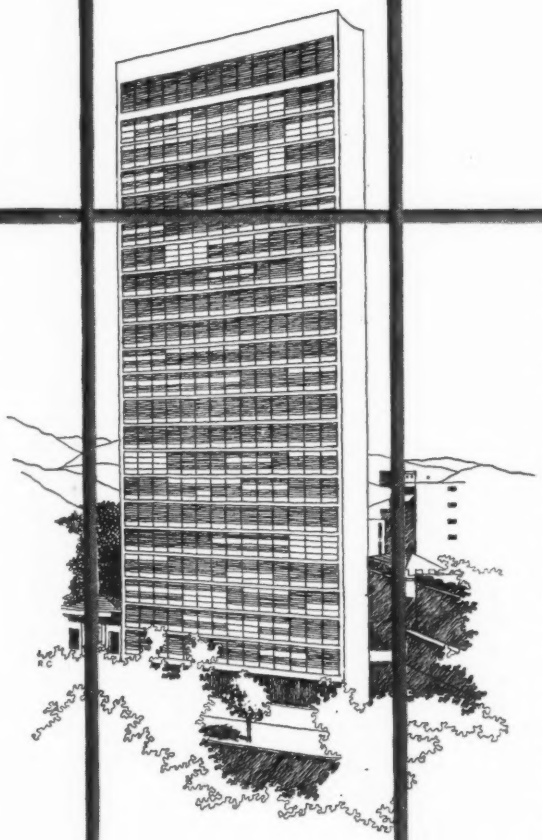
Maxweld reinforces it





Day by day, MAXWELD reinforces it: reinforces concrete and brickwork, reinforces its own reputation. MAXWELD fabric is made to BSS 1221 Part A—and closely controlled for quality from raw material onwards.

Do you need reinforcements?
Call up the MAXWELD man!

He'll tell you all about MAXWELD and what it can do for you. He'll tell you what type you need, how much you need, and how much it's going to cost you. He's backed by *Richard Hill's Design Service*, always ready to work out detailed plans and estimates. He's backed by a first class product—and a first class delivery service. Call up the MAXWELD man—at Middlesbrough, London, Birmingham, Manchester, Leeds, Bristol or Glasgow.

Maxweld fabric

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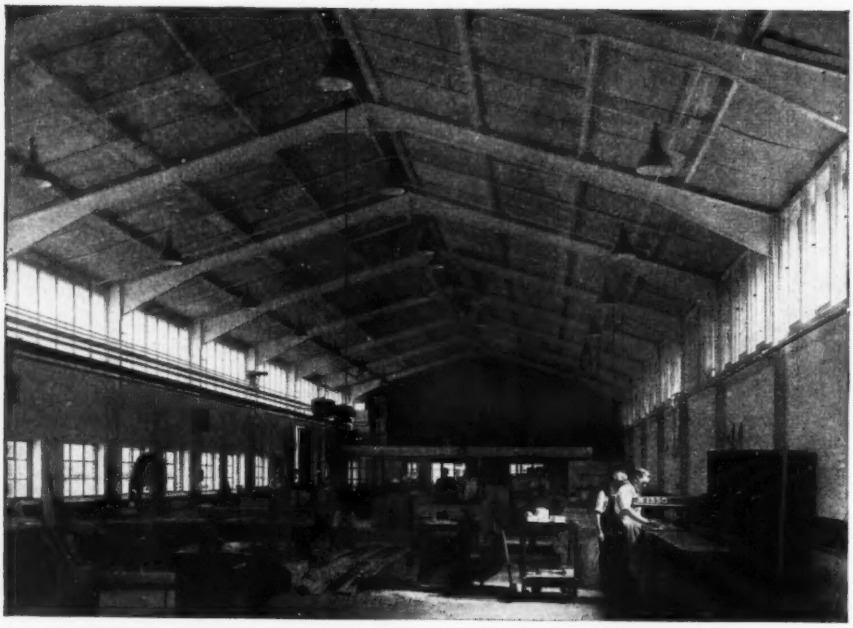

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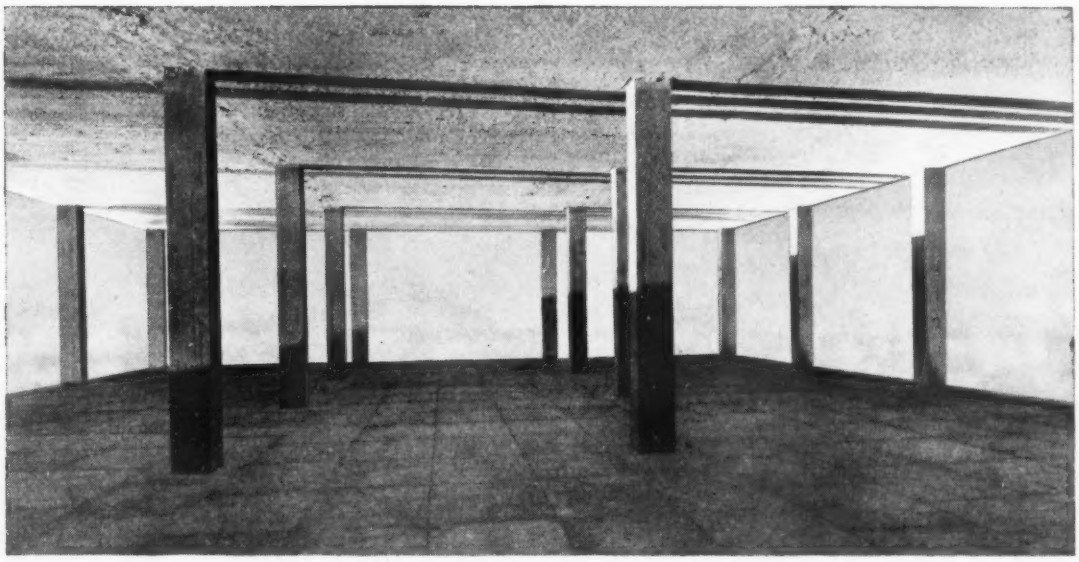

Illusion v.v.

It depends which way you look at it. With the Plate System by Truscon a floor, seen upside down, becomes a ceiling. And v.v. (*vice versa*). Can you tell which is really the floor?

The clue is that when we design and construct in the Plate System we provide a concrete frame without beams. We do not do this by making them into walls, or by using heavy, deep floors, or drop panels with flare-heads to the columns; but simply by designing the beams away.

The Plate System is at its best with a regular grid, yet it is often the only reasonable solution when columns are irregularly placed.

The Plate System does not compress an architect's work within the framework of a stereotyped plan nor does it attempt to do his work for him. It is more than a system of design, for combined with careful planning and the use of cranes and precast components we have made it a very rapid system of construction. It is cheap in cost but not in appearance.

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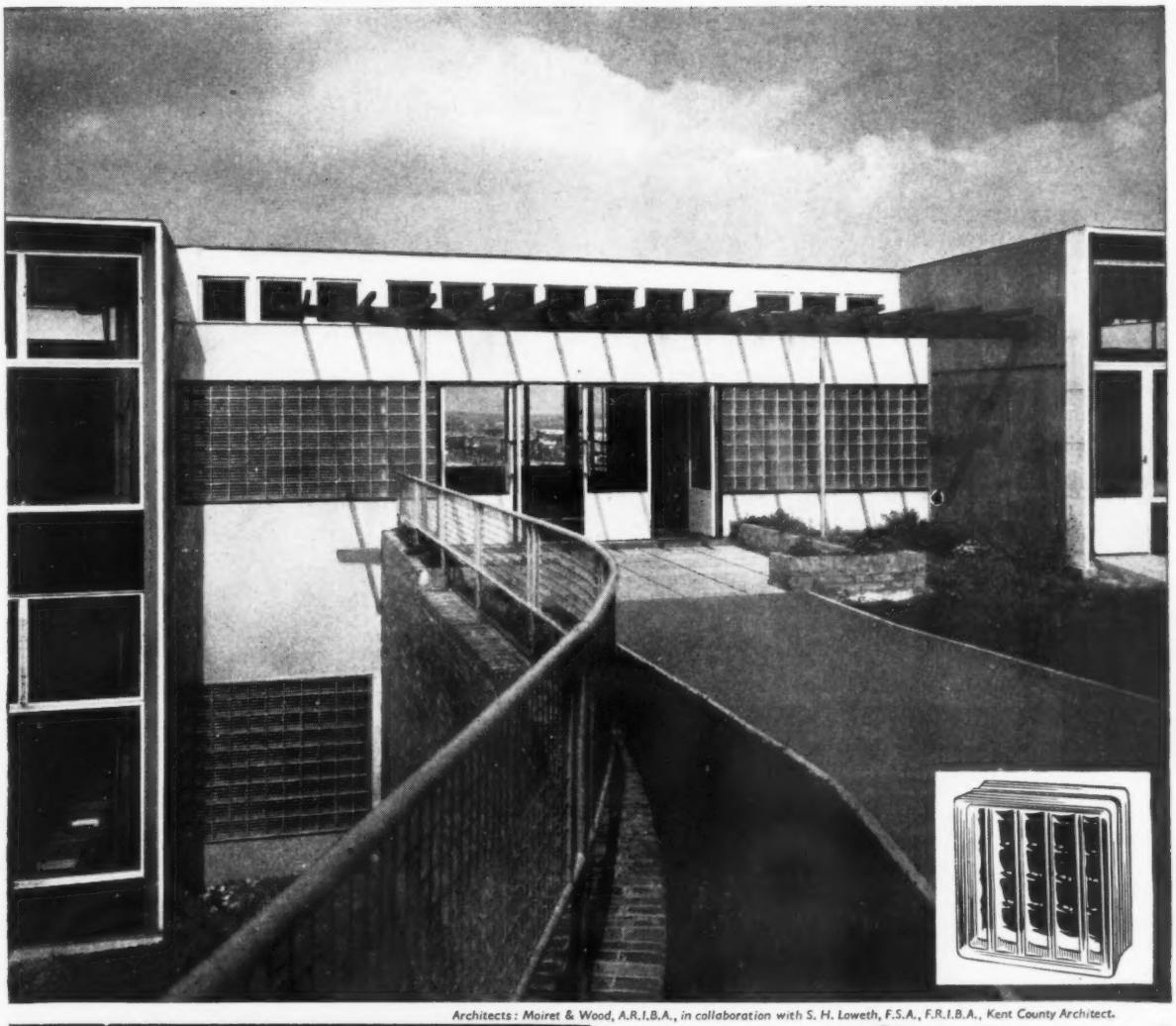

Architects: Moiret & Wood, A.R.I.B.A., in collaboration with S. H. Loweth, F.S.A., F.R.I.B.A., Kent County Architect.

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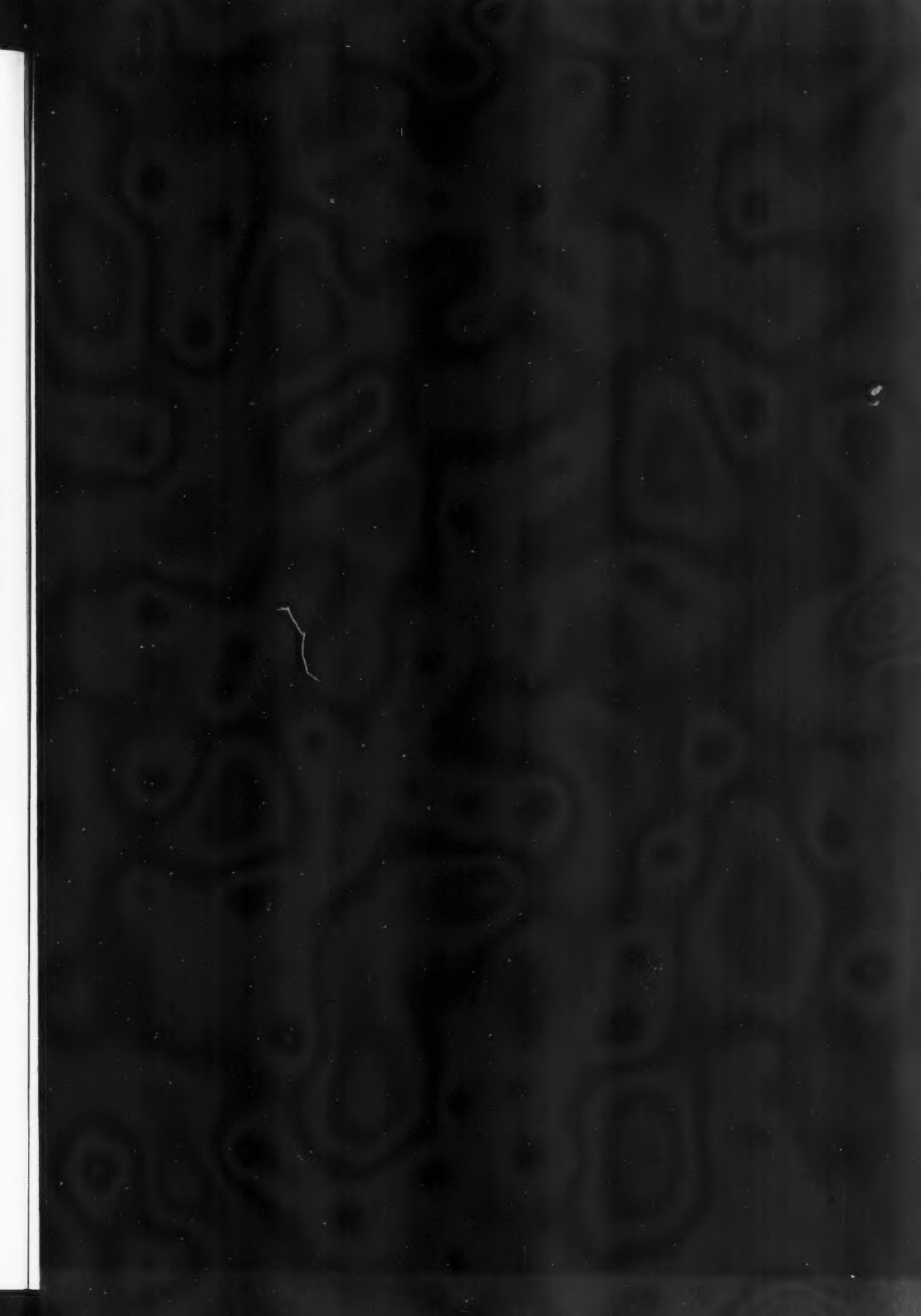

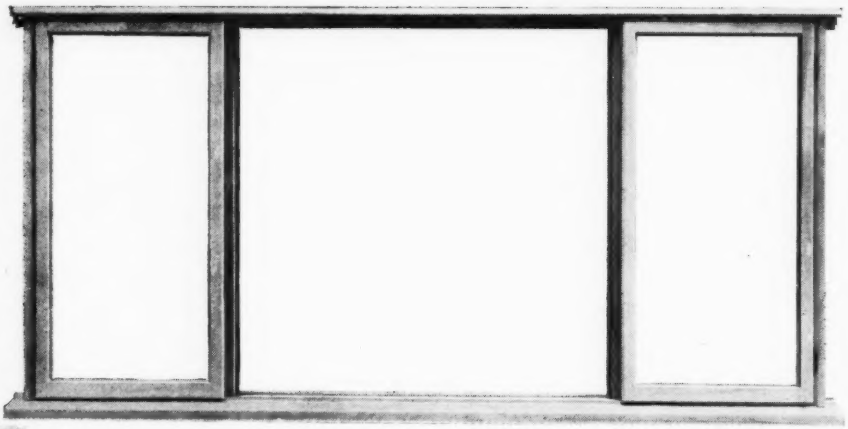

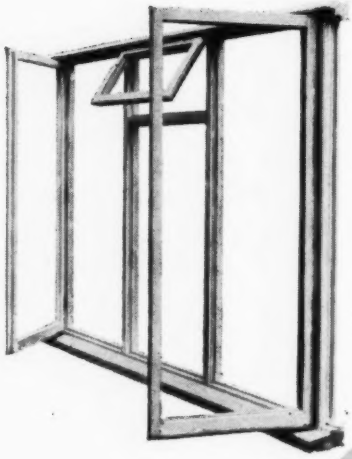

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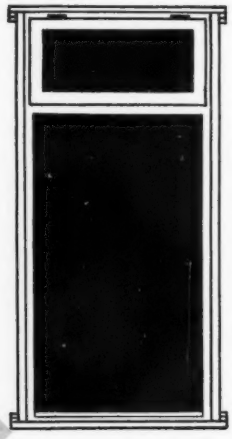

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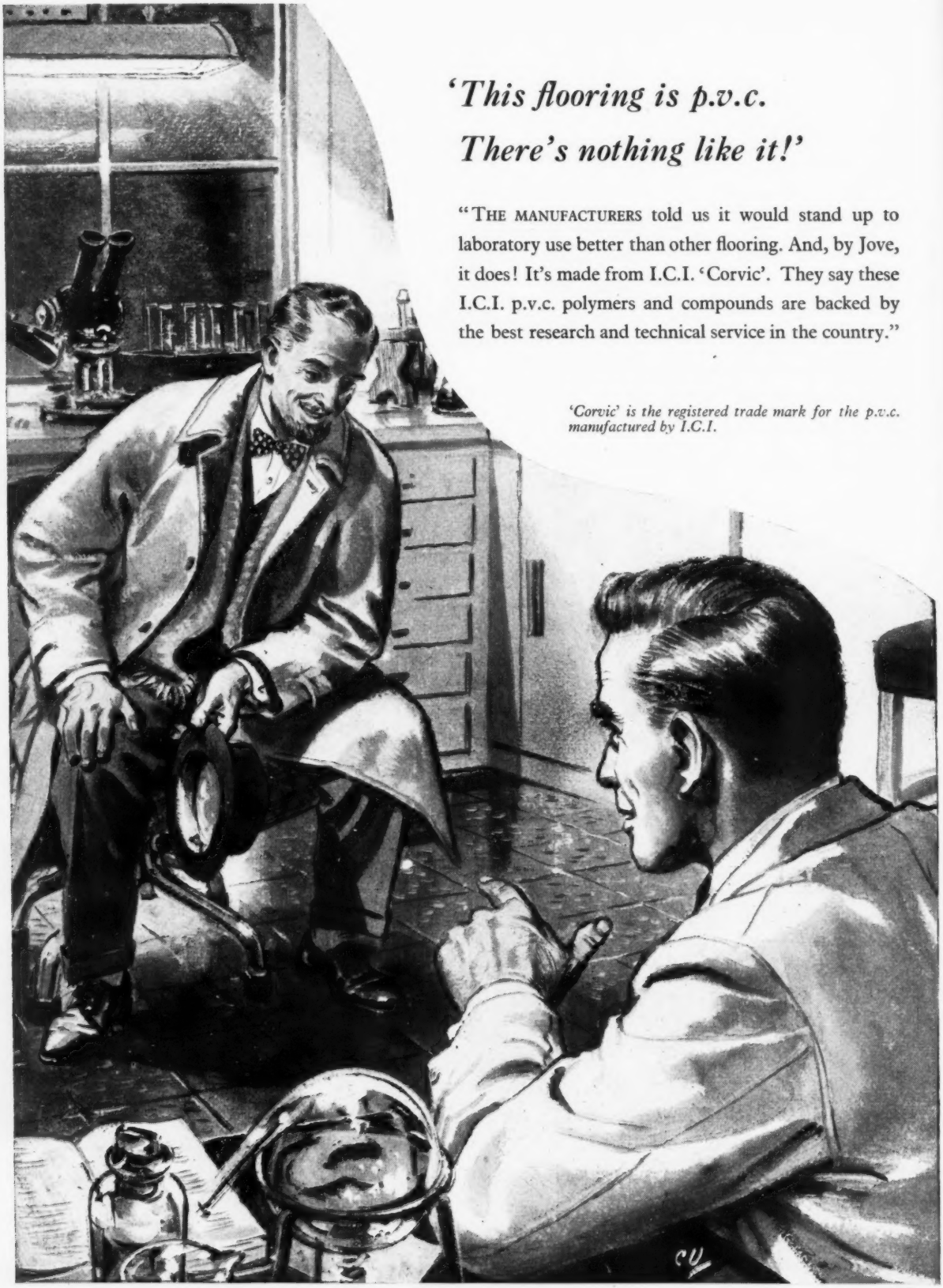

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BURGESS acoustic tiles are in the form of pressed metal trays, each 1½in. deep, perforated with $\frac{3}{32}$in. diameter holes at $\frac{5}{16}$in. centres. The trays are filled with sound absorbent glass silk, rock wool or other media.

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BURGESS acoustic tiles form the perfect fireproof metal suspended ceiling. A complete suspension system is available for all conditions.

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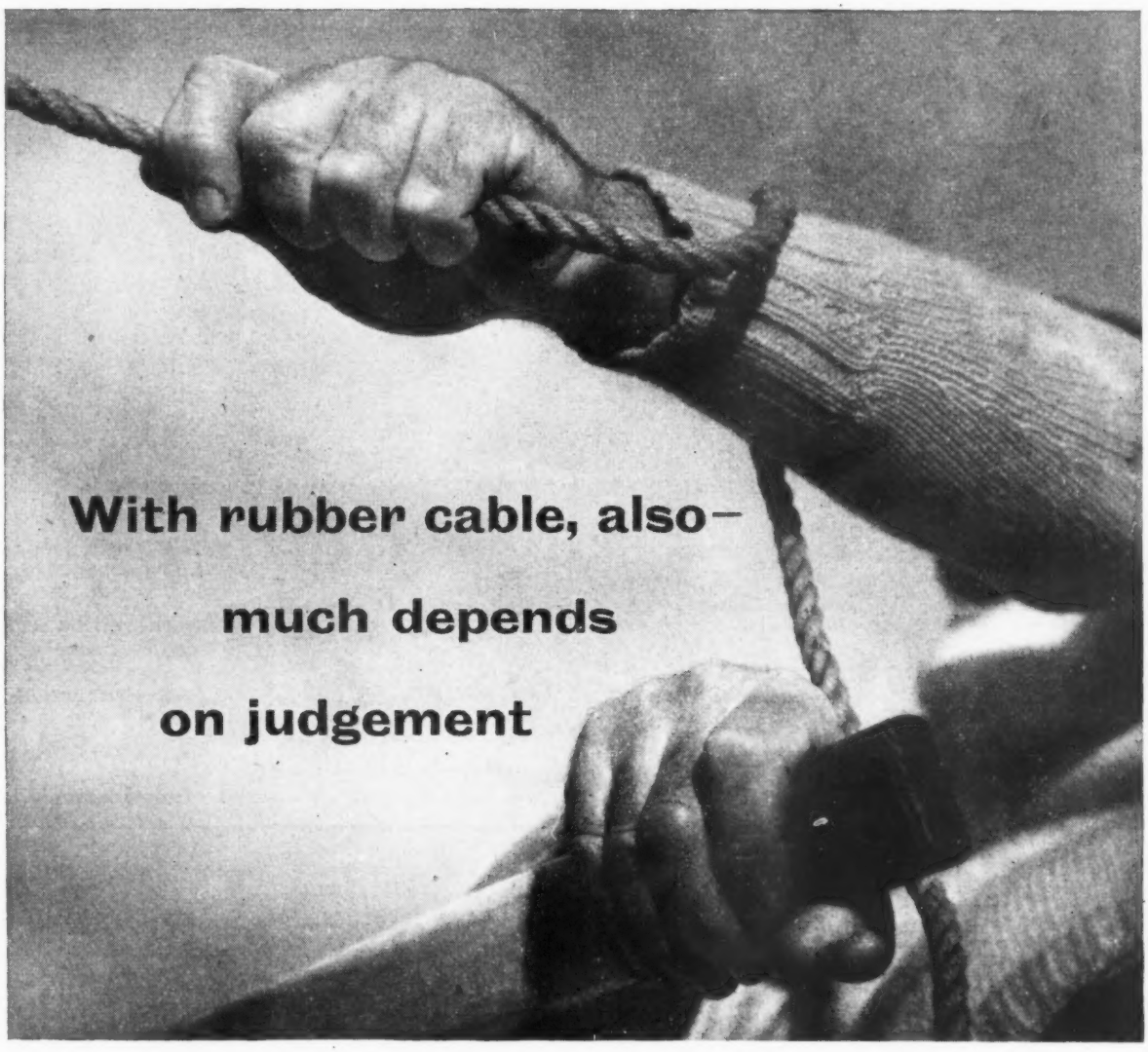

It would undoubtedly be possible to design an automatic helmsman to sail a dinghy — but it is doubtful whether it would win races. The helmsman's skill has been acquired slowly during years of sailing. He knows — in his muscles as well as his head — far more about winds, tides, and the boat itself than he or anyone else could hope to put into words, mathematical notation — or holes punched in a card. You find experience of the same kind — though in this case corporate experience—playing an important part in any Company that has been making, say, rubber cable for a long time. And it has the same result. It is akin to skill, and is sometimes called 'craftsmanship'; it is akin to knowledge which the Americans often call 'know-how'; but it isn't exactly either, and 'experience' is too general. But, even if we haven't a word for it, it's easy enough to recognise, and that's why the name on a product can mean so much.

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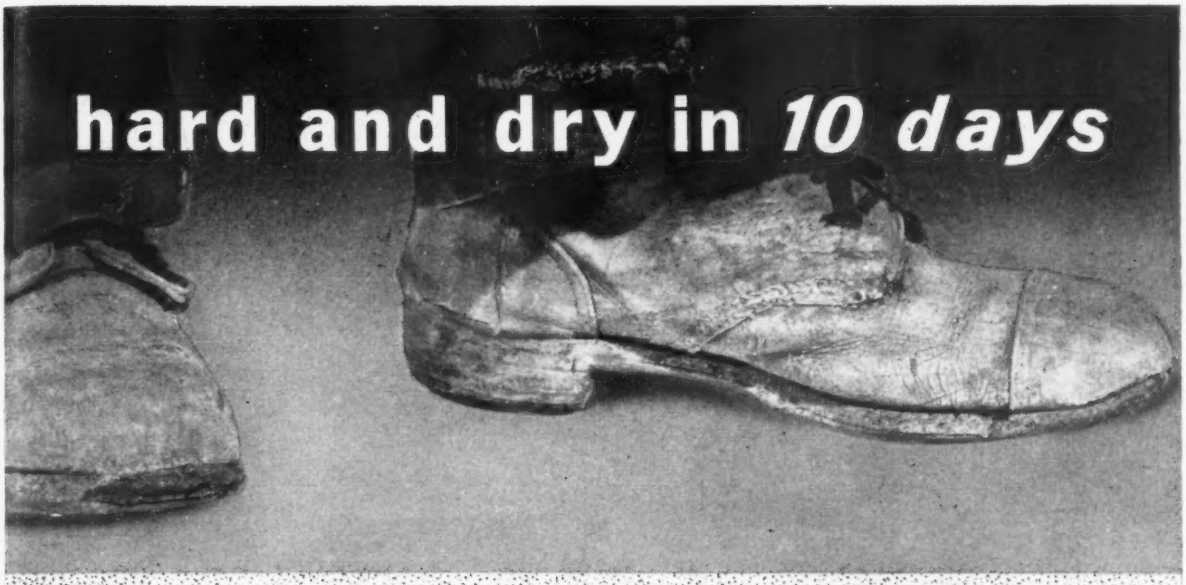

SYNTHANITE

THE FLOOR SCREED THAT SAVES WEEKS IN CONSTRUCTION TIME

SYNTHANITE is a new screed binder with phenomenal hardening and drying qualities. Six to ten days after being laid, a Synthanite screed is hard and dry. No more waiting four to six weeks for this stage of construction. The use of Synthanite therefore allows earlier occupation of the building, and that means saving of time, labour *and* money.

Great strength and virtual absence of shrinkage are outstanding qualities of a Synthanite screed. Up to 600 sq. yds. can be laid at a time with no joints and little fear of cracking. There is no risk of having to do repairs later, and an excellent surface for all floor finishes is obtained.

Laid on top of an acoustic mattress, Synthanite continuous screed forms an ideal sound insulator, and need be no more than 1¼in. thick for this purpose with no reinforcement.

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140 West George Street, Glasgow, C.2. Tel: Douglas 7233

John Hadfield & Sons Ltd.
Effingham Street, Sheffield, 4. Tel: Sheffield 24082

Clifford Hughes & Co. Ltd.
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For full information write to any of the above firms or to: **Morris de Leval Limited,**
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WARDLE

PATTERNS

THE mosaicist was no doubt amused at his own creation as he put together a picture of a fat and bibulous Silenus over-burdening his beast. Yet the years have given proof of the long-lasting endurance of this miniature form of "tiling" and the lively opportunity it gave for the use of colour in decorating floors. Semtex, the modern flooring tile, affords a more general opportunity for design. *Whole* areas can follow an integrated pattern in either traditional or contemporary style, which can be picked out in contrasting colours.

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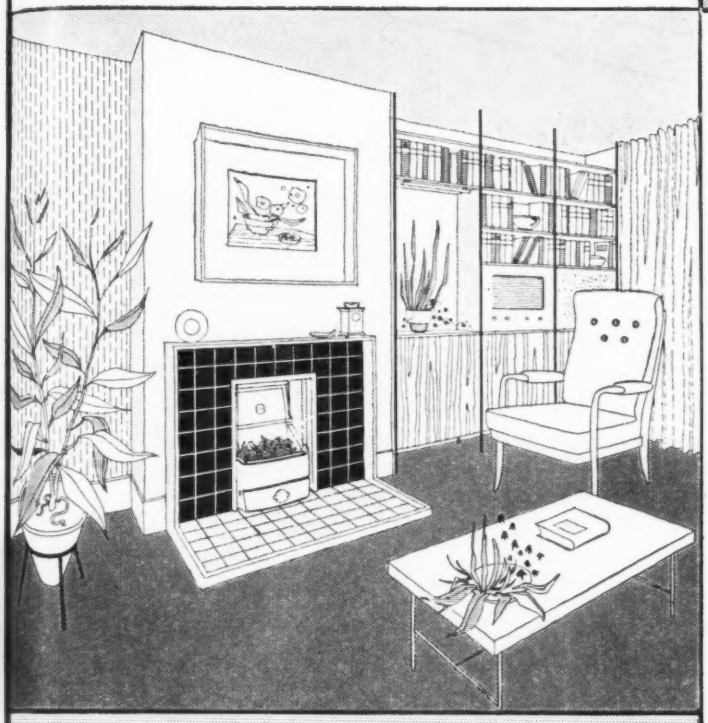
OF PROGRESS

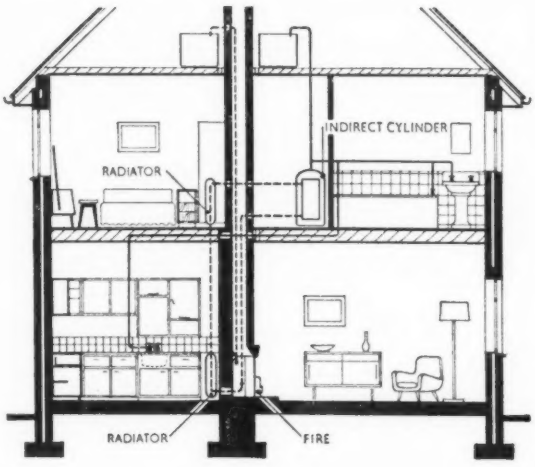
This mosaic, now in the Museo Nazionale, Naples, originally formed part of the floor in the house of Paquius Proculus, a citizen of ancient Pompeii. It depicts Silenus, son of Pan, nurse, preceptor and attendant of Bacchus, proving too great a burden for his ass.

7/58/516



The No. 3 BROOK Fire

Continuous-burning fire with unusually high-powered boiler: a lot of heat for a moderate cost



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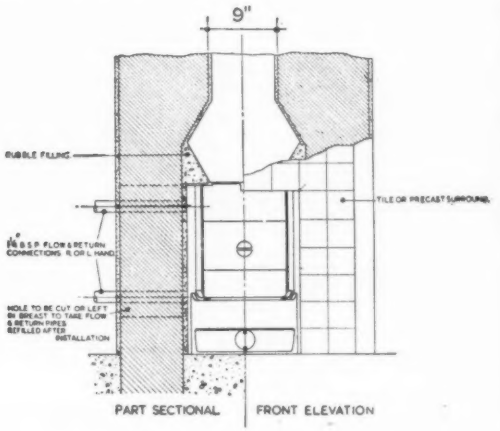
2. It supplies plenty of domestic hot water.
3. Provides background warmth by radiators, if required.

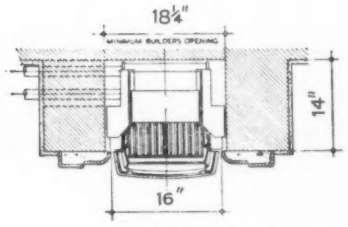
NOTES

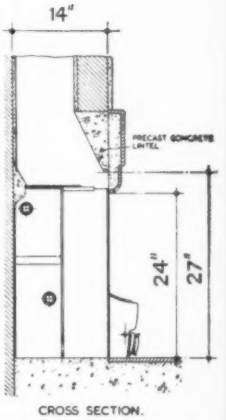
This continuous-burning fire is not expensive, and it does a lot of work for a minimum of fuel. The room in which it is installed can be as large as 1,500 cu. ft. and the back boiler is decidedly more powerful than the usual boiler of this type: it heats 40 sq. ft. of radiation surface and a towel rail. Installation costs are moderate.

GOOD LOOKS

The Brook is a very simply-designed fire which looks well in almost any setting. Note the attractive neat front in vitreous enamelled cast iron—which is easy to clean and very hard-wearing.







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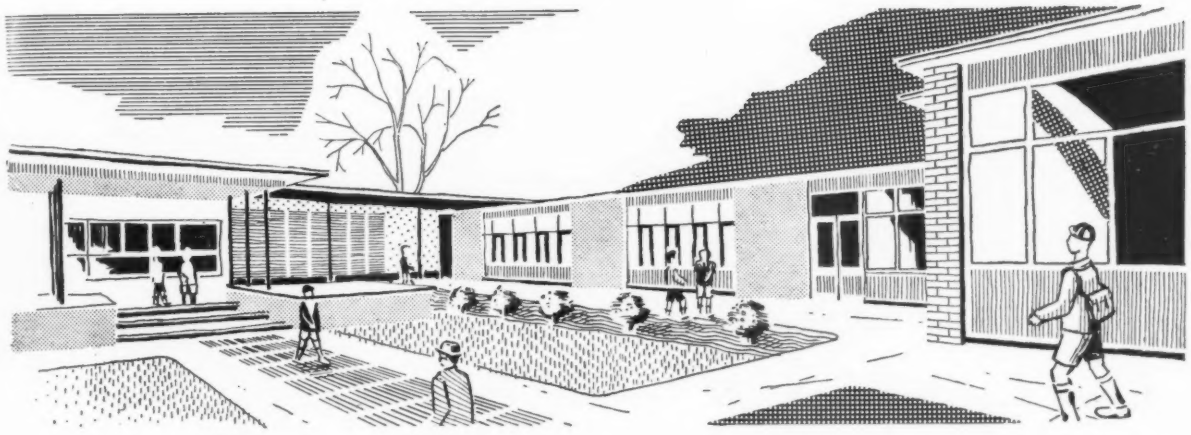

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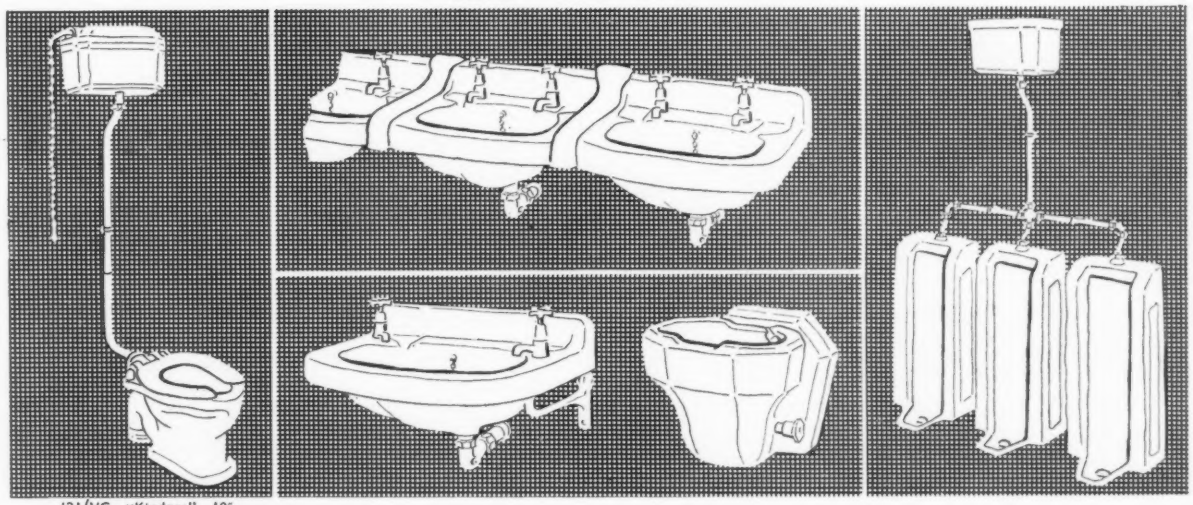

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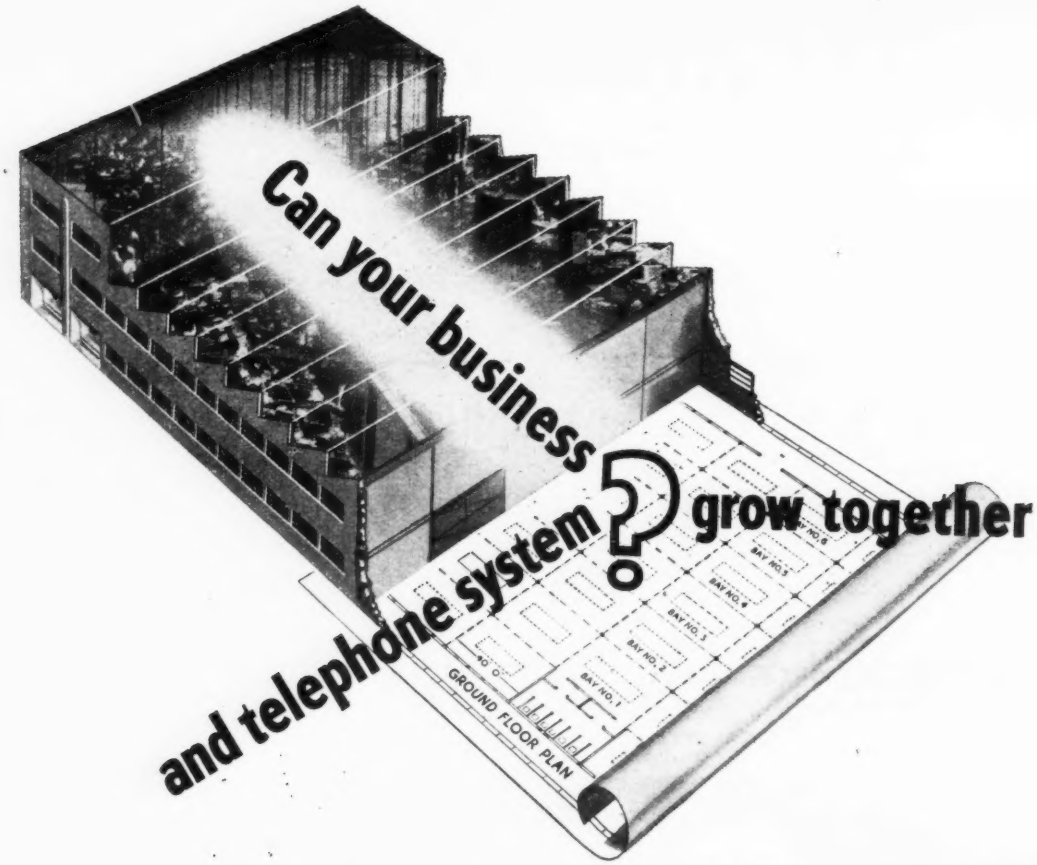

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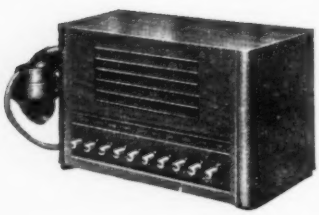

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THE ARCHITECTS' JOURNAL

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NOT QUITE ARCHITECTURE

HANG UNION JACK

We're Not *All Right*

No tin Union Jack hangs stiffly among the national flags that grace the portico of the Palazzo dell' Arte in honour of the Eleventh Triennale of Milan, for there is no official British Exhibit. The sight of British Racing Green in the place of honour on the Monza circuit undoubtedly disturbed the peace of mind of thousands of Italians, but British architects and designers are denied the chance to demonstrate their achievements.

*

Many small nations have taken the opportunity offered by this widely-seen and highly-thought-of Exhibition, to show what they can do—and for some of them that isn't very much. Many of them, however, have had the intelligence to realize the shop-window value of this event and have taken the chance to exhibit articles which they want to export. Whilst this attitude seems particularly pronounced this year, and threatens, if it goes unchecked, to spoil the Triennale's reputation as a pure " design " exhibition, it is difficult to blame the enterprise of the nations concerned.

*

We all tend to be highly critical of the standard of architecture and industrial design in this country, and rightly so, but there is much of which we can be justly proud and we could have produced an excellent national section to show the rest of Europe what is happening here. Such a section would be good for prestige and good for our exports, and at present it seems that we could well afford to have more of both.

*

Britain is represented, it is true, in the industrial design section, where a street lamp, a plastic cup and saucer and part of a locomotive show the vital part that design

The Milan Triennale

John and Sylvia Reid, who have written about the eleventh Milan Triennale in our "Not Quite Architecture" column, will be sending us a review of the exhibition for another issue of the JOURNAL. They were particularly impressed by the dramatic and varied lighting of the exhibits. Many of the exhibits, in their opinion, were of interest mainly because of skilful presentation. Above are two examples. The top picture, which resembles a still from a Hitchcock psychological thriller about a dipsomaniac, shows the lighting of the industrial design section. The impact of these hundreds of bright points of light was heightened by the contrasting technique used in the adjoining graphic display (bottom picture), where only diffused and concealed light sources were used.

plays in the British way of life. British architecture, too, is almost included in the architectural exhibition. "Almost" is the operative word for the few black-and-white photographs and drawings of the Roehampton scheme that are included by no means do justice to the LCC's work when seen after humbler projects glamourized by colour transparencies.

*

A change in the circulation plan which caused the photographs to be seen in the wrong order, an almost total lack of light and the absence of captions must surely have effectively hidden this work from all except British architects equipped with exceptional eyesight.

*

The Triennale is not one but a series of exhibitions which differ widely in type and form. All are exceptionally well presented and all are seen by people of all types and nationalities. Among the smaller countries Norway, Mexico, and Poland had their own sections, and the USA, as usual, built its own Pavilion in the Park. But because there is no official backing, British achievements are not to be shown to the rest of the world. WHY NOT? We have the buildings and we have the products that together could make a first class contribution: surely something could be done to ensure that next time we are there. Is there no private organization that will do what the government won't do?

JOHN AND SYLVIA REID

DIARY

City Centres: Dead or Alive? Talk by Nathaniel Lichfield at the Planning Forum. At the Planning Centre, 28, King Street, W.C.1. 6.30 p.m. OCTOBER 14

Landscape in Modern Life. Civic Trust exhibition at the Royal Festival Hall. Monday to Friday 5.30 p.m. to 9.30 p.m. Saturday and Sunday 1.30 p.m. to 9.30 p.m. NOW ENDING ON OCTOBER 15

The Return to Fixed Price Tendering. Talk by J. T. A. Brooks. At the RICS, 12, Great George Street, S.W.1. OCTOBER 16

The Career of Landscape Architecture. ILA exhibition at the BC, 26 Store Street, W.C.1. Monday to Saturday 9.30 a.m. to 5 p.m. UNTIL OCTOBER 17

Impression of the USSR. Talk by Derrick Greaves, Paul Hogarth and Ruskin Spear. Chairman, Philip James. At the ICA, 17-18, Dover Street, W.1. Members 1s. 6d. Guests 3s. 7 p.m. OCTOBER 22

Managing Building Projects. Four discussions organized by the Brixton School of Building. 1, Architect and client: October 23. 2, Architect and Quantity Surveyor: October 30. 3, Architect and Specialist Consultant: November 6. 4, Architect and Contractor: November 13. At the BC, 26 Store Street, W.C.1. 5 p.m.

ICA Tour of the TUC Memorial Building. Conducted by David du R. Aberdeen. Chairman of the discussion afterwards, J. M. Richards. Admission free to members. Meet at the main entrance at 7 p.m. OCTOBER 24

The Editors

CAN THE CITY BE SAVED ?

THE record which we publish elsewhere in this issue of rebuilding in two typical areas of the City would convince most architects and planners, whatever the merits of some of the individual buildings, that the overall picture is lamentable. Despite modern town planning legislation; despite the ownership of much of the land by the City Corporation itself; despite the fact that there was ample time before the office-building boom began for plans to be made; the result has been neither modern town planning nor modern architecture. Much of the blame undoubtedly rests with the property owners, whose twin desires for monumentality in architecture and the maximum of lettable floor space, have been realized only too frequently. Individual office blocks are now being built with high towers and modern systems of construction that bring light and air both into the offices and into the street. But even the best of architects, working for the most enlightened of clients, cannot hope to make a satisfactory job when he is obliged to fit a modern office building into the confined and unsuitable jigsaw sites, and into a congested street pattern that is basically unchanged. It is only fair to say that the City Corporation (which nominally shares responsibility for town planning with the LCC but in practice must accept the major responsibility) has itself learned from the mistakes of the past, even if it has done so woefully late in the day. It has advanced from having no plan at all in the Fenchurch Street area, and the timid plan for the Gresham Street area, to the comprehensive plans prepared by Sir William Holford for the St. Paul's precinct, and to the Martin-Mealand and the Chamberlin, Powell and Bon plans for the Barbican. The Holford plan still awaits ministerial approval, and the Barbican plans are to be the subject of further examination by yet another committee of the City Corporation. And, when these plans have taken their final shape, it still remains for the architects to translate them into bold and harmonious designs. The experience of the South Bank, where an apparently sound three-dimensional plan produced by the LCC has produced such a questionable result as the Shell building, shows the need for vigilance and public criticism if further opportunities are not to be thrown away. There is still something to be saved in the City. Having lost so much those responsible must take special care to avoid losing any more of it.

WHILE THE MOON IS RED

Duncan Sandys took time off from Defence the other evening to ponder on Counter-Attack. For a few moments he left the world of missiles and walked around the international exhibition of landscape architecture which his recently-formed Civic Trust are showing at the Festival Hall. ASTRAGAL, who was watching the Minister from a respectful distance, admired the way he was able to zig-zag at speed between the elegant screens without even being drawn by the fassinating capshun translayshuns wich rede like a letter hoam from Smith miner. But perhaps Mr. Sandys could not spare two hours to study the exhibition. And that—let's face it—is the time you would need to look at the thing properly. Each screen in this ambitious display needs careful scrutiny. Once you get used to the idea that all the main headings are in another language and that all the information you need can be found in a tiny printed translation you are all set to enjoy yourself—even if you have to make an appointment to come back another day.

*

If you like an exhibition to be small, and to give you the minimum of information in the largest possible lettering, this is not for you. But if you are really interested in the subject you will find a lot here that is worth while.

TRUSTWORTHY BEGINNING

You will remember my report in last week's JOURNAL about the current fuss in Dunblane, where the town council has threatened to demolish a group of 18th-century houses in the Cathedral Close. This, I suggested, was the sort of thing the Civic Trust ought to do something about. Their secretary read my note and telephoned me to say that the Trust had, in fact, joined all the other bodies which were taking an interest in the Dunblane controversy, and that they had been asked to prepare a report on the matter. Dr. Thomas Sharp has now gone up to Scotland to do this for them.

*

This is good news. It means that with its first commission the Trust is getting into the public eye as a responsible body, and not just as another collection of hot-headed preservationists. ASTRAGAL congratulates the Trust and hopes it will not hesitate to join the would-be demolishers if commonsense suggests that it should. With a name which reeks of mayors' parlours and centuries of respectability, the Civic Trust must quickly establish itself as a body that is just as much in favour of good new building as of crutch-clutching period pieces.

RC EQUALS REINFORCED CHEWDER

Incidentally, if there is one thing that makes me feel that decent old buildings should be preserved at all costs it is the thought that a qualified architect might put something up in their place. A Wilde remark? No doubt, but you will understand the irony in my soul when I quote what an architect wrote recently in *The Illustrated Carpenter and Builder*. "Our client has asked us to provide a genuine Tudor feature, *viz.* a projecting first floor front. . . . An oak framework with softwood backing was fixed to the 9-in. wall in such a way that it projected 4 in. and was carried on steel joists. Into this framework the herringbone brickwork was then built, giving us a finish as near to genuine as we would devise under present by-laws. . . . In order to preserve the Tudor appearance we designed an oak casing for the R.S.J.'s so that it resembled a beam. . . ."

HOME, SWEET (?) HOME

BBC television has discovered modern architecture. Last week the television series, "The Englishman's Home," ended with a visit to Farnley Hey, in Yorkshire—one of the few truly modern houses in the county, which was designed by Peter Womersley for his brother. It is an uncompromisingly modern house, although the materials are traditional—white brickwork, stone floors, polished wood ceilings, but all used with tremendous assurance to suit the needs of the design, and with no concessions to tradition. The house is set on a wooded hillside, with no formal garden, so that the birch trees and rough grass crowd up to it, and it fits into the landscape without fuss and with complete success. It is a small house, but has a great feeling of space, which cannot all have been due to skilful camera work. There is one huge room, with an open staircase and a gallery at one end, three bedrooms, a bathroom, and a kitchen, but the one big room is high and airy and the garden falls away from the large windows so that the whole of the Yorkshire countryside seems to be there.

*

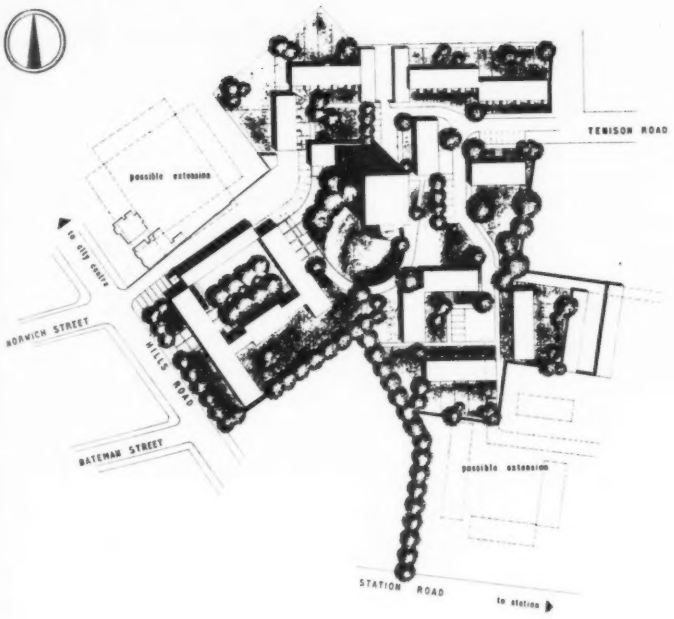
Television is not kind to modern finishes which rely on simplicity, texture and accuracy of detailing for their effect, and there were no elaborate carvings or plasterwork for the camera to pick out, but in spite of this the house came over well. The exterior shots could hardly have been better, and if the interior was not so successful it was still tremendously exciting and hinted at things even if it could not fully show them. Peter Womersley had an advantage over the architects of the other houses in the series, because he could be there and discuss the design with Lionel Brett. His brother's enthusiasm for the house was infectious and should answer the critics who say that this is not a house which can be lived in.

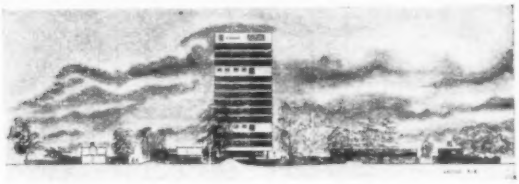
*

This was the most successful of the series of programmes, and the only one to show what sort of houses can be built now, given the opportunity. For most viewers, it was probably their first look at an open plan house which is really being lived in. Lots of them won't like it, but at least they can see how it works, and if the BBC will only show them a few more they might even come to like them in time.

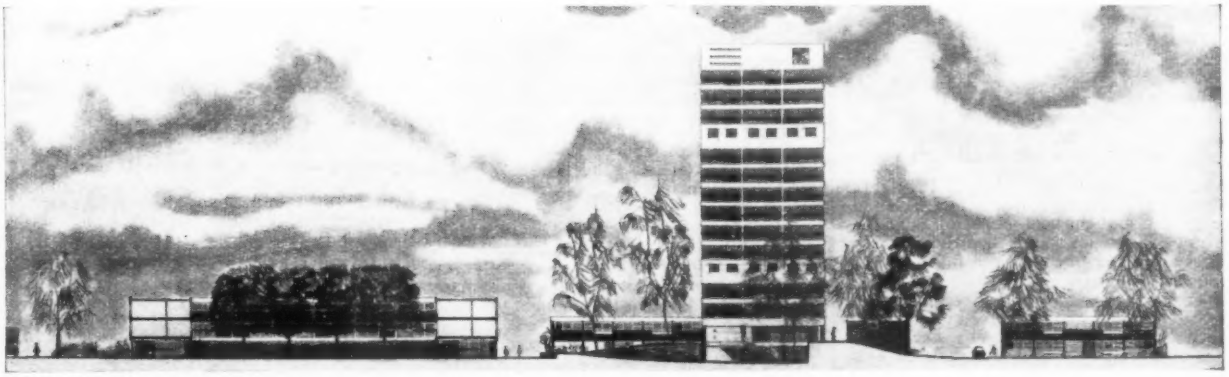
ÆSTHETIC CONTROL

The æsthetic control controversy has reached the ultimate forum of British





ASTRAGAL is delighted to hear that Span Developments Ltd. who, with their architect Eric Lyons, have revolutionised spec housing in several parts of the country, are confident about their proposed housing scheme in Cambridge (illustrated here). The site for which they have designed houses, flats and maisonettes, is owned by Jesus College, and the scheme was prepared in consultation with Sir Leslie Martin (ex-LCC Architect), who is a Fellow of the College, and A. L. Percival, the bursar. Planning permission has yet to be given, but there is every chance that Cambridge will prove to be more enlightened than Richmond —a town which now finds itself famous for the Span housing scheme which it so fiercely opposed.



democracy at last—the correspondence column of *The Times*. ASTRAGAL would like to congratulate Bill Howell, who got it there, not only on the relative moderation with which he put what is—as yet—an extreme position, but also on his tactical ingenuity in deflecting the course of the correspondence he was supposed to be answering. (It was about a humorous piece of sculpture that is annoying the citizens of Upton, Lancs.) If subsequent correspondence on this subject can be kept up to Mr. Howell's level of astuteness, sense and courtesy, this should be a very useful extension of a private debate into a more public arena.

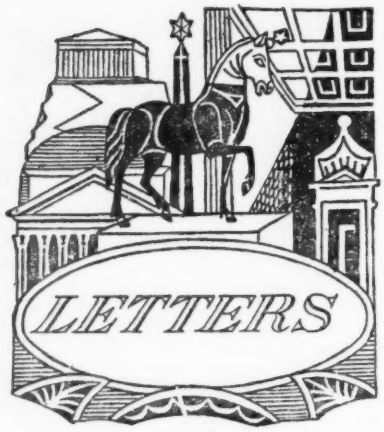
UNESCO AND UNITÉ

A lot of people have been disappointed with the new UNESCO building in Paris which is now nearing completion. A friend of mine, who went to see it during a spare hour or so between trains, wondered whether his appetite for new buildings had become jaded. As a consequence he stopped at Marseilles to see, once again, Corb's Unité, only to be greatly relieved to find that it gave him, if anything, even more of a kick than it had on previous visits.

*

This set him wondering why two buildings designed by architects whose work he greatly admired should produce such different æsthetic reactions. "Breur's UNESCO," he said, "is beautifully built and some of the details, such as the ground floor piloti, are very successful, but the Y-shaped administration block looks thin and curiously shapeless and uninteresting. It is also awkwardly related to the pleated assembly hall. Either another site should have been found or the building really should have followed more closely the spirit and not just the letter of the planning restrictions." (Readers will remember that the architect was told to follow the curve of the Place de Fontenoy.) "The only positive reaction one gets," said my friend, "is that the building is delicate—indeed it is too delicate for a building of this size. Corb's Unité, on the other hand, is so tough that it stands up wonderfully to the chicken-wire lines of general decrepitude which is the normal aspect of French buildings today."

ASTRAGAL



Geoffery Matthews and William Fisher

"Ikon"

G. Eastham

T. Alwyn Lloyd, F.R.I.B.A.

Ralph Lewis, A.R.I.B.A.

Rushbrooke Village

SIR,—What does Mr. Howell (Sept. 19) mean by architecture? If it is fatal to architecture to use night ventilators, although "so terribly useful"; if fascia boards and ridge pieces are "to be detailed out of existence," although the slates might be blown off; if we are to have changes in level, although the site is flat and the occupants would probably find a constant level easier to use; then apparently his architecture is to exist in spite of its function.

By what criteria does Mr. Howell "question whether it was wise to try to get away with five openings in one wall"? What would be so magic about four or even three? The fact that five were apparently necessary and that five have been built and that the wall is still there, structurally safe, suggests to us that the architects have, in fact, "got away with it."

Is it really true that "one of the basic problems in a bungalow, or in the upper part of a two-storey house, is getting enough brickwork left between the window head and the roof"? Is this problem more important than planning bathrooms that open directly off the kitchen? Would Mr. Stirling enjoy preparing food next to the lavatory door?

And do the Smithsons really find it necessary to plan a bathroom so meanly in order to obtain a few more square feet in an already attractively adequate landing? These dwellings are for the country, not to be stacked as deep flats in central London.

Let us get our balance of values straightened out. Do not let us get our ideas so completely divorced from the environmental problems which confront us, to the extent that architecture becomes abstracted from reality. Let us get responsible, analyse the problems and make our buildings more fully serve the needs of the man that has to use them.

GEOFFERY MATTHEWS
AND WILLIAM FISHER.

London.

What My Boss Doesn't Know

SIR,—I studied at Leeds School of Architecture and at fourth year I passed all my exams. including design but my folio failed. I did my folio again the following year but again it failed, though some of my designing was of a high enough standard to be published in a leading professional journal. I had a talk with my instructors and was told that although my designing was of a fair standard, my presentation of drawings did not satisfy the external examiners from the RIBA. I was patted on the shoulder with the cold comforting words of "Hard luck, old chap, it does not look as if you will make an architect but you will no doubt make a first-class architectural assistant."

I am now the chief architectural assistant for the local authority of a small Yorkshire town, with a salary ranging comfortably into four figures plus a car allowance. I'm not grumbling, but the rub is that my superior is a registered architect who never sat for an architectural exam. in his life, and is qualified by virtue of the fact that many moons ago he served a few years in an architect's office, but to this day does not know when a brick is right way up.

The basic trouble was that my "eye-wash" was too weak but, thank heavens, Peter Scher has seen the light: may he shine it bright so that our noble profession will get back to fundamentals, to build in honesty and to build in truth.

"IKON."

Yorks.

Fire Prevention

SIR,—Your leader of September 19 on advisory services, and the letters by W. G. Phillips and G. A. Bendell are in many ways complementary.

Increasing use is being made by many architects of the specialized advisory services provided by fire authorities through their chief fire officers. Any compulsion by legislation would take years and many persons would resist the thought of more control.

There is available a free specialist advisory service, technically trained and backed by practical experience, which is available in every county borough and county area. May I appeal, through the JOURNAL, to architects and builders to use this service fully at the drawing board stage, in the interests of the common good.

Inquests are only useful if we all learn a lesson for the future.

G. EASTHAM.

Worcester.

Milford Haven

SIR,—I must congratulate you on the admirable article, with its illustrations, in your issue of September 5. The whole position was reviewed by your correspondent in an objective manner, such as one has not seen elsewhere in the Press.

I happen to know Pembrokeshire intimately and am conversant with its many planning problems, including those now arising at Milford Haven; these latter are of such magnitude that nothing short of a national approach, with the fullest possible investigation, and planning on broad and most specialized principles will suffice.

The arguments you have adduced to that end are, in my view, unanswerable and I hope that the strong case you have made out for positive action will meet with wide support.

T. ALWYN LLOYD.

Cardiff.

Behind The Curtain Wall

SIR,—"Where is the modern movement?" asks ASTRAGAL, with the sting of a Portuguese Man-o'-War.

Under the drawing board on a tired scrap of Whatman, or marked "superseded" after a local authority tussle? Hardly. Drawing aside the curtain wall shows that part of a building which is acceptable as modern. The plan, the interior decoration, occasionally the furniture and—inevitably the kitchen.

The elevation, however—whether wildly photogenic (so much smaller in actual fact than imagined) or classical nonsensical—is the stumbling block. "Effect" is the operative word—the view the layman sees, or the coloured perspective sitting so happily above the client's desk. As soon as the public, the authorities and the business syndicates become less reactionary then the architect may have his due.

RALPH LEWIS.

Sussex.

CRITICISM

What Readers Think

We continue here the correspondence about the garage and service station at Harlow New Town which J. M. Richards criticized on August 29.

SIR,—After D. A. Birchett's rather chastening reply to my letter in last week's JOURNAL, I would be grateful for the opportunity of saying that my criticism was not levelled at anyone in particular, least of all Mr. Birchett who has probably contributed more than any one to putting service stations on the architectural map.

I was more concerned by the apparent implication in J. M. Richards' article that standardization in this field was immediately desirable. This point has now been clarified in Mr. Birchett's reply, and I apologize for the "modular axe." Nevertheless, the distinction should be clearly made between the use of standard components (which would be difficult to avoid) and standard systems of construction. I agree that a lot of the trouble lies in the unimaginative use of standard components, but there is little one can do if the lack of imagination is already built into a standard system of construction, which is often the case.

What undoubtedly is the most difficult problem is to create some sort of architectural unity from pumps, kiosks, light standards and advertising hoardings as well as the buildings. I suggested that the element of attention should be the building itself, and used the word "folly"; this was a bad choice as it conjures up all sorts of monstrosities. On the other hand simplicity in itself may produce a dullness which encourages the owner to scatter hoardings about the site. Perhaps "arresting simplicity" better describes what I have in mind. Whatever it is I believe that the conventional type of layout, which the client may well insist on, is far from ideal and that a much more fundamental approach is required before the problem can be solved. Until then, it seems a little early to think in terms of standardized design or systems of construction, whether they are to be adopted universally or not.

JOHN BURKETT.

London.

Mr. Richards will resume his critical articles on November 7.

COMPETITION

Kenneth Cross To Give Prizes for Good "Literature"

On October 24 Kenneth Cross, RIBA president, will give certificates, at the Building Centre, to winners of the competition for manufacturers' trade and technical "literature." The assessors who were nominated by Kenneth Cross, were G. Grenfell Baines, Sir Hugh Casson, E. D. Jefferiss Mathews, Edward Mills and Bruce Martin (who was prevented by illness from judging).

The results are as follows:

Certificates of Exceptional Merit.

Class I. The Natural Asphalte Mine-Owners & Manufacturers' Council.

Class II. Hammond & Champness Ltd.

Certificates of Merit.

Class I. The British Cast Concrete Federation, The Coal Utilisation Council and the Solid Smokeless Fuels Federation (Joint Entry), The Modular Society, Domestic Insulation Committee of the Solid Fuel, Gas & Electricity Industry.

Class II. Langley (London) Ltd.; Troughton & Young Ltd., Crittall Manufacturing Co. Ltd., British Ropes Ltd., Twyfords Ltd.

Honourable Mentions.

Gyproc Products Ltd., Carter & Co. Ltd., Copperad Ltd., Pilkington Brothers Ltd., Bowater Sales Co. Ltd., Morris Singer Co. Ltd., Imperial Chemical Industries Ltd., British Aluminium Co. Ltd., Marley Tile Co. Ltd., Celotex Ltd., The Standard Range & Foundry Ltd., Holoplast Ltd., The Armstrong Cork Co. Ltd., The Brightside Engineering Co. Ltd., Falk Stadelmann & Co. Ltd.

Commended.

Entries from the following firms did not conform with the provisions of British Standard 1311:1955 as to size, but were otherwise commended by the assessors.

British Paints Ltd., Secomastic Ltd., The Merchant Adventurers, B. Finch & Co. Ltd.

The entries for this competition, which was organized by the Building Centre and the RIBA, will be exhibited at the Building Centre from October 24 until November 1.

LCC

"New Town" near Norwich

Last week a small exhibition was opened at the Guildhall, Thetford, illustrating proposals for the expansion of the town.

The exhibition (writes a correspondent) consists of a series of about twenty panels or screens illustrating the various phases of the proposed development. The LCC have contributed largely to the display with not only some excellent maps, plans and photographs, but a small scale model of the first section of the new town to be built, and a large scale map-model showing the whole of the existing old town and surrounding country and roads together with the new factory and housing sites to the south west.

The Thetford borough council have arranged the exhibition in an interesting sequence and are to be congratulated on the layout.

The first displays trace the history of the ancient Borough from its early Danish origins in the year 880 through Saxon and Roman times to the present day. Drawings and photographs show some of the simple but beautiful architecture that makes up this delightful town.

Following the historical displays come the LCC plans—showing typical new town development—and then maps showing the proposed new by-pass road (not by-passing nearly enough, incidentally) and the industrial and housing site placed adjacent to the main A 11 trunk road from London.

The sites for factories are shown each side of the A 11 road and will be the first thing a visitor to Thetford will see when driving from the London or Newmarket direction. Admittedly the existing belts of pine and fir trees have been made use of, but they will by no means hide the industrial sprawl that is bound to develop. Even assuming the highest possible standard of design and the greatest possible guard against Subtopia this will not make a very pretty approach to the town.

The housing layouts, as shown in the models and drawings, are not terribly inspiring. Two-storey dwellings are arranged in monotonous rows with, very occasionally, some bungalows.

There are no small blocks of flats. These would be helpful in the landscaping as well as saving land in a highly agricultural district.

The Thetford scheme is different to any other building scheme in England in that it will have the old town as a nucleus, and this should give the new extensions a maturity and dignity that would otherwise take years to acquire. But not enough note seems to have been taken of the fact that there are probably more flint-faced buildings in Thetford than in any other town in Norfolk, let alone England. The new planners should take advantage of this local material—and it *can* be used, as has been shown by the Norwich city architect and by other Norfolk architects.

But now we are getting too near to detail and this exhibition is only intended to show the general trend of the first stages of town planning. The word architecture was seldom, if ever, mentioned in fact, by the speakers at the exhibition's opening: the accent was on movements of population, areas of land and finance. The scheme is to cost an initial £3,500,000.

We must hope that architecture will rear its head before it is too late. As the chairman of the LCC declared in his speech, "a great opportunity is here to be taken by Thetford to show the country what can be done." Let us hope it will also show the country some inspiring town planning and landscaping, a homely intimacy and a touch of locality breathing from contemporary buildings.

YORK

Course On Townscape

The course on townscape held recently at the York Institute of Architectural Study turned out to be rather frustrating (writes a correspondent). Despite wide canvassing, the attendance was small and consisted entirely of architects and students. The director had hoped to attract members of local authorities—those who, as the MoHLG has it, would acquire knowledge of value in the discharge of their statutory duties. Alas, local authorities must have thought they had better ways to spend their money—or else they just weren't bothered.

It also became apparent that it was a serious weakness that none of the lecturers had met together beforehand, and that only the vaguest suggestions had been made about treatment. This meant considerable repetition—and considerable contradiction. Had the whole course been arranged as a forum, this might have been an advantage, as several members felt during an informal discussion. As it was, the total impression was bewildering, though, oddly enough, the most promising item, a forum on advertising, was in fact the least satisfactory and the least likeable. It brought together two planning officers, an architect, two representatives of the CPRE and one of the advertising industry, and produced—apart from two members who were more or less silenced after their original contributions—an apparently cosy agreement all round that the situation isn't too bad, that advertisers are really nice chaps whose first thought is for the look of the town and who are falling over themselves to satisfy the CPRE (who seemed in part easily satisfied indeed).

The thing got off to a bad start and was conducted throughout in platitudes expansively delivered but never examined: "advertising is an essential part of the machinery of distribution," we were solemnly informed, and the entire discussion remained at this superficial level.

Of the more serious contributors, J. L. Berbiers, now chief city architect of Canterbury, made it quite clear in his description of the rebuilding of the city that it has only been through very strict planning control that Canterbury has achieved such measure of success as it has. This was something of a rebuke to the pious faith in more visual education for the public which was breathed out at the end of most of the sessions. And the weakness of this general attitude was underlined by D. L. Thomas during his lectures on the town planning of townscape. On the basis of extensive inquiries which have been made at Newcastle into habits of work, shopping, home and travel, Mr. Thomas developed a number of very localized projects whose townscape reflected directly the function they were to perform. Unfortunately, as he admitted, such successes were restricted almost to details as a result of the want of any present-day agreement on the more substantial features of a way of life. Hence the scarcity of satisfying design in the new towns, where the lowest common denominator of communal life has been the highest social basis that could be used for the visual design. This indeed was the point made in a rather depressing survey of the weakness of new as against the successes of old towns, which formed the centre of the opening lecture by Andor Gomme, who was there on behalf of the Counter-Attack Bureau. A comparison between the two Yorkshire towns of Huddersfield (which has so far been left alone) and Wakefield (which has not) revealed the devastating failure, in architecture and planning, so characteristic of the modern English town centre.

The passing round of a few new ideas is obviously agreeable and may be useful. So, to the audience that was in fact there, H. F. Clark's lectures on landscape design may have been the most helpful. As far as the architect *is* in control, some sort of positive attitude, very likely a poor one, may prevail, and attention to detail may bring some clarity out of chaos. But the total achievement will inevitably be limited where individualism holds the whip and the fear of rates sets the only standard.

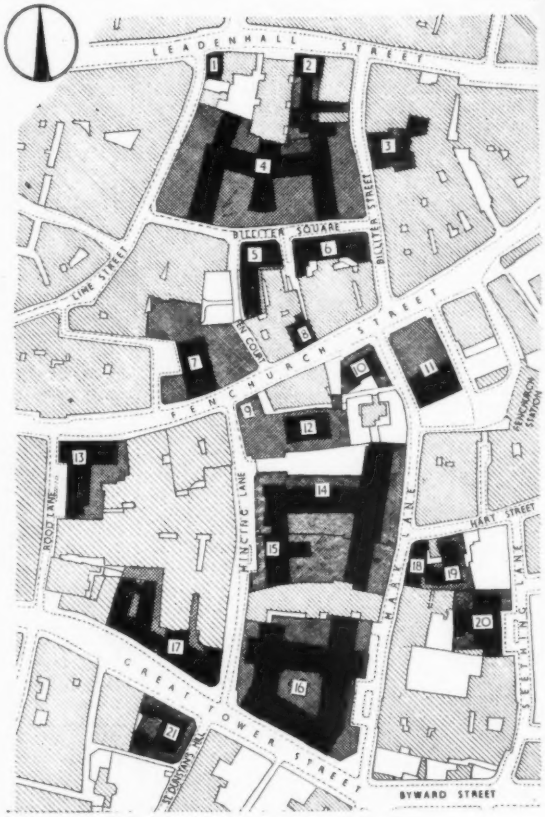
REBUILDING IN THE CITY

Two reconstruction areas illustrated

On the following pages we illustrate, with minor omissions, every building already built, under construction, or given planning approval in two areas of comprehensive development in the City of London. These areas, although small, are a microcosm of the whole, and in total present a typical picture of post-war architecture and planning in the City up to the present time.

1. Fenchurch Street area

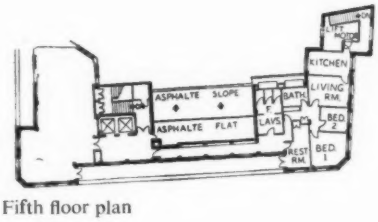
This area, lying between Leadenhall Street and the river, was heavily damaged in the war. It includes Mincing Lane, centre of the tea and other commodity markets, and is one of the principal insurance centres, containing Lloyd's. Although listed as an area of comprehensive development no plan for its redevelopment was ever prepared by the City Corporation, which shares responsibility as planning authority with the London County Council. The Corporation simply awaited proposals by individual developers, with the result that redevelopment proceeded by the sporadic infilling of individual sites. There have been minor modifications of the street lines, an amalgamation of some of the smaller sites into larger sites (such as that for the new Lloyd's building) and improvements in daylighting of streets and buildings. But otherwise the existing street pattern has been retained, and the opportunity to replan the area or to give it any architectural unity has been lost.



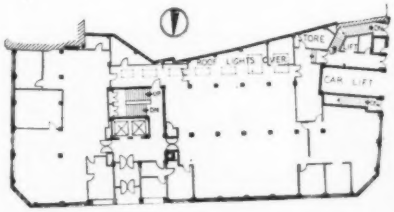
Right: plan of the Fenchurch Street area [Scale: 1:3750] New buildings whether erected, under construction or approved are shown cross-hatched at the ground floor level and in black at an upper floor level

1. Offices and shops, 21-26 Leadenhall Street. Architect, the architect to the Prudential Insurance Co. Ltd.
2. Blue Star Line offices, 34 Leadenhall Street. Architect, Alan W. Pipe and Sons
3. Offices, 22 Billiter Street. Architects, Montague Evans and Son
4. Lloyd's new building. Architect, T. E. Heysham
5. Offices, 13 Fenchurch Avenue, and Fen Court. Architects, Howard, Souster and Fairbairn
6. Offices, 9-11 Billiter Square. Architects, Howard, Souster and Fairbairn
7. Fountain House, 125-135 Fenchurch Street. Architect, W. H. Rogers, architect to the City of London Real Property Co. Ltd. Consultant architect, Sir Howard Robertson
8. Office, Langbourne House, 118-119 Fenchurch Street. Architect, C. E. Wilford
9. Offices, 44-45 Fenchurch Street, and 41-43 Mincing Lane, for the Clothworkers' Company. Architects, Whinney, Son and Austen Hall
10. Offices, 52-54 Fenchurch Street. Architects, Lewis, Solomon, Sons and Joseph
11. Institute of Marine Engineers' headquarters building. 56-59 Fenchurch Street. Architects, Ronald Ward and Partners
12. Clothworkers' Hall. Architects, Whinney, Son and Austen Hall
13. Offices, 24-29 Rood Lane. Architects, Howard, Souster and Fairbairn
14. Dunster House, Mark Lane. Architects, Howard, Souster and Partners
15. Colonial House, Mincing Lane. Architects, Howard, Souster and Partners
16. King's Beam House, Mark Lane. Architects, Howard, Souster and Partners
17. Plantation House, Mincing Lane. Architect, Albert W. Moore and Son
18. Borneo House, offices, 62-63 Mark Lane. Architect, David Stern
19. Offices, 60-61 Mark Lane and 4-7 Hart Street. Architect, W. H. Rogers, architect to the City of London Real Property Co. Ltd.
20. Offices, 1 Seething Lane. Architect, W. H. Rogers, architect to the City of London Real Property Co. Ltd.
21. Offices, 5-10 Great Tower Street. Architects, Gunton and Gunton

Left, Leadenhall Street facade of the Blue Star Line offices (architect, Alan W. Pipe and Sons), a large block with a rear entrance on Billiter Street. Above, Lime Street view of the Prudential Insurance Co.'s offices (architect, the company's architect), 21-26 Leadenhall Street. Below, looking east along Fenchurch Avenue to offices, 13 Fenchurch Avenue and Fen Court, and beyond, 9-11 Billiter Square (architects, Howard, Souster and Fairbairn). Lloyd's new building lies behind the hoarding. Left, 22 Billiter Street (architects, Montague Evans and Son).

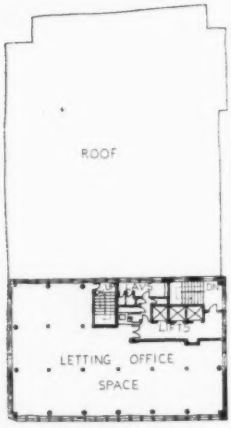


Fifth floor plan

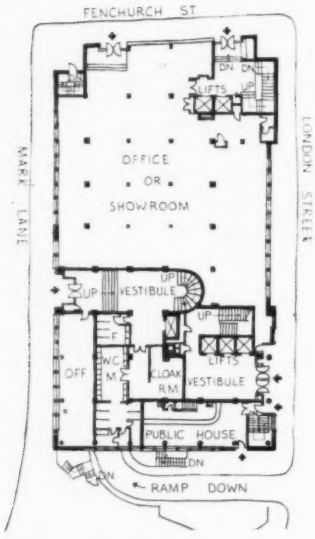


9-11 Billiter Square
Ground floor plan [Scale: $\frac{1}{16}$" = 1' 0"]

REBUILDING IN THE CITY

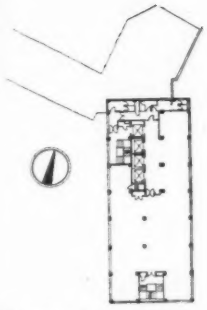


Typical upper floor plan



Institute of Marine Engineers
Ground floor plan
[Scale: $\frac{1}{64}$" = 1' 0"]

Above, Institute of Marine Engineers, Mark Lane elevation (architects, Ronald Ward and Partners) with, right, a progress picture from Fenchurch Street. Below, Clothworkers' Hall (architects, Whinney, Son & Austen Hall), Mark Lane, and right, view north up Billiter Street, with Lloyd's in the background.



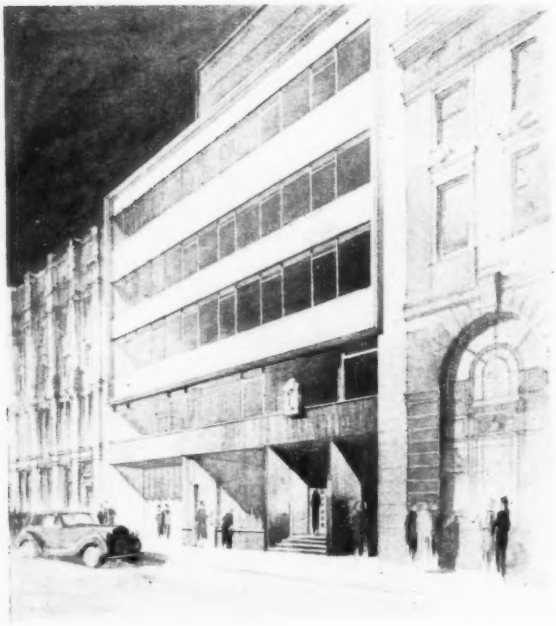
Eleventh floor plan

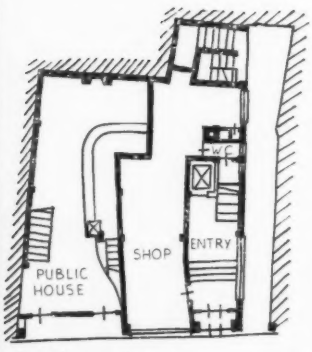
Fountain House
Ground floor plan [Scale: 1/16" = 1' 0"]

Above, Fountain House, 125/135 Fenchurch Street (architect, W. H. Rogers, architect to City of London Real Property Co. Ltd., consultant architect, Sir Howard Robertson), seen looking west from the Institute of Marine Engineers' building. The narrow south elevation rises directly from Fenchurch Street. This view shows how the tower block, in contrast to earlier office buildings, has opened up the offices to light and air. Below, right, Fountain House from Cullum Street, where the old street congestion remains. Below, left, offices at the corner of Fenchurch Street and Mincing Lane for the Clothworkers' Company (architects, Whinney, Son & Austen Hall).

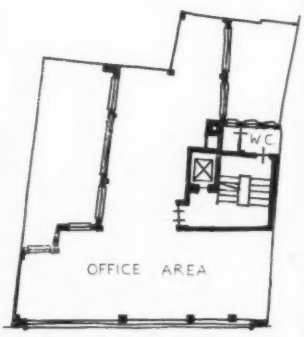
REBUILDING IN THE CITY

Above, Lloyd's new building (architect, T. E. Heysham), seen from the top of the Institute of Marine Engineers' building, almost the only place from which it can be seen, as its vast bulk is surrounded by narrow streets. Below, Lloyd's south elevation, Billiter Square. Right, perspective of Langbourne House, 118-119 Fenchurch Street (architect, C. E. Wilford).





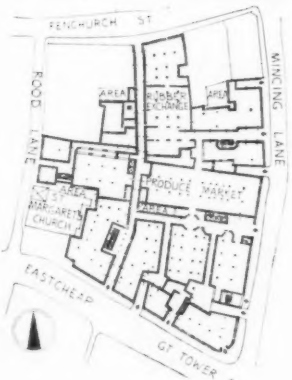
Langbourne house
Ground floor plan [Scale: $\frac{1}{32}$" = 1' 0"]



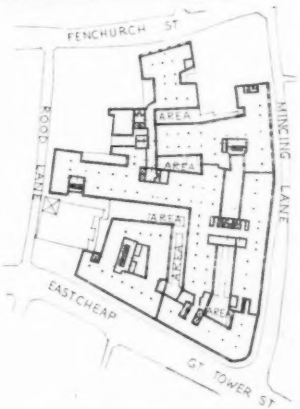
Typical upper floor plan

Left, offices, 5-10 Great Tower Street (architects, Gunton and Gunton). Centre, looking north along the reconstructed Mincing Lane, with Plantation House on the left, Colonial House (architects, Howard, Souster and Partners) immediately on the right, and Fountain House beyond. Right, daylighting setbacks on the roof of Dunster House (see overleaf).

Above, offices, 24-29 Rood Lane (architects, Howard, Souster and Fairbairn). Left, Plantation House (architect, Albert W. Moore and Son) and, below, Norwich Union Insurance offices, 52-54 Fenchurch Street (architects, Lewis Solomon, Sons & Joseph).



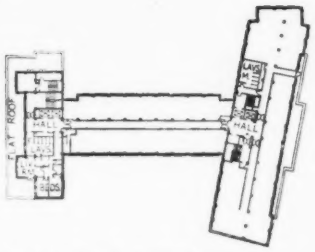
Plantation House. Ground floor plan
[Scale: 1/16" = 1' 0"]



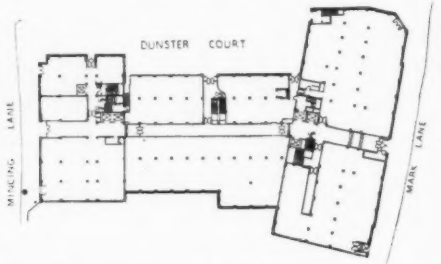
Upper floor plan

REBUILDING IN THE CITY

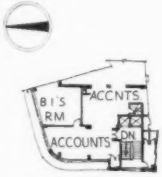
Right, Dunster House (architects, Howard, Souster and Partners) from Mark Lane. Dunster, Colonial and King's Beam Houses were among the earlier post-war buildings. Centre, right, Borneo House, Mark Lane (architect, David Stern).



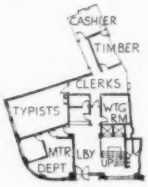
Typical upper floor plan



Dunster House, ground floor plan [Scale: $\frac{1}{32}$" = 1' 0"]

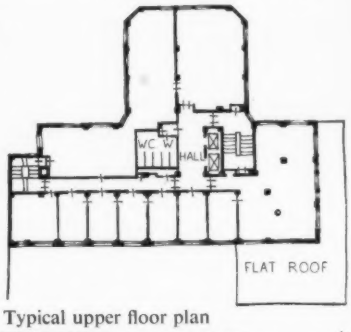


Third floor plan

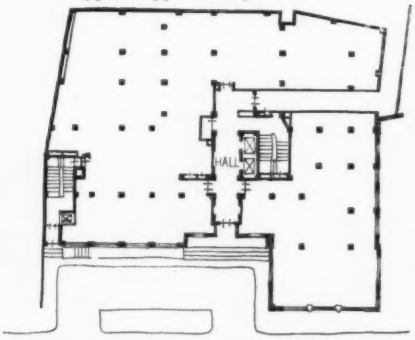


Borneo House, ground floor plan [Scale: $\frac{1}{64}$" = 1' 0"]

Above, perspective of offices, 60-61 Mark Lane and 4-7 Hart Street, seen from Hart Street (architect, W. H. Rogers), with an existing public house. Right, at foot, offices, 1 Seething Lane (architect, W. H. Rogers).



Typical upper floor plan



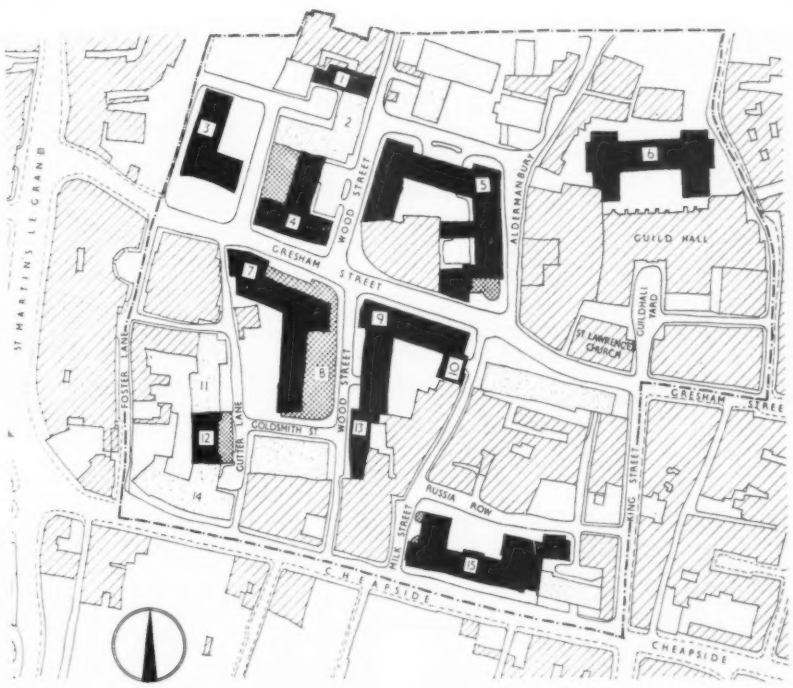
1 Seething Lane, ground floor plan [Scale: $\frac{1}{64}$" = 1' 0"]

2. Gresham Street area

This view from St. Paul's, looking east, shows the new Bank of England offices (architect, Victor Heal) in the foreground, with Cheapside running east to the north of it. The Gresham Street area, illustrated on succeeding pages, lies north of Cheapside.

The redevelopment of this area, which lies between the St. Paul's precinct, to the south west, and the Barbican area to the north, was begun later, and is consequently not so far advanced, as that of the Fenchurch Street area. Here the City Corporation, profiting to some extent from its failure to plan the Fenchurch Street area comprehensively, did prepare an outline scheme which is now being progressively realised, and of which the principal feature is the widening and straightening of Gresham Street. The area is undergoing a marked change of character, the demand for offices having induced property companies and

continued on page 552



This plan (scale 1/3750) shows the buildings and projected buildings illustrated in the following pages. Buildings completed or under construction are shown cross-hatched at the ground floor level, and black at an upper floor level. Projected buildings are indicated by scattered dots.
The numbered buildings are as follows:

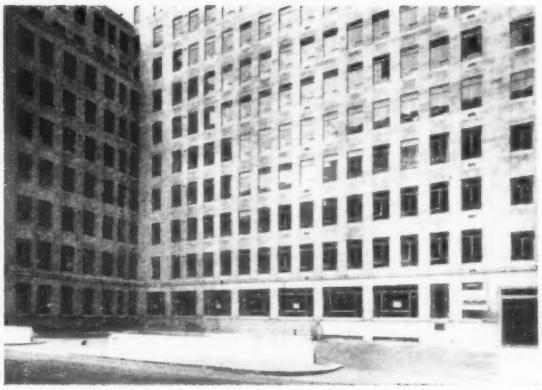
1. Office block, 90-91 Wood Street. Architects, Gunton & Gunton
2. Headquarters offices for the Nestles organization, 94-101 Wood Street. Architects, T. P. Bennett & Sons.
3. Office block, 19-29 Gresham Street, incorporating head offices for Trollope & Colls Ltd. Architects, Ellis, Clarke & Gallanaugh
4. Garrard House, 31-49 Gresham Street. Haberdashers' Hall is physically incorporated in this building in the three-storey development on the west side. Architect, A. S. Ash.
5. Barrington House, 59-69 Gresham Street. Architects, Sir John Burnet, Tait and Partners
6. Guildhall office block, for the City of London Corporation. Architects, Sir Giles Gilbert Scott and Partners
7. Wax Chandlers' Hall. Architects, Seely and Paget
8. Office block, 2-12 Gresham Street. Architects, Easton and Robertson
9. Clements House, 14-18 Gresham Street. Architects, Trehearne, Norman, Preston and Partners
10. Offices for Morleys Ltd., Milk Street. Architect, Stanley Peach and Partners
11. Office block, 34-40 Gutter Lane. Architects, Knapton and Deane
12. Saddlers' Hall. Architect, L. Sylvester Sullivan
13. Compter House, 4-8 Wood Street. Architects, Ronald Ward and Partners
14. Cheapside House offices, with shops, 134-147 Cheapside. Architect, Theo. H. Birks
15. Sun Life Insurance building, offices and shops, 106-116 Cheapside. Architects, Curtis Green, Son & Lloyd

REBUILDING IN THE CITY

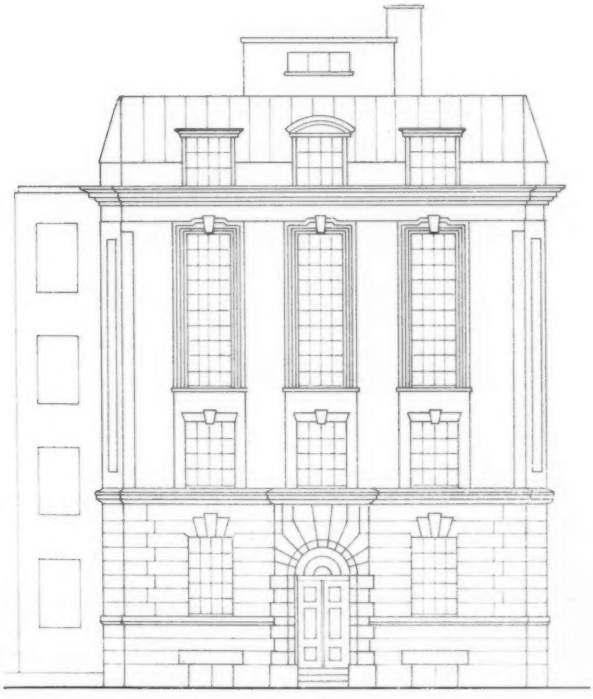
others to build large new office blocks in an area which before the war contained a large number of warehouses. Each scheme has been considered in model form by the Corporation to ensure that detailed variations did not materially prejudice the overall conception. The City's main objects have been to secure uniformity of height and good neighbourliness, and to avoid conflict with its proposals for the Barbican. The development has been a combined operation between those freeholders who were prepared to co-operate and the Corporation, which acquired those sites whose owners were unwilling or unable to co-operate, and consolidated the sites into development units. For this purpose a number of usable buildings were acquired and demolished. The fact that the whole area has been subject to compulsory purchase has made owners more willing than would otherwise have been the case to agree to schemes which in some cases limited floor space to a figure below the maximum plot ratio of 5 to 1. The floor space in the area (25 acres) was 3,351,540 sq. ft. before the war, and will be 2,995,050 when development is completed. Private car parking for some 600 cars will be provided in the basements of major buildings, the standard of car parking required having been raised from 1 car space for 5,000 sq. ft. to 1 for 2,500 sq. ft. The City Livery Companies—in this case the Wax Chandlers and the Saddlers—have decided to rebuild in architectural styles derived from the past which assort very oddly with office blocks around them.

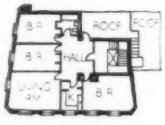
Above, perspective of offices, 90-91 Wood Street (architects, Gunton and Gunton). Below, south elevation of offices for Trollope and Colls Ltd., 19-29 Gresham Street (architects, Ellis, Clarke and Gallanaugh).

Above, I. & R. Morley Ltd. offices, Milk Street (architect, Stanley Peach and Partners).

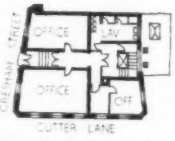


Above, Garrard House offices, 31-49 Gresham Street, from the south (right) and from the east (left) (architect, A. S. Ash). Left, elevation of Wax Chandlers' Hall, (architects, Seely and Paget). Below, perspective of the Guildhall office block, and progress picture from Basinghall Street (architects, Sir Giles Gilbert Scott and Partners).





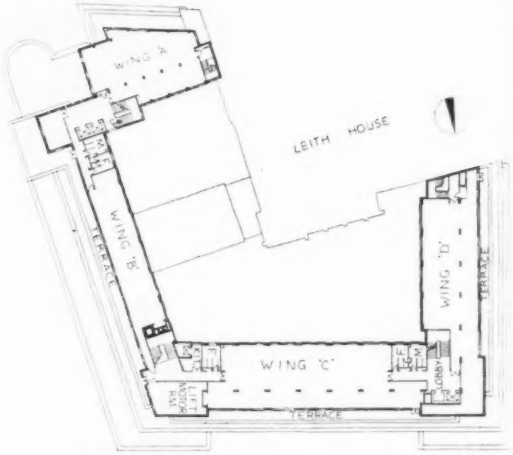
Upper floor plan



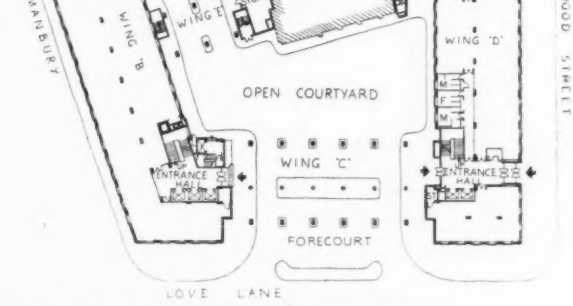
Wax Chandlers' Hall
Ground floor plan
[Scale: 1/16" = 1' 0"]

REBUILDING IN THE CITY

Right, perspective of offices, 2-12 Gresham Street (architects, Easton and Robertson). Below, Clements House, offices, 14-18 Gresham Street (architects, Trehearne, Norman Preston and Partners).

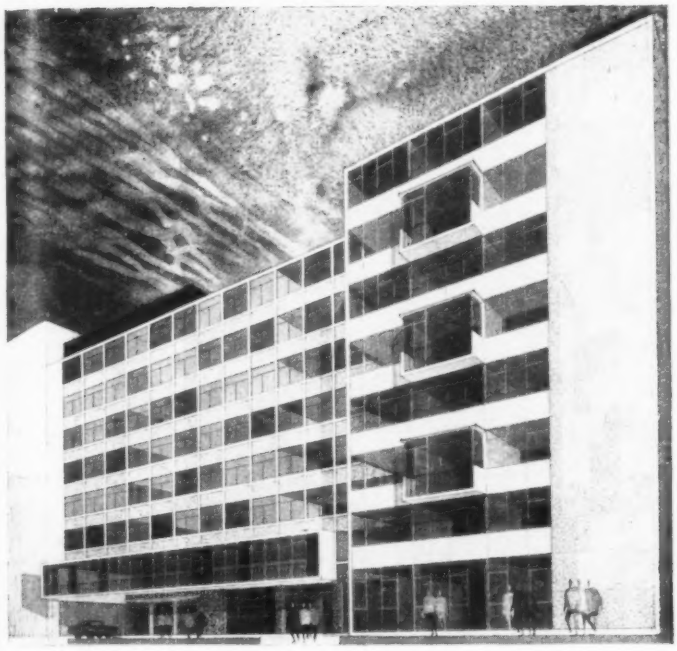


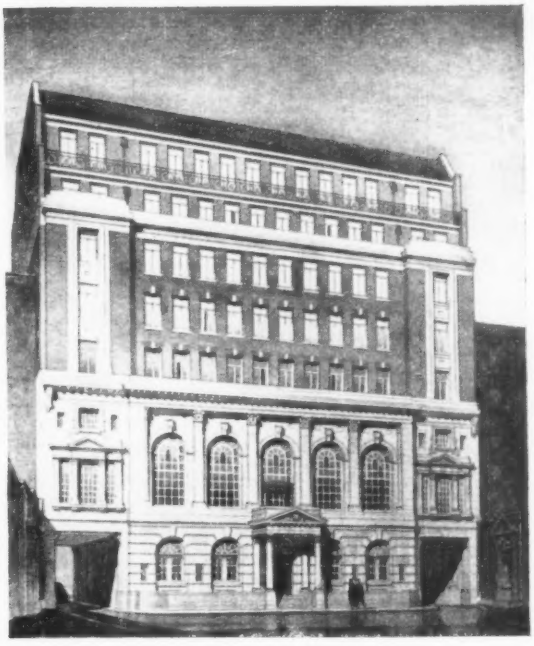
Typical upper floor plan



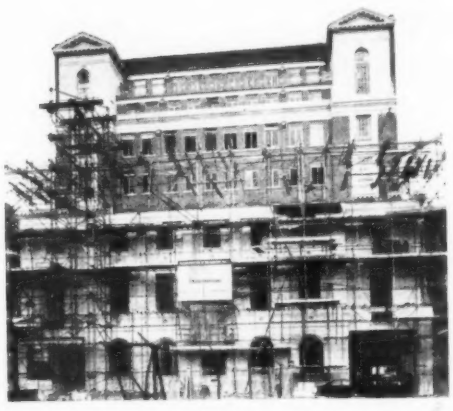
Barrington House. Ground floor plan [Scale: $\frac{1}{16}$" = 1' 0"]

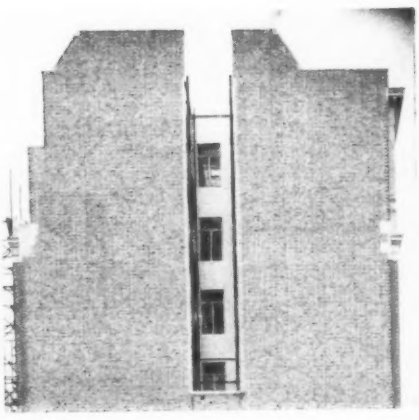
The main entrance to Barrington House, at the corner of Gresham Street to the left, and Aldermanbury (architects, Sir John Burnet, Tait and Partners).

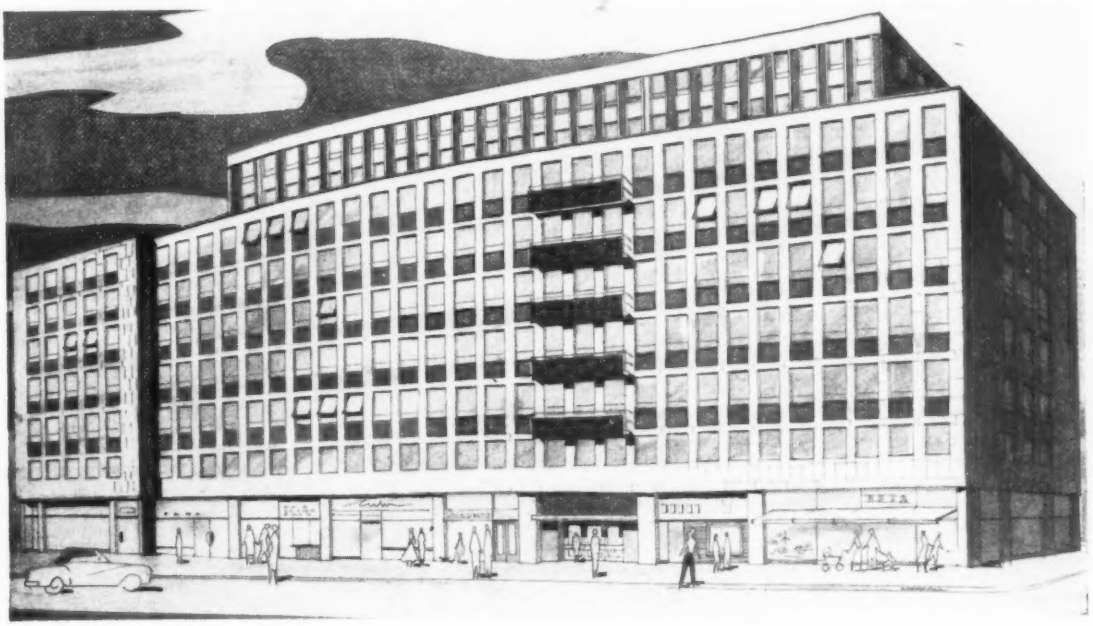




Above, offices, 34-40 Gutter Lane (architects, Knapton and Deane). Above, right, perspective of Saddlers' Hall (architect, L. Sylvester Sullivan) from the west, with, right, a progress picture from the east, and, extreme right, a side elevation showing light wells. Below, perspective of Cheapside House, offices with shops, 134-147 Cheapside (architect, Theo. H. Birks).

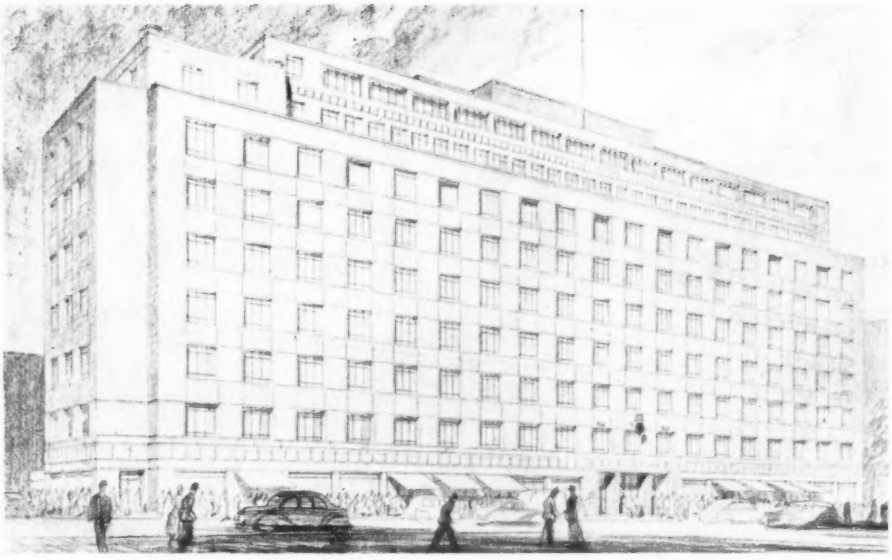


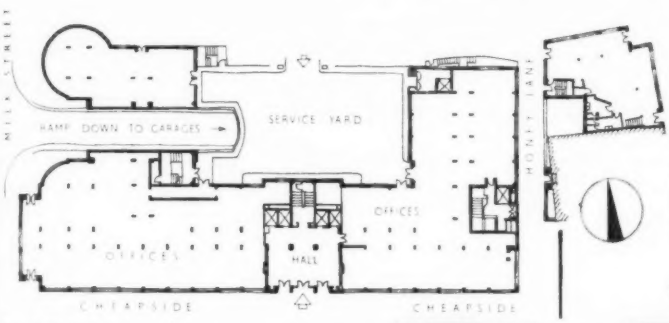




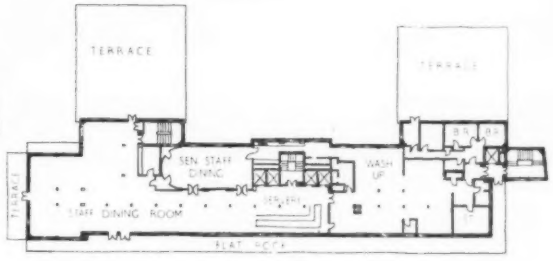
REBUILDING IN THE CITY

Right, perspective of Sun Life Insurance building, with shops, 106-116 Cheapside (architects, Curtis Green, Son and Lloyd). Below, Compter House, 4-8 Wood Street (architects, Ronald Ward and Partners).

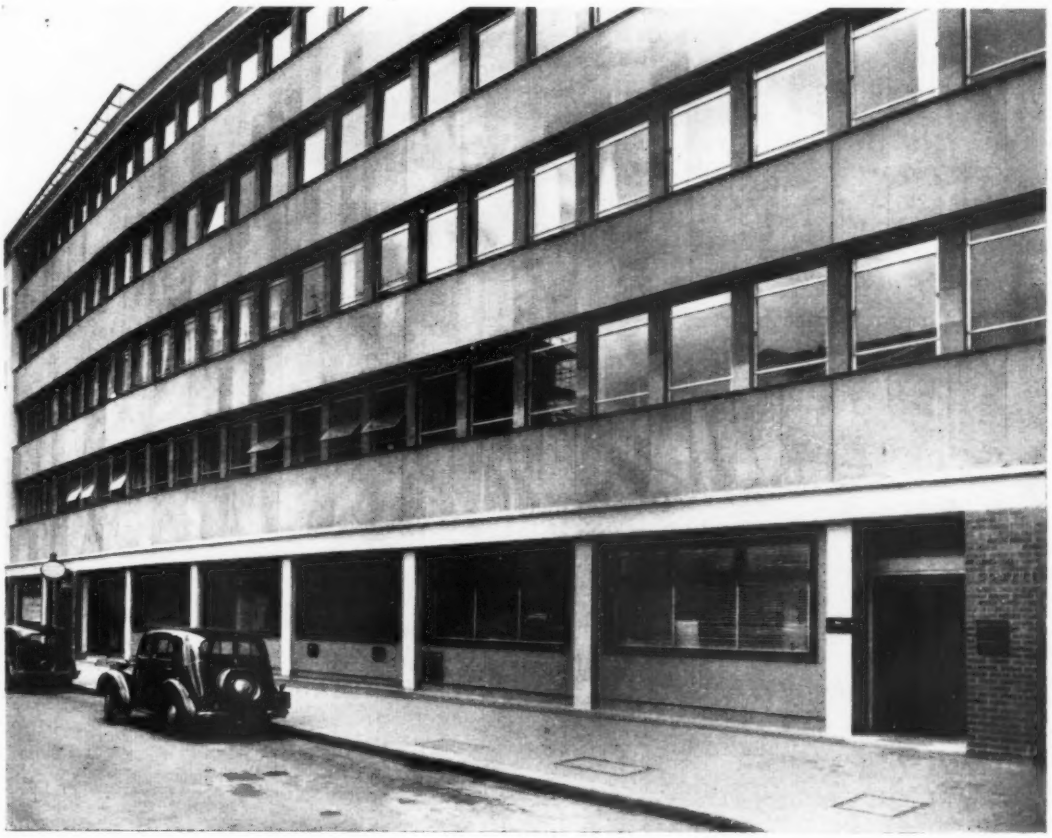




Sun Life building Ground floor plan
[Scale: $\frac{1}{16}$" = 1' 0"]



Typical upper floor plan



technical section

18 CONSTRUCTION: THEORY
design for mining subsidence

On September 25 we published an article by W. D. Lacey and H. T. Swain describing the reorganization of the Nottinghamshire County Architect's Department which was carried out in order to make " development work " possible. We followed this up with a second article, published the week after, by J. Edward Mason, the Director of Education at Nottingham, describing a complementary change which had taken place in client/architect relations in the design of Nottinghamshire schools. This week our first authors, W. D. Lacey and H. T. Swain, continue the story by describing in detail the attainment of the Department's first objective after the reshuffle, namely the solution of the problem of design for mining subsidence. We are particularly glad to publish this article, not only because it is in itself of first-rate interest, but also because it illustrates the part the architect can play in matters which would normally be considered the exclusive field of the specialist.

This article describes the method developed by the Nottinghamshire County Architect's Department of constructing schools on mining subsidence sites. A system of construction has been designed which is intended to give protection against damage caused by surface movement due to all normal conditions of coal mining. It is light in weight, completely articulated and has no foundations or footings other than a thin concrete slab.

The traditional method of protecting structures against subsidence damage is to build them on special foundations which are generally an expensive addition to the normal cost of building. Today, Nottinghamshire is approaching the problem in a new way and is building schools on severe subsidence sites in which the structure as a whole has been designed to allow them to follow the predicted movement of the ground. They are costing no more than if they were being built on stable ground.

The analysis of the problem of mining subsidence and the design of the system of construction has been a development operation involving at different stages the assistance and advice of other people outside Nottinghamshire Architect's Department. The main collaboration, however, has been throughout with W. H. Ward, B.SC., A.C.G.I., A.M.I.C.E. of the Building Research Station and F. W. L. Heathcote, B.SC., M.I.MECH.E., Development Engineer of John Brockhouse and Co. In addition, the help of the National Coal Board has been available at all times at a national and local level, and particularly valuable has been the experience and advice of R. J. Orchard, A.R.I.C.S., Subsidence Engineer.

The nature of the problem

Mining subsidence is the expression used to describe the ground movement which occurs when the strata overlaying coal seams settle into the space left when coal is extracted. In varying degrees it happens in all coal mining areas. The coal seams run under most of Nottinghamshire and inevitably under the main centres of population. These are being worked now, or will be worked in the future by the East Midlands Division of the National Coal Board. There are many seams and only a relatively small proportion have been worked out. Surface subsidence is, therefore, a continuing phenomenon and may be expected to continue in the future. It will often occur again and again in the same place as subsequent seams at different depths are extracted.

It is not proposed here to discuss the effect of subsidence on existing old buildings. The majority of these have not been designed to withstand ground movement and in some cases, according to mining and geological conditions they will suffer damage. Occasionally houses have to be demolished because they are beyond repair; but the damage is more often confined to cracked brickwork and plaster and jammed doors and windows—defects which can be made good when the subsidence movement is complete. The NCB is generally responsible for repairs and the cost of this is ultimately paid for by the public.

In the design of new buildings, it is usual to incorporate mining subsidence precaution, and, if the building is, like a school, to be built by a local authority, it is

Fig. 1, house in West Bridgford, Nottingham, damaged by mining subsidence.

technical section

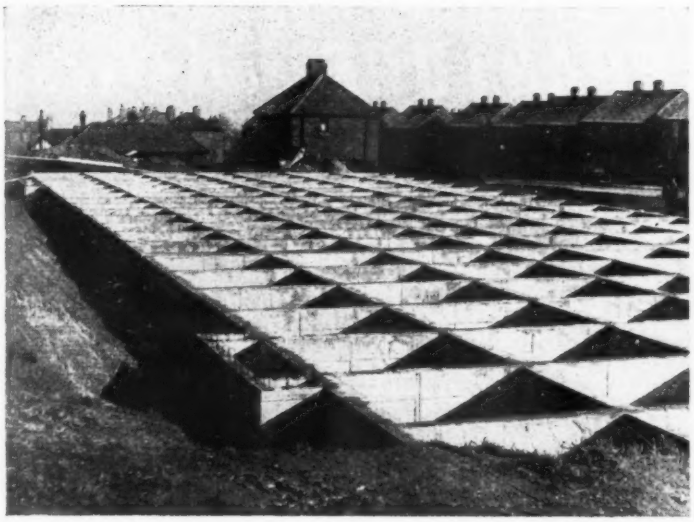


Fig. 2 (left), 4-ft. deep cellular reinforced concrete raft foundation for school on subsidence site in Yorkshire. Fig. 3 (above), Nottinghamshire school showing deep concrete foundations of former attempts to combat mining subsidence.

essential that these precautions be approved before the Treasury will sanction the loan. In this case, the responsibility for recommending whether a site is suitable for building on at all, and for ensuring that precautions are taken if the expected subsidence is to be moderate rests with the Mineral Valuer.

Nottinghamshire County Council has an annual school building programme of about £1,000,000. The urgent need for school places in the county means that rapid methods of building new schools are required. Their cost is rigidly controlled by the Ministry of Education. Complex educational requirements, together with varying site conditions, mean that complete planning freedom is needed, as well as the ability to go up to three storeys. In addition, the schools must have a high quality of finish. If delays due to the shortage of craftsmen are to be avoided and the schools handed over on the date agreed with the client, they must be built with the minimum of site labour. The problem of protecting buildings from damage caused by mining subsidence must be seen within this context and represents one factor only in the total situation which dictates the choice of building method to be adopted. Nevertheless almost all new schools in the county are built in the areas of the coalfields, where most of the population lives, and of the eleven new schools in the 1957-58 programme only two will not be subject to moderate or fairly severe subsidence. The County Council is, therefore, closely concerned with the problem and to a considerable extent it has been allowed to influence the design of the constructional system with which the schools are being built.

Traditional mining subsidence precautions

The method of giving subsidence protection to new schools built in Nottinghamshire has, in the past, been similar to that used fairly generally in the country. A normal brick or concrete structure has been designed and underneath it special subsidence foundations have been incorporated. These consist of strongly reinforced concrete slabs with deep reinforced edge beams and a grillage of heavy ground beams. The foundations and the superstructure are divided into separate sections of about 60 ft. in length by slip joints. Each section is intended in turn to cantilever as the ground settles, then tilt, and finally take up a horizontal position when subsidence is complete. It is obvious that ground beams of sufficient strength to support the weight of the superstructure as well as their own weight in cantilevering perhaps a third of their length are extremely expensive. They have often been four or five feet in depth and have required enormous quantities of steel. A great deal of site labour has been needed and foundation work has been extremely slow. The cost is usually about ten per cent. extra on the cost of the building and has often been very much more. This money is simply buried underground and does nothing to increase the value of the building in use. Even with these precautions there has been frequent damage; and quite considerable repair work has to be carried out. Whilst subsidence is taking place cracking walls and breaking windows have been a source of anxiety to teachers; and the danger of concrete roof units becoming unseated has meant that parts of two schools have recently had to be closed to the children.

A new approach

In view of this generally unsatisfactory situation the County Architect decided that the whole question needed re-examination. In September 1955 one or two architects in the department were set aside to study mining subsidence design, together with the more general reconsideration of constructional methods for new schools in the 1957-58 programme. It was clear that the public was paying quite a lot for not very much protection. Design seemed to be based on guesswork and on inadequate knowledge of the actual nature of subsidence. Everybody was trying to play safe and the solution was bigger and stronger ground beams at greater and greater cost.

The object of the research was to develop a system

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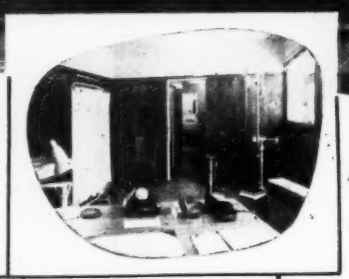

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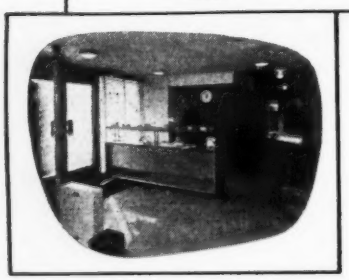

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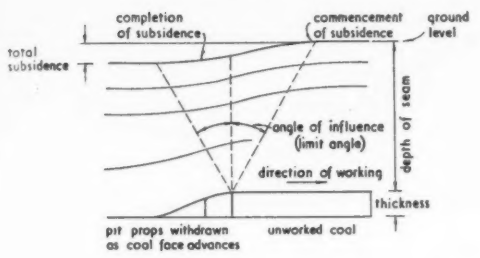
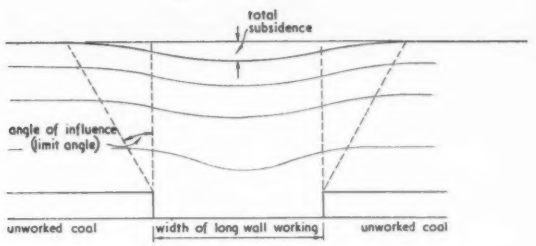
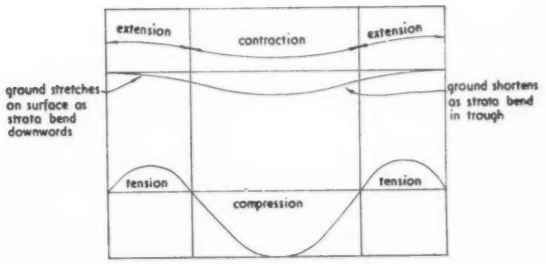






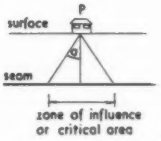


Fig. 4, the effect on the surface of underground working. Top left, section parallel to direction of working. Top right, section looking towards coal face. Centre right, diagram showing horizontal strain on surface. Bottom right, diagram illustrating zone of influence. The sectional diagrams illustrate the wave-like formation of the strata curving into the void left by the coal extraction using longwall mining. The angle between the vertical at the working face and the limit of subsidence effect is called the angle of influence. It is a fairly constant angle for any particular area. Thus in the diagram bottom right a building on point P will become affected by subsidence if coal is extracted in zone of influence. a = angle of influence.

of construction which would not involve extra cost and yet meet all the other requirements of school building on sites subject to normal subsidence movement. There should be no limitation on planning freedom or number of storeys, and mining conditions should not restrict the shape of the schools. In the event of abnormal and unpredictable ground movement any damage caused should be easily made good and at all times the structure should remain sound. The danger of deck or ceiling units becoming unseated or windows bursting into the faces of the children should be completely eliminated. Finally, to avoid the frequent long sterilization of sites for building purposes the schools should be capable of being built whilst subsidence was actually taking place.

How the ground moves

The first task was to find out how the ground moved when coal mining took place underneath.

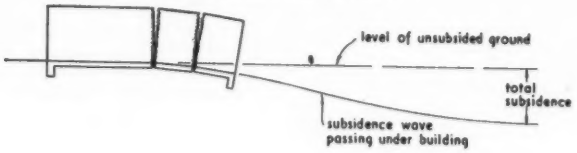
A general appreciation of the mining conditions in the county was made. With the co-operation of the chief surveyors of Areas No. 6 and 3 of the East Midlands Coalfield—the areas in which most schools were likely to be built in the future—information was obtained about the depth and thickness of unworked seams, possibilities of future working, rates of mining, geological conditions, and observed effects of subsidence.

It was necessary to study all the available theory of mining subsidence. A good deal has been published on the subject—most of it based on measurements taken in Holland and Germany. The best simple explanation based on work done in Britain is contained in National Building Studies, Special Report No. 12, *Mining Subsidence, Effects on Small Houses**. It is only in recent years that the problem has been studied in greater detail, and the tradition that says it is impossible to obtain any useful general laws relating coal working with surface movement dies hard. For a long time, before the nationalisation of the coal industry, the question of compensation for damage had driven the whole subject " under the counter."

The diagrams in Fig. 4 illustrate in a very general way the principles of mining subsidence.

Mining subsidence produces a travelling wave on the earth's surface whose effect on buildings can be considered under two headings—the vertical subsidence and the horizontal strain.

Fig. 5, effect of differential vertical subsidence. Building has a tendency to break its back as ground curves away beneath it (curvature is very much exaggerated).



*H.M. Stationery Office, 1951. 1s. 9d.

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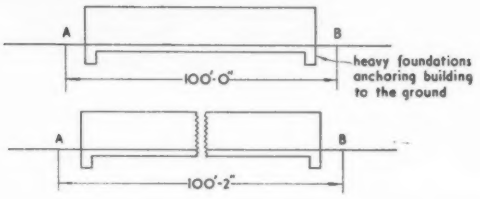


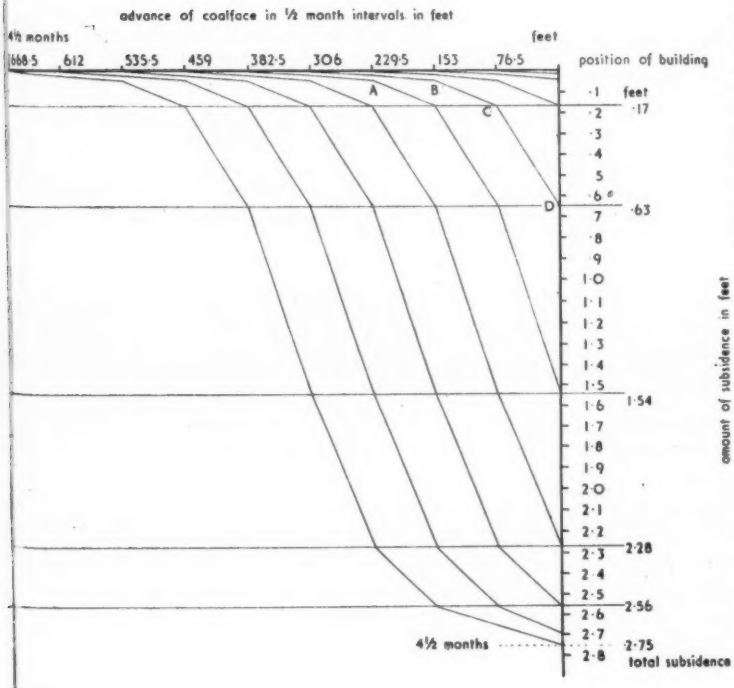
Fig. 6, effect of horizontal tension in ground. Two points, A and B on surface, may stretch apart by perhaps 2 in. Building will have tendency to tear apart (curvature is ignored in diagram).

VERTICAL SUBSIDENCE: A uniform settlement of the ground will obviously not affect a building on it however great it may be. The effect of the subsidence wave advancing under the building, however, is to lower the ground beneath the building differentially. One end of the building begins to settle before the other end, with the result that the building tends to distort to conform with the wave in the ground surface. Subsidence is therefore bending the building and it is the length of the subsidence curve relative to the length of the building that is an important factor (see Fig. 5). Mining conditions being equal, a large building, such as a school, will have a greater differential settlement over its length than a small building such as a semi-detached house.

Fig. 7, critical mining subsidence curve, indicating inclination of ground from horizontal under building from commencement of subsidence to completion (to simplify analysis, "curve" is drawn as series of straight lines).

Depth 250 yd.
Total subsidence 2 ft. 9 in.
Rate of advance 5 ft. per day.
Angle of draw 20°.

$$\text{Tan A} = \frac{\text{amount of subsidence in } \frac{1}{2} \text{ month}}{\text{distance of advance in } \frac{1}{2} \text{ month}} = \text{inclination of ground.}$$



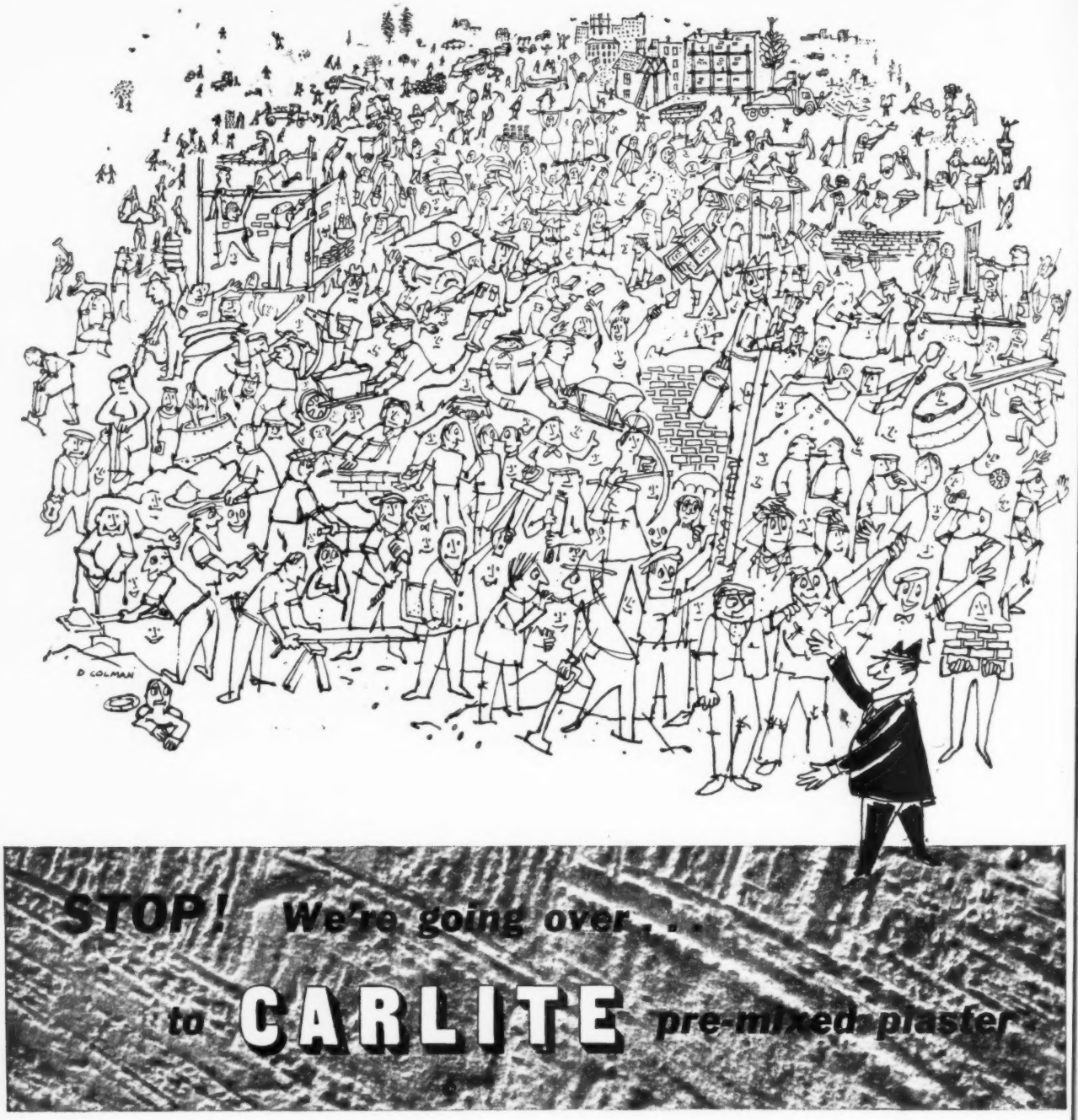
HORIZONTAL STRAIN: The subsidence of the ground causes horizontal changes in length or strains at the surface (see Fig. 4). It is these strains which have often been ignored in the design of subsidence precautions. Experience in Nottinghamshire indicates that it is this horizontal movement which causes most damage. The foundations of a building firmly bedded in the ground will be shortened or lengthened with it. This explains why sometimes the provision of heavy ground beams designed to span over the subsiding ground actually increases the danger of damage (see Fig. 6). As also do sunken boiler houses, sub-floor pipe ducts, and deep stanchion bases.

The magnitude of mining subsidence ground movements

The nature of the ground movements that affect a structure are known, but how great are they? If the amount of vertical movement of the ground and its curvature could be predicted from knowledge of the coal extraction conditions, it would obviously be possible to establish the limits of structural design. K. Wardell wrote a paper published in the *Transactions of the Institution of Mining Engineers* 1953-54, Vol. 113, Pt. 5, p. 471-482, entitled "Some observations on the relationship between time and mining subsidence." This paper sets out a method by which if one knows the rate of underground working, the depth of the coal seam, the thickness of extraction, and the angle of influence, one can, within certain limits, predict the amount of subsidence observed at any point at any time. This time-subsidence curve was produced as a result of measurements of subsidence made in the Yorkshire Coalfields, and took into account a wide range of differing mining conditions. The value of K. Wardell's work was that he had produced a single curve which generalised the development of the subsidence wave.

It was apparent that this curve which related the position of the working face to the subsidence of any point on the surface could be used to give the maximum inclination of the ground and the maximum rate of change of inclination (*i.e.* the maximum curvature). After surveying other available published work it was decided to accept Wardell's paper as the basis for design. A critical case of mining was assumed on the basis of local knowledge of mining conditions in the county. This was as follows:

Rate of advance of the coalface: 5 ft. per day
Depth of working: 250 yards
Total subsidence (approx. 80 per cent. of seam thickness): 2 ft. 9 in.
Angle of influence: 20 degrees



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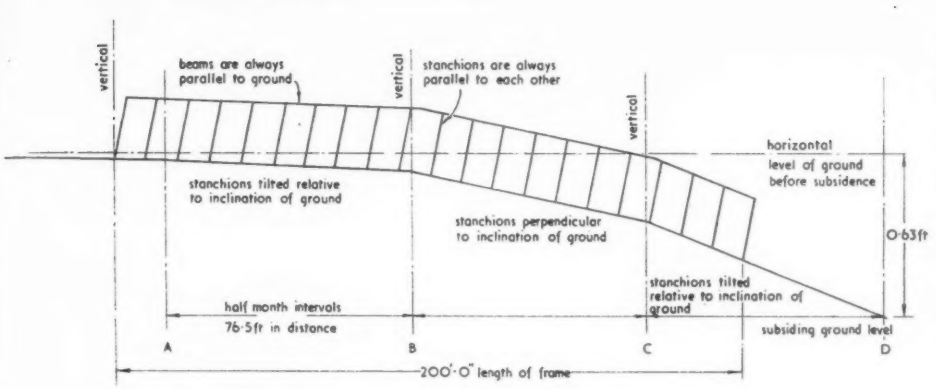


Diagram illustrates:
1. Angular deflection (or degree of "lozenging") in 200-ft. length of frame to allow it to follow the curvature of the ground without any member altering in length. Difference in slope of ground between one end of building and the other is 0 deg. 31 minutes, or 1.08 in. in 10 ft.
2. Assuming frame has tendency to square itself up stanchions will tend to become perpendicular to central part of curve under the building (or to plane BC on diagram) tilting stanchions at ends in different directions relative to the ground.
3. Angular distortion of frame (or degree of "lozenging") is therefore less than 0 deg. 31 minutes but is approximately half, i.e., 0 deg. 15½ minutes.

Fig. 8, frame building shown on position of maximum curvature of critical subsidence curve. 1 ft. on the vertical scale = 255 ft. on horizontal scale

These figures would give the steepest subsidence wave likely to occur under normal conditions. More sudden movements might, of course, be met with if there were unknown geological faults in the strata under a school, or if for other reasons mining suddenly stopped for a few weeks when the coalface was passing below. These are relatively rare conditions. To design for them would be unrealistic; it was sufficient to design to the critical normal case of mining and to ensure that if worse conditions were encountered the structure would still be safe.

The factors of the critical case of mining were applied to the time-subsidence curve. Fig. 7 shows the predicted curvature of the ground in section. The curve on the left shows the fully developed subsidence wave with the building at the fully subsided ground level after 4½ months from commencement of subsidence effect.

Fig. 8 shows an imaginary 200 ft. length of frame building drawn in the position of maximum curvature. The following is a summary of the ground inclinations.

Maximum inclination of ground from horizontal: 0 deg. 46 min. (or 1·61 inches in 10 ft.).

Maximum relative inclination of ground (in other words difference in slope of ground at one end of 200 ft. long building from slope of ground at other end when building is in position of maximum curvature of ground wave): 0 deg. 31 min. (or 1·08 inches in 10 ft.).

Curvature or maximum differential inclination between two adjacent 10 ft. bays of building: 0 deg. 4 min. (or ⅛ inch in 10 ft.).

Angular deflection of frame structure or amount of "lozenging" necessary: 0 deg. 15½ min. (or ·54 inches in 10 ft.).

The Architect's Department is indebted to R. C. Coates, B.SC.(ENG.), PH.D., A.M.I.C.E., A.M.I.MECH.E., of the Engineering Department of the University of Nottingham, for confirming and correcting analytically some of the original figures arrived at graphically.

The conclusion of the analysis of the vertical component of the subsidence wave in the critical case of mining was that the structure of a building should be able to "lozenge" (*i.e.* go out of square) 0 deg. 22 min. or ¼ in. in 10 ft. in all directions and that the curvature tolerance between adjacent 10 ft. bays should be ⅛ in. change of slope (Fig. 9).

As far as the horizontal movement of the ground was concerned there were no figures. In 1955 insufficient measurement had been taken to enable any general theory to be arrived at. The shortening and lengthening of the ground was known to exist but its magnitude was unpredictable.*

The general design principle

With a knowledge of how the ground moved and the magnitude of its vertical movement it became possible to formulate the design policy. A solution which was based on the modification of a normal but appropriate

* The relationship between underground working and horizontal surface strain has now been established and published in a paper by R. J. Orchard A.R.I.C.S., Subsidence Engineer of the NCB, *Prediction of the Magnitude of Surface Movements* on April 9, 1957, read at the European Congress on Ground Movement held at Leeds.

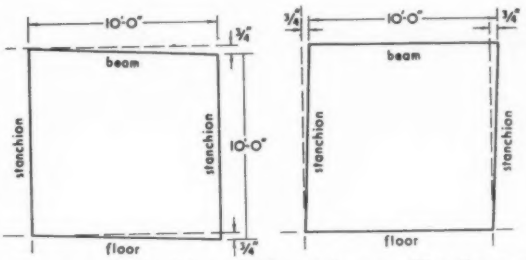
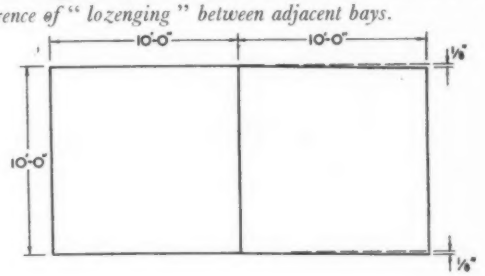


Fig. 9, required mining subsidence tolerances. Top diagrams illustrate degree of "lozenging" in 10 ft. × 10 ft bay. Bottom diagram illustrates curvature tolerance: maximum difference of "lozenging" between adjacent bays.



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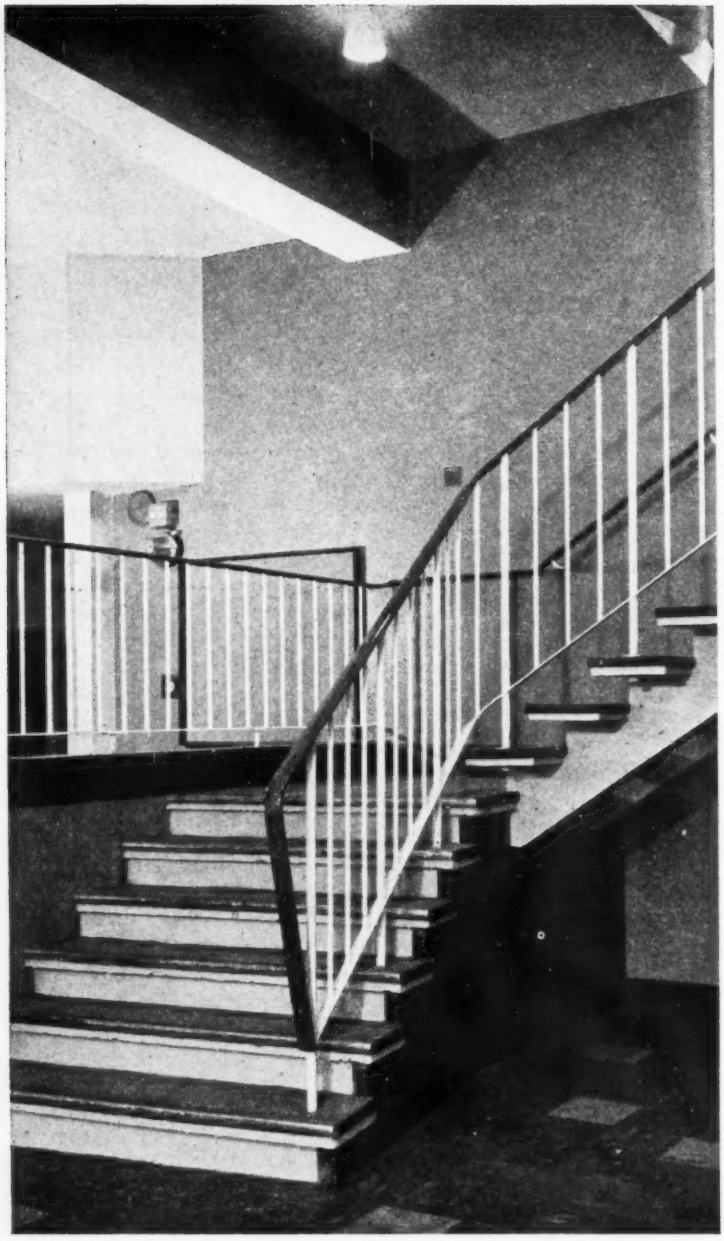

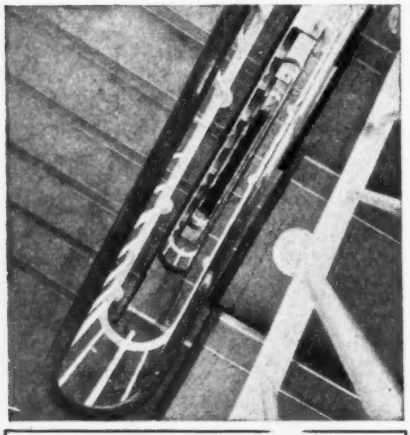

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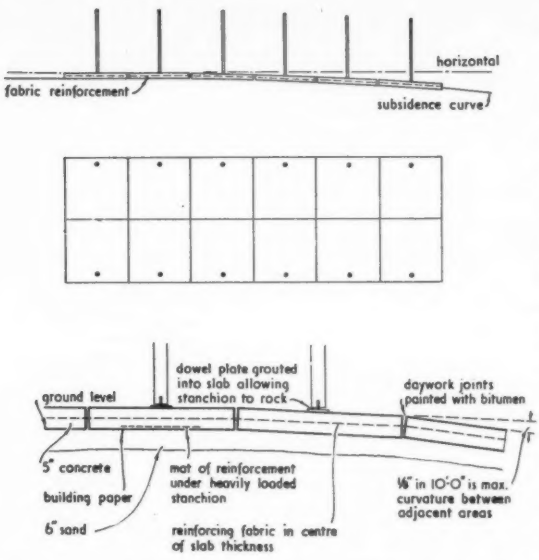


Fig. 10, site slab. Top diagram, section showing caterpillar effect (vertical scale is exaggerated). Tensional fabric reinforcement continuous through separate squares of concrete to tie all together and maintain stanchion spacing at foot and prevent slab being torn apart. Centre diagram, plan of slab showing daywork joints in concrete. Bottom diagram, section showing construction of slab.

structure appeared preferable to one that depended on the addition of protective equipment such as special foundations, jacks, etc. The latter would inevitably mean an extra cost whilst the former might not. The main principles required of the design are as follows:

1. A structural frame is to be designed to deflect sufficiently to follow the differential vertical subsidence, with no attempt to cantilever over the approaching subsidence depression.
2. In order to neutralize the horizontal movements of the ground, however great they may be, the structure is to rest lightly on the surface and the ground is to be free to slide horizontally beneath it. Hence to reduce the horizontal forces in the building it must be light and there must be no foundations or other projections sticking into the ground.
3. Walls, windows, floors and roofs are to be designed to allow the structural frame to distort with the ground.
4. Each part of the construction must be designed in such a way that the extreme but rare and unpredictable subsidence effects cannot endanger life or cause structural instability, and repairs will be cheap and easy.

It was clear that either a timber or a steel frame could be designed to allow the necessary "lozenging" and could be founded on a flat concrete slab. For a variety of reasons unconnected with subsidence, of which the chief one was the requirement of three-storey construction, it was decided to use steel. It seemed reasonable to aim at developing a perfectly articulated pin-jointed frame which would have no stability whatever in a vertical plane except that imparted by steel wind bracing. Thus the problem of differential "lozenging" would be contained within the design of the wind bracing units.

To carry the flexibility of the frame through into the cladding, overlapping hanging sheet materials could be used, and an examination of houses damaged in the area indicated that timber windows could be designed to allow the necessary tolerances. A study of the expected stanchion base loading and soil strengths showed that a thin site slab with no base pads would adequately support a three-storey structure provided dead weights were kept to a minimum.

The site slab

All single and multi-storey structures are based on a 5 in. thick lightly reinforced concrete site slab which rests on a 6 in. bed of sand or other fine granular material having a reproducible friction coefficient. The slab is cast in small daywork areas of not more than 200 sq. ft. and is allowed to follow the subsidence wave vertically. Small cracks will appear in the floor, probably at joints. If, however, the floor finish is designed to allow for this, no damage will be done and the cracks will later close up when the ground becomes level again. With a pin jointed frame no wind moments from the stanchions are transmitted to the slab, hence there is no need for greater depth of concrete at stanchion bases to give end fixity and resist overturning. The stanchions, in fact, sit each on a single dowel grouted into the slab. The maximum load on any stanchion in three-storey construction is 16 tons. This is based on 60 lbs. per sq. ft. floor loads, 15 lbs. per sq. ft. roof loads plus the dead load. This load can be dispersed without exceeding the bearing capacity of the soil by means of a mat of reinforcing fabric within the thickness of the 5 in. slab. This reinforcement is located at the bottom of the slab. Punching shear is taken care of by the steel dowel plate on which the stanchion sits. This stanchion base reinforcement is rarely required on reasonable ground for single storey loads. As far as possible the daywork joints in the slab are located to run between stanchions. See Fig. 10.

In addition to providing a floor and transmitting the vertical loads from the stanchions to the ground, the concrete slab has the rôle of maintaining the horizontal position of the stanchion bases. It is, in fact, the bottom diaphragm of the structure resting on the sand bed.

The contraction or extension of the ground caused by the subsidence wave will tend to compress the slab or tear it apart. It is therefore reinforced in order that it will stay in one piece, allowing the ground to move beneath it. The horizontal compression or tension in the slab is governed by the friction between it and the ground*. The sand bed is levelled and consolidated and the concrete is poured on to building paper over-

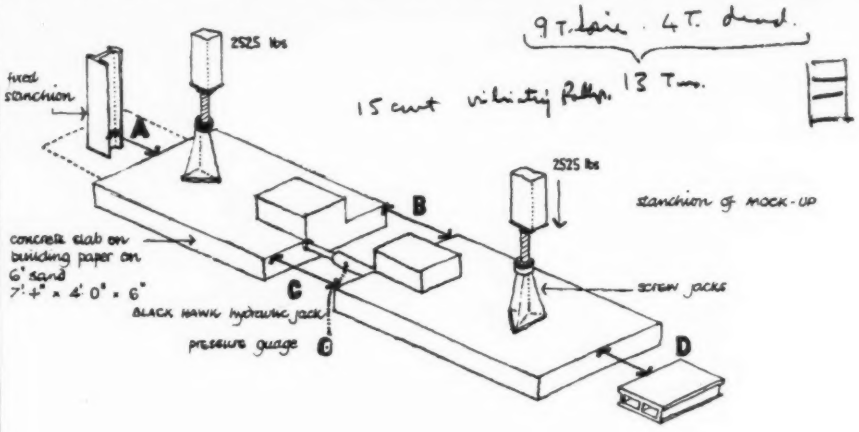
* National Building Studies Special Report No. 12 indicated in principle the method of calculating friction reinforcement—in this case applied to small rigid buildings.

technical section

OBJECT

To confirm assumed COEFFICIENT OF FRICTION (0·66) between concrete site slab and dry sand.

APPARATUS



METHOD

The vertical jacks were all levelled to DATUM
Initial readings were taken at points ABCD before any pressure was applied between the slabs
Pressure was then applied by the hydraulic jack, and a succession of readings taken, approximately at every 500 lbs, until the readings showed that the slabs were moving apart.
Readings were taken when the slab commenced to move, to determine the STATIC pressure, and the pressure required to keep the slab moving, the SLIDING pressure, was also recorded
Calibration charts were used to convert the SLIDING pressure into an equivalent load in tons, and this figure was divided by the dead weight on the stanchion and concrete base slab to give the Coefficient of friction
The procedure was repeated on the North wall of the frame

RESULTS

	GUAGE PRESSURE	A	B	C	D	
SOUTH	0	8 3/8"	1' 5 5/16"	1' 5 3/4"	7"	
	900		NO CHANGE			
	1400		NO CHANGE			
	1800	8 3/8"	1' 5 5/16"	1' 5 5/16"	6 29/32"	

The slab then continued to slide at 1700 lbs, giving a calibrated SLIDING PRESSURE of 1·4 tons

NORTH	100	8 3/16"	1' 5 7/16"	1' 5 5/8"	10"	
	500		NO CHANGE			
	1000		NO CHANGE			
	1500	8 1/8"	NO CHANGE			
	1750	8 1/8"	1' 5 5/8"	1' 5 13/16"	9 13/16"	

In this case the slab continued to slide at 1600 lbs, giving a calibrated sliding pressure of 1·3 tons.

CONCLUSION

The dead load on the stanchion = 2525 lbs
Weight of concrete 2475 lbs
Total Weight = 5000 lbs or 2·24 TONS

SOUTH $\frac{1.4}{2.24} = 0.625$ NORTH $\frac{1.3}{2.24} = 0.58$

(This discrepancy is probably due to the fact that the load on the NORTH wall stanchion could not be accurately assessed, & was probably a little less than the SOUTH wall).

∴ The assumed COEFFICIENT OF FRICTION (0·66) gives a safety factor of 10%

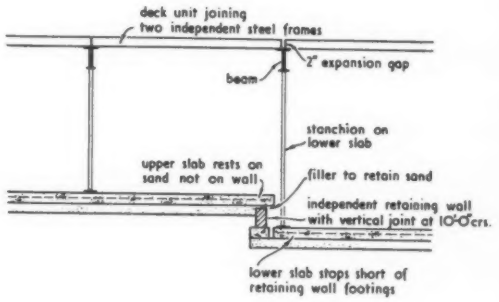
Fig. 11, architect's report on mock-up tests.

AREA OF STEEL PER FOOT RUN OF SLAB

technical section

lying the sand. Experience has shown that the slab attains a fairly smooth flat soffit. Under these circumstances the Building Research Station advised that a friction coefficient of 2/3 might reasonably be assumed. This was subsequently confirmed by jacking apart two sections of the ground floor slab of a "mock-up" structure constructed in Nottingham; the testing being carried out under the direction of Dr. R. C. Coates, of Nottingham University. (See Fig. 11.) To resist the tearing apart of the slab, tensional reinforcing fabric is introduced throughout. The tensile force across any vertical plane through the slab is determined by the product of the lesser total building weight acting on the ground to one side of the plane and the friction coefficient; the weight of the building being assumed to be the actual dead weight of the site slab and the superstructure plus one third of the live load. Then the required area of steel reinforcement to resist this horizontal tensile force can be calculated for any part of the site slab. (See Fig. 12 and also National Building Studies, Special Report No. 12.) Hard drawn steel wire fabric is used with a design stress of 45,000 lbs. per sq. in.

There is, of course, a limit to the length of slab that can be held together by tensional reinforcement. A continuous slab longer than about 180 ft. in single storey construction, and over about 140 ft. long in three storey, would necessitate more than two layers of fabric. For greater length it would be advisable to break the site slab with a 2-in. joint and incorporate a simple expansion joint in the steel frame. Normally one layer of fabric is enough with an extra layer in zones of maximum stress. Slabs are also broken at changes of floor level—the upper and lower slabs being able to "skid" independently of each other (Fig. 13). The continuous tensional reinforcement is



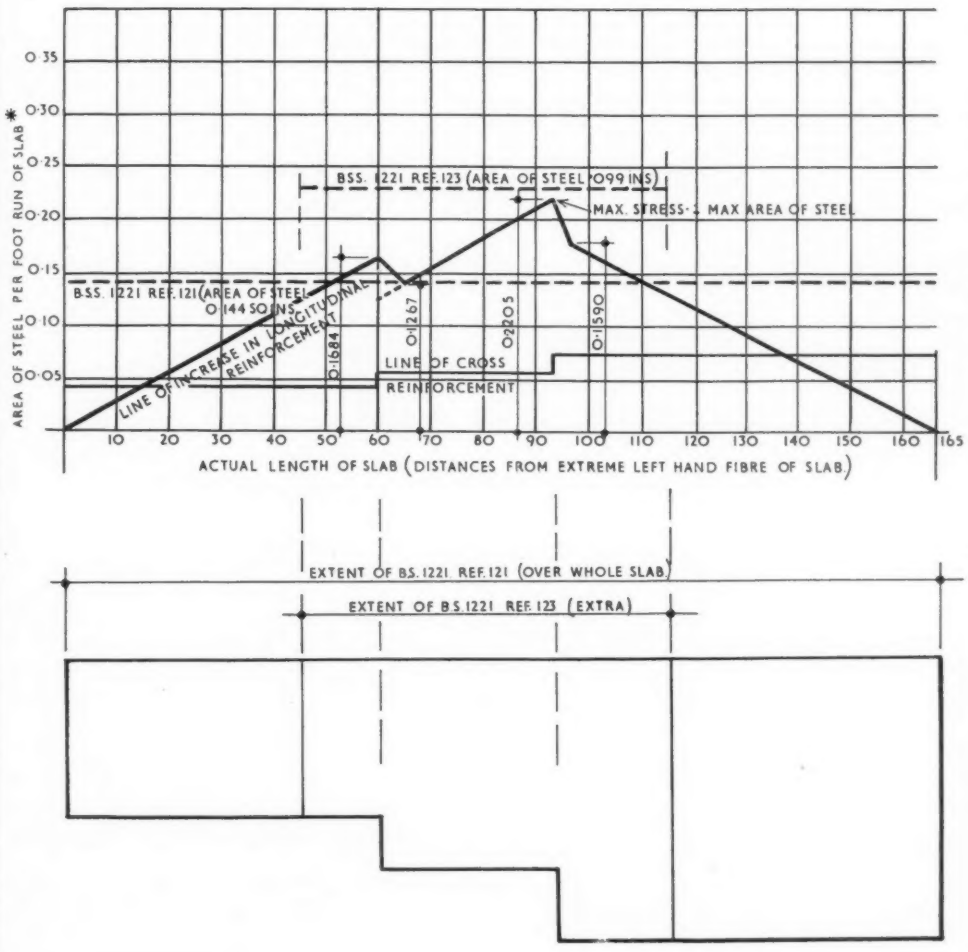


Fig. 12, graph (left) showing area of steel required in any given section of site slab for subsidence reinforcement. Below left, actual plan of site slab.

Fig. 13 (above), section at change of floor level showing how expansion joint for opening and closing is carried through structure. Retaining wall is built as part of ground and not part of slabs.

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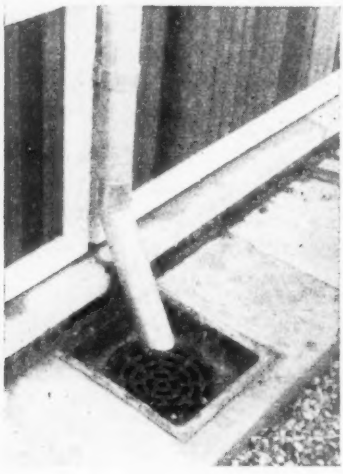


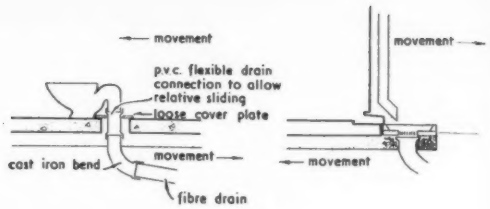


Fig. 14 (left), rainwater pipe discharging over open gulley. One method of disconnecting the building from the extending and contracting ground.

Fig. 15 (above), underfloor drainage. Left, showing how fittings fixed on slab will "skid" relative to drains which are in the ground. Right, rainwater pipe discharging over open gulley.

located in the centre of thickness of the slab to provide equal flexibility to bending in either direction.

The corresponding compressive stress is taken by the concrete alone. Since the slab as a whole is assumed to be "pinjointed," *i.e.*, without any rigidity, there would normally be a tendency for the slab to buckle, the vertical loads and its own self weight alone tending to prevent this. Fortunately the compressive stresses only occur in the ground when the strata are sagging downwards. The slab is therefore already tending to bend in a concave direction. The horizontal compression transmitted from the shortening ground will therefore tend to bend the slab downward and not upwards. (See Fig. 4.)

To design such a thin slab without footings or edge beams for three-storey buildings meant an examination of the soil mechanics factors. The Building Research Station confirmed that there were no records of frost affecting footings however shallow in completed buildings and that, in any case, the sand layer was not subject to frost expansion. A flexible construction such as this, capable of dropping 2 ft. 9 in. in 4½ months was hardly likely to be damaged by any minor movements in the soil. In any case, an apron of paving slabs and gravel around the perimeter of the building is incorporated in the slab design to protect the sand bed from washing away from under the slab; this will help to protect a clay subsoil from moisture movement. Every site has to be investigated for subsoil conditions, but it is not anticipated that any schools will require another type of foundation.

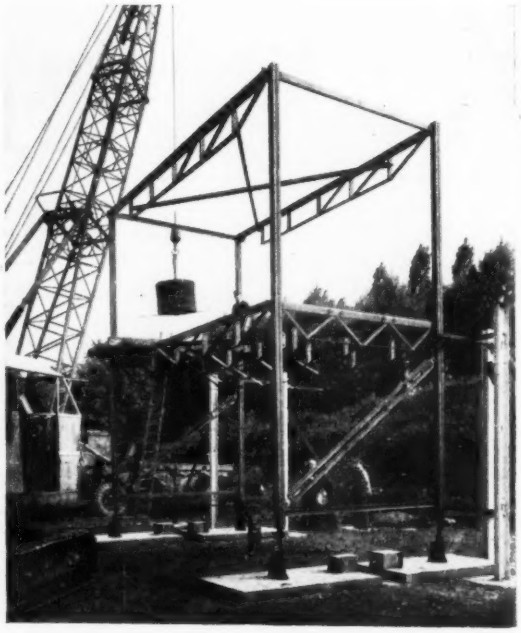
The steel frame

The design of the steel frame is largely dictated by other considerations than mining subsidence. The characteristics of the subsidence wave, however, imposed two specific requirements: Firstly that it should be completely pin jointed in every direction and, secondly, that it should be wind braced to resist the "Code of Practice" wind loading and yet be able to "lozenge" out of square to the specified angular distortion. These problems were solved in collaboration with F. W. L. Heathcote of Messrs. Brockhouse who have subsequently developed the light steel frame in co-operation with the County Architect's Department.

All bolted connections are either single 1¼ in. dia. bolts or are face bolted connections having two 1¼ in. bolts side by side. Stanchions sit on dowels and can therefore rock. Multi-storey stanchions have a dome-shaped rocker plate at the base to assist this process and avoid moments from eccentric loading when the angle between foundation plate and stanchion varies from 90 deg.

A two-storey made-up structure on four jacks was

Fig. 16, testing articulation of steel frame. Photo shows diagonally opposite jacks lowered 8 in. below datum. This was an extreme test and goes far beyond any requirements of mining subsidence movement.



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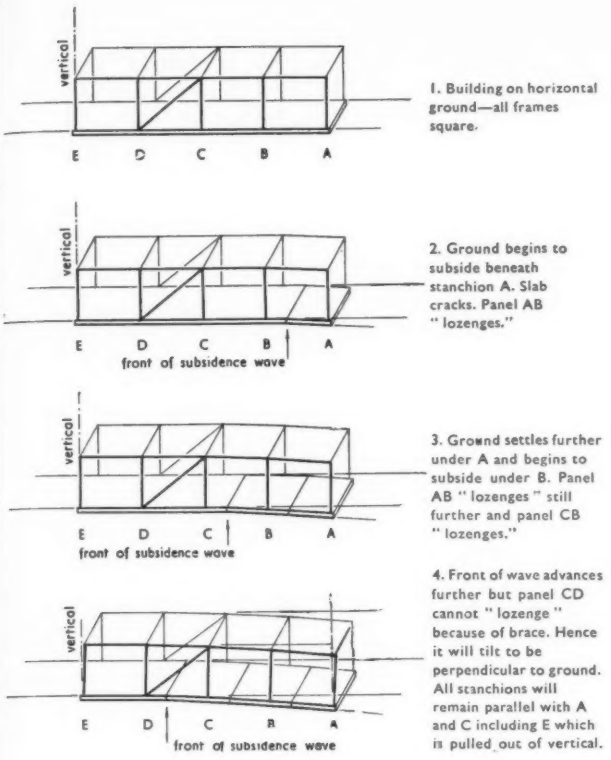
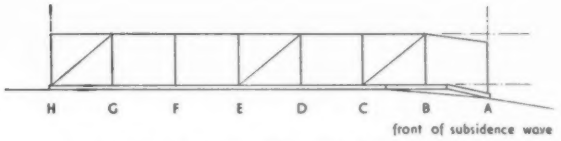


Fig. 17, pin-jointed frame on subsiding ground, ordinary fixed diagonal wind bracing one in line.



Ground subsides below B panel BC. Panel BC cannot " lozenge " because bracing unit is fixed. It cannot tilt because it is held up by the other braced panels still on horizontal ground. The building is in fact rigid and BC will attempt to cantilever. Stresses will be built up in the wind bracing units until they collapse suddenly.

Fig. 18, pin-jointed frame on subsiding ground with ordinary fixed diagonal wind bracing three in line.

built by Messrs. Simms, Sons and Cooke, the general contractors for the first school, at their yard at Nottingham, and a series of tests were carried out to confirm that the steel frame joints allowed the necessary articulation (Fig. 16). The result of these tests showed that the structure would stand an enormous differential in jack height without overstressing the members.

At first sight the problem of wind bracing an articulated pin jointed steel frame to resist wind without moving and, at the same time, to allow the frame to " lozenge " to accommodate mining subsidence seems one of mutually exclusive requirements. The process that led to the solution of this problem is shown in Figs. 17, 18 and 19.

Fig. 17 shows in a simplified way ordinary wind bracing operating as the frame conforms to the curve of the subsidence wave. It will be seen that provided the rigid braced units are never in line with each other, but always parallel to the front of the wave of mining subsidence they will allow all stanchions to settle as required without building up stresses in any member. The braced unit remains square and all other stanchions are parallel to it. This application of rigid cross bracing is of course a great limitation on the size of the building. The real difficulty was to design bracing units which could be in line with each other and disposed in the best way to brace against the wind load in fairly large buildings. Fig. 18 illustrates what will happen if fixed bracing is used " in line." What was needed was bracing which would operate against other bracing without building up stresses, and a solution to this problem was devised by F. W. L. Heathcote calling on his very long experience of chassis and vehicle design. Heavy compression springs are incorporated in the bracing member. When the

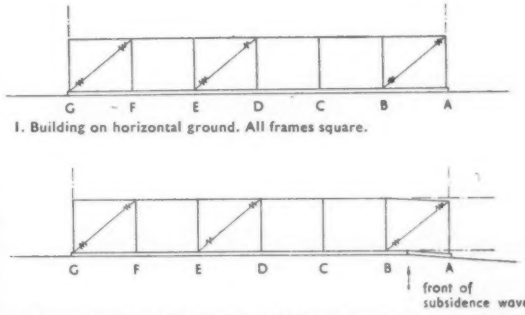


Fig. 19, Pin-jointed frame on subsiding ground, spring bracing.

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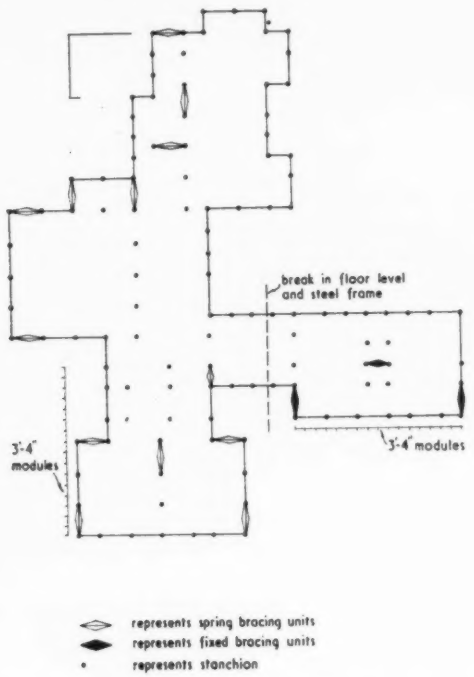

Fig. 20, distribution of wind bracing in single-storey construction.

frame "lozenges" one or other of the springs of each brace goes into compression according to which way the steel bays are going out of square. The design ensures that no spring is subjected to the possibility of failure in tension. Fig. 19 shows the operation of these spring braces and indicates how bracing can be located in its best position from a wind loading and a planning point of view without relation to the subsidence movement. Fig. 20 shows a typical distribution of wind bracing on a single-storey primary school. It is assumed that the subsidence wave may approach from any direction.

The length of the springs will permit the necessary deflection of a 200 ft. length of continuous frame on the critical mining subsidence curve. The springs are designed to be preloaded—that is to say that up to the wind load the braces are virtually rigid but after this a greater load will make them compress easily. The theoretical load-extension characteristics were checked by measurement on a wind bracing unit at Nottingham University. As it settles the dead weight of the building imposes a very much greater load on the wind bracing than the wind load. It is for this reason that the structure is rigid as far as wind is concerned and yet will lozenge when the ground begins to drop away differentially beneath it. It is clear that the wind brace units are always trying to return to their normal length and tending to re-align the frame. When the subsidence is complete and the ground becomes horizontal again at the lower level the braces will have squared the frame and the springs will have returned to their normal compression to resist wind loading. The compression springs themselves cost about a pound each making the spring braces slightly more expensive than rigid braces. The braces are a relatively small item in the cost of steel components and the extra cost on the building is therefore negligible.

Roofs and floors

The conditions imposed on the design of roofs and floors by mining subsidence movement is somewhat similar to those imposed on the site slab; that is to say that they are horizontal diaphragms maintaining the relative positions of the stanchions on plan and at the same time allowing the building to go out of square in elevation to follow the subsidence curve. There is, however, the additional considerations of danger to life by unseating of overhead units and the need to keep down weight. These, and other factors, including cost, speed of erection, etc., have led to the development of forms of construction in timber for these elements.

Walls and windows

With the 5 in. site slab, the steel frame with its wind bracing, and the timber roof and floor diaphragms, the structure as such is complete. It is strong enough to take all vertical imposed and dead loads, stable against wind, and capable of sufficient angular distortion to follow the subsidence curve. Because of its light weight and smooth underside the superstructure is isolated from the horizontal strains in the ground. The problem of designing the vertical planes in the building system (*i.e.* the walls and windows) has been to eliminate, as far as possible, any stiffening of the structural frame and at the same time keep weight to a minimum. The policy has been to keep units small, allowing tolerances for each to move to its calculated angular distortion, with the minimum frictional resistance. By using large numbers of small units the gaps between each are correspondingly small, and unpredicted strains, due to movement, are more easily dispersed. Carrying the principle of flexibility through the walls and windows has meant, as with the frame, the adaptation and modification of appropriate existing methods of building rather than the addition of new devices. As with the slab, frame and roof, the application of this principle has not in any way added to the cost of building.

Examination of steel windows in Nottinghamshire showed that the slightest movement caused considerable breakage of glass and the frames buckled and were very difficult to repair. It was decided to develop timber windows for the schools with the following modifications:

1. Very large sheets of glass to be avoided.
2. Glazing tolerances to be about double what is

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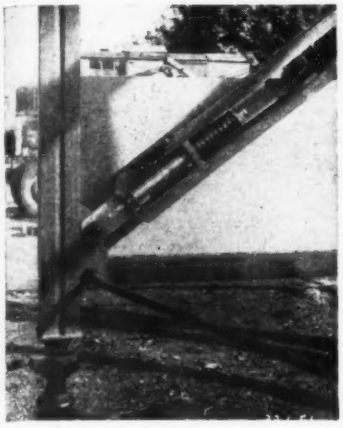


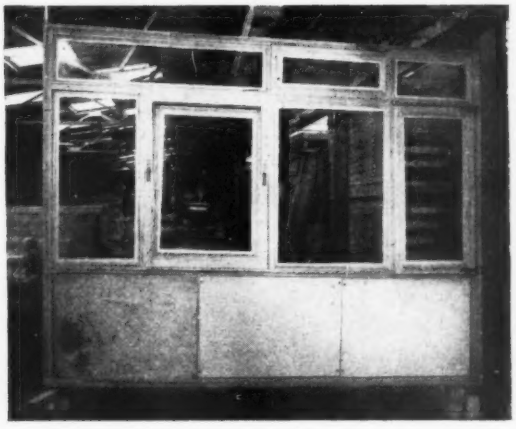


Fig. 21 (left), spring-loaded wind bracing unit on test structure. The spring is in compression allowing bracing unit to lengthen as the jack below the stanchion on left is lowered. Fig. 22 (centre), testing timber window for "lozenging." The window is 10 ft. wide × 8 ft. high. It is fixed rigidly to the stanchion on the right. The jack on the left has raised the left-hand side of the window 3 in. No glass was broken but the pivot window was jammed and the ordinary asbestos cement sheet on the left had broken. Asbestos wood sheets on the right had moved the necessary amount. The very thick timber sections were not, of course, used in the final window design. Fig. 23 (right), concrete cladding blocks hung on brackets at two corners on prototype school. View from inside.

normally required.

3. Glazing to be by beads and non-setting compound —not putty.

4. Rebates of opening lights to be large enough to prevent jamming.

5. Comb joint of window frames to be left unglued to allow rotation.

6. All tolerances in the windows to allow an angular deflection of four times the amount required by the "lozenging" calculated for the critical mining condition to ensure that unpredictable distortion caused by geological faulting would in no case cause the bursting of glass. These principles were tried out on a test window (see Fig. 22).

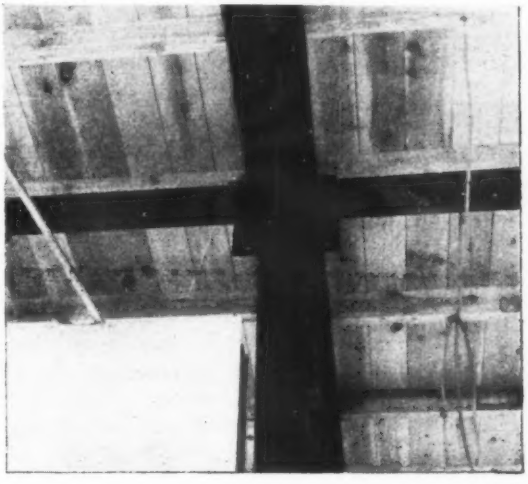
External cladding involving wet monolithic construction—such as brickwork—was obviously ruled out because of its weight and stiffness.

Three kinds of external walling have been developed which suit all the other stringent requirements as well as answering the needs of flexibility. Weather hung clay tiles on light prefabricated frames are used where there is little risk of impact damage. A variation of "mathematical" tiling involving the same principle has been developed with the Maidenhead Brick and Tile Company to enable clay tiling to be used where there is a greater risk of impact. Large concrete cladding slabs are hung like shiplap weather boarding involving the same overlap principle as tiling (see Fig. 23). These are hung on the steel stanchions at the top two corners and are therefore pin jointed. There is virtually no friction at the dry horizontal joint and the slabs therefore cannot impede the movement of the frame. The third method of cladding is timber shiplap boarding. Some of these methods were tried out on the "mock-up" structure and were entirely satisfactory from the point of view of subsidence movement.

Inner linings are generally asbestos wood boards in 2-ft. high sheets. Tests have shown that the nail fixing of these will give sufficiently to allow them to follow the frame movement.

It proved impossible with the time available to develop a flexible and light partition system made up

Fig. 24, precast gypsum internal partitions. They stop short of steel stanchion, allowing room for stanchions to tilt relative to them, but are fixed to the underside of the roof diaphragm so that they will tilt with *the steel frame in the other direction.*



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of small units because of the requirements of 30 decibels sound reduction between rooms. Partitions are moderately heavy precast gypsum panels with poured *in situ* plaster joints making monolithic sheets of up to 26 ft. 8 in. long. They are designed to tilt with the frame, but obviously will not "lozenge." There is therefore a ¾-in. gap at intersections which is to be pointed up with weak plaster (see Fig. 24).

Conclusions

Far too much money is being spent in mining areas on subsidence precautions. It is necessary to emphasize the decision made by the County Architect of Nottinghamshire that not a penny more would be spent on it on the new schools programme. This has led to the design of a system of construction which, as far as possible, meets all the requirements of school building and, almost incidentally, accommodates the ground movements caused by mining.

The re-examination of structural principles caused by having to study the effect of movement on buildings has in itself led to economies. There is little doubt that the light articulated steel frame braced horizontally with timber roofs and floors and founded only on an absolutely flat 5 in. thick concrete slab is an inherently cheap method of constructing three-storey schools. Since the war, methods of building based on the dry assembly of prefabricated components have been developed. For mining subsidence movement the flexibility and lightness inevitable in such methods has been analysed and exploited deliberately. The structure thus corresponds more nearly to that of vehicles and ships in which a degree of flexibility is a normal requirement.

There is no reason why this method of dealing with the moving ground cannot be applied to buildings other than schools. In principle, it seems possible that very much larger buildings can be built this way having four or five storeys. Similarly, this type of construction suggests itself for use in conditions of ground movement other than mining subsidence.

The subsidence ground movement caused by the extraction of a coal seam 491 yards beneath the first school built with these methods will begin to affect the site at the beginning of 1958. A programme of measurements has been arranged in collaboration with the National Coal Board to ensure that results in terms of ground movement and structural movement can be compared with the actual mining conditions. This, and similar "feeding back" of results should gradually lead to a greater precision of design as time goes on. In the meantime, the Nottinghamshire County Council is confident enough in the results of tests and studies so far carried out to turn its entire school building programme over to this constructional method.

No extra cost allowance will be claimed from the Ministry of Education on any of the schools for "mining subsidence precautions," which in effect means that there is a saving of about £60,000 of public money in each year's building.

THE INDUSTRY

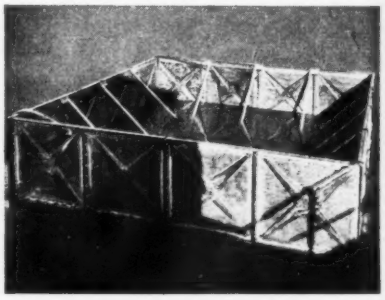
Brian Grant reviews a paint catalogue and describes a glass-fibre storage tank and a synthetic-resin floor preservative.

Paint handbook

International Paints, who make virtually every type of protective coating down to anti-foulings for ships, have recently issued a new catalogue giving details of all their decorative paints, including appropriate undercoats and primers. The list gives detailed painting specifications for all surfaces, and also contains colour cards. (*International Paints, Ltd., Grosvenor Gardens House, London, S.W.*1.)

Storage tanks

For a number of years the steel firms have been making water storage tanks built up to any capacity from square pressed steel panels bolted together. Similar panels are now being made in glass fibre reinforced polyester, and give a reduction of about



The Saunders-Roe storage tank, made up from panels of glass fibre reinforced polyester.

two-thirds in weight, while at the same time they should need no painting or other surface treatment. The panels weigh only about 50 lb. each, and are easily assembled by hand with cadmium coated nuts and bolts. The price works out at approximately the same as a steel tank. (*Saunders-Roe Ltd., Osborne, East Cowes, Isle of Wight.*)

New floor preservative

Synteko is a liquid synthetic resin floor preservative which is claimed to penetrate deeply into the pores of the wood, gradually hardening and improving the wear of the floor, and at the same time preventing discoloration. Two brush coats cost about 8s. per sq. yd., according to the condition of the floor, and the treatment can also be applied to old floors. (*Synteko Ltd., St. Margarets Works, Leicester.*)

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DOORS: 30

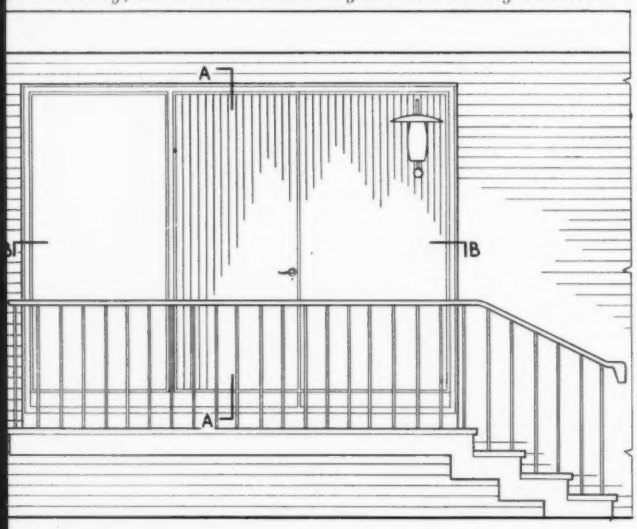
MAGISTRATES' ENTRANCE DOOR: MAGISTRATES' COURT AT SLOUGH, BUCKS

F. B. Pooley, Architect to the Buckinghamshire County Council

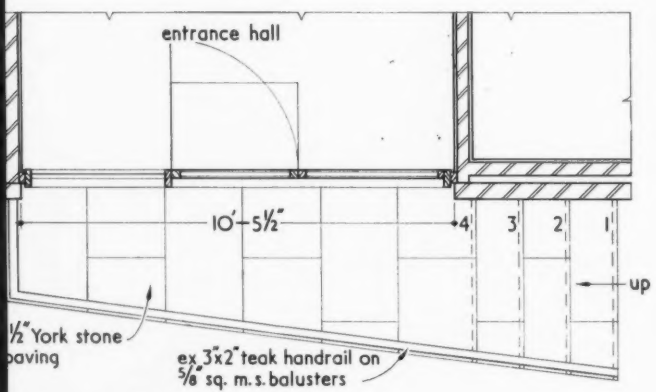
An "informal" door designed to read as a single unit with an adjacent solid panel. This has been realized by the use of teak slats. These have been fixed flush with the outside face and the side stiles have been rebated to simulate slats. To reinforce the effect of the pattern the rebates between slats have been stained matt black.

MAGISTRATES' ENTRANCE DOOR: MAGISTRATES' COURT AT SLOUGH, BUCKS

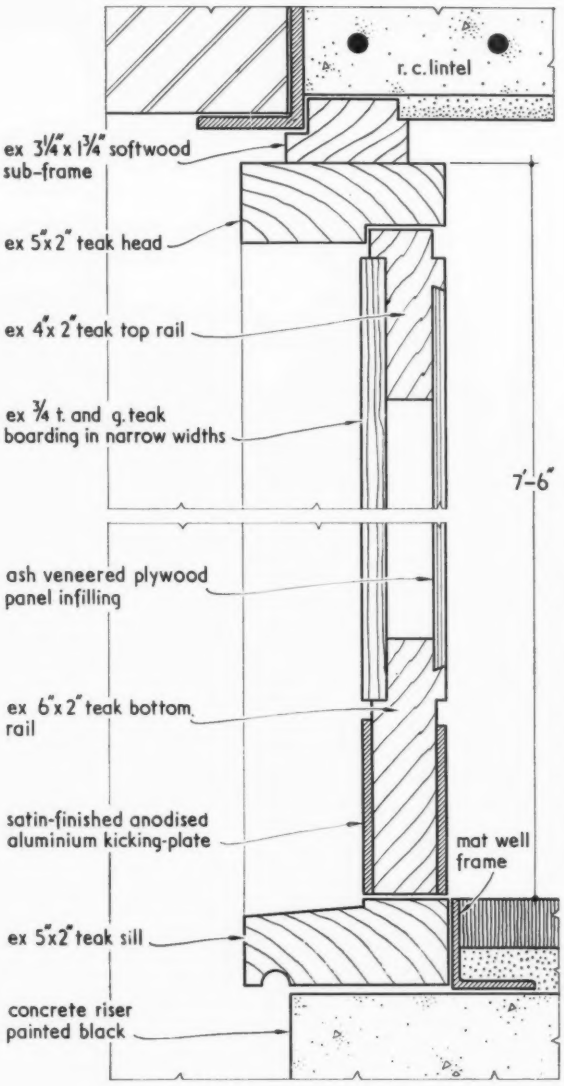
F. B. Pooley, Architect to the Buckinghamshire County Council



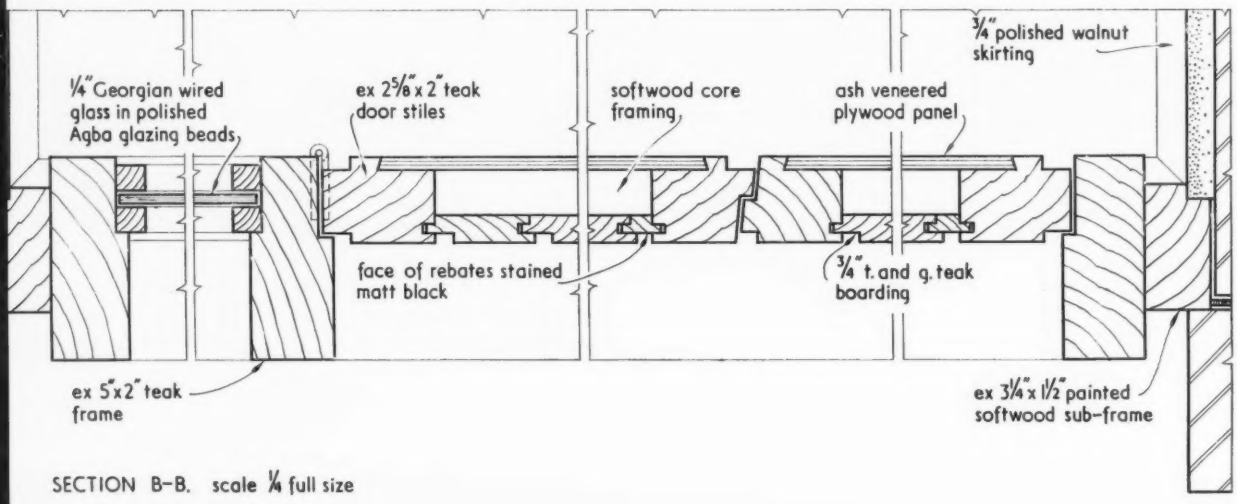
ELEVATION. scale ¼" = 1'–0"



PLAN. scale ¼" = 1'–0"



SECTION A–A. scale ¼ full size



SECTION B–B. scale ¼ full size

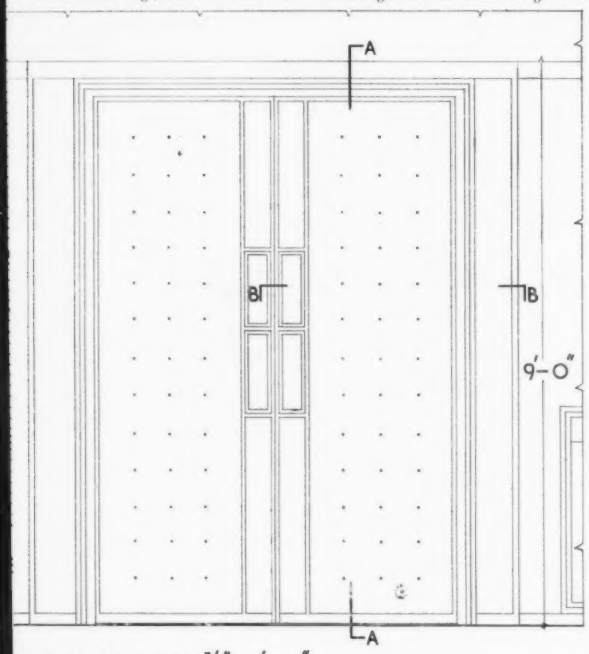
COURTROOM DOORS: MAGISTRATES' COURT AT SLOUGH, BUCKS

F. B. Pooley, Architect to the Buckinghamshire County Council

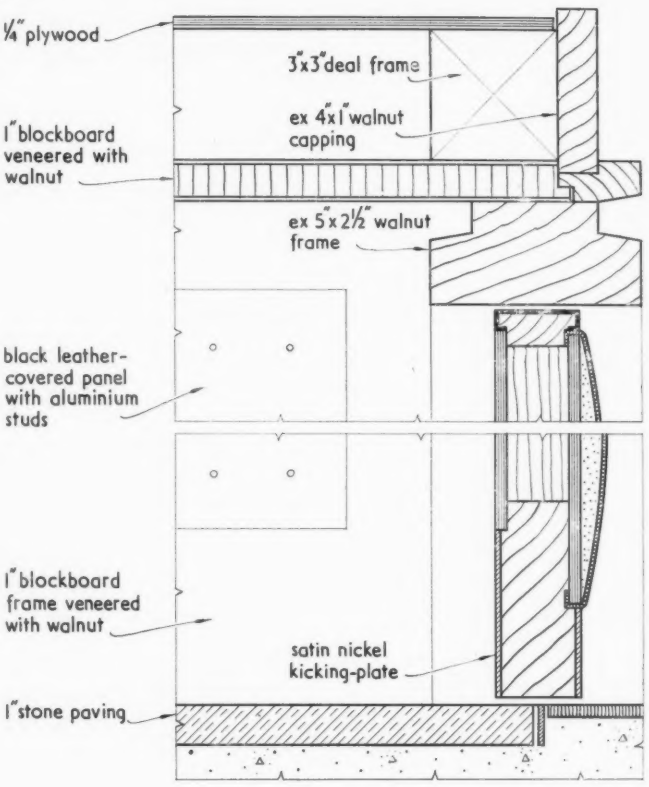
A pair of exceedingly sumptuous doors in black padded leather, satin nickel finish brass and Derbyshire fossil marble. Note the skilful accommodation of observation panels and push plates on meeting stiles and use of recessed mouldings on the frame to avoid interrupting the main lines of the door casing. The inlaid marble push plates are secured to thin brass holders with screws.

COURTROOM DOORS: MAGISTRATES' COURT AT SLOUGH, BUCKS

F. B. Pooley, Architect to the Buckinghamshire County Council



ELEVATION. scale 3/8" = 1'-0"



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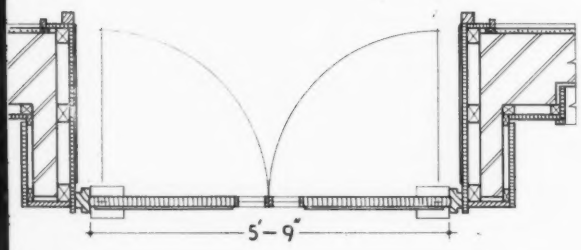
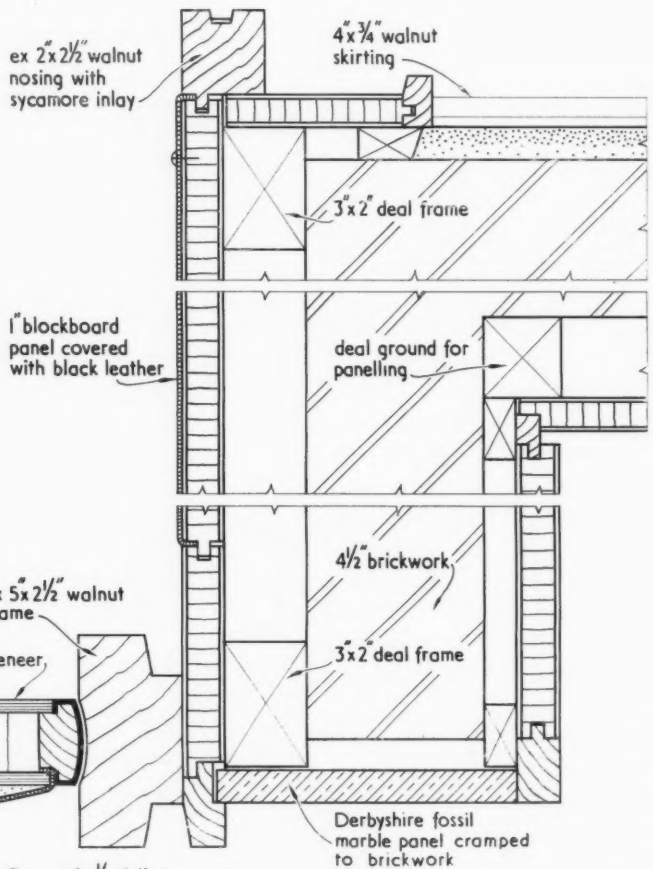
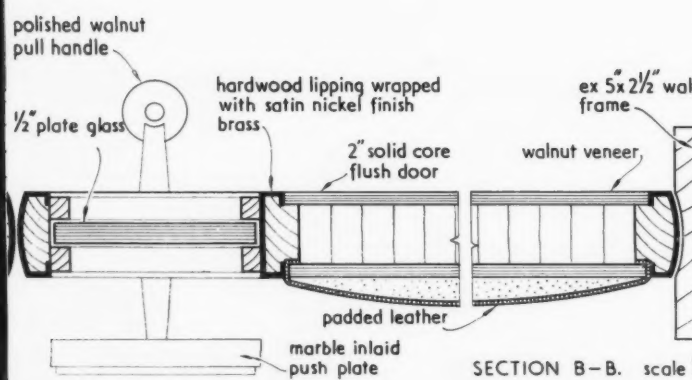


PLAN. scale 3/8" = 1'-0"





SECTION B–B. scale ¼ full size

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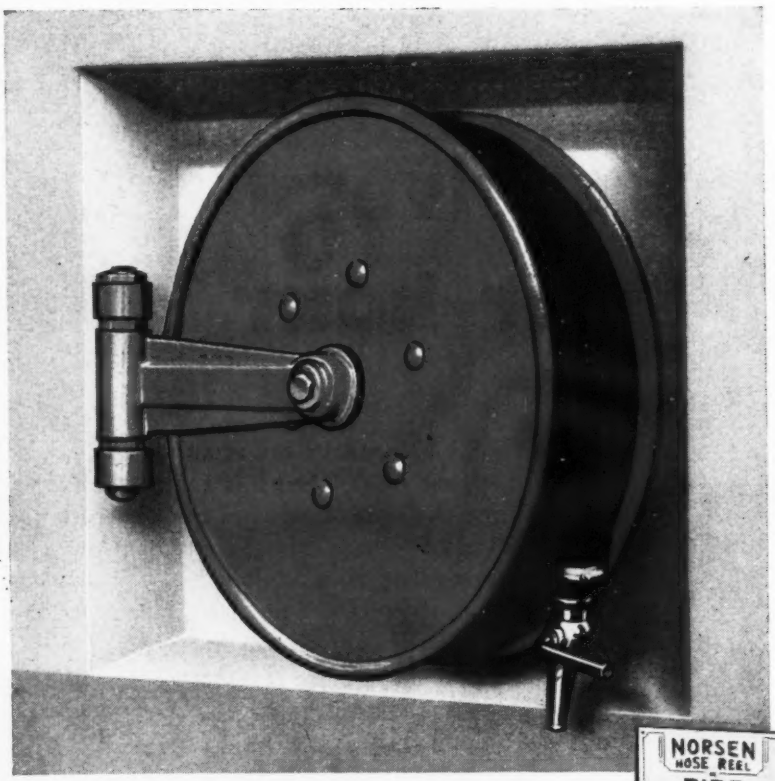

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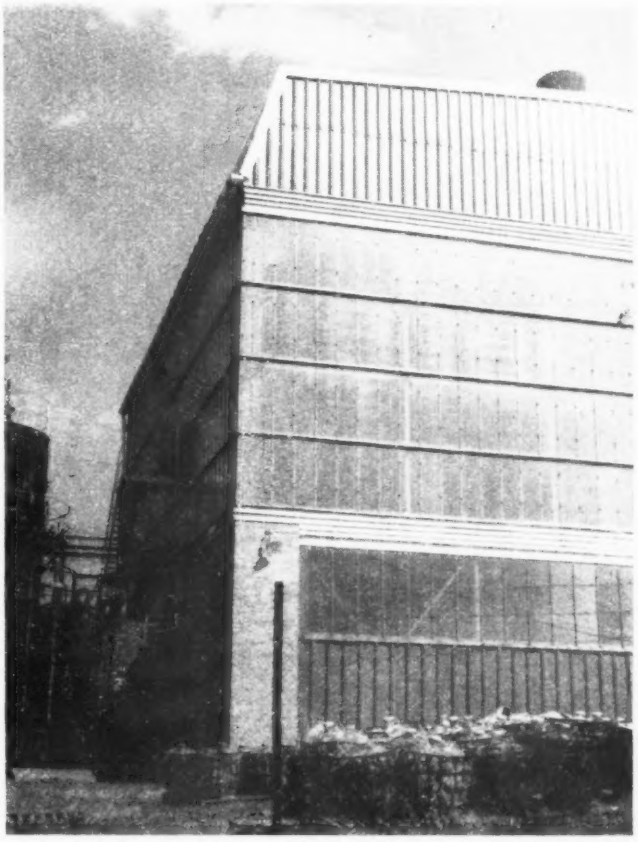

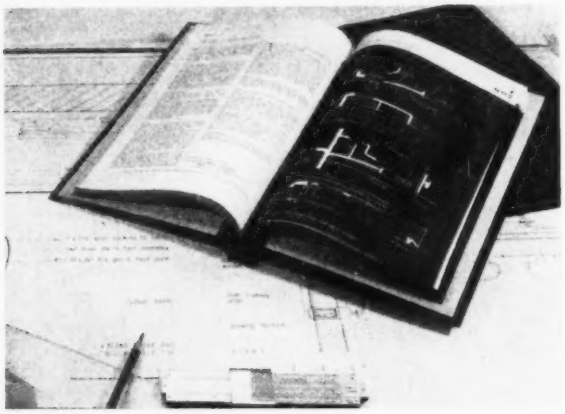

THE LIBRARY OF INFORMATION SHEETS COMPLETE TO SEPTEMBER, 1957

REPRINTS

All Information Sheets published since the new series was started in October, 1947, have been reprinted. Specially-designed binding cases to hold approximately 100 Sheets may be obtained at the price of 6s. 0d. each. (Postage 1s. 1d.)

Individual Sheets may be ordered (3d. each) Readers requiring sets or individual Sheets should fill in the form below. Sets in classified order (without binders) are available as follows, and the publishers will quote for sets not detailed below

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Announcements

PROFESSIONAL

Scherrer and Hicks, F/F.R.I.B.A., of 27 Harcourt House, 19, Cavendish Square, London, W.1, have opened an office at 27, King Street, Manchester (telephone Deansgate 7303), under the charge of B. J. Moxham, A.R.I.B.A. They will be pleased to receive trade catalogues at their new address.

A. F. Sewell, A.R.I.B.A., has commenced practice at 28, Lowther Street, Carlisle, where he will be pleased to receive trade catalogues.

Shepperdson and Dixon, L/A.R.I.B.A., of 2, Museum Street, Ipswich, have opened a new office at 15a, High Street, Colchester (telephone Colchester 5904). They will be pleased to receive trade catalogues.

John E. Myers, A.R.I.C.S., has moved to 20, Finkle Street, Stockton-on-Tees (telephone Stockton 66206).

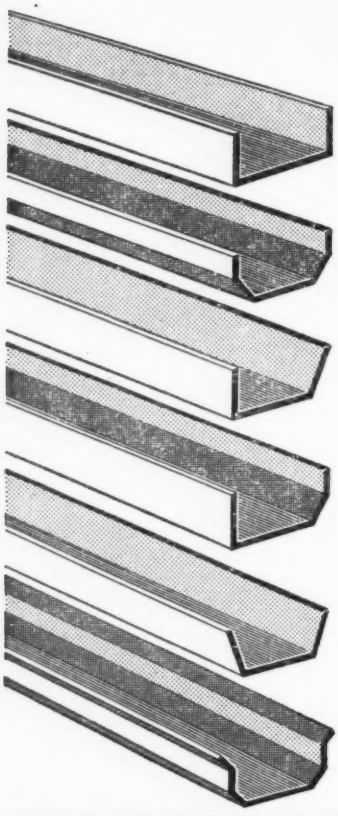
John Strong, A.R.I.B.A., has opened an office at 137, High Street, Billericay, Essex (telephone Billericay 983), where he will be pleased to receive trade catalogues, etc.

S. P. Jordan & Partners, A./A.R.I.B.A., have moved to 1, Bloomsbury Court, London, W.C.1 (telephone Chancery 7266-7).

TRADE

Treetex Acoustics Ltd., of 8, Guilford Street, London, W.C.1, announce that their telephone number has been changed to Chancery 7387.

Rhoden Partners Ltd., design and development engineers in mechanical engineering, have moved to 29, Park Crescent, London, W.1 (telephone Langham 7488).



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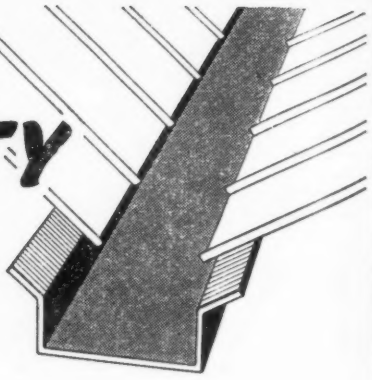

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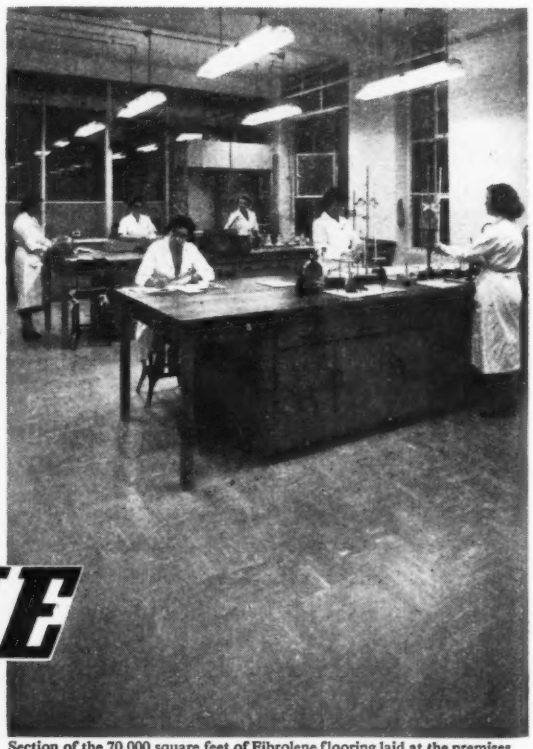

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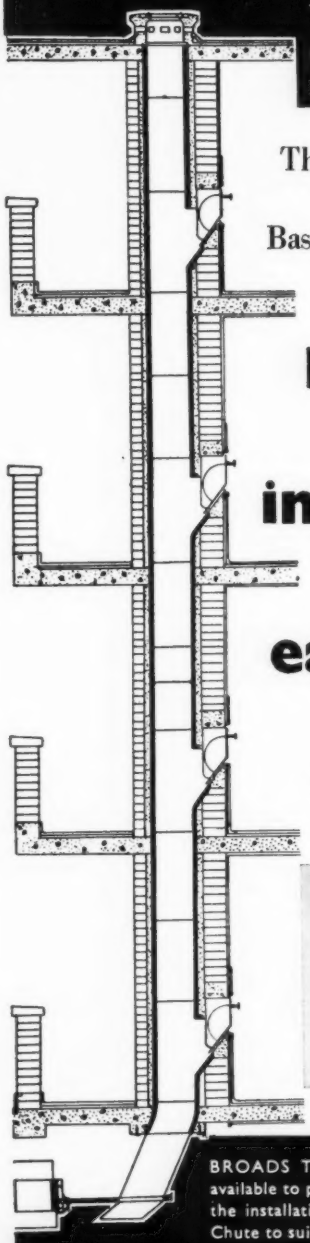

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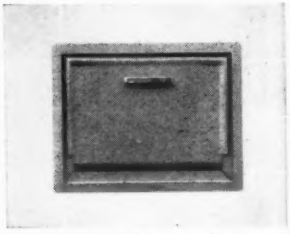

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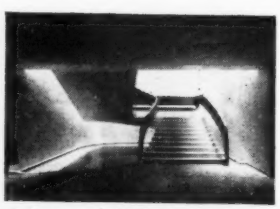
Universities
Staircase
Arcadia

October Architectural Review

Vexed by conflicting interests and lack of comprehension of the issues at stake, the design of *Universities* has become a problem that excites passion and prejudice, rather than constructive thinking. In the October number of the Review, Professor Pevsner and the Hon. Lionel Brett will attempt to put the problem back on a realistic basis in a special feature covering both the historical growth of *universities* and their present needs, emphasising the diversity of concepts, both in organization and architecture that the term embraces. Two articles in the same issue will deal with problems of architectural lettering; Nicolete Gray contributing a study of *Lettering in Three Dimensions* and *Skill*, surveying the design of *Fascia Boards*. Also in *Skill* will be an illustrated description of Arne Rudberger's stunning staircase for the MEA department store in Stockholm, and other recent structures to be illustrated will include a small house by Sir Hugh Casson on the South Coast, and another well-designed adjunct to a department store—G. A. Jellicoe's roof garden on top of Harvey's at Guildford. Two historical features will deal with developments in the first quarter of the present century: Ian Nairn's delayed study of Hampstead Garden Suburb is now expanded into a larger study of *Arcadia* as a place to dwell in, and Reyner Banham will investigate the implications of recent publications on the position of *Mondriaan* both as a pioneer of modern design, and as a model to be set up for emulation by architects in the future

3 D shop lettering in Dublin.



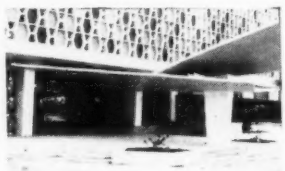
Staircase at the MEA Store, Stockholm.

Smithsons
Building Exhibition
ONNO

November Architectural Review

The controversial Smithsons will make their first appearance as contributors to the Review in November, with an illustrated study of the Shape of the Community, in which they set against the exhausted diagrams of CIAM planning their vision of a more humane type of city. For non-visionaries—and for visionaries too—*Skill* will provide a full cove age of the Building Exhibition from the technical point of view, as well as an *Interiors* treatment of G. A. Jellicoe's restaurant and shopping floors at Harvey's of Guildford.

Visionary qualities, spurred by hard practical necessities, illuminate Kenneth Browne's proposals for applying the ONNO traffic-directing technique to Park Lane and west Mayfair. The study of the functional tradition is advanced by Brian Spiller's article on Georgian Breweries. Buildings described in this issue will include the new Bowater Factories by Farmer and Dark, whose cladding provides a practical follow-up demonstration of patent-glazing techniques, and Rangoon University and Technical Institute, by Raglan Squire and Partners, extensively illustrated in colour. Professor Pevsner reviews Tschudi Madsen's important book on the Origins of Art Nouveau, whose character is summed up in the title *Beautiful and, if need be, useful*, and Dr. S. Lang will provide a note on Architectural Visitors to Padua, based upon a register kept by the university there, in which practically every English architect and amateur of note signed his name when passing through.

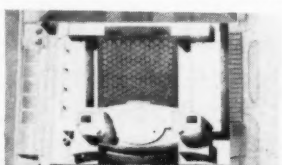


Entrance to the Library of the new Rangoon University. Architects, Raglan Squire and Partners.

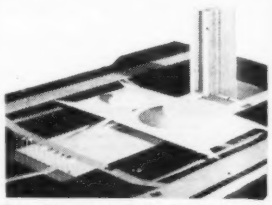
TUC
Brasilia
Street Lighting

December Architectural Review

Design for public and administrative functions will form the subject of the two most important features in the Review for December. The *TUC Memorial Building*, designed by David Aberdeen, which is only the second public building of consequence to go up in London since the War, will be described and illustrated for the first time in completed form, and a supporting article in *Skill* will examine in detail the finishes and mechanical equipment that make this one of the most lavish buildings—outside the commercial field—of recent years. The other major feature is concerned with *Brasilia*, the projected new capital city for Brazil, typically grandiose and Latin-American in conception, but more likely than most such schemes to achieve completion. Sir William Holford,

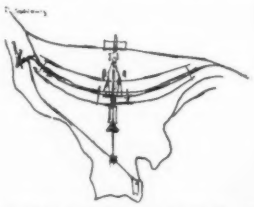


Airview drawing of David Aberdeen's TUC Memorial Building.



Oscar Niemeyer's design for the Congress Building at Brassilia.

who was one of the jury who assessed the competition for the new capital's plan, introduces the project and its site, discusses the competition, and adds a few words by way of introduction to the brilliant and unconventional winning scheme, by Lucio Costa, father of Brazil's modern movement, whose report is published in English for the first time.



One of Lucio Costa's sketches for Brasilia.

Another father of his art, *John Britton*, founder of English topographical studies, will be the subject of an historical article by Peter Ferriday, and the bicentenary of the birth of the great neo-Classical sculptor *Antonio Canova* is celebrated by one of England's leading neo-Classical scholars, F. J. B. Watson, with a chronicle of English visitors and admirers at the sculptor's studio in Rome. Gordon Cullen will tackle one of the most vexed and debated problems of outdoor detailing, *Street Lighting*, in terms of distribution and siting, as well as the design of equipment, and interiors to be described include the IBM offices and the Garden Centre, both in new office blocks in Wigmore Street. Foreign reports will cover the *Triennale di Milano*, and the *Berlin Interbau* exhibition, and regular features like the *Counter Attack* Bureau and Robert Melville's provocative art-criticism will continue.

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.

AIR MINISTRY Works Designs Branch require in London and Provinces ARCHITECTURAL ASSISTANTS experienced in planning/preparation of working drawings and details for permanent and semi-permanent buildings. Salaries in London up to £1,015 per annum for men and £932 for women. Somewhat lower in Provinces. Starting pay dependent on age, qualifications and experience. Long term possibilities with promotion and pensionable prospects. 5-day week, 3 weeks 3 days leave a year. Liability for overseas service. Normally natural born British subjects. Write stating age, qualifications, employment details including type of work done, to any Employment Exchange quoting Order No. Borough 600. 7187

BOROUGH OF MANSFIELD

Applications are invited for the following appointments in the Architect's section of the Borough Engineer and Surveyor's Department.

(1) TWO GENERAL ARCHITECTURAL ASSISTANTS.

Salary: Special Grade £750 × £40—£1,030.

Applicants must have passed parts I and II of the R.I.B.A. Final or Special Final or their equivalent and to have had at least five years' experience (including training).

(2) JUNIOR ARCHITECTURAL ASSISTANT.

Salary (*a*) General Division (£200—£450) or Higher General Division (£230—£560); (*b*) A.P.T. I (£575 × £30—£725).

Salary (*a*) will be paid to a person having passed the general certificate of education in appropriate subjects. Experience in architectural draughtsmanship is essential.

Salary (*b*) will be paid to a person having passed the R.I.B.A. Intermediate examination.

Applications giving the following particulars:

(1) Age.
(2) Training.
(3) Qualifications.
(4) Present and past appointments with salaries.
(5) Experience in (*a*) housing development including 2 and 3 storey flats; (*b*) shops; (*c*) swimming baths; (*d*) crematorium.
(6) Names and addresses of not more than 3 referees should be sent to the Borough Engineer and Surveyor, Carr Bank, Mansfield, not later than Monday, 14th October, 1957.

A. C. SHEPHERD,
Town Clerk.

Carr Bank,
Mansfield. 7639

ARCHITECTURAL ASSISTANTS
Required by
MINISTRY OF WORKS

For employment in London and Provinces on design and detailing work on construction and maintenance of all types of public buildings.

Salary range £550 (age 21) to £870 p.a., London (slightly less elsewhere).

5-day week. 3½ weeks' annual leave initially. Starting pay according to age, qualifications and experience. Good prospects of promotion, with salaries of £1,030 p.a. and above.

Opportunities for permanent posts leading to pensions (non-contributory).

Interviews at Regional Offices, where possible. Applicants should be of Inter. R.I.B.A. standard. State age, training and experience to Chief Architect, Ministry of Works (A), Abell House, John Islip Street, S.W.1. 7484

BOROUGH OF CHORLEY

Applications are invited for the position of DRAUGHTSMAN in the Borough Engineer's Department. Salary the maximum of Miscellaneous Grade IV (£620).

After a period of satisfactory service, and if considered suitable, the successful applicant may be offered articles under the Borough Engineer.

The National Scheme of Conditions of Service and the Superannuation Acts apply.

Applications stating age, qualifications and experience with copies of two recent testimonials must be received by the undersigned not later than the 14th October, 1957.

GEORGE JACKSON,
Town Clerk.

Town Hall,
Chorley.
23rd September, 1957. 7659

BOROUGH OF POOLE
ASSISTANT ARCHITECT
Special Grade £750—£1,030

Applications are invited for the above appointment to the Borough Engineer's Staff. Candidates should have passed the appropriate professional examinations. Experience in the design of schools will be an advantage.

Application forms from the Borough Engineer & Surveyor, Municipal Buildings, Poole, to be returned to the undersigned by the 21st October.

J. G. HILLIER,
Town Clerk.

Poole.
September, 1957. 7688

COUNTY BOROUGH OF DEWSBURY
BOROUGH ARCHITECT AND BUILDINGS SURVEYOR'S DEPARTMENT

Applications are invited for the following appointments in the above Department:—

(*a*) ASSISTANT ARCHITECT (Education Section)—Special Grade.
(*b*) TWO ASSISTANT ARCHITECTS (Housing and General Section)—Special Grade.
(*c*) ARCHITECTURAL ASSISTANT — A.P.T. Grade II.
(*d*) ARCHITECTURAL ASSISTANT — A.P.T. Grade I.
(*e*) ASSISTANT QUANTITY SURVEYOR — Special Grade.
(*f*) ASSISTANT BUILDING INSPECTOR — A.P.T. Grade I.
(*g*) TEMPORARY CLERK OF WORKS (Housing) —A.P.T. Grade I.
(*h*) TEMPORARY CLERK OF WORKS for a period of approximately 1½ years for the erection of a new Primary School—Salary £13.13.8 per week.

The commencing salaries will be fixed within the scope of the grades stated according to qualifications and experience, i.e., Special Grade £750—£1,030 p.a., A.P.T. Grade II £725—£845 p.a., and A.P.T. Grade I £575—£725 p.a.

Applicants for appointments (*a*) and (*b*) must have passed the final examination of the R.I.B.A. and preferably have a knowledge of local government procedure and those for appointment (*e*) must have passed the final examination of the R.I.C.S.

Housing accommodation may be made available if required.

The appointments will be subject to one month's notice on either side and to the provisions of the Local Government Superannuation Acts. Successful applicants will be required to pass a medical examination.

Applications stating age, education, qualifications, full particulars of training and experience, together with copies of two recent testimonials, should be sent to the undersigned not later than Monday, 21st October, 1957, in envelopes endorsed with the name of the appointment applied for.

A. NORMAN JAMES,
Town Clerk.

Town Hall, Dewsbury.
26th September, 1957. 7691

BOROUGH OF WARWICK
READVERTISEMENT
CHIEF ARCHITECTURAL ASSISTANT (Special Grade, £750—£1,030)

Applications are invited for the above permanent appointment from candidates who are Associate Members of the Royal Institute of British Architects.

The appointment is on A.P.T. Special Grade (£750—£1,030). The commencing salary will depend upon the qualifications and experience of the successful candidate. Applications, stating age, qualifications, training and experience, must be delivered to the undersigned with the names of three Referees by first post Saturday, the 26th October, 1957.

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

The Corporation is offering FREE HOUSING ACCOMMODATION to the successful candidate.

HECTOR SETON BROWN, A.M.I.C.E., A.M.I.W.E.,
Borough Engineer, Surveyor and Water Engineer.

23, Jury Street, Warwick.
1st October, 1957. 7728

COUNTY COUNCIL OF ESSEX
require 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 1 and 2 of R.I.B.A. Final, and for (*b*) the Intermediate R.I.B.A. Examination.

Commencing salary in each case according to qualifications and experience.

Appointments offer opportunities for design and supervision on a variety of buildings—Colleges, Libraries, Day and Boarding 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 25th October, 1957.

Canvassing disqualifies. 7757

EAST ANGLIAN REGIONAL HOSPITAL BOARD
ARCHITECTURAL STAFF

Applications invited from suitably qualified persons for a range of architectural appointments for work in connection with development and design of a large new hospital and general hospital work for the whole region.

The posts are permanent and pensionable providing scope in the entire field of hospital planning, design, construction, specification writing, surveys, etc. Hospital experience desirable, but not essential.

All grades of staff are required, ranging from qualified ASSISTANTS to DRAUGHTSMEN. Applications, giving full personal details, qualifications, experience, present salary, etc., with names and addresses of two referees, to Secretary of Board, 117, Chesterton Road, Cambridge, by 26th October, 1957. 7758

GOVERNMENT OF NORTHERN IRELAND
ASSISTANT ARCHITECT, CLASS II

Applications are invited for unestablished posts in the Ministry of Health and Local Government. Salary scale £744 (age 25)—£1,002 (age 34 and over), rising to £1,160. Candidates must be registered Architects by examination, with general experience and an aptitude for research. Opportunities will be given for experience in work connected with housing, public health buildings and Town and Country Planning. Preference will be given to ex-Servicemen. Application forms, obtainable from Director of Establishments, Ministry of Finance, Stormont, Belfast, should be returned, together with copies of two recent testimonials, by 28th October, 1957. 7727

CUMBERNAULD DEVELOPMENT CORPORATION

Applications are invited for the following posts in the Department of the Chief Architect and Planning Officer:—

SENIOR ASSISTANT QUANTITY SURVEYOR (Ref. Q.S.2). Salary scale A.P.T. VIII (£1,100—£1,320).

To be responsible for assisting and deputising for the Chief Quantity Surveyor in all professional and administrative functions of the section. A.R.I.C.S. required.

ASSISTANT QUANTITY SURVEYORS (GRADE B) (Ref. Q.S.3)—TWO POSTS.

Salary scale A.P.T. V—VI (£815—£1,107).

To take charge of a project from pre-planning stage to final account, working in close co-operation with the Group Architect. A.R.I.C.S. required.

Salary scales are those of the Whitley Council for New Towns Staff and appointments may be made above the minimum of the scale. The Corporation will endeavour to give, in approved cases, assistance in the provision of living accommodation.

Write to L. Hugh Wilson, O.B.E., A.R.I.B.A., Dist.T.P., A.M.T.P.I., Chief Architect and Planning Officer, Cumbernauld House, Cumbernauld, Glasgow, for application form (quoting Ref. No. of post) to be returned not later than Monday, 21st October, 1957. 7755

THE URBAN DISTRICT COUNCIL OF FELLING
SURVEYOR'S DEPARTMENT
APPOINTMENT OF ARCHITECTURAL ASSISTANT

Applications are invited for the permanent appointment of Architectural Assistant in the Department of the Surveyor. The salary payable will be in accordance with Grade A.P.T. III of the National Salary Scales, *viz.* £915 per annum rising to £1,025 per annum.

Applicants must have passed the Final Examination of the Royal Institute of British Architects.

Forms of application together with particulars and conditions of employment can be obtained from the undersigned to whom they must be returned not later than the 24th October, 1957.

Housing accommodation will be provided if necessary.

Canvassing will disqualify any applicant.

JOHN DONKIN,
Clerk of the Council.

Council Buildings,
Felling,
Gateshead 10.
2nd October, 1957. 7754

COUNTY BOROUGH OF DERBY
BOROUGH ARCHITECT'S DEPARTMENT

(1) ARCHITECTURAL STAFF
(a) A.P.T. Grade II (£725—£845 per annum).
(b) A.P.T. Grade I (£575—£725 per annum).
(c) Higher General Division (£230—£560 per annum).

(2) QUANTITY SURVEYING STAFF
(d) Special Grade (£750—£1,030 per annum).
(e) A.P.T. Grade II (£725—£845 per annum).
(f) A.P.T. Grade I (£575—£725 per annum).
(g) Higher General Division (£230—£560 per annum).

(3) ASSISTANT BUILDING INSPECTOR. A.P.T. Grade I (£575—£725 per annum). The position is that of assistant to the Senior Building Inspector and applicants must have a thorough knowledge of Building Byelaws and ancillary duties.

Commencing salary according to qualifications and experience. Permanent superannuable appointments, subject to one month's notice and to medical examination. National Conditions of Service.

Applicants must state for which post they are applying.

Application forms obtainable from and to be returned to the Borough Architect, The Council House, Corporation Street, Derby, not later than Monday, 28th October 1957.

G. H. EMLYN JONES,
Town Clerk.

3rd October, 1957. 7751

BOROUGH OF RICHMOND, SURREY
JUNIOR ARCHITECTURAL ASSISTANT—GRADE A.P.T. II

Salary in accordance with A.P.T. Grade II (£725—£845, plus London weighting). Preference will be given to candidates who have passed the Intermediate Examination of the R.I.B.A. Applications to the Borough Engineer and Surveyor, Hotham House, Heron Court, Richmond, Surrey, naming two referees, by 28th October, 1957, and stating relationship, if any, to members of the Council or senior officers. No assistance with housing. Canvassing prohibited.

CLIFFORD HEYWORTH,
Town Clerk.

7731

BOROUGH OF NEWCASTLE-UNDER-LYME
Requires:
(a) ARCHITECTURAL ASSISTANT
Special Scale £750 × £40—£1,030 p.a.
(b) ARCHITECTURAL ASSISTANT
A.P.T. II, £725 × £30—£845 p.a.
Commencing salary will be in accordance with qualifications and experience.
Applicants for post (a) must be Registered Architects and should be Associate Members of the Royal Institute of British Architects. They should have good experience in the design and construction of Municipal Housing Schemes, Flats and Public Buildings. The department is also responsible for the design and construction of new schools.
Applicants for post (b) should have passed the Intermediate examination of the R.I.B.A. and should be able to prepare working drawings from preliminary sketches under minimum supervision.
Favourable consideration will be given to the provision of housing accommodation in suitable cases.
Application forms and conditions of appointment may be obtained from the Borough Surveyor, Lancaster Building, High Street, Newcastle, Staffs, and must be returned to him not later than Monday, 21st October, 1957.
C. J. MORTON,
Town Clerk.
7750

SURREY COUNTY COUNCIL
Applications invited for following appointments:—
1. ASSISTANT ARCHITECT GRADE IV, £727 15s.—£907 2s 6d. p.a. plus £30 London allowance. Must be A.R.I.B.A.
2. ARCHITECTURAL ASSISTANT, GRADE II, £609 17s. 6d.—£691 17s. 6d. p.a. plus L.A. up to £30 p.a. Must be of good general training, preference given those who have passed Intermediate R.I.B.A.
3. ASSISTANT BUILDING SURVEYOR, GRADE III, £656—£784 2s. 6d. p.a. plus L.A. £30 p.a. Preference given those who have passed Intermediate R.I.C.S. (Bldg. Sub. Div.). Capable drafting specifications in all trades, prep. schedules of dilaps., detailed estimates for gen. maint. works and surveys of properties.
Full details, present salary and three copy testimonials to County Architect, County Hall, Kingston, as soon as possible. 7749

ARCHITECTURAL AND ENGINEERING STAFF (Male or Female) required by the Prison Commission. Salary (men) £550 at age 21, rising to £755 at age 28 then to £870; (women) £550 at age 21, rising to £742 at age 28 and then to £809. Starting pay according to age up to 28. The women's scale is subject to the introduction of equal pay scheme
Hours 42 per 5-day week. Annual leave 3 weeks 3 days rising to 4 weeks 2 days after 10 years' service.
Qualifications: ARCHITECTURAL ASSISTANTS. Recognised training with a good general knowledge of building construction and surveys, preferably up to Intermediate R.I.B.A. standard. ENGINEERING DRAUGHTSMEN. Should preferably have obtained educational training to Ordinary National Certificate in mechanical or electrical engineering course standard or the equivalent in heating and ventilating course
Appointments in temporary capacity in first instance with prospects of permanency.
Regulations and application forms from Establishment Officer, 126/2/20, Prison Commission, Horseferry House, Dean Ryle Street, London, S.W.1, to be returned by 22nd October, 1957. 7748

COUNTY BOROUGH OF MERTHYR TYDFIL
PERMANENT APPOINTMENT OF TWO SENIOR ARCHITECTURAL ASSISTANTS
Applications are invited for the above appointments at a salary in accordance with Grade A.P.T. V of the National Scheme of Conditions of Service.
Applicants must be Associate Members of the Royal Institute of British Architects, and must have had good all round experience in the architectural work usually undertaken by the Local Authority. Planning experience would be an advantage.
Housing accommodation will be provided if required, and reasonable removal expenses of the successful applicant will be paid.
The appointment will be subject to the Local Government Superannuation Acts and to the passing of a medical examination. The appointment will be terminable by one month's notice on either side.
Applications, stating age, past and present appointments, qualifications and experience, together with copies of three recent testimonials, should be delivered to the undersigned not later than 12 noon on Thursday, 24th October, 1957.
Canvassing in any form will disqualify.
T. S. EVANS,
Town Clerk.
Town Hall, Merthyr Tydfil.
1st October, 1957. 7729

COUNTY BOROUGH OF HALIFAX
APPOINTMENT OF ARCHITECTURAL ASSISTANT
Applications are invited for the above appointment on Special Grade £750—£1,030 p.a. Applications stating age, education and training, qualifications, present and past appointments (with dates and salaries) and experience, accompanied by copies of two recent testimonials should reach the Town Clerk, Town Hall, Halifax, by 26th October, 1957. 7753

CITY OF BIRMINGHAM
CITY ARCHITECT'S DEPARTMENT
Applications are invited from qualified Architects for the appointment of ASSISTANT ARCHITECTS, Grade A.P.T. III (£845/£1,025 p.a.), at commencing salaries according to capabilities and experience.
The posts are permanent and superannuable. Medical examination. 5-day week.
Applications endorsed with the heading of the post, and stating age, qualifications, experience and two referees to reach the under-signed by 25th October, 1957.
Canvassing disqualifies.
A. G. SHEPPARD FIDLER,
Civic Centre, *City Architect.*
Birmingham, 1. 7764

STEVENAGE URBAN DISTRICT COUNCIL
ARCHITECTURAL ASSISTANT
Applications are invited for the above-mentioned appointment in the Engineer and Surveyor's Department.
Salary within Special Grade (£750—£1,030).
Applications, stating age, qualifications and experience, together with the names of two referees, must reach the undersigned not later than Saturday, 19th October, 1957.
Housing accommodation will be available if required.
E. J. BOWERS,
Clerk of the Council.
Council Offices, Orchard Road,
Stevenage, Herts. 7730

GLOUCESTERSHIRE COUNTY COUNCIL
COUNTY ARCHITECT'S DEPARTMENT
ARCHITECTURAL ASSISTANTS
(QUALIFYING CLASS)
A.P.T. Grade I (£575—£725), A.P.T. Grade II (£725—£845), and Special Grade (£750—£1,030). Applicants for Grades I and II must have passed Intermediate Examination R.I.B.A., and for Special Grade the Final Examination. N.J.C. Service Conditions. Superannuation. Medical examination.
Apply, giving age, present position, salary and date of appointment, previous appointments, names and addresses of two persons for reference, to County Architect, Shire Hall, Gloucester, by 17th October, 1957.
GUY H. DAVIS,
Clerk of the County Council.
7726

WOKING URBAN DISTRICT COUNCIL
The Council invite applications for the following temporary appointment, in the architectural section of the Engineer and Surveyor's Department.
ASSISTANT ARCHITECT.
Salary £900—£1,000 per annum.
Candidates must be A.R.I.B.A., and experience in large modern office buildings will be an advantage.
The work is the further development of the Council's proposals for a New Civic Centre.
Forms of application to be obtained from and returned to Mr. H. P. Tame, A.M.I.C.E., M.T.P.I., Reg. Arch., Engineer and Surveyor, Council Offices, Woking, not later than Monday, 28th October, 1957.
M. SHAWCROSS,
Clerk of the Council.
Council Offices, Woking.
30th September, 1957. 7725

AMENDED ADVERTISEMENT
BOROUGH OF BEDFORD
APPOINTMENT OF ASSISTANT ARCHITECT, GRADE A.P.T. II (£725—£845).
Applicants should have passed the Intermediate Examination of the R.I.B.A. The point of entry into the grade will be determined by experience and/or further qualifications.
Work in the first instance will be in connection with housing schemes, including the design of new types of houses. In addition the Council have in hand a building programme, including multi-storey flats, shops and offices.
THE COUNCIL ARE PREPARED TO ASSIST IN THE PROVISION OF HOUSING AND WILL CONTRIBUTE TOWARDS REMOVAL EXPENSES.
Forms of application and particulars of the appointment may be obtained from the undersigned, by whom applications should be received not later than Monday, 21st October, 1957.
F. W. DAWKES,
Borough Engineer and Surveyor.
Newnham House, Horne Lane, Bedford. 7724

COUNTY BOROUGH OF ROTHERHAM
ARCHITECTURAL ASSISTANT
Applications are invited for the above appointment on the salary scale £750×£40—£1,030 per annum from Associate Members of the R.I.B.A., with several years' post-registration experience, preferably with a Local Authority.
The commencing salary will be as considered appropriate to the successful applicant's age and experience.
HOUSING ACCOMMODATION AVAILABLE IF NECESSARY.
Applications, to be endorsed "Architectural Assistant," stating age, qualifications and details of experience, together with the names of two referees, should be received by me not later than Wednesday, 23rd October, 1957.
JOHN S. WALL,
Town Clerk.
Municipal Offices, Rotherham.
27th September, 1957. 7710

HARLOW DEVELOPMENT CORPORATION
Architect Planner: FREDERICK GIBBERD, C.B.E., F.R.I.B.A., M.T.P.I.
Executive Architect: VICTOR HAMNETT, B.Sc., A.R.I.B.A., A.M.T.P.I., A.R.I.C.S.
Applications invited from suitably qualified candidates for post of ASSISTANT ARCHITECT, to work on varied and interesting programme of Housing, Commercial and Industrial buildings, which offers exceptional opportunities for candidates with good design ability.
Dependent upon qualifications and experience, salary within £656—£907 per annum. Housing accommodation available in approved cases.
Applications, giving full details and names of two referees, to General Manager, "Terlings," Harlow, Essex, within 10 days. 7711

LONDON COUNTY COUNCIL
ARCHITECT'S DEPARTMENT
Vacancies for ARCHITECTS and SURVEYING ASSISTANTS in the Building Regulations Division as follows:—
(*a*) For surveys of existing premises and consideration of proposals for alterations and new construction in the Theatres Section; and
(*b*) For building control work in connection with applications under the London Building Acts and Bye-laws as regards compliance with the Council's construction and means of escape standards.
Salaries up to £860, with starting rates according to qualifications and experience.
Application form and particulars from the Architect (Ref. AR/EK/47/57), The County Hall, S.E.1. (1610) 7707

COUNTY BOROUGH OF GREAT YARMOUTH
EDUCATION COMMITTEE
Applications are invited from Registered Architects for the permanent appointment of SENIOR ASSISTANT ARCHITECT in charge of Minor Capital Works and Maintenance.
Salary within A.P.T. Grade III (£845—£1,025). A car allowance of £112 10s. per annum is also payable.
Further particulars may be obtained from the Schools' Architect, 22, Euston Road, Great Yarmouth, to whom applications should be sent not later than the 11th October, 1957. 7666

THE NORTH OF SCOTLAND COLLEGE OF AGRICULTURE
Applications are invited for the post of ASSISTANT ADVISORY OFFICER within the Farm Buildings Department of the College. Salary scale will be one of the following:
(Men) Grade III, £810 to £1,280 per annum.
(Men) Grade IV(b), £575 to £800 per annum.
Entry will be according to age and qualifications.
Forms of application, which can be obtained from the Secretary of the College, 41½ Union Street, Aberdeen, must be lodged not later than 19th October, 1957. 7756

CITY OF COVENTRY
ARCHITECTURAL AND PLANNING DEPARTMENT
(QUANTITY SURVEYING DIVISION)
AMENDED ADVERTISEMENT
Quantity Surveyors required in the following Grades:—
(*a*) SENIOR QUANTITY SURVEYOR, A.P.T. V (£1,175×£50—£1,325).
(*b*) SENIOR QUANTITY SURVEYOR, A.P.T. IV (£1,025×£50—£1,175).
(*c*) QUANTITY SURVEYOR, "Special" Grade (£750×£40—£1,030), with additional local award of £26 p.a. on salaries up to £795 in certain circumstances.
Appointments will be made, according to experience and qualifications held, within the Grade, and are permanent and pensionable, subject to satisfactory medical examination.
HOUSING ACCOMMODATION may be granted in approved circumstances, also interest-free loan to cover removal expenses.
An interesting and expanding programme of work is being undertaken for major City redevelopment projects, new schools, and large housing schemes, including multi-storey flats, also smaller works of a varied nature, many involving new constructional techniques.
Applicants should have good general experience and the ability to undertake responsibility and to work with subordinate staff.
Further details and application forms (stating post for which application is made) may be obtained from the City Architect and Planning Officer, Bull Yard, Coventry, to be returned by 28th October, 1957. 7709

NORTHAMPTON COUNTY BOROUGH
ARCHITECTURAL ASSISTANT (HOUSING)
A.P.T. II (£725—£845)
Full details and application form, returnable by 24th October, from Borough Architect, Guildhall, Northampton.
C. E. VIVIAN ROWE,
Town Clerk.
7752

COUNTY BOROUGH OF HALIFAX
ARCHITECTURAL ASSISTANT (SCHOOLS)
Applications are invited for the above appointment on Special Grade (£750—£1,030 p.a.). Applicants must possess appropriate technical qualifications, and preferably have had experience on school work. Applications, stating age, qualifications, present position and salary, experience, and names and addresses of two referees, to be delivered to the Town Clerk, Town Hall, Halifax, by 1st November, 1957. 7760

WARWICKSHIRE COUNTY COUNCIL
ARCHITECT'S DEPARTMENT

Applications are invited for the appointment of ASSISTANT ARCHITECTS, on salary scale £750 × £40—£1,030, the commencing salary to be in accordance with ability and experience.

Applicants 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 Final Examination, or their equivalent, at one of the recognised schools of architecture.

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.
October, 1957. 7761

LONDON COUNTY COUNCIL
ARCHITECT'S DEPARTMENT

Selections for appointment are now being made from ARCHITECTS who have passed their Final Examinations this summer. Starting salaries up to £712 10s. a year, in scale £637 10s. to £860.

Vacancies also for ARCHITECTS of experience at starting salaries up to £1,090.

Full programme of Houses, Flats, Schools, and many other interesting buildings.

Application forms and full particulars from the Architect (Ref. AR/EK/46/57), The County Hall, S.E.1. (1609) 7708

COVENTRY CORPORATION

PLANNING CONTROL ASSISTANT, Grade A.P.T. I (£575—£725) or A.P.T. II (£725—£845), according to qualifications/experience. Salary within grade if appropriate. Additional local award £26 in approved circumstances in salary up to £795. Loan for removal expenses if required. Application forms, etc., from City Architect and Planning Officer, Bull Yard, Coventry, returnable within 10 days of publication. 7759

Tenders for Contracts

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

BOROUGH OF EALING

1. Twenty-four two-storey bedsitting room type flats on two sites on the Lime Trees Estate, Northolt, and

2. 122 flats and maisonettes in two- and three-storey blocks on the Northolt Park Estate.

Forms of Tender and Bills of Quantities may be obtained from the Borough Surveyor, Town Hall, Ealing, W.5, upon a deposit of £2 which will be returned on receipt of a *bona fide* tender.

Tenders must be delivered to the Town Clerk, Town Hall, Ealing, W.5, not later than 9.30 a.m. on Friday, 1st November, 1957. 7656

Architectural Appointments Vacant

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

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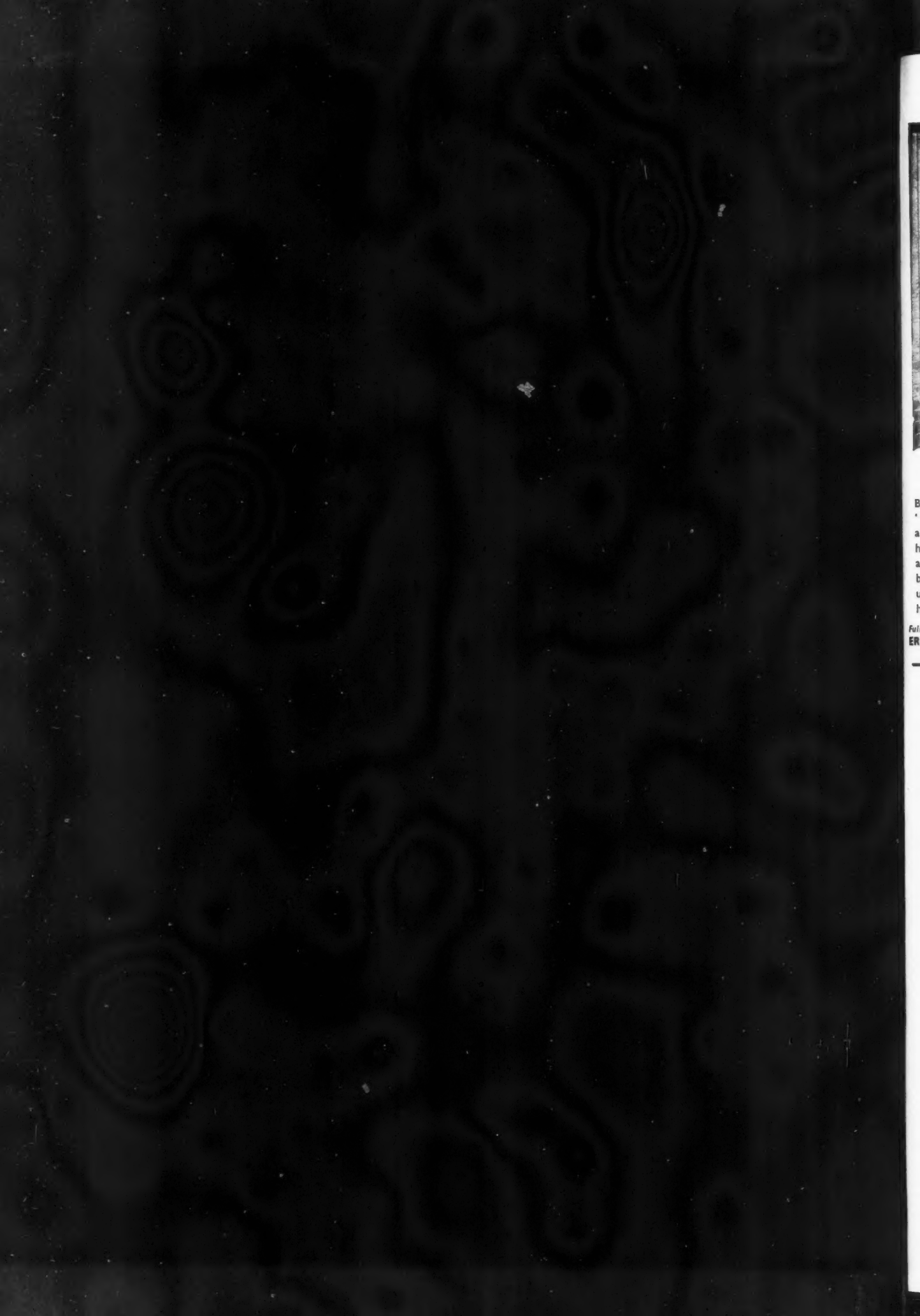

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