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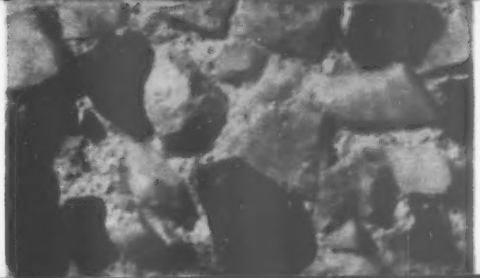

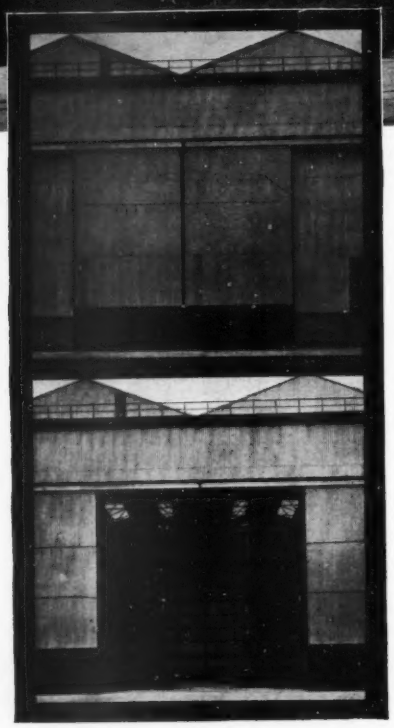

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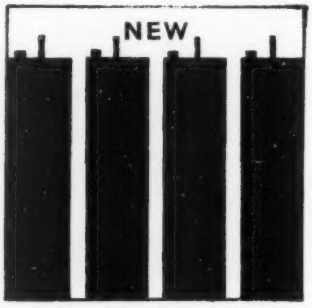
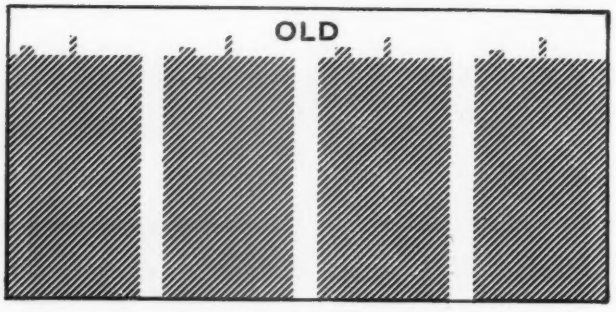
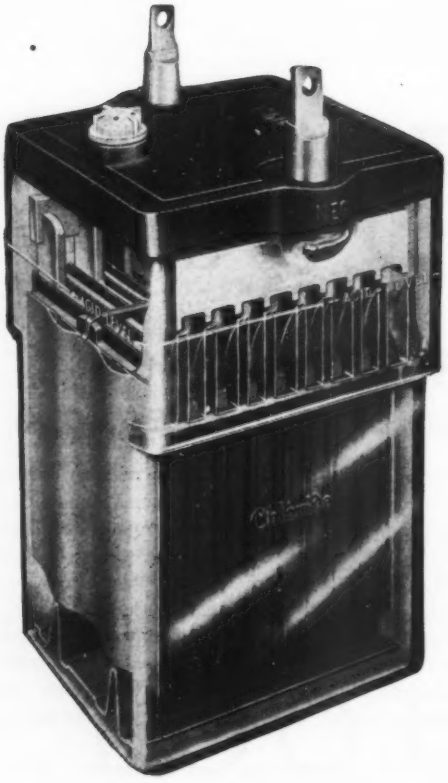


from the new CHLORIDE stationary cell





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Haskins shutter doors

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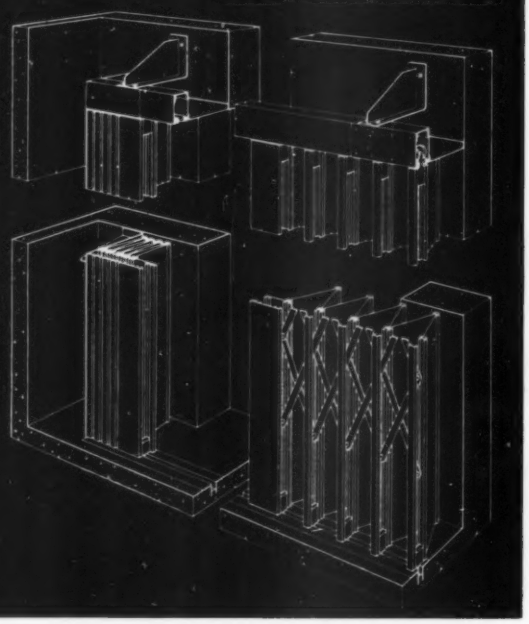

Consulting Engineers: Frederick S. Snow & Partners.
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Illustration of the recently completed manually operated shutter doors installed at Gatwick Airport. Each leaf is fitted with a vision panel of toughened glass.

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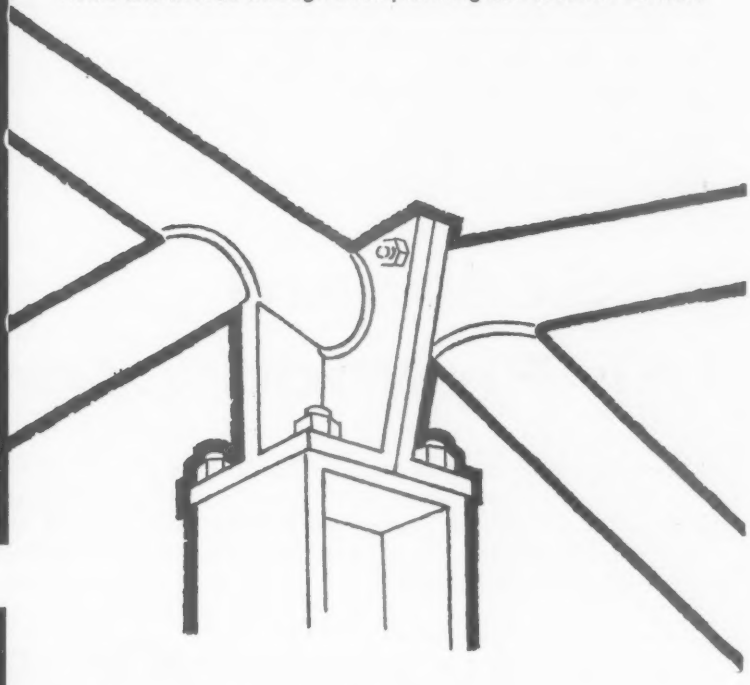

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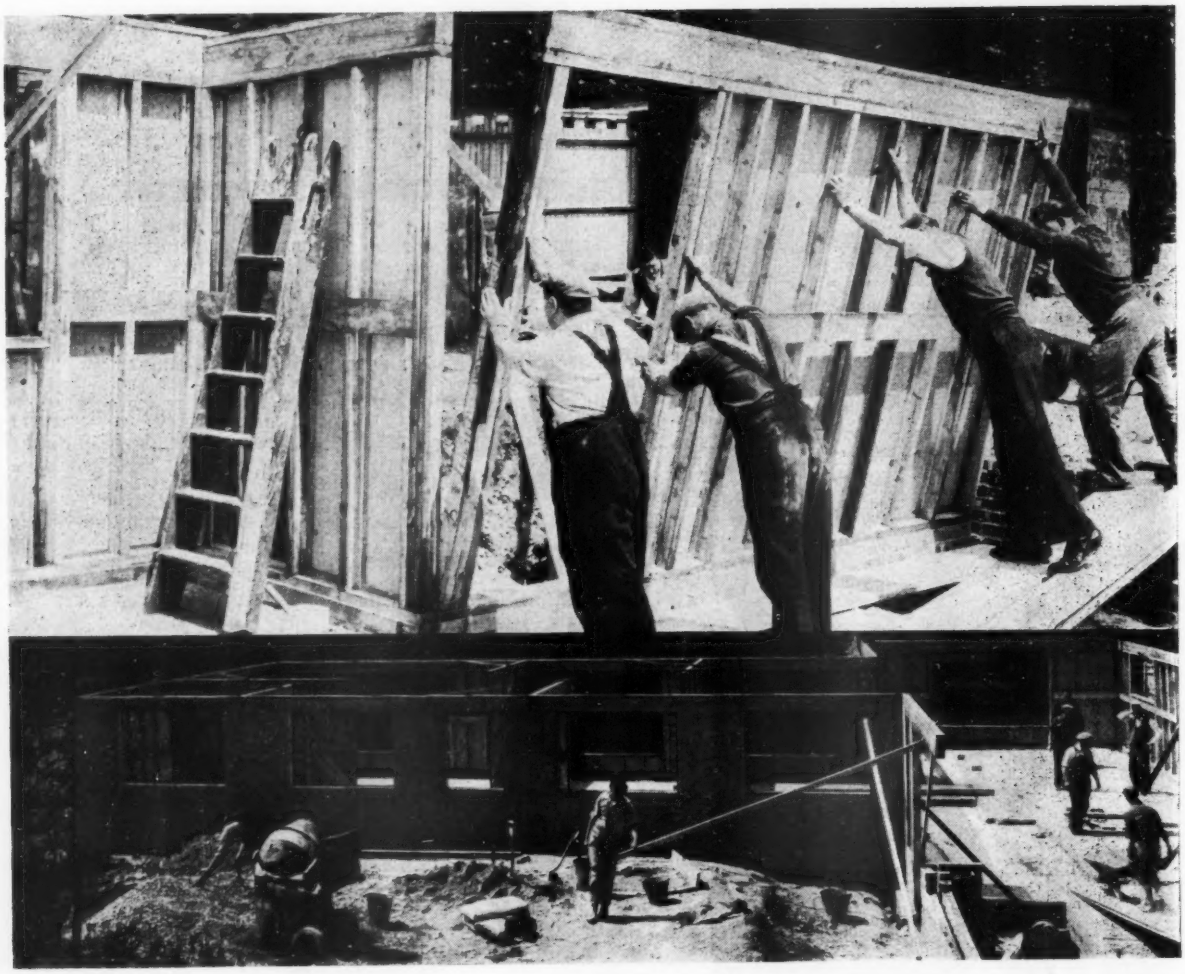

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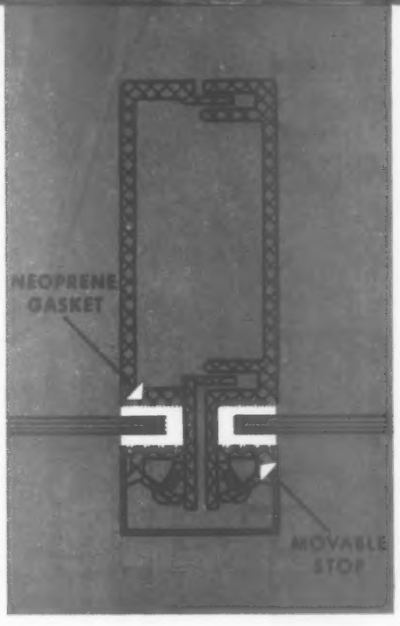

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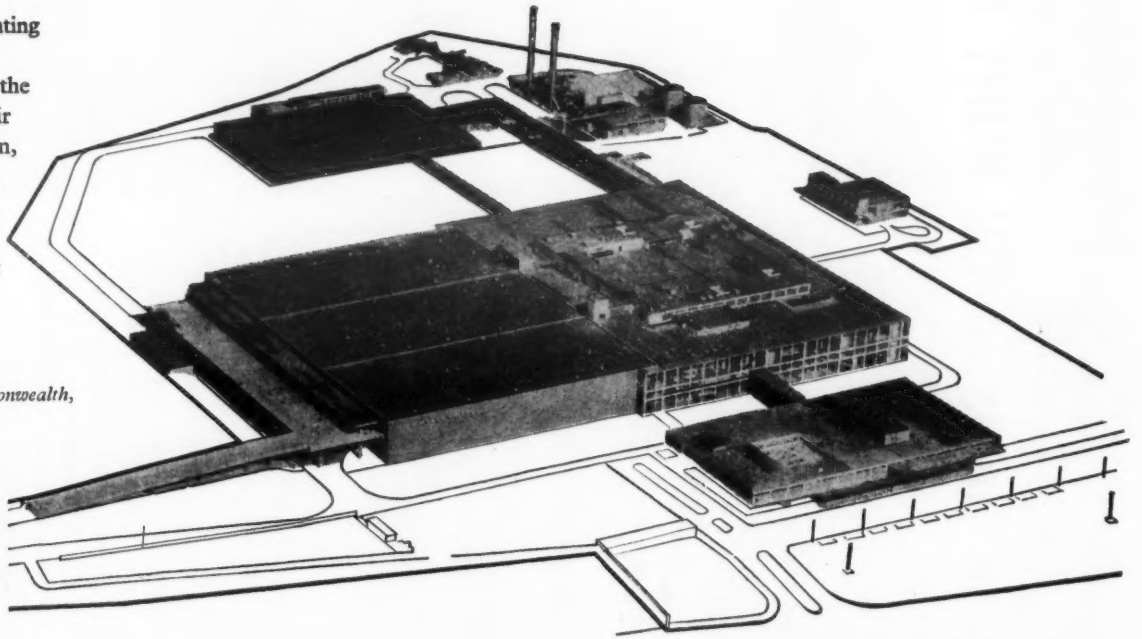

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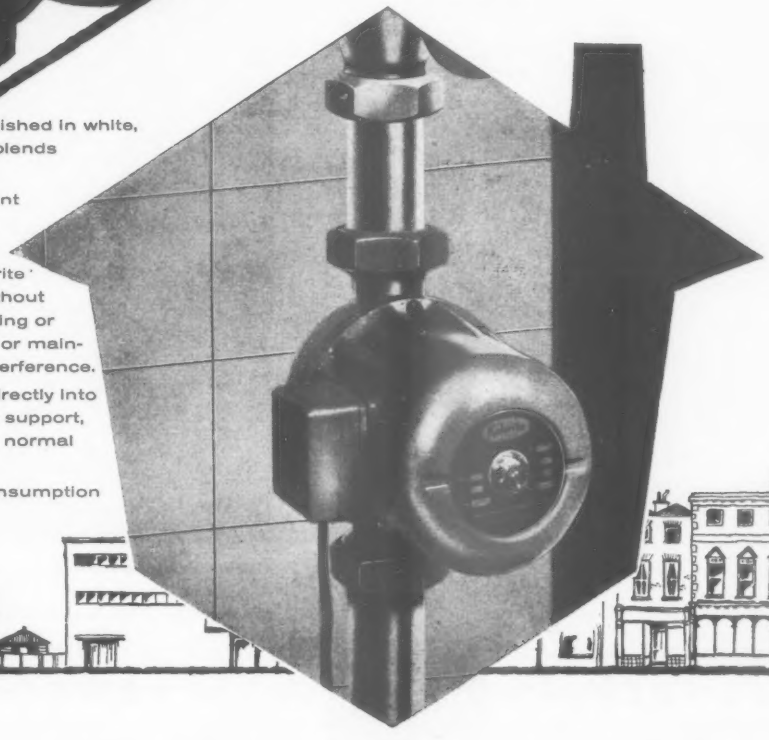

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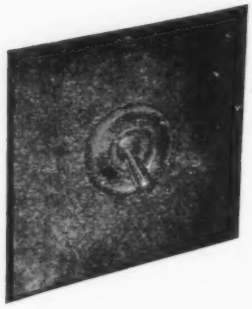

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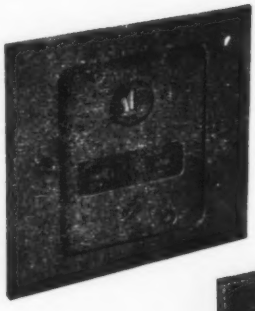

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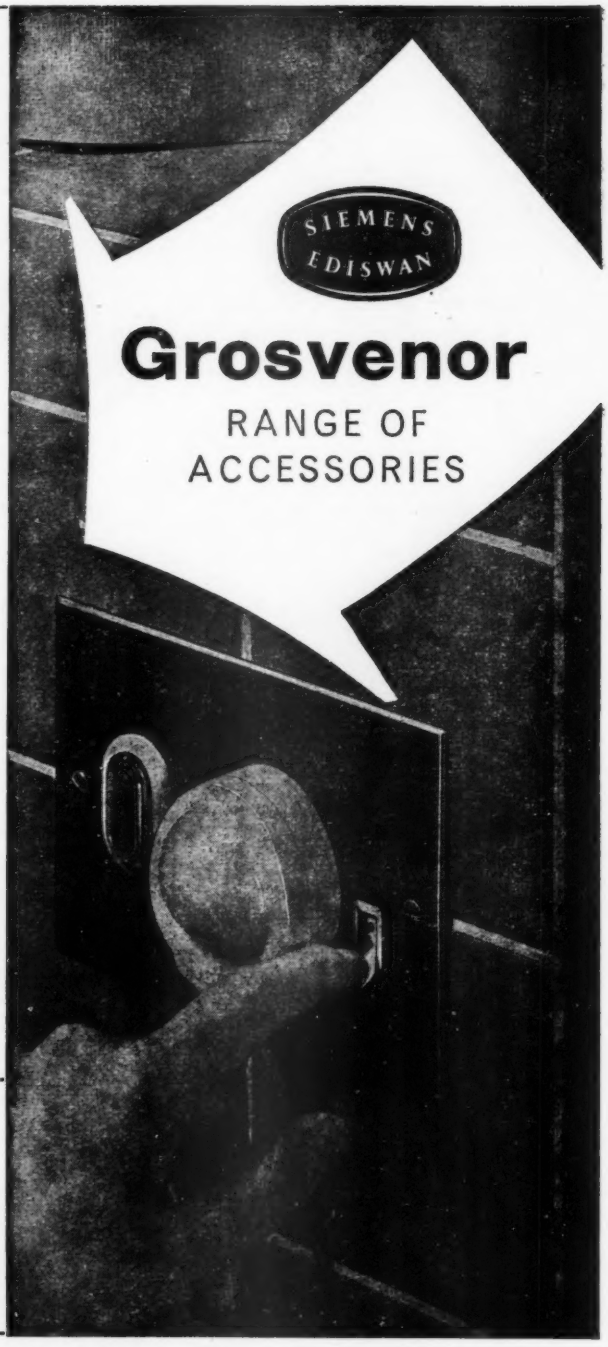

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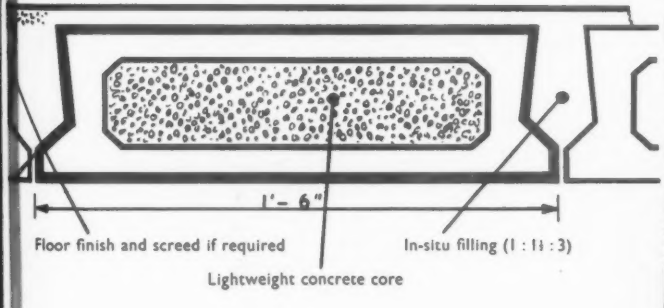

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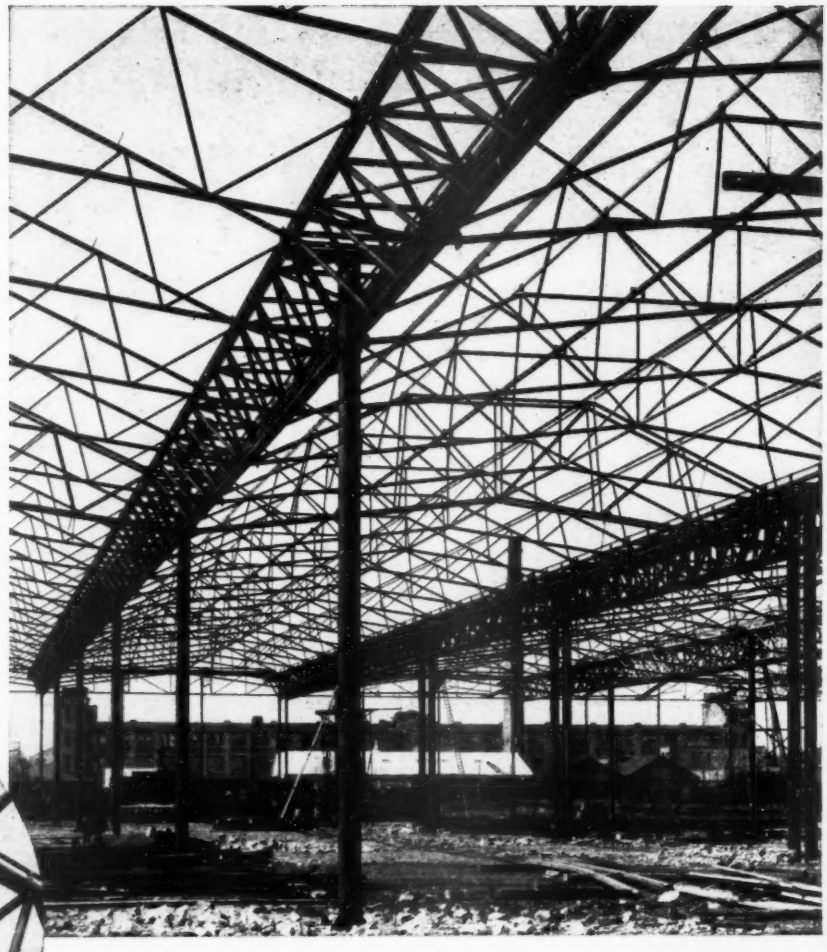

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Centre: Connection of roof trusses and triangular girders to column.

Below: An exterior view of the warehouse.

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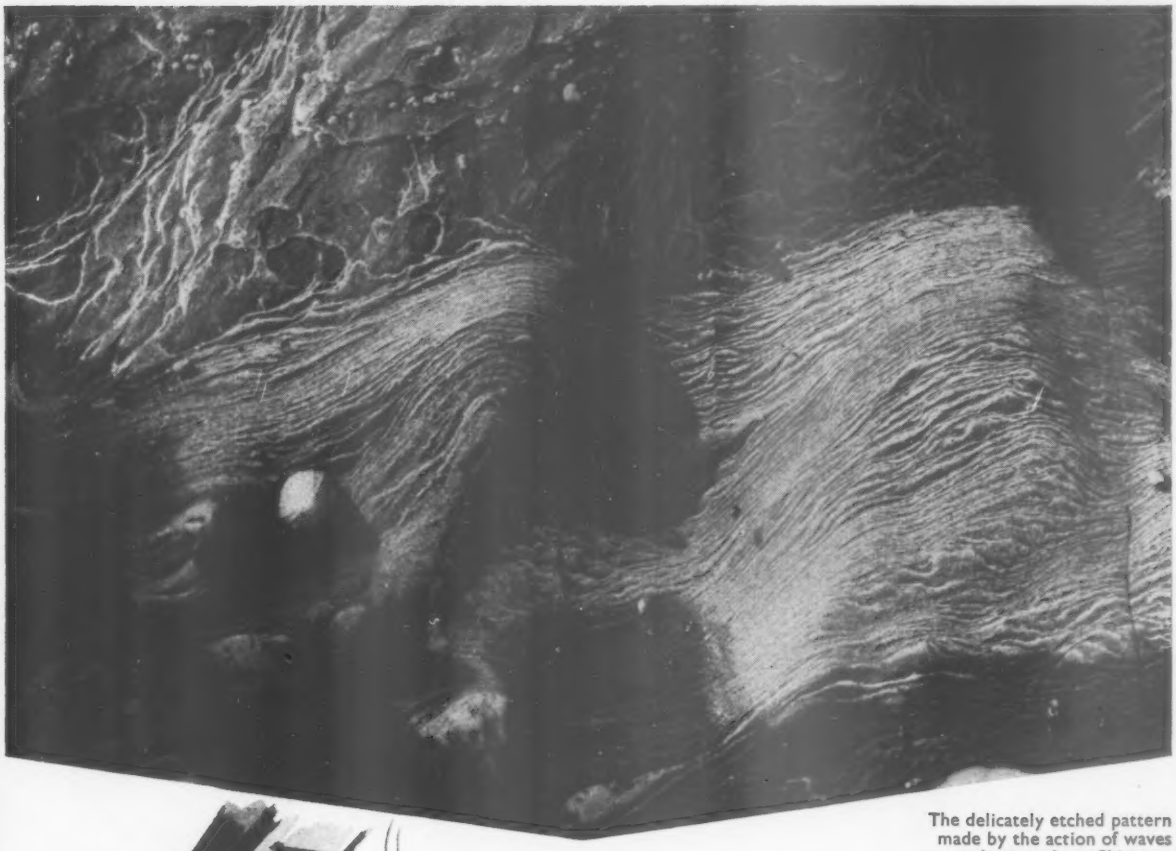
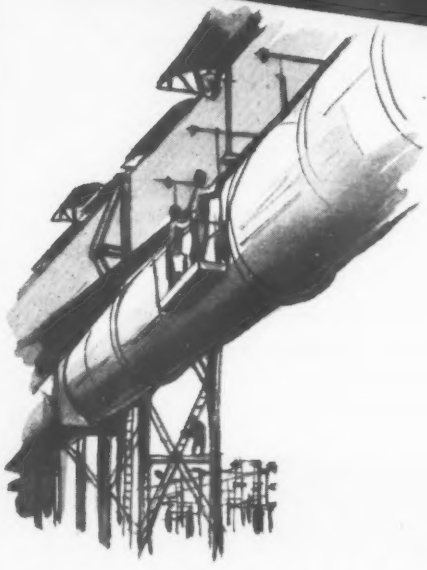


The delicately etched pattern made by the action of waves on seashore rocks at Skipness, Kintyre, Argyllshire.



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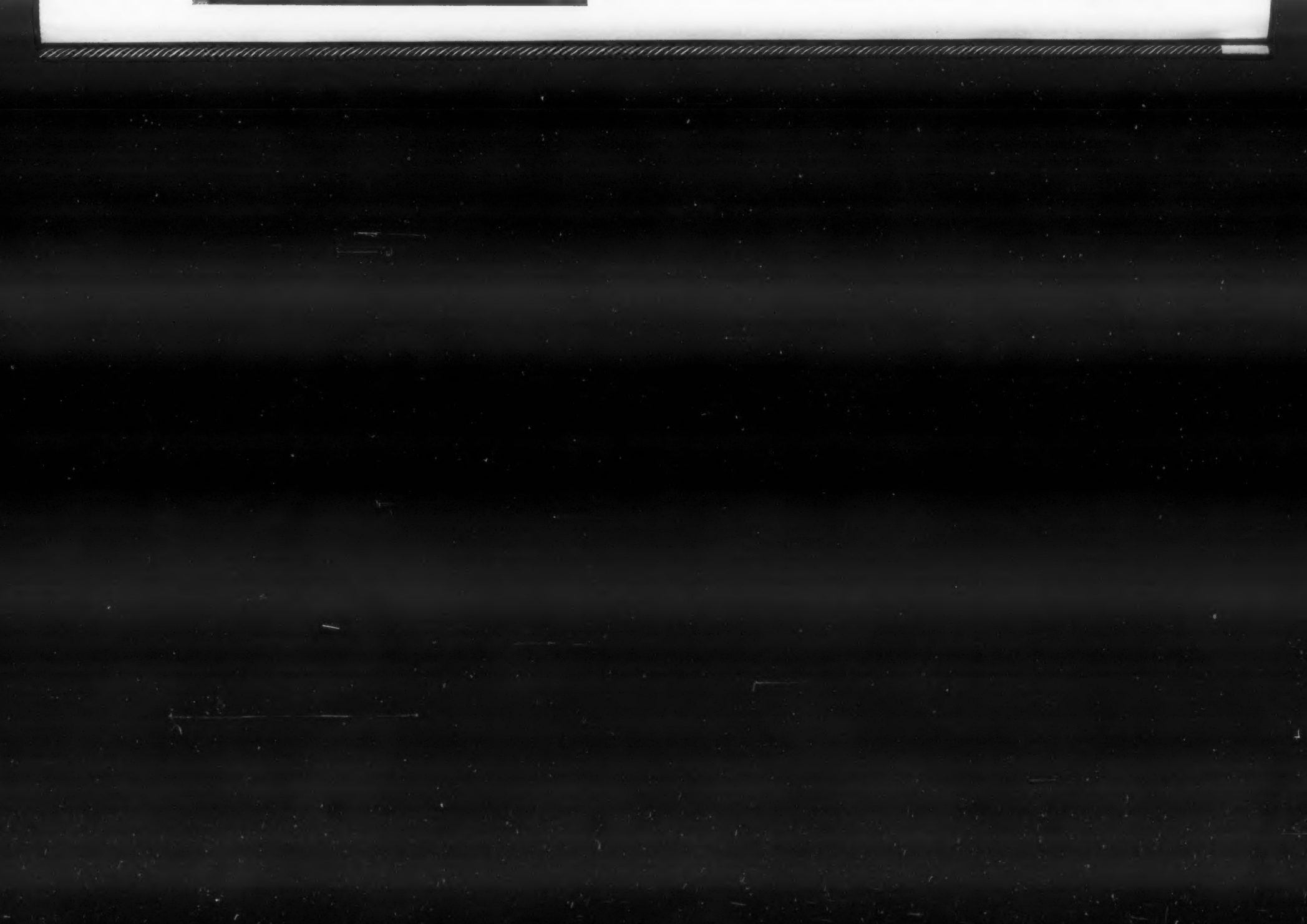

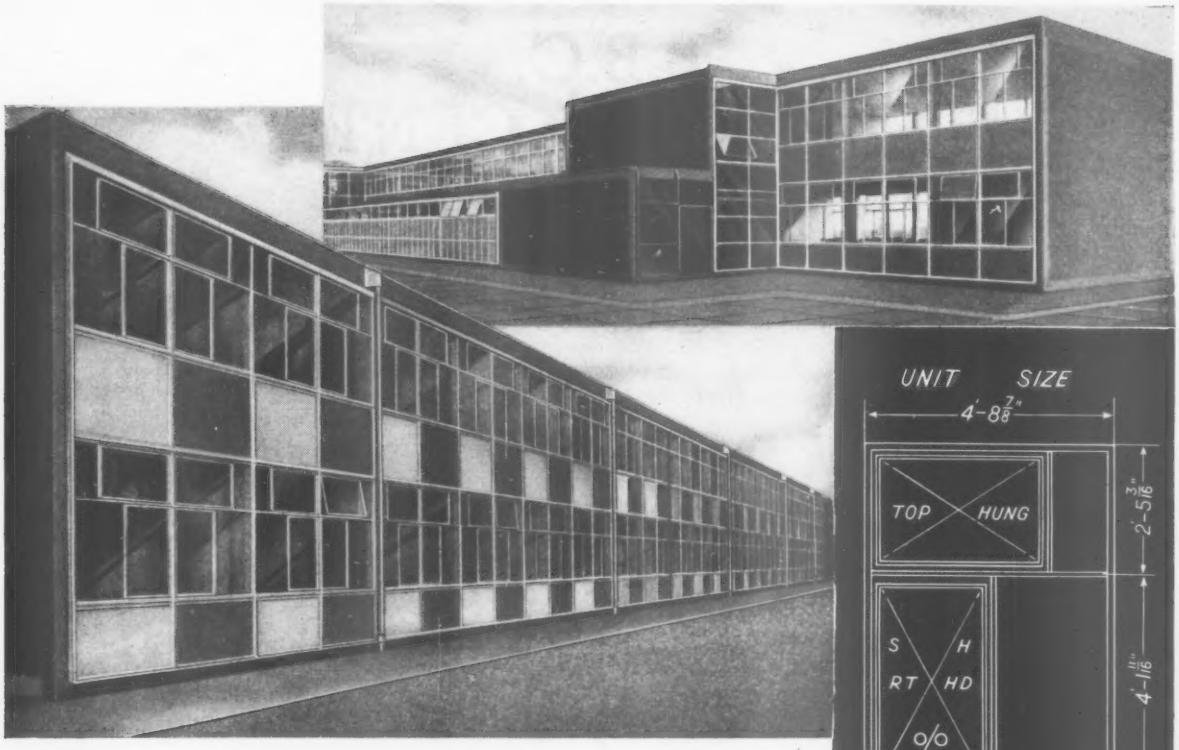

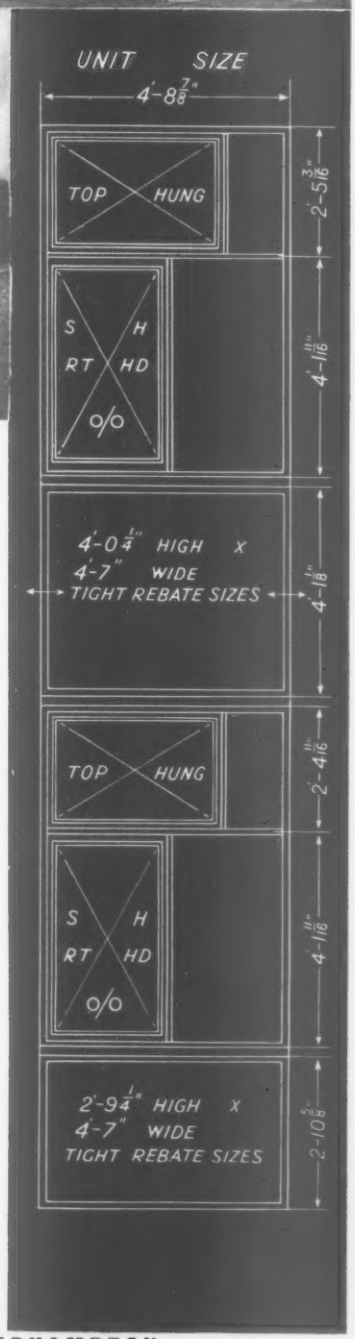

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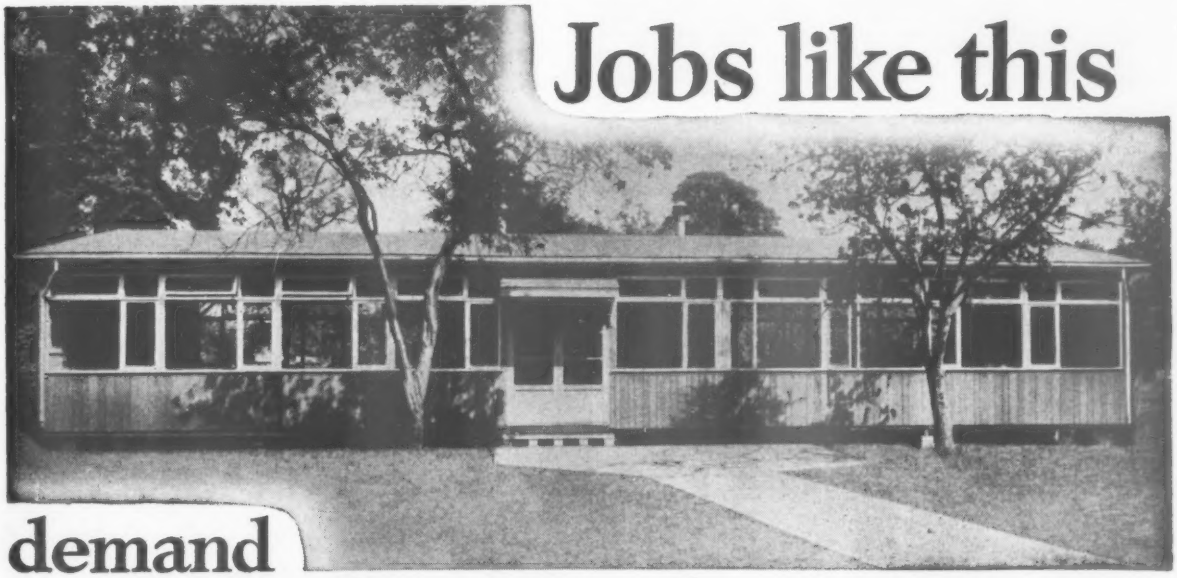

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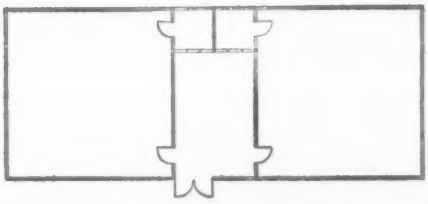
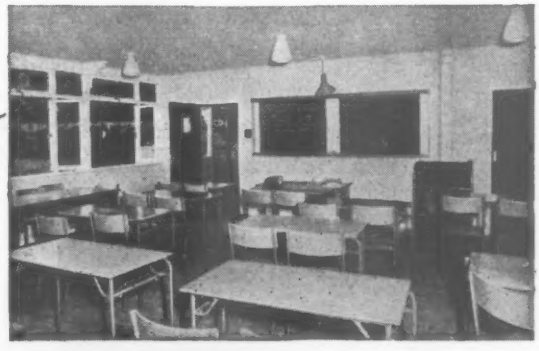
SPECIFICATION
A timber building to form two classrooms, each 24' x 24'. A store room for each classroom and a cloak bay to house 80 coat pegs. A timber floor and flat ceiling providing space for electric lighting. The building to be based on a panel unit, capable of being dismantled and removed to another site in approximately two years' time. Erection to be carried out by supplier on a prepared foundation.



FAIRFORD FARMOR'S SECONDARY MODERN SCHOOL near Cirencester, Glos.



Photographs by courtesy of the County Architect, Gloucestershire County Council.

Thorns' Contemporary Design, which conforms to Ministry of Education recommendations for school buildings, was eminently adaptable for this requirement. The consequent saving in time and cost was substantial. A trained THORNS' team was ready to start erection as soon as the foundations were completed.

The size agreed upon was 60ft. × 24ft. × 8ft. 6in. eaves. Walls were clad with vertical tongued and grooved boarding of Western Red Cedar with building paper behind, and lining of hardboard and insulation board. Partitions, similarly lined, were fitted to plan. The floor was constructed of tongued and grooved boards on joists, with sleeper plates. Rain-water goods were included in the contract.

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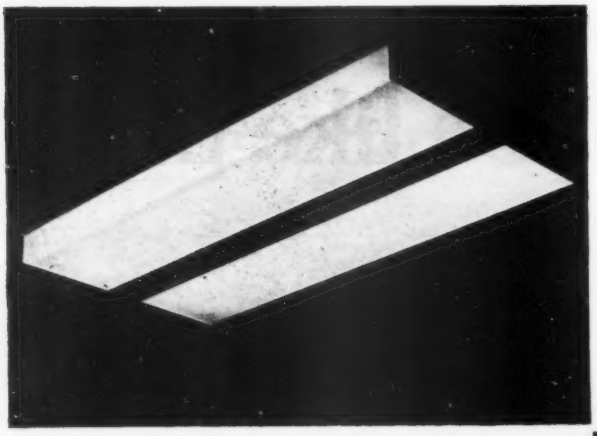

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RIGHT:

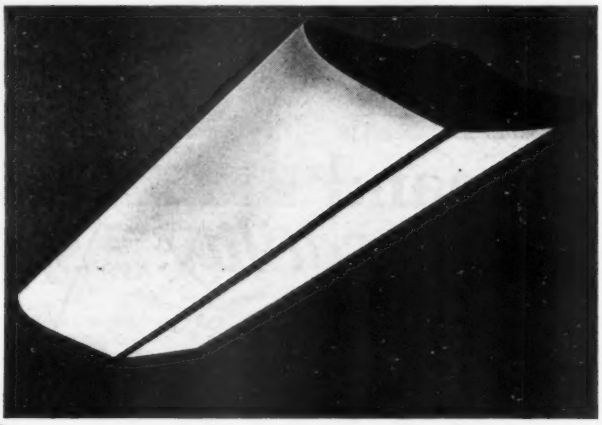
C.F.2. KESTREL

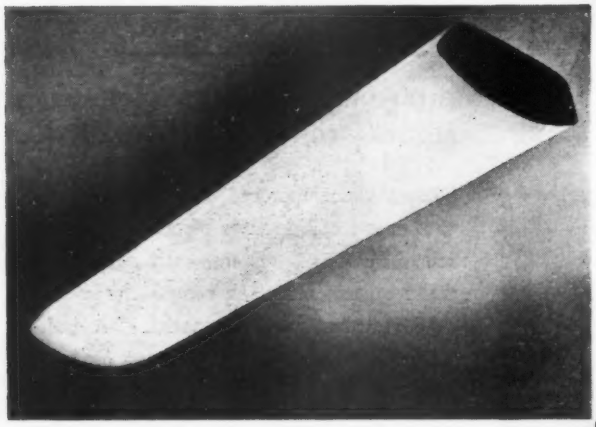
To take four 5'-0" 80 w. lamps

BELOW:

C.F.15. SURREY

To take two 5'-0" 80 w. lamps





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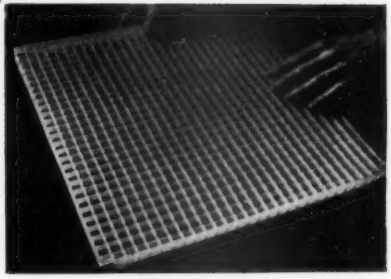

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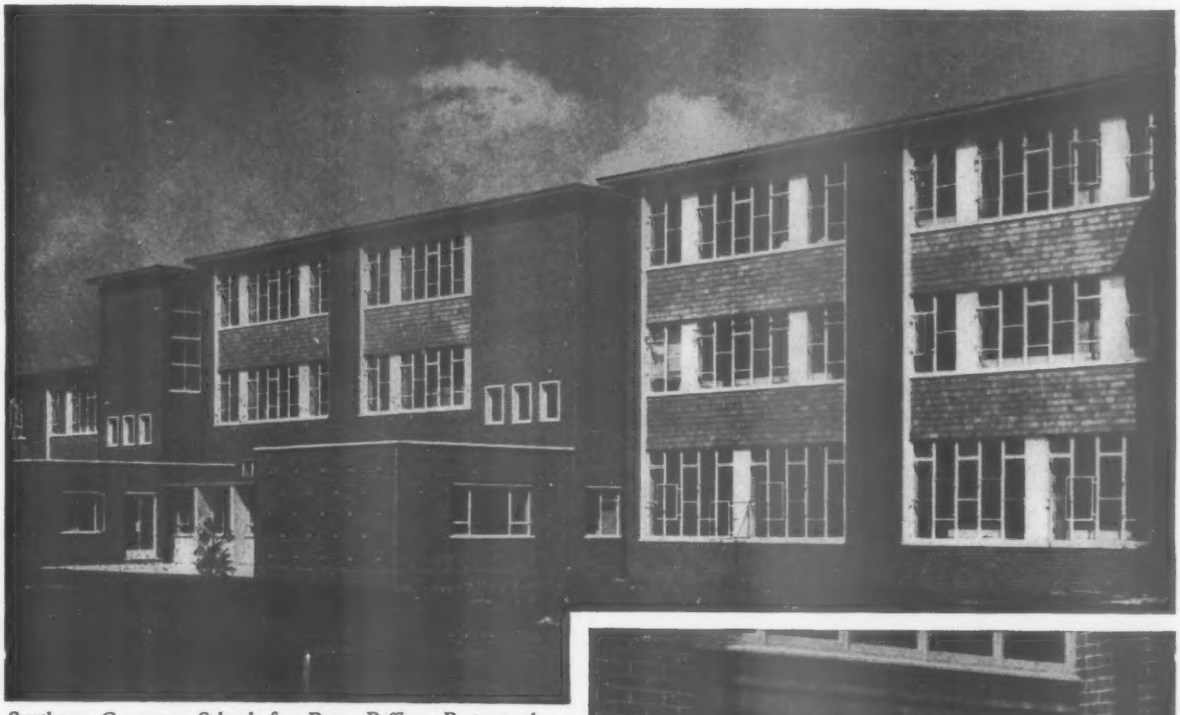

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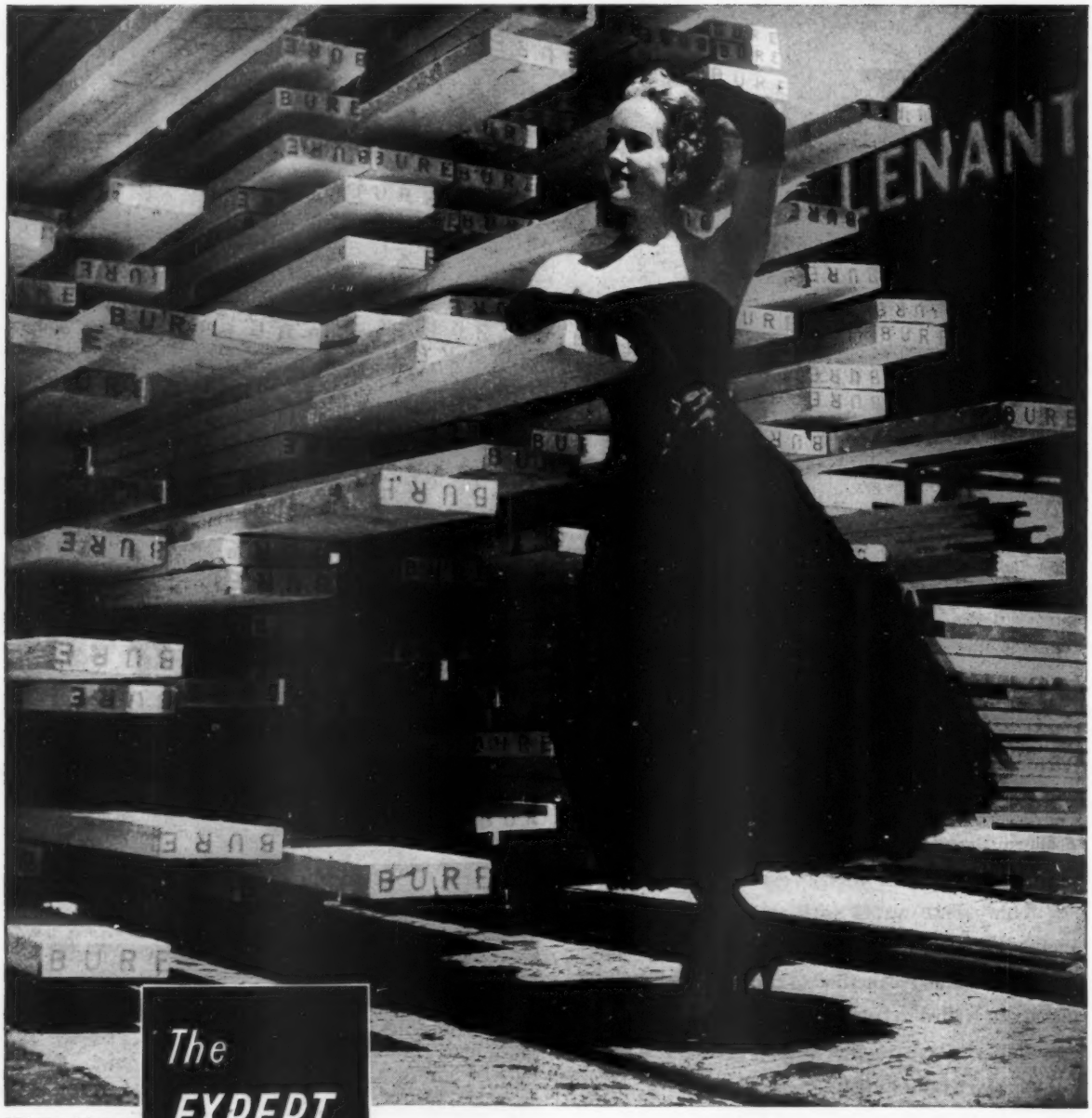

With acknowledgements to Susan Small Ltd. who supplied the model gown.

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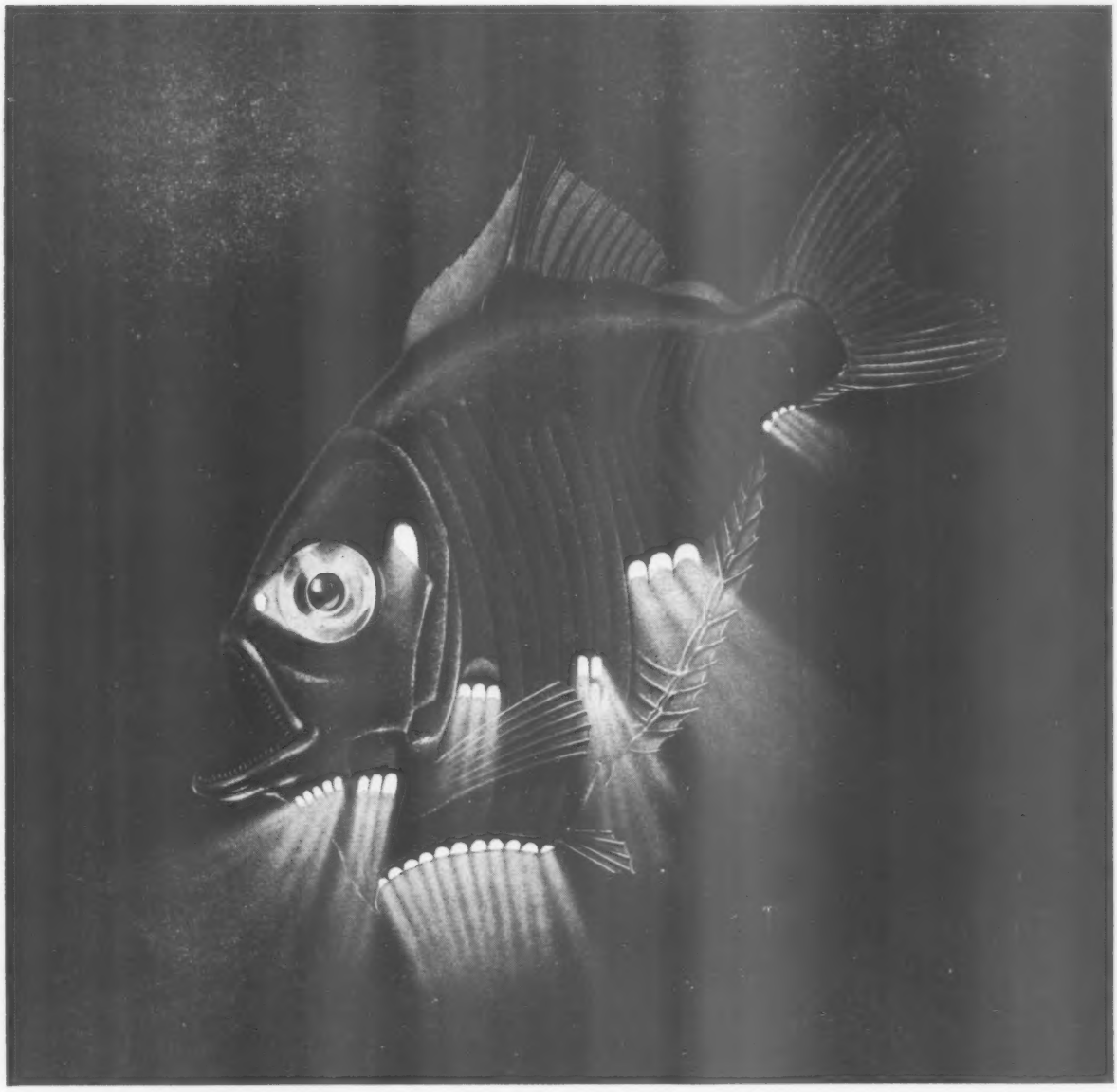

The lady with the lamp The Hatchet Fish, *Sternoptyx diaphana,* can see where she is going even in the eternal blackness that prevails a mile down in the ocean. Nature has equipped her with an imposing lighting system of over sixty lamps which she can switch on and off as the need arises.

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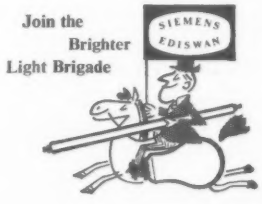

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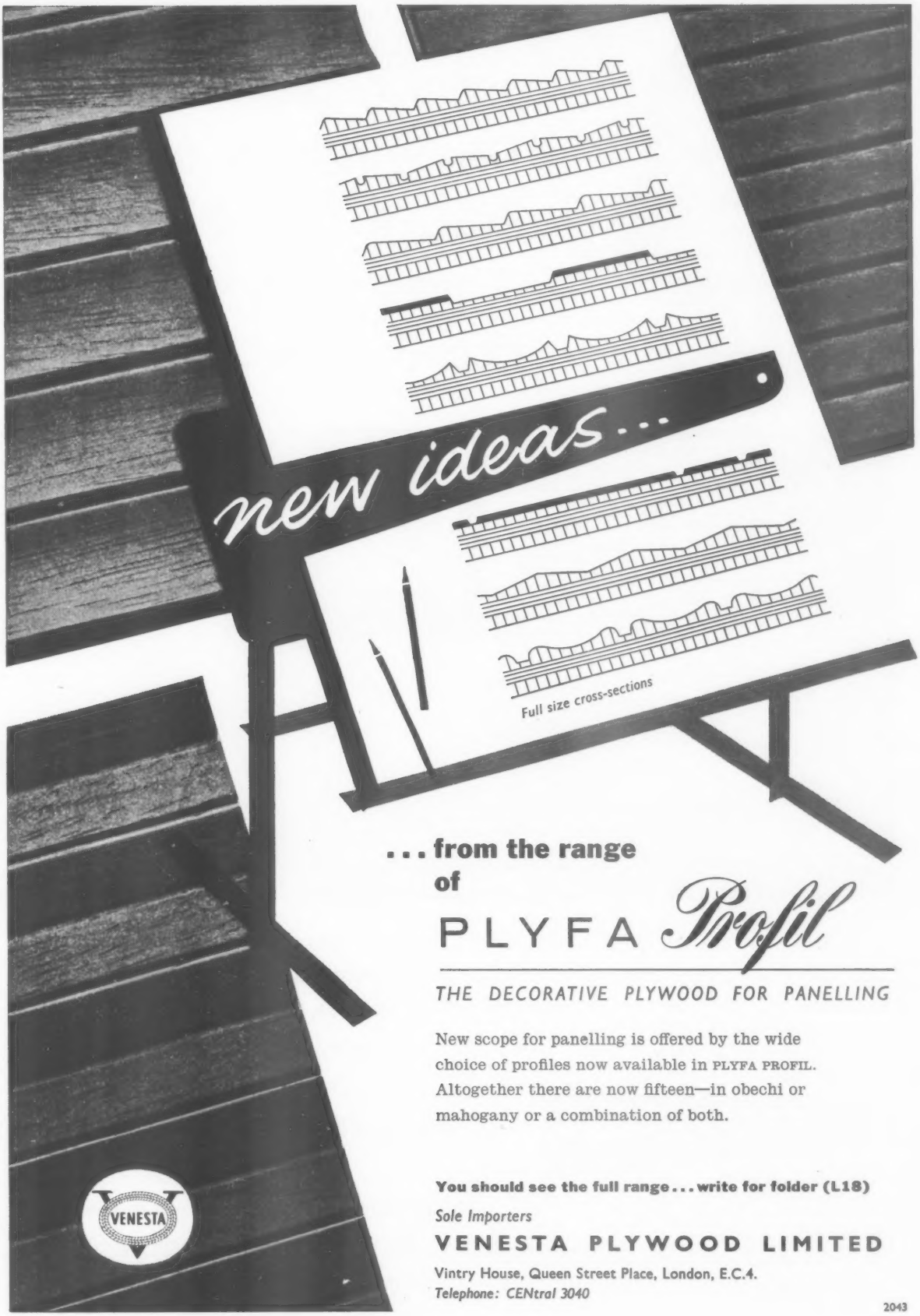

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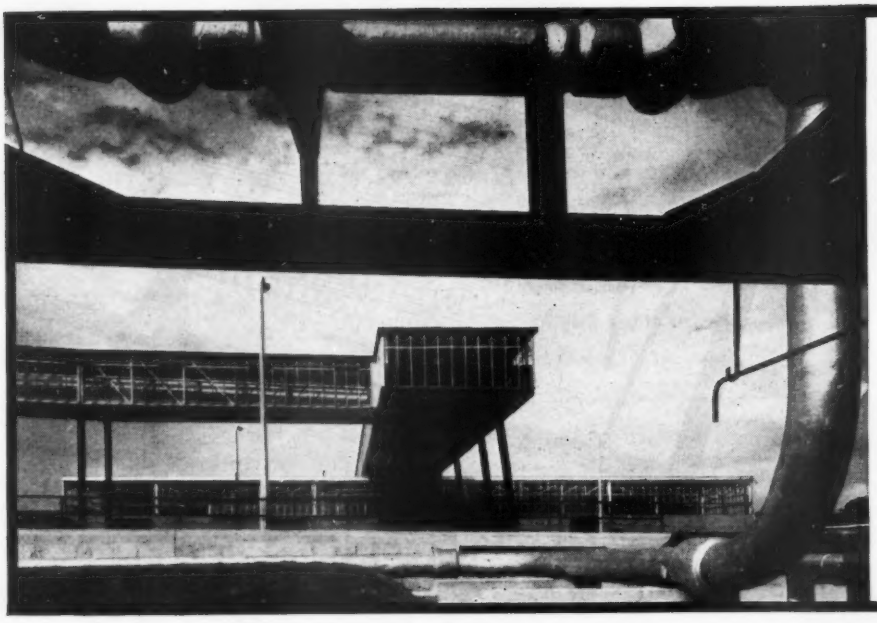


The new Heinz factory at Wigan is the largest factory to be built in Britain since the war. Shown here is the ancillary can-factory, clad in Williams & Williams "Aluminex" vertical patent glazing. The continuous opening lights are gear-operated to give critical control of ventilation.

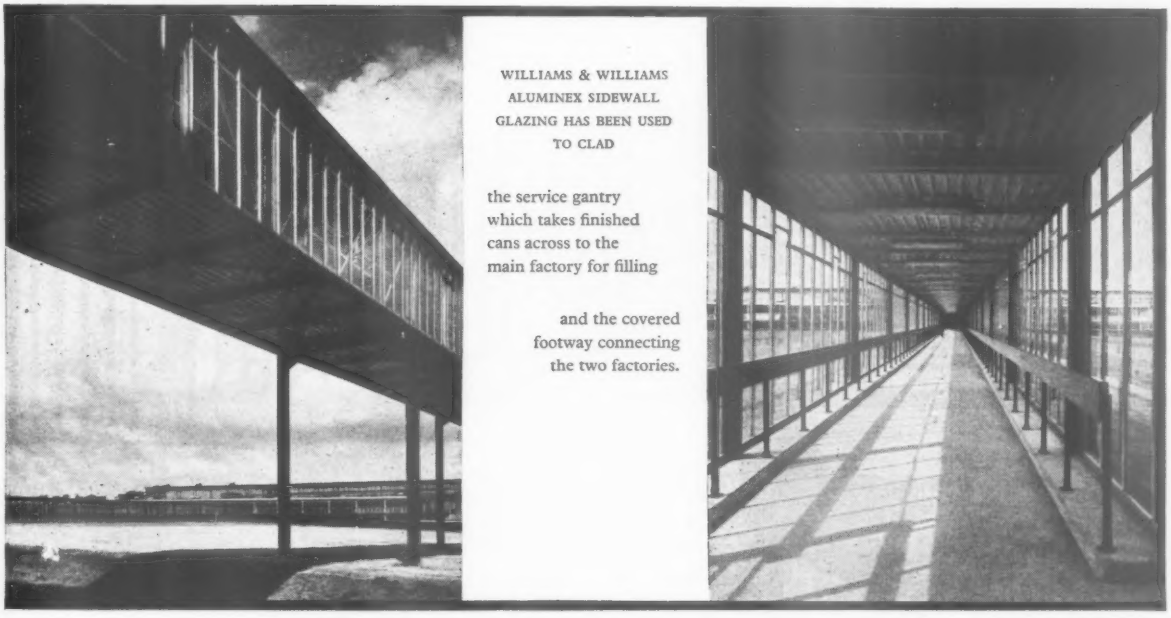
Architects:
J. Douglass Mathews and Partners, London in association with Skidmore, Owings and Merrill, New York.

The new Heinz factory is turning depressed Wigan into a boom area. By the time it is in full production it will be employing some 3,000 local people and taking up a good deal of the local agricultural produce, which is both abundant and high in quality.

The 127-acre site has a gradient of 1 in 40 which has been exploited to give the factory two working levels—both accessible to lorries.

Manufacture starts on the upper level with unloading, storage, preparation and cooking. Products are then gravity fed to the lower level for can filling, sterilization, packing, warehousing and finally dispatch.

The presence of old coal mines underneath the site meant careful positioning of the component buildings. The can factory is therefore at some distance from the food production unit



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the service gantry which takes finished cans across to the main factory for filling

and the covered footway connecting the two factories.

and is linked to it by a service gantry which feeds the finished cans into the appropriate stage of production process.

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in a choice of boards.

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8′ x 4′ boards

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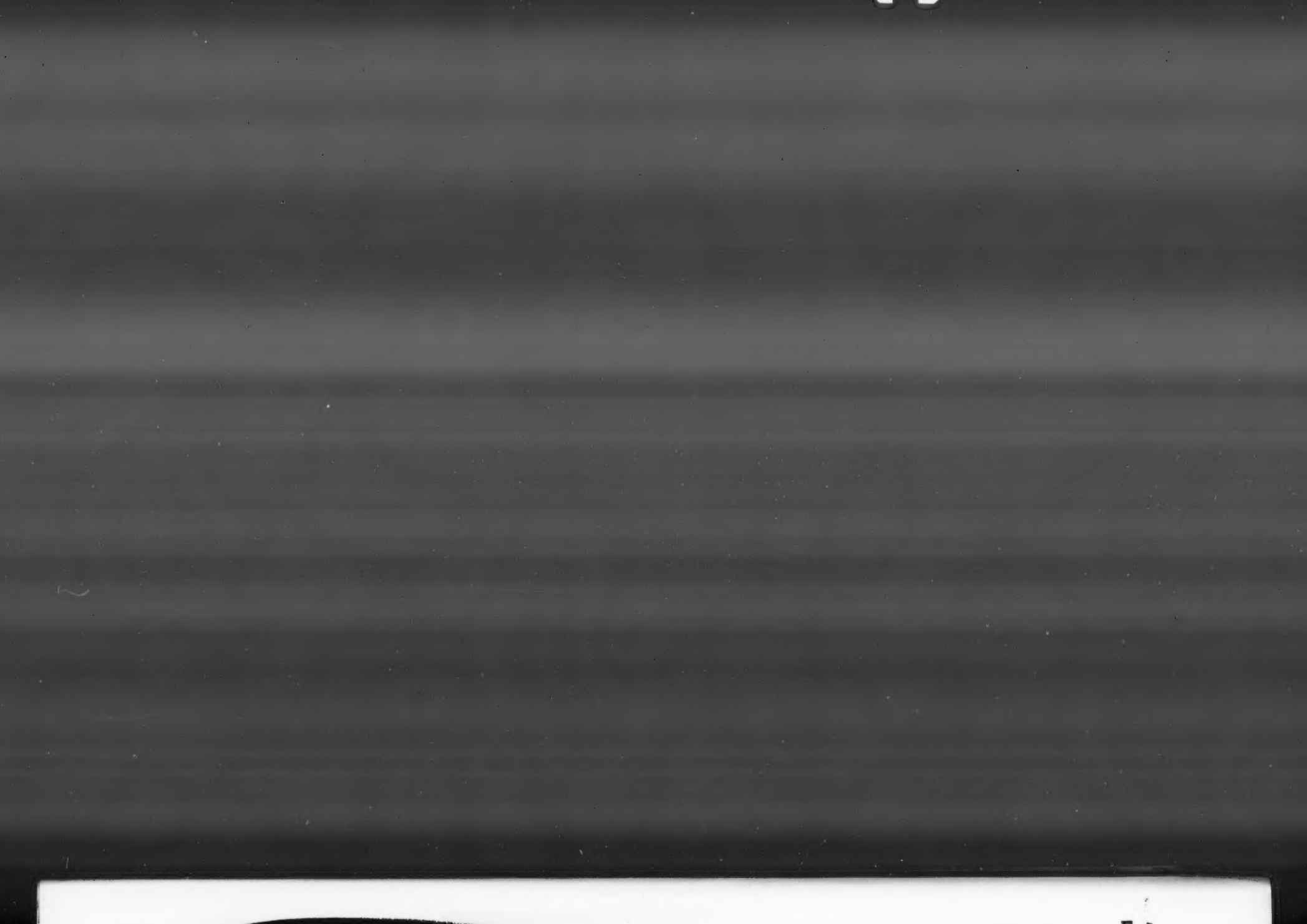

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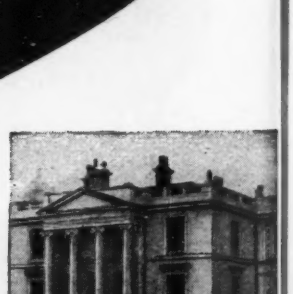

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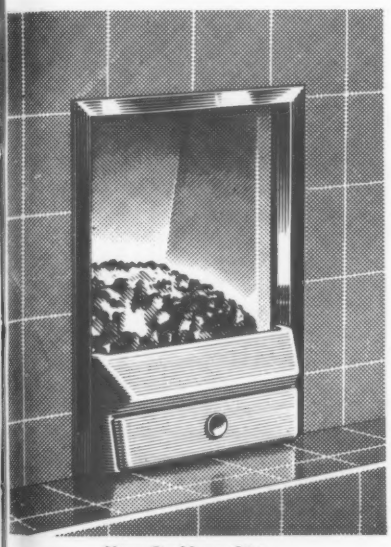

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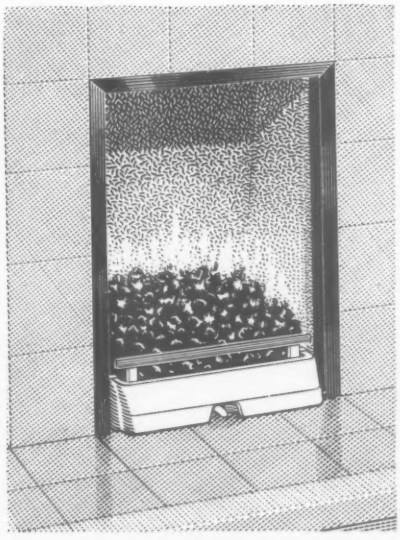

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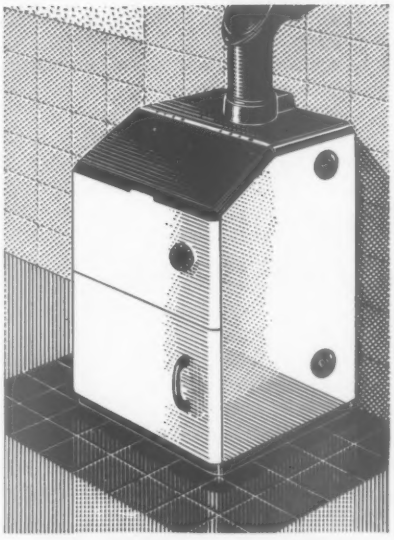

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Architects: T.P. Bennett & Son.

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Capacity (persons per hour)	*5,000*
Service	*Ground to first floor*
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Mouldings and Deckings	*Aluminium Alloy, gold anodised.*
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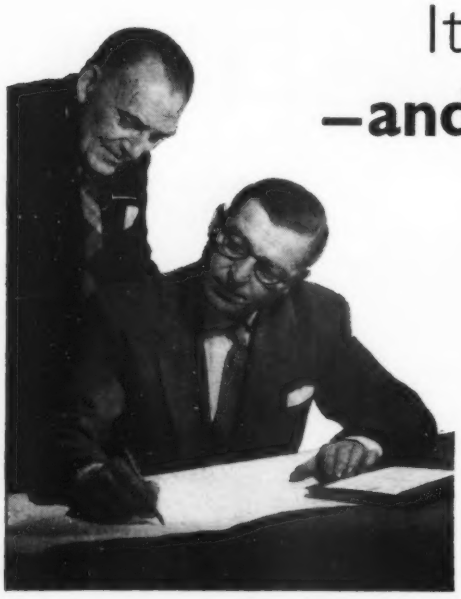

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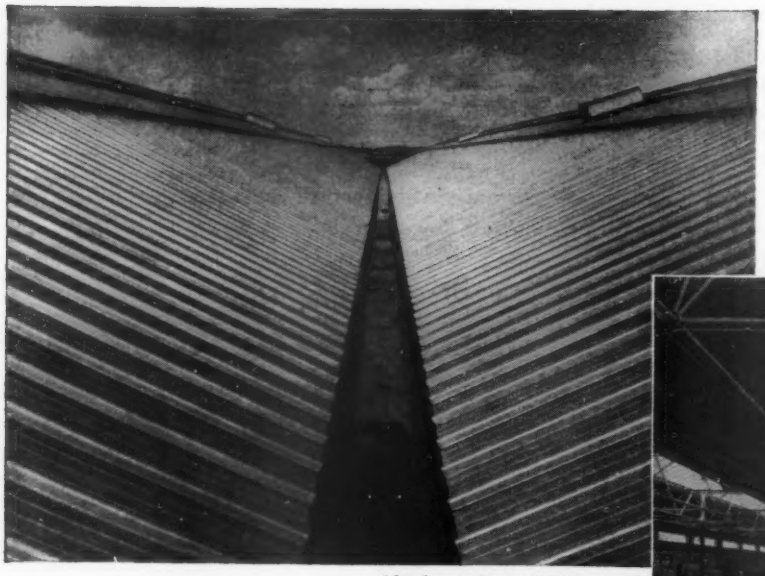

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SNAPDEK

THE MODERN INSULATED ALUMINIUM ROOF DECKING

The Building Exhibition OLYMPIA LONDON 18 Nov–2 Dec 1959

See our Exhibit

STAND NO. 524

Further technical information may be obtained from:—

SNAPDEK LIMITED, CHESTER STREET, ASTON, BIRMINGHAM 6. Telephone: ASTON CROSS 4804 and 4805

"SNAPDEK IS AN ADAPTATION OF "SNAPRIB"

The largest Dandelion in captivity!

6 ft. 6 in. high, it is a conspicuous feature of our stand at the BUILDING EXHIBITION. It will help you to locate us, and to get acquainted with the new

'SIRAPITE' (REGD.)
LIGHTWEIGHT PLASTERS

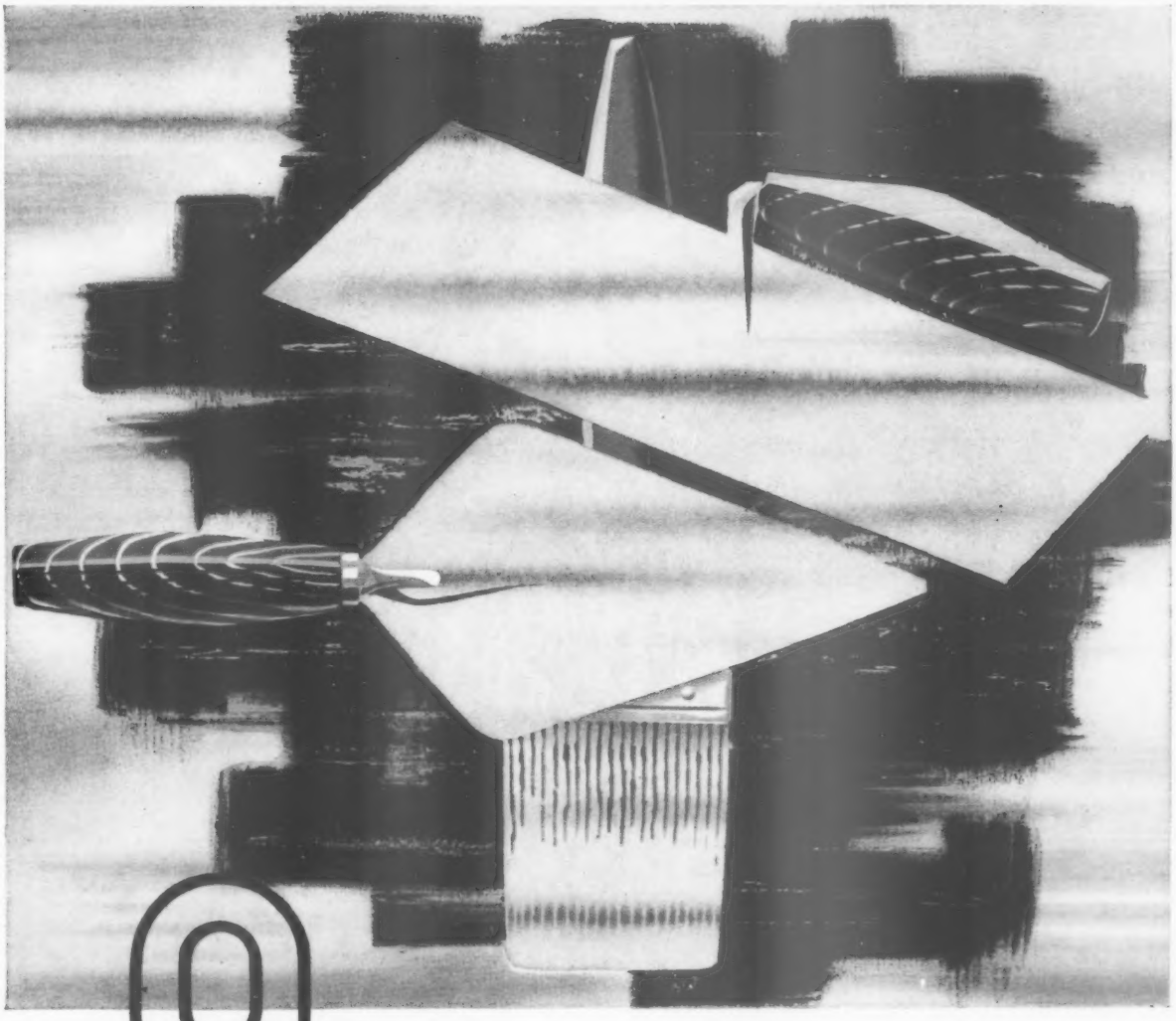
Come and see these interesting materials or write for literature.

STAND 256 ROW R
NATIONAL HALL

THE GYPSUM MINES LTD.

Registered Office:
Mountfield, Robertsbridge, Sussex.
Telephone: Robertsbridge 80/81
(Products Grey in colour)

Midlands Works:
Kingston-on-Soar, Nottingham.
Telephone: Gotham 364/5
(Products Pink in colour)



THERE ARE **9** DIFFERENT **CEMENTONE PRODUCTS**

including decorative finishes and cement additives. Technical advice or information is available on request.

Cementone **No 1**	Permanent Colours for Cement
Cementone **No 2**	Waterproofing Powder
Cementone **No 3**	Transparent Waterproofer
Cementone **No 5**	Concrete Floor Binder
Cementone **No 6**	Waterproof Flat Finish
Cementone **No 7**	Flat and Gloss Finishes
Cementone **No 8**	Concrete Hardener
Cementone **No 9**	Waterproof Stoneface Composition
Cementone **No 10**	Surface Tinter

Joseph Freeman Sons & Co Ltd
Cementone Works
London SW18
Phone: VANdyke 2432

YOU CAN DEPEND ON CEMENTONE

Figured marble on a Roman terrace. Painted patterns in Florentine frescoe. Intricate mosaic of Byzantine Venice. Stained glass in Gothic stone . . . To each age and place its own media of decorative delight.

For here and now, the materials of today—laminated plastics! Able to capture the moods of many eras, yet having a vital character all their own.

Gay and exuberant. Cool, calm or restless. Sometimes commanding, sometimes retiring. Soft, subtle or sophisticated. Always clean, clinical, smooth, functional.

Inevitable in their own way as the framed building and the curtain wall.

'WARERITE 1960'
We invite you to see this new range of WARERITE patterns at 23 Knightsbridge, S.W.1. On view from December 2nd – 4th, 10 a.m. till 5 p.m.

(Patterns shown reduced size)

Look to WARERITE for design leadership

A product of **BAKELITE LIMITED** 12-18 GROSVENOR GARDENS, LONDON, SW1 SLOane 0

REGD.

TGA W228

How long will it last ?

We are asked this important question daily. And our short answer is...an ASBESTOLUX lining specification will outlast the life of the building in which it is installed!

THERMAL INSULATION AND FIRE PROTECTION

The new Thermal Insulation (Industrial Buildings) Act, 1957, specifies the kinds of materials which, if used to a substantial extent to achieve the standard of insulation, must either conform to a prescribed standard of resistance to the spread of flame or be used in such a way that they do not add to the risk of fire.

An Asbestolux lining specification *will provide a superior standard* of insulation and fire protection to the minimum standard as laid down in the new Act, and at the same time ensure EXTREME DURABILITY.

Technical data sheets on constructional details, planned fire protection and specification recommendations, finishes, etc. are available.
You are recommended to write for details or for consultant advice NOW!

ASBESTOLUX

The non-combustible asbestos insulation board

Manufactured by:
CAPE BUILDING PRODUCTS LIMITED, COWLEY BRIDGE WORKS, UXBRIDGE, MIDDX
TELEPHONE: UXBRIDGE 4313
Also at: MANCHESTER . BIRMINGHAM · GLASGOW · NEWCASTLE
A subsidiary of The Cape Asbestos Company Ltd.
AX9

Pioneers...

In 1620 Edmund Gunter, one of a group of English clergymen engaged in the pursuit of mathematical knowledge, introduced 'Gunter's Scales.' These were single lines marked into segments proportional to the logarithms of the numbers. Gunter's Scales inspired the Rev. William Oughtred (1574-1660) to evolve the principle of interchangeable scales by sliding one against the other. Oughtred's instrument was the precursor of the slide rule of today, a device which has made rapid calculation a relatively simple procedure.
In much the same way the Crabtree plate-frame, introduced in 1930, reduced the problem of special-purpose switch assemblies to the selection of a small number of standard components. It brought a degree of simplification and flexibility until then unknown and led directly to the development of the 'Closegang' type of assembly of today.
The plate-frame is typical of the many contributions which the Crabtree Company has made, and will continue to make, to the progressive development of electrical control equipment.

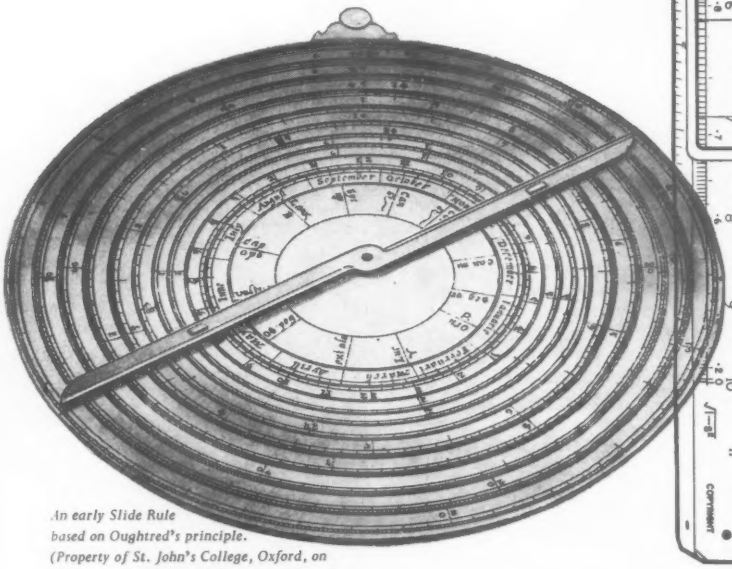
Control Gear
Air-break contactor starters for motors up to 70 h.p. Oil-break contactor starters for motors up to 15 h.p. Hand-operated starters for small motors. Remote push-button stations for general purpose, weatherproof and flameproof applications. Limit switches. Pilot light and indicator units. On-load isolating switches.

Wiring Accessories
Type AC and AC/DC tumbler switches of all types. Ceiling and suspension switches. 13 amp. socket-outlets and other ring-circuit wiring accessories. 2, 5 and 15 amp. socket-outlets. Plugs of all types. Ceiling roses, lampholders and bell pushes. Industrial wiring accessories.

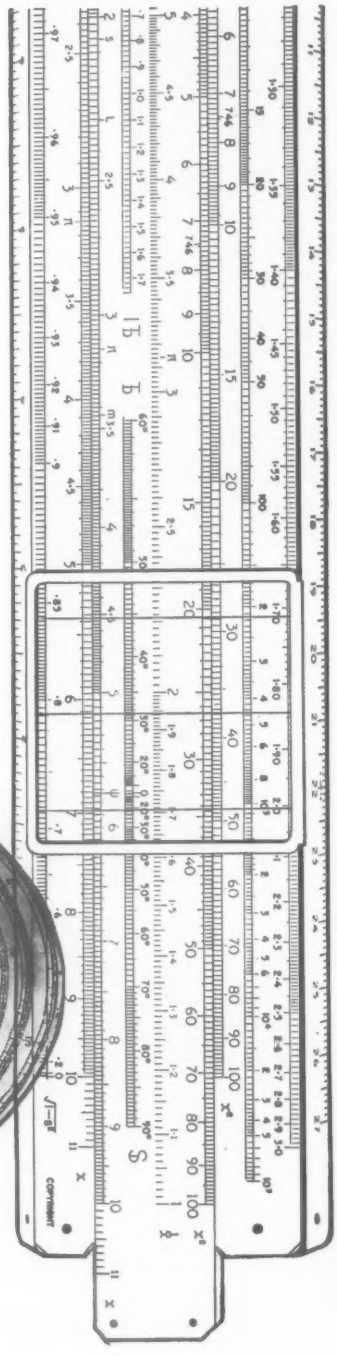
Circuit Breakers
Miniature (moulded case) circuit breakers in single pole, double pole, and triple pole and neutral patterns up to 60 amp. Earth-leakage circuit breakers in double pole, and triple pole and neutral patterns up to 60 amp. Distribution boards.

Manufacturers of

The Rev. William Oughtred (1574-1660)
Originator of the Slide Rule



An early Slide Rule
based on Oughtred's principle.
(Property of St. John's College, Oxford, on loan to the Museum of the History of Science, Oxford)



A Modern Slide Rule

Rising Mains, Underfloor, Floor & Skirting Trunking.

FLOOR TRUNKING

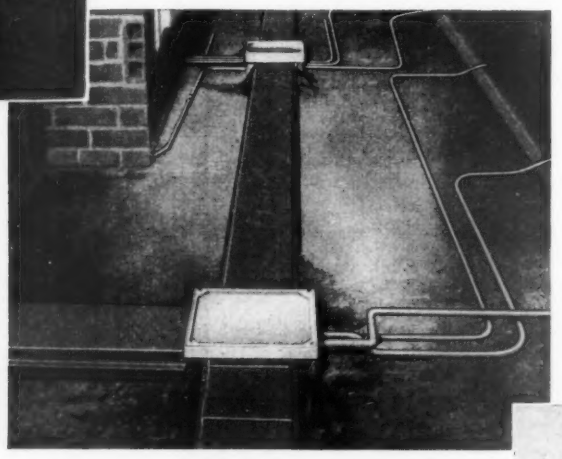
Choice of Covers: Available with chequer plate cover and gasket joint, or with recessed cover to carry any flooring medium—wood blocks, linoleum, tiles, etc.

Construction: With exception of chequer plate, Zinc coated steel is used throughout.

Sizes: Standard sizes available. Special sizes made to order.

Finish: Zinc coated natural finish or Grey Enamel.

Fittings: Elbow. Rising Elbow. Tee Piece. Four-way Box. End Bush. Blank End.



UNDERFLOOR TRUNKING

Choice of Covers: Solid or recessed for fitting with any floor medium.

Floor Traps: Cast or fabricated, in 1-way, 2-way, 3-way and 4-way forms.

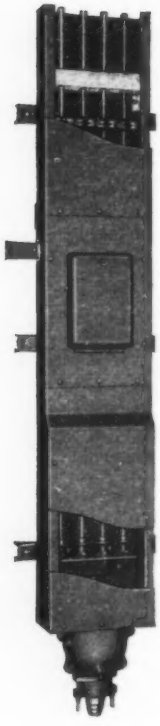
Levelling Feature: Traps can be supplied with provision for levelling.

Construction: With exception of solid cover plates, zinc coated steel is used throughout. The assembly is rigid and waterproof. Dividing fillets can be embodied.

Sizes: As above.

Finish: Zinc coated steel painted with red oxide.

Fittings: Rising Elbow. Elbow. Tee Piece. Four-way box. End Bush. Blank End.



RISING MAIN—BUSBAR TRUNKING

Construction: Zinc coated steel with cover plate secured by set screws and washers, to provide dust-proof enclosure.

Support Rack: Incorporated at base of riser to carry full weight of rising copper conductors.

Fire Proof Barrier: Fitted at each floor level.

Amperage Range: 100 amp. to 1,500 amp. in either 2-, 3- or 4-bar assemblies.

Finish: Grey Enamel.

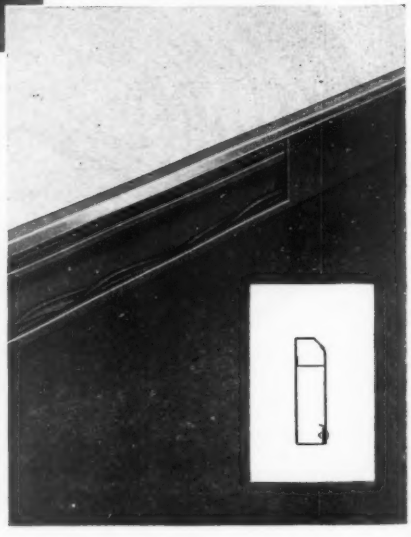
SKIRTING TRUNKING

Construction: Zinc coated steel, with dividing fillets embodied as required.

Sizes: As above.

Finish: Grey Enamel.

Fittings: Elbow. Rising Elbow. Tee Piece. Four-way Box. End Bush. Blank End.



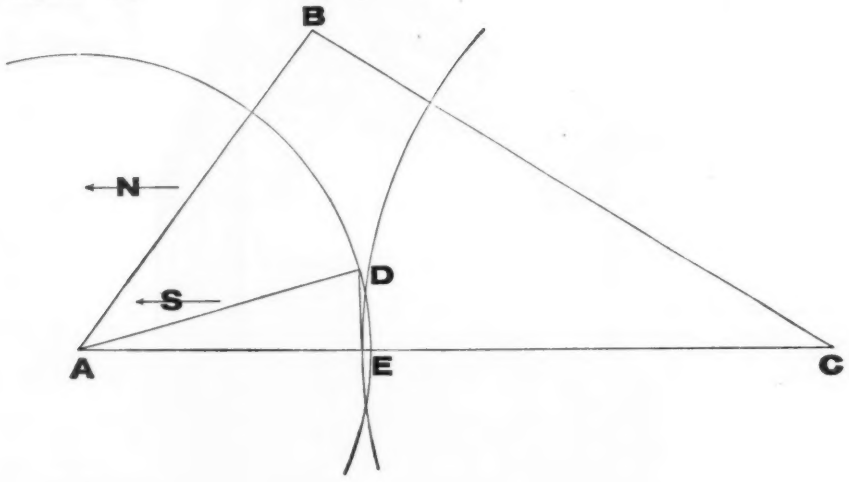
Fully detailed literature available on Power Centre industrial electrical distribution gear.

THE
Power Centre Co. Ltd.

P.O. Box 18, Lloyd Street, Wednesbury, Staffs.

Telephone: Wednesbury 1311. *Also at Newcastle and London.*

Theorems of **PLY** *thagoras No. 5*



That the use of Diffusing Plyglass in a revolutionary form of rooflighting gives glare-free daylight whilst improving insulation.

Use of Plyglass shows the saving achieved over conventional roof lighting. Architects: Gotch, Saunders and Surridge, Kettering

Let ABC represent a section of conventional sawtooth northlight roofing, and ADE a section of new design made possible by the use of Diffusing Plyglass, AB and ADE being the respective glazed areas. By describing arcs it will be seen that ADE is approximately equal to AB, and CE is appreciably less than CB. Further, it will be noted that AD is tilted towards the South, but is substantially opposite to the zenith, whilst AB faces North. Therefore ADEC, though smaller than ABC, admits a similar amount of light. It follows that, as Diffusing Plyglass has a lower heat transmittance than ordinary glass, heat loss in cold weather is close to that of an unglazed, well insulated roof.

Moreover, the volume represented by ADE is only 10% of that represented by ABC.

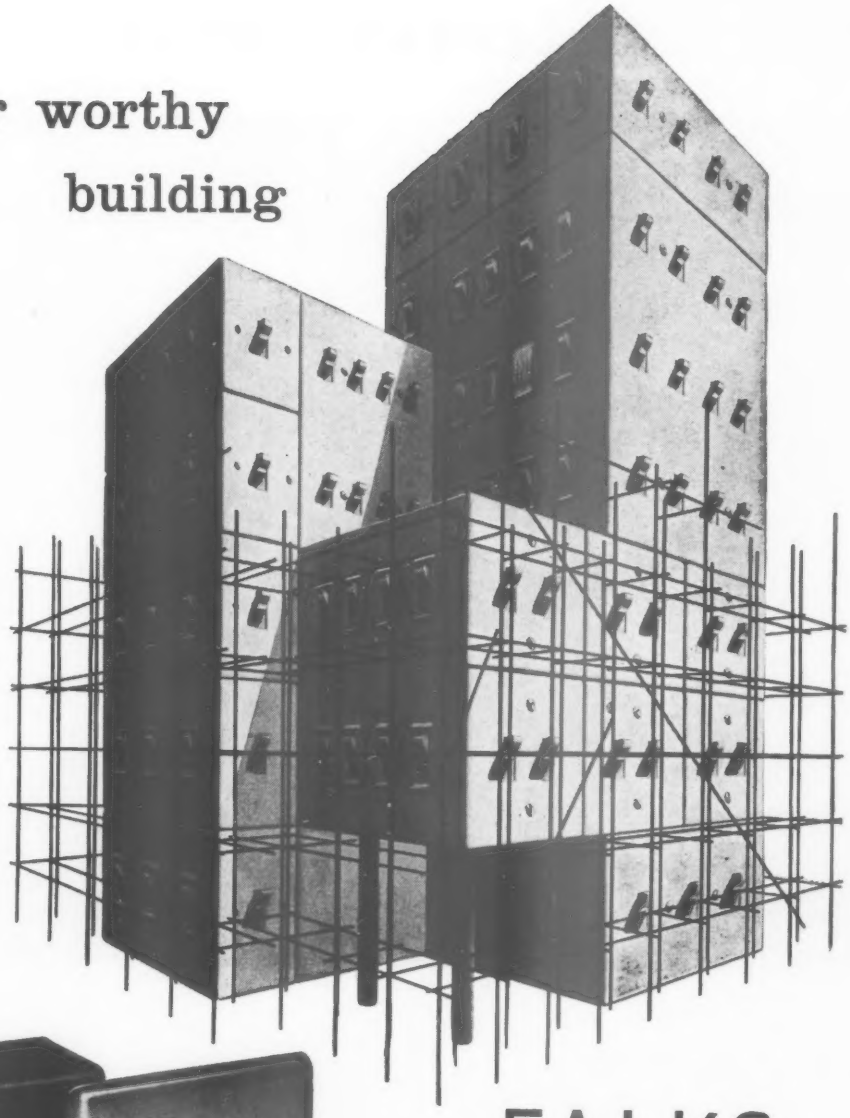
IT IS OBVIOUS, THEREFORE, THAT THE OUTSTANDING QUALITIES OF DIFFUSING PLYGLASS GIVE THE ARCHITECT UNPRECEDENTED FREEDOM OF SITING AND DESIGN, IN ADDITION TO MEETING CONTEMPORARY THERMAL AND LIGHTING REQUIREMENTS AT LOW COST.

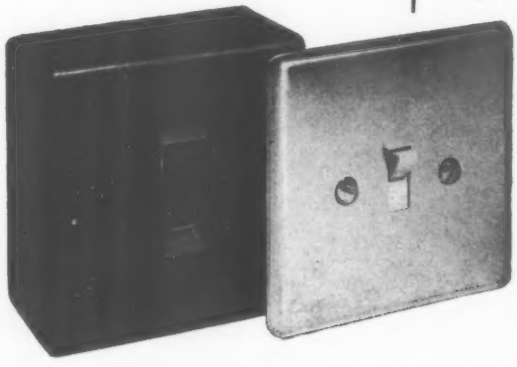
PLYGLASS

For further information write to :-
PLYGLASS LTD., EDINBURGH WAY, HARLOW, ESSEX
Telephone : Harlow 24271 *Cables :* Plylux, Harlow
City Office :
18, London Street, London, E.C.3. Telephone: ROYal 8511
Northern Office :
8, Eldon Terrace, Leeds 2 Telephone : Leeds 2-5792

MP2

For worthy building





FALKS

METALCAST and PLAINPLATE multi-unit switching

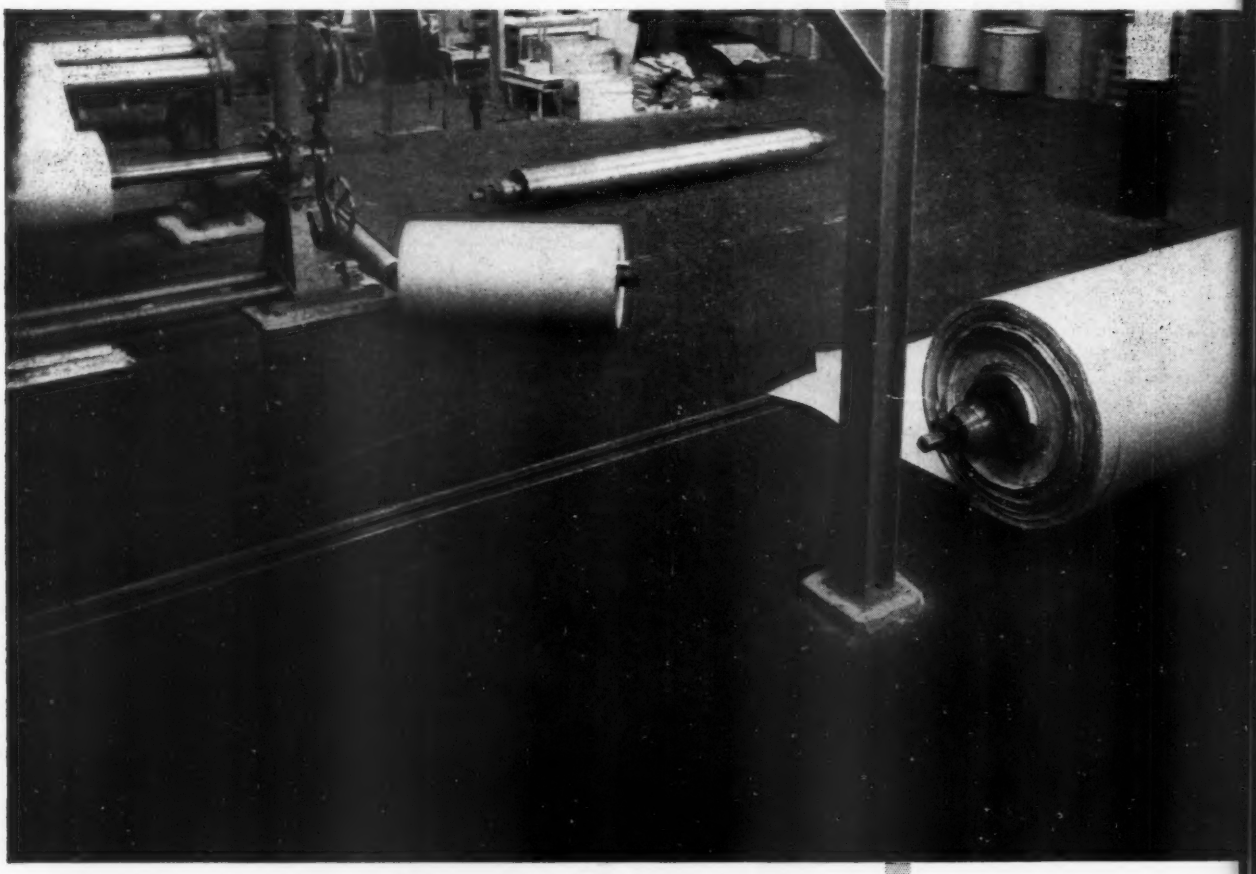
Modern in conception—at home with contemporary design, satisfying the most stringent electrical requirements and above all—thanks to the FALKS grid system, quickly installed. These are the features of FALKS two new multi-unit switches.

Samples available from: FALK STADELMANN & CO., LTD.
91 Farringdon Road, London, E.C.1. Telephone: HOL. 7654
Showrooms: 20/22 Mount Street, London, W.1. · MAY. 5671

Branches at :— Glasgow: Central 9494 (4 lines). Edinburgh: CAL 2364. Manchester: Deansgate 3351. Liverpool: Central 7683/4/5. Birmingham: Central 8031/2/3. Newcastle-under-Lyme: Tel. No. 69573. Dublin: Tel. No. 77694/5. Cardiff: Tel. No. 30351. Swansea: Tel. No. 55442. Newcastle-on-Tyne: City 22483/4/5. Leeds: Tel. No. 29741/2. Bradford: Tel. No. 21905. Nottingham: Tel. No. 51448/9. Brighton: Tel. No. 64077/8. Southampton: Tel. No. 21336. Bristol: Tel. No. 27117/8. Belfast: Tel. No. 31269.

A Flintkote REGD. Floor

Flintkote flooring in paper mill in Sweden. (Photo. by courtesy of Fiskeby Fabriks A.B.)



Flintkote industrial flooring is:

Simple to apply · Cold laid · Tough and durable · Dustless

Non-slip · Self-healing · Shock-absorbent · Resilient · Fire resistant

Economical · Sound-deadening · Damp-proof · Hygienic and odourless

Available throughout the world

Backed by world-wide technical advisory service

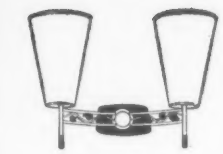
Details on application to:

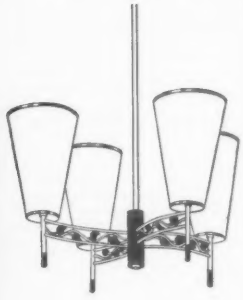
THE FLINTKOTE COMPANY LIMITED

Adam House
One Fitzroy Square
London, W.1

Telephone: EUSton 7224
Telegrams: Flintkote, Wesdo, Londo
Cables: Flintkote, London

FLINTKOTE





to grace elegant homes – leaf fittings

Leaf's Luxury Look . . . . .
Slimly elegant satin brass and sculptural green leaf motifs. A suite of six designs—pendants, ceiling fittings and wall brackets. Leaf fittings add grace and beauty to any home, whether modern or traditional.
Colour leaflet gladly sent on request.

G.E.C.
LIGHTING DIVISION

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

More 'PHORPRES' bricks than ever before...

The programme is outlined on

IN SUMMARY

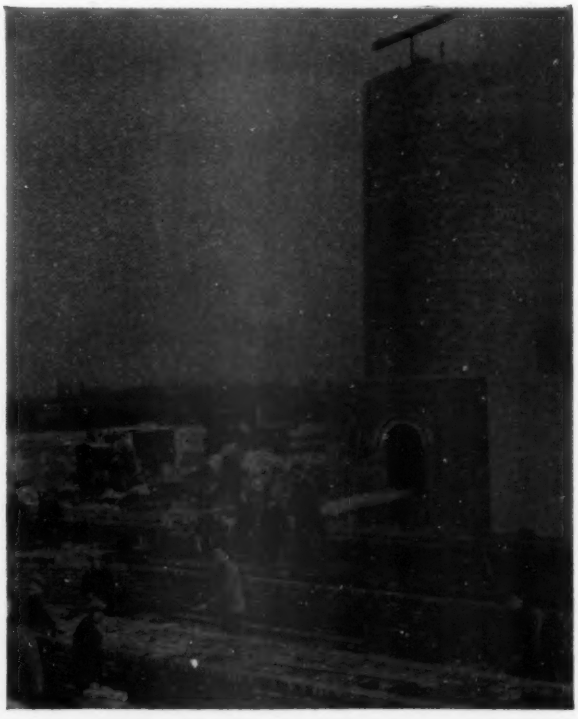
In November 1958, foreseeing an even greater demand for 'Phorpres' bricks, work was commenced on building a new large kiln at the London Brick Company's works at Calvert.

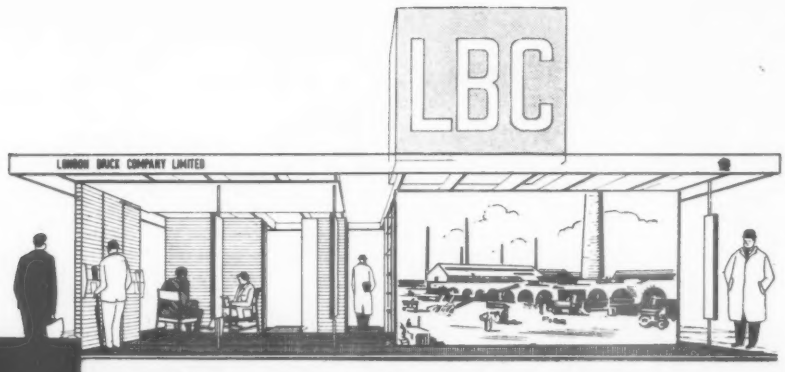
With the exception of stack erection, all building operations in this very considerable project were carried out by the Company's own operatives. Normal production at Calvert was maintained during the period of construction.

In addition to the Calvert programme, extensions were also planned and put in hand at the Company's works at Bletchley.

In fact, the overall result of the various operations will ensure that *an additional 100,000,000 'Phorpres' bricks will be available during the next twelve months.*

The illustration shown on the opposite page gives an idea of the extent of the programme. On the London Brick Company's stand at the Building Exhibition the facts are presented in greater detail. You are invited to examine them for yourself.

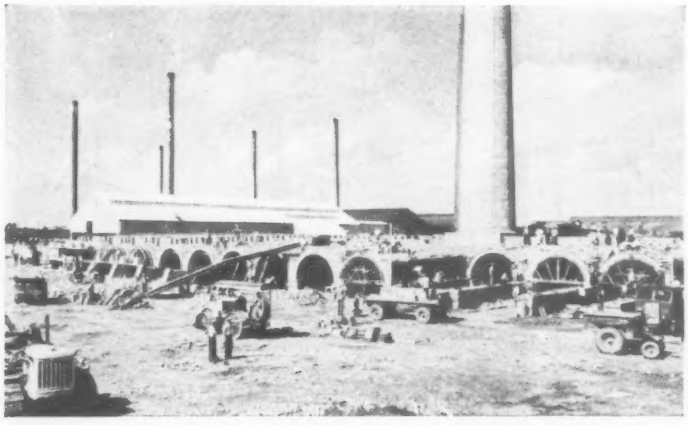




STAND 86-87 ROW E at the Building Exhibition

The Kiln at Calvert

Calvert in Buckinghamshire was the Works chosen for the main increase in production because of its favourable geographical position. The work of modification and extension was energetically pushed forward and schedules maintained without disruption of normal production.



Extract from the Chairman's speech at the lighting of the Calvert kiln, September 4th, 1959.

"We shall not rest upon our laurels and will only be satisfied when we can once again provide the industry with the delivery service on which our Company's reputation was founded."

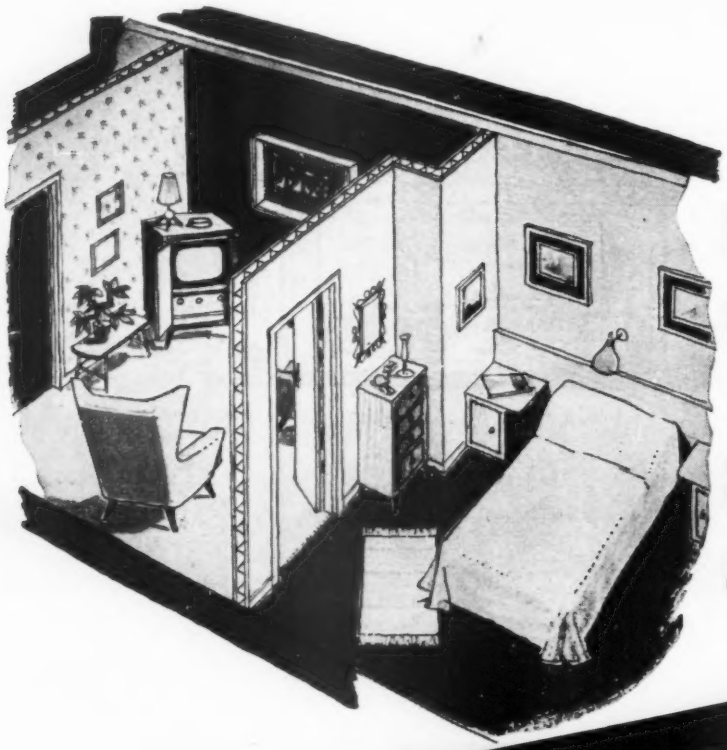
LONDON BRICK COMPANY LIMITED

in the service of the building industry

BY APPOINTMENT TO HER MAJESTY QUEEN ELIZABETH II BRICK MAKERS

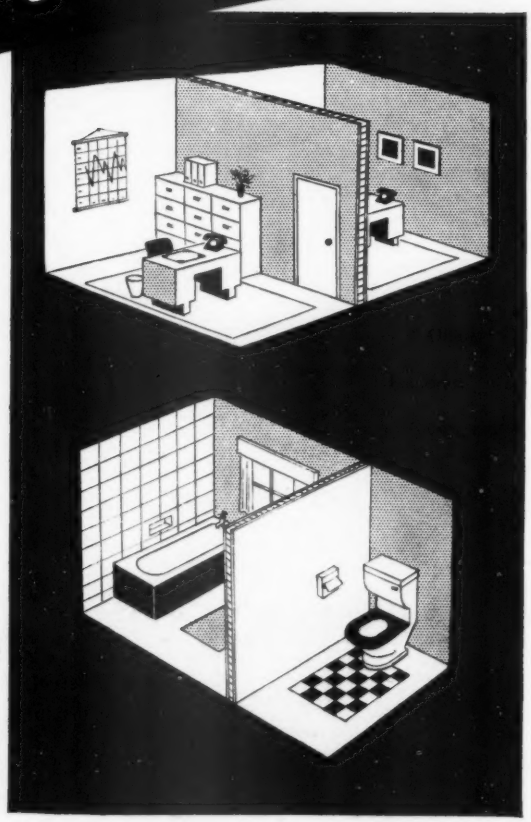
Head Office: Africa House, Kingsway, London, W.C.2. Telephone: HOLborn 8282
Midland District Office: Prudential Buildings, St. Philip's Place, Birmingham, 3. Telephone: Central 4141
South-Western District Office: 11 Orchard Street, Bristol 1. Telephone: Bristol 23014/5
Northern District Office: St. Paul's House, 20-22 St. Paul's Street, Leeds. Telephone: Leeds 20771

PHORPRES



Used exclusively for internal construction work in the Sceaux Garden Flats at Camberwell

Paramount Dry Partition



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

THE
BRITISH PLASTER BOARD
(*MANUFACTURING*) LTD.

BATH HOUSE, 82 PICCADILLY, LONDON, W.1 TEL: GROSVENOR 8311

BLUE HAWK PRODUCTS

AP 204

PLATE'

IDGLASS DOOR ASSEMBLIES

STANDARD SIZES EX STOCK

"×54"

HEONG MARKS ON THE SHORT EDGE

STEELE'S (CONTRACTORS) LIMITED

GLASS WORKS, STAMFORD ROAD, LONDON, N.1.

Telephone: CLIssold 1121 (P.B.X.)

GLASS MERCHANTS & MANUFACTURERS

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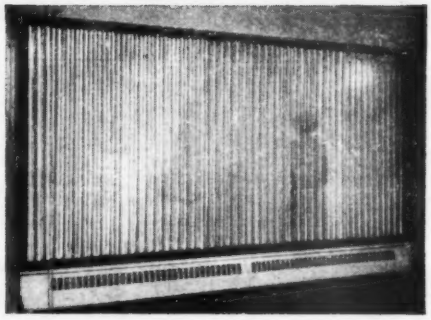
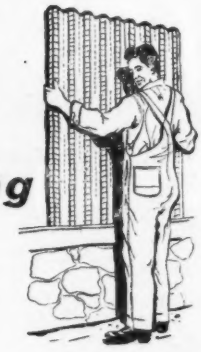


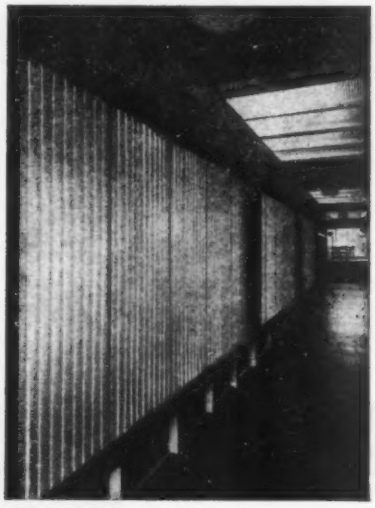
Note how Corroglaze provides for both illumination and privacy in this office.

introducing

decorated corroglaze

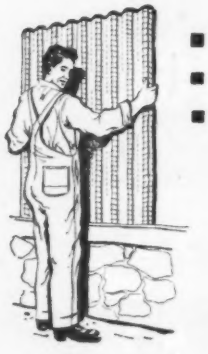
100% pure glass *internal partitioning*





Decorated Corroglaze sheets used to provide a corridor in a school.

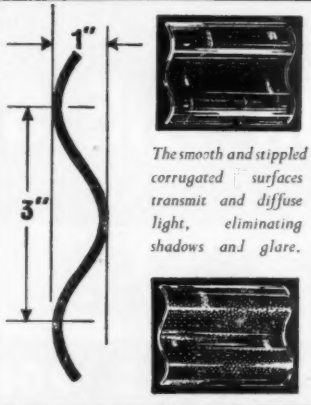
Decorated Corroglaze represents an entirely new approach to the problems of partitioning and sub-division of larger areas. It enables the architect to escape from the rigid, uninteresting, conventional design imposed by the use of flat sheets of glass, hedged in by numerous shadow-forming steel or timber supports and large areas of metal sheeting or masonry. It is 100 per cent. corrugated glass; one surface is smooth and the other stippled. The individual sheets are applied vertically, and are butt jointed by means of slender plastic or metal strips. The ONLY support required, irrespective of the length of run, is the outer framework. Decorated Corroglaze, when illuminated, gives a pleasing, slightly fluviatile effect, the upward flowing lines of the corrugation impart both elegance and dignity.



- faster to install
- more light
- more efficient

technical advisory service

Large stocks of all sizes are available for immediate delivery from area stockists throughout the Country. For further information and advice on applications, installations, etc., write to the Decorated Corroglaze, Technical Advisory service, Corroglaze Ltd., Wembley, Middlesex.
Telephone: Wembley 9411.



The smooth and stippled corrugated surfaces transmit and diffuse light, eliminating shadows and glare.

SPECIFICATION:
LENGTHS: 59in., 78¾in., 118in.
WIDTHS: standard—32½in.
NET COVER: fixed—32¾in.
LIGHT TRANSMISSION: 85%
'U' VALUE: 1.20 B.T.U./hr./sq.ft./°F
STABILITY: does not discolour, maintains light transmission coefficient indefinitely.

Prices on application.

can be used externally
without restriction. A centre supporting rail, supporting, cushioned, to help resist heavy wind pressure is recommended.

See our Exhibit
Building Exhibition
Stand No. 583
Grand Hall Gallery.

corroglaze

the sheet that never burns

B.O.A.C. Victoria Air Terminal extension. Linoleum tiles laid to design. Architects: T. P. Bennett & Sons. Contractor: A. E. Symes Ltd.

Lino

Service Catesbys have laid lino for 60 years. Service built upon the fruits of this experience—full understanding and knowledge of the craft—is worth having. Only Catesbys can give it.

Staff Well laid lino gives longer, better service than lino laid indifferently. Catesbys send an expert and their own trained fitters to every contract. They ensure perfect lino laying.

Advice Catesbys advice is impartial. They will recommend lino only when lino is known to be the ideal floor covering. Catesbys will suggest the most suitable grade.

Stock It is always easier and quicker to choose a design, colour and grade from lino in stock. At Catesbys you see lino in the piece—and you can choose from the biggest stock in Europe.

Catesbys

Contracts (Linoleum Division)

TOTTENHAM COURT ROAD, LONDON, W.1. MUSEUM 7777


'INSU
de
m
Due to th
'INSULIGH
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that res
transpare
that bloc
evenly d
within th
Light D
the prop
building
Sound I
Fire Ret
Thermal
Reductio
Privacy
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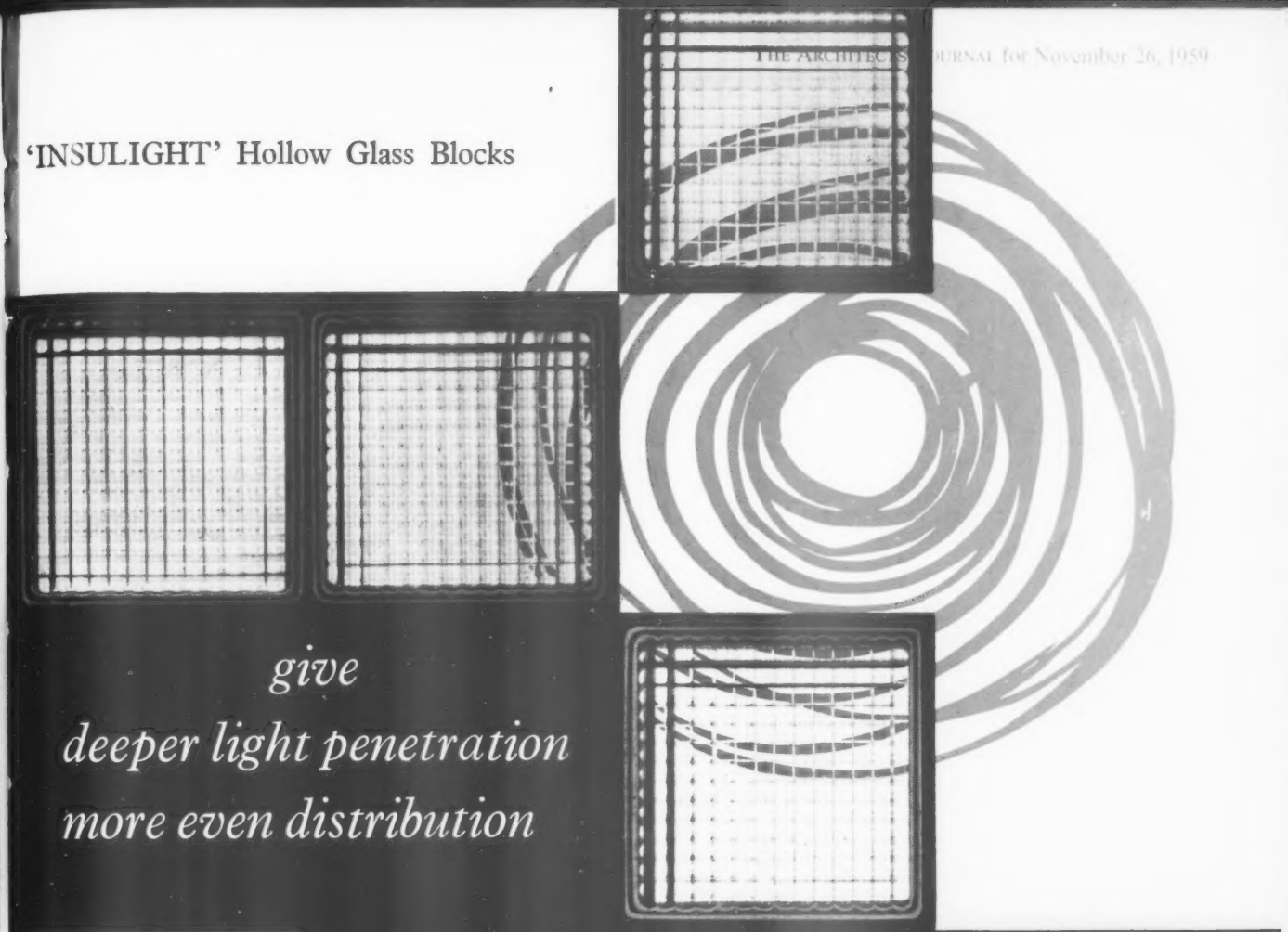
the usua

'INSULIGHT' Hollow Glass Blocks



give
deeper light penetration
more even distribution

Due to the patterned surfaces of 'INSULIGHT' Hollow Glass Blocks, the depth of light penetration is much greater than that resulting from normal transparent glazing. This means that blocks provide much more evenly distributed illumination within the building.

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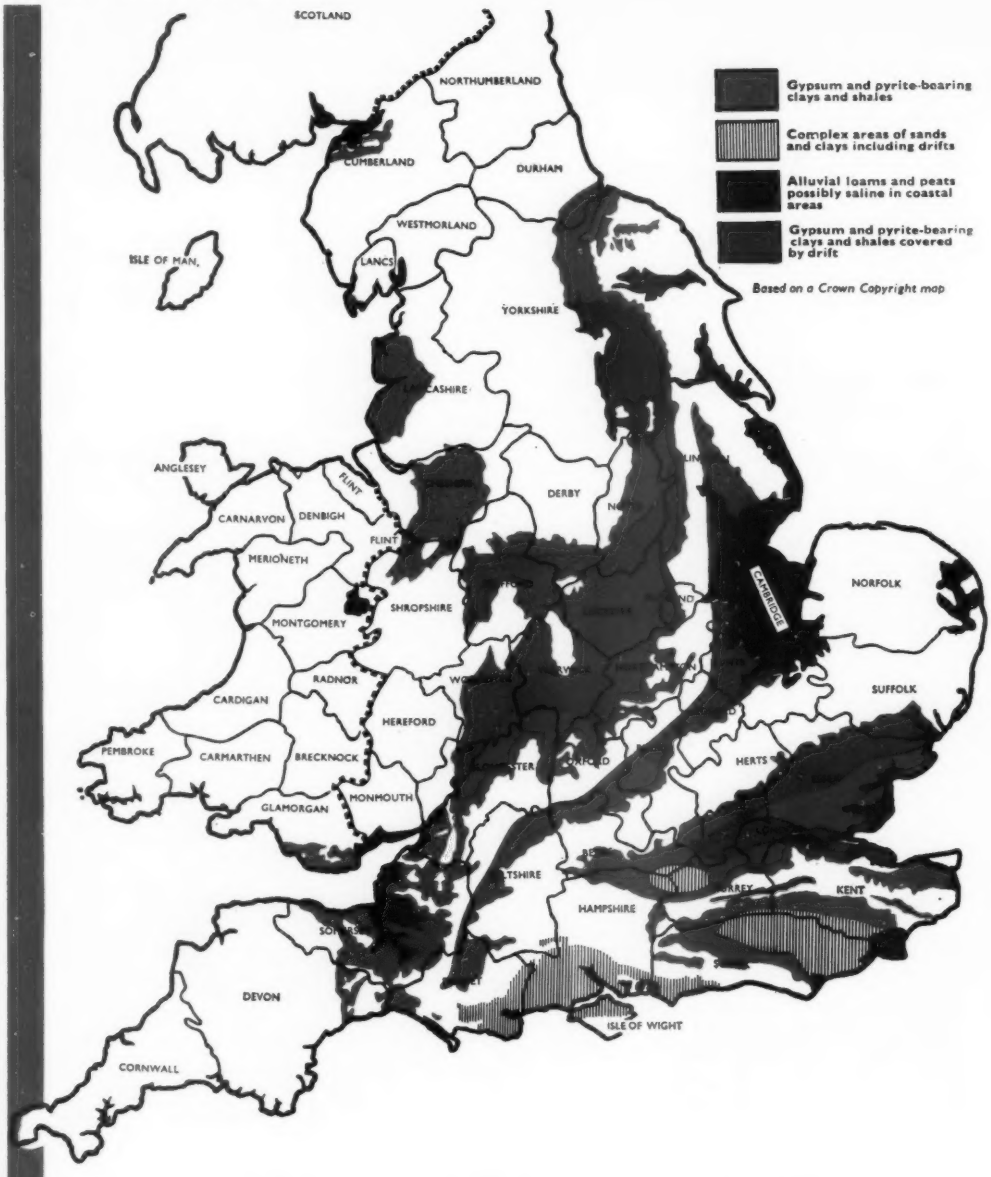

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The Architects' Journal

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NOT QUITE ARCHITECTURE

History is strictly for Dad

The two unsolicited testimonials to works of architecture in the public eye, which appear below, were written by members of the same family—one with his eleven-plus just behind him, the other with life-begins-at-forty not far ahead of him. No prizes are offered for guessing which is which, and no attention will be paid to funny-guys who get it wrong on purpose. Nevertheless, people who "care about architecture" will note that the virtues of Modern are now, at last, apparent to the innocent eye of childhood, or—alternatively—that the revaluation of history is in full swing, Man! First, Castrol House:

*

The building's locality is on Marylebone high street opposite the library and the town hall. It is made for Castrol. It is used for an office block. The structure is made of glass steel and concrete, most of it glass. I think they are better than the older buildings which get very dirty and drab and are not easy to clean because of their nooks and crannies. The building is twelve storeys high. In between the floors are coverings of green glass. Buildings like these are very conspicuous because they are striking in appearance, towering above other buildings. Compared with other buildings it goes along more with the modern world. There is more space in the interior because each room goes in line with the next systematically.
The building is in two parts, the vertical which stands on the horizontal part. The ground is used for stock storing rooms for necessities like ink paper typewriters, etc. I think the building takes up much less space because it goes up instead of spreading around. The structure is almost all

Pointer for Piccadilly

Castrol House is a compromise. The RFAC wanted a simple rectangular block to continue the lines of Marylebone Road and thus perpetuate the corridor street. The slab of offices was also restricted in height by the proximity of Marylebone Town Hall tower. The architects' (Gollins, Melvin, Ward and Partners, in association with Sir Hugh Casson and Neville Conder and Associates) original conception was a tower block with a public patio at ground level. Compromise or not, the result is still pleasing: a street line has been retained and the bulk of the offices are getting the light and views to which workers are entitled. And if the influence of advisory bodies has slowed the development of an entirely twentieth-century solution, nevertheless the result is some badly needed variety to the London skyline and a further development of the simple, neutral, curtain wall by the firm which was among the first in this country to master it. How frustrating it is that there should have to be such disaster and public demonstration over Piccadilly when Castrol House shows—in terms of design if not of traffic engineering—how easy it is to achieve competence.

windows, so compared with other buildings it is much brighter and cleaner therefore pleasanter to work in. With the windows it is much lighter and airier. I should think it would be much easier to move around in a building like this being square and divided in parts, the ground part and the tower part, one offices and the other stock rooms.

*

I do not think I would like to live in it, because it is very cramped and I do not think I could sleep with artificial breathing system and ventilation. I like the building because it towers above other buildings and it is very exciting against the blue sky and fleecy clouds. Another thing I like about it is that it looks more like a simple pattern than a monotonous structure. It reminds me of a towering skyscraper of New York which you see in magazines and the cinema. Blocks like these are very plain now-a-days but the size, height and colour makes them very exciting to look at.

*

And now the Alhambra, having dealt first with a few other Spanish landmarks.

*

Suddenly there is Madrid: for no reason that one can determine: just standing out on the plain. No particular feelings about the place: seemed mostly to have been laid out and put up in an expansive mood at the tail end of the 19C, as part of the game "let's make a capital."

*

Toledo—a kind of picture postcard ghost town: scheduled in entirety as a national monument: a sunbaked little museum full of flick-knife shops and "the grandeur that was Spain." Jampacked with El Greco and that sort of thing. But—¿me dig espanol? Granada—now here is a cat of a different hue. The Alhambra is the most. Those old Moors really had the place sorted out: talk about *environment control*—it's no crazy talk to describe the Alhambra as real cool but laconically a temperature notation.

*

The rest of Spain seems strictly from guilt and Indian goïd: cast of thousands looking for death in the afternoon. But the Alhambra takes a fine emery board to those jaded old nerve-endings, and you know why they called every day from the muezzin (Allah has the message and Mahomet is his only true press agent). But the Alhambra was just the front office—to really relax those Moorish cats strolled along a few yards down to the Generalife—pronouncing it like the French "Highlife" and meaning it likewise—there they shacked up for the summer and latched their hubble-bubbles on to the mainline. My version has it then that the local voters, disenfranchized by these cool pagans and stuck out in the noonday sun really got the blues—and Man that's how Flamenco was born.

JULIAN MCHALE
JOHN MCHALE

The Editors

A PLAN FOR PICCADILLY

THE drama of Piccadilly Circus was degenerating rapidly into farce when the Minister of Housing and Local Government decided last week-end to call the application in and hold a public enquiry. Not only was the public confused by the LCC's claim that the model and drawings submitted to the Council by the developers of the Monico site differed from the model and perspective published to the press (the differences appear in fact to have been slight), but in a television interview Hubert Bennett, the architect to the LCC, made it all too clear that the LCC is in no way committed to the overall design for Piccadilly Circus prepared by his own Planning Division. How can the Minister possibly decide whether any building does or does not prejudice the future redevelopment of an area if the LCC itself has no clear plan?

The enquiry will fail in its purpose if it is concerned only with the aesthetics of the building—important as this is—and whether it conforms to the zoning, plot ratio, daylighting, car parking and other formal town planning requirements. The real issue is whether Piccadilly Circus and the large adjoining area that is ripe for renewal (and for which the LCC has received several important applications) is to be carried out piecemeal or in accordance with a comprehensive plan. One cannot, when designing for the future, use Piccadilly Circus as one of London's major east-west north-south intersections (to handle some 80,000 vehicles a day) and as a pedestrian concourse, shopping and entertainments centre, all on the same level. A year ago the LCC published a model as a basis for negotiations with developers. Within the limitations imposed by the proposed road pattern it treated the Circus as an architectural unity; while retaining pavements at the road level, it made an advance towards

segregation by introducing a system of upper-level pedestrian walkways. This idea is full of difficulties, not least because it has to be realized in stages over a long time, but it was well worth exploring it to see whether it could not be made to work over a large area, with moving ramps or escalators and attractive shops and entertainments at the higher level. If the first developer is allowed to reject the idea out of hand, then all the others are likely to do the same. And if the LCC abandons the idea, as it has done on the Monico site, we are back at frontage development along narrow, crowded pavements lining roads jammed with vehicles. Similarly, if an aggressive and ill-proportioned building is approved on the Monico site, the architectural design of the entire circus is prejudiced.

It would be unfair to the LCC not to emphasize the appalling difficulties that face any planning authority attempting to secure good development in an area of fabulous land values. With a planning budget of only £1,500,000 a year, and its capital resources fully committed on urgent projects, the LCC cannot hope unaided to buy much land, and any desire to be firm with developers must be tempered by fear of having to accept purchase notices or pay heavy compensation. Unfortunately the LCC has neither explained these difficulties, nor argued the need for additional powers or finance to secure comprehensive development. It has lowered its reputation for good planning and architecture by entering into a weak compromise, and then defending it. Exchanges in Parliament and the attitude of the press show that had the LCC taken a much tougher line it would have had strong support.

Nevertheless, the LCC cannot solve this problem, which is of national concern, without national backing and national money. Piccadilly Circus and the whole of the adjoining areas where early redevelopment is probable should be made an area of Comprehensive Development. Pending the preparation of an over-all three-dimensional plan (which might well be the subject of a competition) all applications for new buildings should be refused. This would give the LCC time to reconsider, as it must, the long-term solution of the road traffic problems. No real harm would be done, and irreparable harm would be avoided, for nobody except the developers is in a tearing hurry about the Circus.

The government would have to stand behind the LCC financially, but it should not be thought that in the long run comprehensive planning would lose money; on the contrary, any public capital invested here would show a very high return —a point that Mr. Cotton can no doubt confirm.

By a striking coincidence the Piccadilly Circus row blew up at the same time that the City of London Corporation finally decided to approve Chamberlin, Powell and Bon's Barbican scheme, and rejected a proposal to hand the development over to private enterprise. The LCC is entitled to much of the credit for all the Barbican proposals, which mark a major, even a revolutionary advance in British town planning. The sordid muddle of Piccadilly Circus and the West End calls for an equally bold and imaginative plan.

OLYMPIAN DEPTHS

A little while ago *Architectural Forum* published a sketch showing what a town would look like if twenty or so distinguished buildings from various parts of the world were bunged together with no thought of planning. It was a horrible, cautionary picture, and I remembered it as I wandered round the Building Exhibition which is an Awful Warning that it's no good employing a hundred or more architects if you don't impose some sort of planning control. Well-designed products are hard to see amongst the pastiche and glitter at Olympia. When will the exhibition's organizers realise that gimmicky, over crowded stands are merely a nuisance to the professional visitor who is looking for information and not for the imbecile treatment handed out on television commercials?

*

The Minister of Works, Lord John Hope, opened the exhibition with a sensible speech, though it was a bit galling to hear his warning that everyone should show flexibility in specifying materials so that if one material was scarce others could be used. After all, it was the Government itself which helped to create shortages with its controls and decontrols. However, it was good to hear the Minister say he intended to pay particular attention to

spreading the word about research and new techniques throughout the industry. It's time we had that long-talked-about information service. It's time, too, that someone got on with the joint training of architects, surveyors and builders.

*

Talking of which, I was amused to find—at a time when inter-profession co-operation is the thing—that the Institute of Quantity Surveyors had designed its own stand. Frankly, it looked like it. But the RIBA, which is still sweeping with its new broom and turning over its new leaf, has transformed the sepia-tinted morgue it used to have as a club room, and now vaunts Conran chairs and Forrest lights.

ICE MELTS FOR ARCHITECTS

I'm glad to hear that architects will be welcomed by the Traffic Engineering Study Group which was founded last week at the ICE by Sir Herbert Manzoni and other civil engineers. Richard Nugent, MP, the former Parliamentary Secretary to the MOT, spoke at the Group's press conference—very sensibly correcting pressmen who thought America had solved the urban traffic problem with traffic engineering. He pointed out that while we had a lot to learn from America, we were twenty years ahead in public transport.

TIMES OUT OF JOINT

Does *The Times* know anything about planning? Last week it attacked Henry Brooke, the Minister of Housing, for his determination (see page 57€) to stop office concentration in central London. Then it criticized the Government for trying to persuade Fords to build their new £50 m. factory in Scotland, where there is unemployment, instead of in Dagenham, where there is neither labour nor spare housing.

*

Someone should explain to Sir William Haley that the more offices that are built outside London, the fewer the workers who will have to travel to and from the City. As W. F. Deeds (Ashford, Con.) said in the excellent Commons debate on landscape last week: "A Government which allows the fantastic concentration of commerce in London which has been countenanced in the last decade . . . and which also pursues a policy of overspill from London into the country ought to have its head examined."

The end of Regent Street. The new BBC extension faces on to Portland Place with, naturally enough, a face of Portland stone. But no one seems to have remembered that the Mary Ann back side would be equally important in forming a new termination to Upper Regent Street. Nash's All Souls thus looks like Osbert Lancaster's "amenity preserved," and where once it neatly turned the eye into the curve of Langham Place it has now been rendered architecturally meaningless. If it had to be there at all, the new building would have been better twice the height. St. Mary le Strand comes off better than this under the cliffs of Bush House. This is two-dimensional planning at its worst, or how to obstruct from behind.

SIR AMBROSE HEAL

It's difficult for a merely middle-aged body like ASTRAGAL to imagine a state of affairs where Heal's didn't exist, or —what's even more difficult to imagine —didn't exist in its present form, with its present reputation as one of the cornerstones of English Taste.

*

Yet, as the learned obituaries of Sir Ambrose Heal, who died last week, make clear, the Heal's we know and admire, the Heal's that angry young designers simultaneously respect and execrate, is the creation of Sir Ambrose himself, in the years since he took over the chairmanship in 1913. Before that it was just a bedding company (they still have a four-poster on a lot of their trade literature, it occurs to me) and the build-up into the present status as number-one well-designed universal household furniture emporium is entirely since that time.

*

The other sobering thought that one gleans from the obituaries is that he was born early enough (he was eighty-seven when he died) to have known not only people like Lethaby and Voysey, but William Morris as well.

M. O. DELL

If you were to ask me for the couple of names that had most to do with putting modern architecture across when it was struggling to establish itself in the 1930s, my answer wouldn't be Lubetkin and Tecton or Cornell and Ward or Gropius and Fry. It would be Dell and Wainwright, the two photographers who worked for the *Architectural Review* up to the war and had a genius for bringing out in their photographs the special qualities modern architecture had to offer.

I am reminded of these past days by the sad news of M. O. Dell's death. He retired after the war, since when H. L. Wainwright has been carrying on alone —still producing impeccable photographs. But to architects old enough to remember the controversies of the 1930's the two names are inseparable, and those whose buildings D. & W. photographed will remember not only their skill and understanding but how firmly their genius was rooted, as genius is supposed to be, in an infinite capacity for taking pains.

MOTROPOLIS REPRINT

Additional copies of *Motropolis* (which sold out and has been out of print) are being printed to meet the continuing demand, and will be available shortly at the price of 1s. 6d. post paid.

ASTRAGAL

DIARY

Building Exhibition. At Olympia.
UNTIL DECEMBER 2

Exhibition of High Buildings in London. LCC, County Hall (North Block), London, S.E.1. UNTIL DECEMBER 19

Exhibition of Sculpture in Ciment Fondu. At the Building Centre, 26, Store Street, W.C.1.
NOVEMBER 26 TO JANUARY 2, 1960

Still Life and Industrial Design. Talk by Reyner Banham at the Courtauld Institute of Art, 20, Portman Square, W.1. 5.30 p.m.
DECEMBER 1

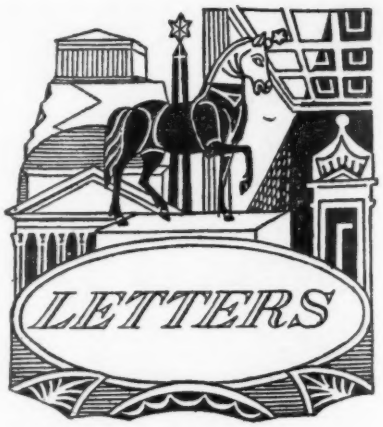
A Symposium on "Space Heating with Particular Reference to Dwellings." Speakers, R. S. Eve, George Ferry and J. P. Macey. At the RICS, 12, Great George Street, S.W.1. 5.45 p.m. DECEMBER 1

Symposium: Modern Architecture and the Church. Speakers, James Cubitt, Robert Maguire, Peter Smithson and Lance Wright. Organized by the University of London, Department of Extra-Mural Studies, and the New Churches Research Group. At the Lecture Theatre, Institute of Archæology, 31/34. Gordon Square, W.C.1. 6.30 p.m.
DECEMBER 2

LMBA Tripartite Conference with RIBA and RICS. At Sundridge Park.
DECEMBER 2 TO 5

Theory, Research and the Practical Design of Reinforced Concrete. Talk by W. E. J. Budgen. RCA, 11, Upper Belgrave Street, S.W.1. 6 p.m. DECEMBER 2

The Relation Between Research and Productivity. Yerbury Foundation Lecture by Dr. Weston, at TUC Hall, Great Russell Street, W.C.1. 6.30 p.m. DECEMBER 3



B. Agard Evans,
Chief Librarian, Ministry of Works, Vice-Chairman, International Building Classification Committee.

R. Baden Hellard, A.R.I.B.A.

John G. Fryman, A.R.I.B.A.

T. O. M. Upfield

J. B. Lehrman, A.R.I.B.A., A.M.P.T.I.

Paul Ritter, A.R.I.B.A., A.M.P.T.I.

Derek Abbott, A.R.I.B.A.

SfB Filing System

SIR: The approval of the RIBA Council and the wholehearted support of your good selves to the SfB system is to be welcomed; and the tribute to Dargan Bullivant for its introduction to this country is well-deserved. There is some danger, however, in spoiling a good thing by over-enthusiasm. The International Building Classification Committee approved the SfB "for use in the classification of trade catalogues, codes of practice and other documents dealing with building elements, building products and building works and intended for filing in practitioners' offices." It went on to state "The IBCC recognizes, however, that the UDC remains the principal classification system for international documentation." The UDC also in this country remains the principal classification system for information in the building field; it is used by the three publications, *RIBA Library Bulletin, Building Science Abstracts* and *MOW Library Bulletin*, which analyse the world literature. It is used in the library of the Institution of Civil Engineers and on British Standards.

The SfB is essentially a rough grouping and as such can be very useful for breaking down a small collection. For the finer division required by a large collection of items, the authors of SfB themselves recognize that recourse to UDC is necessary, as indicated in the filing manual published in your issue of September 17. For any collection of general information that is likely to grow large, it would be advisable to adopt the UDC from the beginning; a limited number of the main UDC numbers may be employed while the collection is small and may then be expanded as the collection grows, without the necessity for re-classification.

Within its limitations the SfB can be of great value and its universal adoption for pre-classification of trade catalogues, etc., can be most helpful to practitioners.

B. AGARD EVANS,
Chief Librarian, Ministry of Works, Vice-Chairman, International Building Classification Committee.

Architects As Directors

SIR: The question is "Will the change in the Code give the public a better architectural service?" If the key word is "service" then the answer is probably "Yes." I am never sure of the definition "architectural" and perhaps this lack of definition is one of the main problems that, as a profession, we have to face.

To me the key would seem to be a "declared interest." Many clients prefer to deal with someone whose knowledge, integrity and context they respect. They are less concerned with professional names or hieroglyphics, and the protection afforded to them by the Code is mostly unknown and sometimes ridiculed; the knowledge of a man's integrity and the competition of an open market being regarded as better protection than remuneration on "cost plus"

In selecting its Governors the Bank of England prefers knowledge with integrity to dis-associated professional impartiality. There would seem to be no reason why business interests should select their architects differently.

R. BADEN HELLARD

London.

SIR: The crux of this argument arises from the necessity for better architecture, but I submit that the projected amendment of the Code would be largely abortive.

A cursory glance at the post war scene and the Press abundantly exposes the disgraceful standard of work turned out by a large section of the profession. Really good design is in the capable hands of a few who one imagines have no need to extend their activities to directing contractors firms. For the rest, who would no doubt welcome this move, it would merely extend the scope of their phoney "contemporary" cliches. Such architects as directors would merely be the blind leading the blind.

The maintenance of impartial status is essential if we are to continue as a profession. A solution follows when the results of improved standards of training coincide with an awareness by the layman of the function and qualities of an achitect. When this level is reached, and not before, legislation to ensure architects controlling all building work will produce the results we now seek.

JOHN G. FRYMAN

Medmenham.

Top Industry: Motors

SIR: I am surprised at Professor Wright, in the November 5 issue of the JOURNAL, making the common mistake of assuming

that the prediction of 1,300,000 new motor vehicle registrations will be in addition to the number of vehicles *already on the roads*. Of course it means nothing more than something over 1,000,000 motor vehicles will be turned into the breakers' yards, either due to old age or "write-off" accidents, for there is only a certain percentage of the population which wants to, or can afford to, buy and run motor vehicles, and this number of people can only be increased by (*a*) increase in the population with the percentage remaining stationary, and (*b*) increased purchasing power at the lower income levels, which will increase the percentage.

Trade vehicles have the shortest life, for they are worked to death, mechanically and structurally; big cars, expensive to buy and expensive to run, are not for the masses; but the moderately priced vehicles, cheap to run, will live as long as the "do-it-yourselfer" can buy replacements for worn parts, and there are plenty of Austins, Morrises, B.S.A.s, and Ariels, etc., 25-30 years old, which are still quite roadworthy and regularly licensed, and which will be replaced only when their owners can afford a newer old model. The new motor vehicles poured out of the factories each year only push the old ones off the roads at the other end of the sausage-machine.

If Professor Wright cares to make a rough calculation of the number of motor vehicles *registered* since, say, 1945, and compare this total with the number of currently *licensed* vehicles, he will see what I mean.

T. O. M. UPFIELD

London

The net increase in vehicle registrations has averaged more than half a million a year since 1954, as shown in the graph in Motropolis (AJ, October 1). The figures for the year to September 30, 1959, have not yet been published, but it seems unlikely that the wastage will reach anything like the figure of one million. Wastage in 1957-8, for example, was 504,745, or slightly more than half the new registrations.—THE EDITORS.

Check Lists

SIR: The check-list contained in the AJ for October 15 is excellent, and there is no doubt of its usefulness. But it took, by your admission, a *year* to formulate! When will the further check-lists that are promised appear?—when today's working-drawings are no longer the system used for showing the contractor what we want? Please, let us have our check-lists now, week by week, or even month by month, and not as historical curiosities.

J. B. LEHRMAN

Ottawa

SIR: Allow me to comment on Mr. Davies' letter criticizing your review of my Radburn Exhibition (AJ, October 1).

To me, as to your reviewer, the half-hearted way in which some of the new towns have taken into account the existence of the motor car is not at all impressive, although perhaps better than those who continue to bury their heads in the sand completely. In the sense in which these developments are "no longer strictly Radburn" they are worse than the original idea. I believe they are a compromise not with a way of life but with the ignorance of those who plan. The new town of Cumbernauld shows what the approach of the other 15 might have been.

The Radburn separation of motor cars and pedestrian is essentially so wonderful because it makes life better for both. The criteria underlying this are, first of all the primary creation of a footpath system within a superblock, the paths being the working link with shops, playgrounds, pubs, and anything else that serves groups of people. Even in a tiny lay-out of a few dozen houses this can be achieved. Secondly, the creation of service road access to every house with a similar provision of private garages.

It is obvious that any lay-out which lavishes much of the open space to areas adjoining roads and not connected to a footpath system disregards the basis of the Radburn Idea. The mere addition of a service cul-de-sac to a front motor road is as far removed from the Radburn Idea as one can get, and a very inefficient way of planning. Such minor Radburns as are under construction in some of the new towns do not obscure but accentuate the tragedy that the New Towns Mark I did not seriously consider separation.

The Radburn Idea was effectively used twenty years before the New Towns Act. Lewis Mumford's masterpiece *Culture of Cities* illustrates the Radburn schemes and has this to say:

"Here was the first town built anywhere that consistently abandoned the corridor avenue lined with houses, that divorced the functions of domestic living from the noise and traffic of the street, and that provided a continuous belt of park space within the residential superblocks, instead of placing the park on the outskirts. Each superblock was planned in relation to a school, a playground, and a swimming pool: open spaces were treated as part of the original cost of development. By means of footpaths with underpasses and bridges one can walk from one part of the community to another without encountering a motor car."

The book was first published in 1938. Radburn was built ten years before that!

PAUL RITTER

Nottingham

Australia and Sydney

SIR: I have read with intense interest John Carter's observations on Australia AND Sydney. The salient point that he has missed is that Sydney is no more Australia, than London is England, or Paris is France. I spent a year on that continent, mainly in Adelaide, but also frequently visited Melbourne. Both these cities are very different in atmosphere and "tempo" than Sydney, as every native-born "Aussie" will tell you. At heart Australia, despite it's veneer of North American Influence, is still very British. Indeed, most Australian Cities, and their outer environment is much closer to that of Southern Rhodesia or New Zealand than USA.

DEREK ABBOTT

Basildon

SANITARY WARE COMPETITION

"Disappointing Standard"

Gordon H. Taylor, Wolverhampton, has won the first prize of £1,000 in the Associated Builders' Merchants Limited Competition for designs in ceramic sanitary ware. There were two other finalists, L. Daniels, A.R.I.B.A. (Second Prize, £350), and John V. Sharp, A.R.I.B.A. (Third Prize, £250).

The Assessors were C. J. B. Pratt (succeeded by T. E. Marshment) and Wallis M. Goslett (both appointed by A.B.M. Ltd), P. A. Newnham, A.R.I.B.A., and F. B. Pooley, F.R.I.B.A. (both appointed by the RIBA). As the promoters intend to arrange for the articles in the first premiated design to be manufactured and marketed as soon as possible, photographs and details of the winning designs are not being issued at this stage, and the Assessors have been asked to avoid describing the awards in their reports.

The Assessors had full regard to the Promoters' wishes that the object of the competition would be to achieve better designed sanitary ware which could be mass-produced at no additional cost to articles currently being marketed. The Assessors were of the opinion that it was unlikely that any revolutionary or novel designs in sanitary ware could be produced whilst the existing Statutory Regulations and By-laws remained in force. Half-full size models of the three premiated designs were made for the second stage.

In the first stage of the competition all competitors were asked to design a lavatory basin, low level closet suite and a urinal, and the three chosen for the final stage were asked to produce in addition designs *en suite* with their originals for an angle basin, a high level closet suite and a bidet. 424 applications were received for entry forms for the competition: 177 people registered as competitors and 42 valid entries were received.

There were half a dozen entries which, in the view of the Assessors, reached a very high standard indeed, but the general standard of entry for the competition was disappointingly low. Before coming to their

final conclusion the Assessors took advice from experienced ceramic manufacturers and were satisfied that the three designs which they selected for prizes were capable of economic mass manufacture within the next year or so.

In arriving at their final conclusions the Assessors particularly bore in mind the following six points which they thought to be of importance: (*a*) quality of design, (*b*) standard of hygiene, (*c*) ease of plumbing arrangements, (*d*) suitability for manufacture, (*e*) method of fixing, (*f*) economics and sales appeal. They were satisfied that the winning designs came nearest to meeting these points and were likely to be a commercial success.

COMPETITION

Flats at Halesowen

The Borough of Halesowen invite registered architects in Great Britain and Northern Ireland to submit designs in competition for development comprising about 250 flats at Highfields, Halesowen, Worcestershire. The assessor is Eric Lyons. There is a further £1,000 to provide up to ten further premiums. The sending-in day is March 31, 1960. Conditions are available from: Town Clerk, P.O. Box 14, Council House, Halesowen, Birmingham. Applications should include a cheque for £2 as deposit returnable on submission of design or return of Conditions by March 3, 1960.

MOH DESIGN UNIT

Out-patients Department

An out-patients department at Walton Hospital, Liverpool, will be the first project to be undertaken by the Ministry of Health's new Design Unit, under the Chief Architect, W. Tatton-Brown. It has been included by the Minister of Health in the expanded hospital building programme for 1961-2. The Minister announced in the Commons last week that £31 million will be spent on capital development in the hospital service in England and Wales in that year, compared with £25½ million for 1960-1.

According to a Ministry spokesman, the Design Unit is now discussing the accommodation schedule for the Walton out-patients department with the regional board and the hospital management committee. The Unit will do the whole of the design, working drawings and supervision, following the practice of the Ministry of Education. An out-patients department has been selected for the first study because these departments are not only one of the most difficult problems in hospital planning, but show wide differences between individual hospitals.

It is probable that the Walton out-patients department will provide beds for day patients, who have to spend a few hours in hospital because they have to receive an anæsthetic, or need time to recover from their treatment, or some such reason. At present these patients have to be given beds as in-patients, and over-all economies may result from accommodating them in the out-patients department. It is also expected that instead of providing special consulting rooms and facilities for individual consultants (who may only use them for a few hours a week) general purpose consultants' suites will be provided.

OFFICES IN LONDON

Henry Brooke's Statement

Henry Brooke, Minister of Housing and Local Government, said last week that he is determined to stop the concentration of all new office employment in Central London. When opening a new office block at Kew Bridge he said he hoped that the new block would give impetus to a trend with far-reaching consequences.

"In Central London, 22 million sq. ft. of new office buildings have been completed since the war, and another 9 million sq. ft. or so are in course of erection. Of course, not by any means all of that is net addition. A great deal of it is replacement of office buildings destroyed in the war. Six million sq. ft. of offices were lost in the City of London alone. We also have to reckon that on average the new offices are distinctly more spacious than the old, so in proportion to size they do not contain as many staff. But, after allowing for all that, the fact remains that office employment in Central London has been continuing to go up and up and is very difficult to stop; and you can see the direct effects in traffic blocks and crowded rush-hour trains and buses.

"In modern life with its growing complexity, an increase in office work, proportionately to the total of work of all kinds, is natural and inevitable. It is inevitable, too, that much of it must be in or near London, for London is the capital city and the centre for so much trade and commerce. What is not inevitable, and what I am determined to stop, is that all the new office employment should be concentrated in Central London.

"Of course there are disadvantages too; the upset of making the move and the problem of communications if part of the staff stays in the centre, as it must often do. The advantages are permanent; the disadvantages are largely transitional."

RIBA

Electric floor heating

The rapidly growing interest in electric floor heating was reflected in a well attended meeting at the RIBA last week. Organized by Anthony Williams and chaired by architect Richard Eve, the meeting aimed to bring together architects, electrical engineers and manufacturers to discuss common problems and exchange experience. Like most new, or comparatively new ideas, electric floor heating suffers from an imperfect understanding of when and how it should be employed. Difficulties arising out of this should not be allowed to prejudice its consideration as an efficient means of whole house heating at a time when the standards of comfort demanded by the public in terms of heating are steadily rising. This was the underlying theme of the speakers, Oliver Cox of the LCC and J. B. Dick of BRS.

Oliver Cox spoke about the studies of this form of heating in flats made by the LCC architect's department. His talk necessarily centred on cost and he pointed out that as a result of the studies made, a figure of 0·8d. per unit had been arrived at as the optimum point at which electric floor heating would be competitive with other forms where the heating demand was high. In London, at present, where the off-peak tariff is 0·95d. per unit it could only be competitive where the heating demand was low. He was the first of several speakers who suggested that the logical role of electric floor heating was as background heating at temperatures not exceeding 65° F. For this he was taken to task by an architect from Hertfordshire county architect's department who pointed out, amongst other things, that a background temperature of 55° F., which really was adequate, could reduce operating costs by as much as half on a figure of 65° F. as suggested by Mr. Cox. He also stated that studies made by his own authority had shown that electric floor heating was not a suitable system for flats in terms of running costs.

Architects who, after all, have the final say in advising their clients on the type of heating system to be used, were invited by the chairman to put their questions to the meeting and many took advantage of this opportunity to make use of the engineers and manufacturers present. It fell to C. J. Wheeler, of Thermodare (Great Britain), to answer most of the architects' questions and, in doing so, he made a number of useful points. A 2-in. screed, according to Mr. Wheeler, is not sufficient. Hollow block floors are quite satisfactory provided air in the cavities is static. Again, 1-in. fibreglass is not suitable as thermal insulation as it can compress to as little as ¼-in. between floor slab and screed. Insulation to suspended slabs should always be on the underside of the slab and not between slab and screed. (Nobody explained how this should best be done.) Complete thermal insulation to a ground floor slab is not essential, though perimeter insulation should always be provided. Mr. Wheeler went so far as to say that the influence of the structure on electric floor heating was over-rated. This is the very sort of basic information which architects who contemplate the use of electric floor heating should know at the earliest stage. However elementary some of it may seem to be, the fact is that it is not sufficiently well known. There is, therefore, much to be said for the suggestion (made by one of those present) that an explanatory booklet should be published as soon as possible.

It was obvious, moreover, that even on basic principles the experts present were unable to agree. Figures ranging from 60° F. to 80° F. were mentioned as an average comfort level, and the use of special equipment such as thermo-time regulators was the subject of debate.

MOTROPOLIS

American Traffic Engineer in London

Paint and clear signals were two of the main features of successful traffic engineering, according to Henry A. Barnes, the Commissioner of Traffic in Baltimore, USA, who visited this country last week. By hanging traffic lights directly overhead, and painting the signals yellow, so that they could be seen, he claimed that right-angle collisions decreased in Baltimore by 92 per cent. in the first year after installation, and accidents of all types decreased by 57 per cent. He claimed that traffic capacity could be doubled by painting lanes, ten foot wide as a minimum, in every street. He used 50,000 gallons of paint to mark out Baltimore's streets. Baltimore, with a population of a little over one million, had provided 25,000 off-street car-parking spaces. The city lends up to 85 per cent. of the cost of a garage at 3½ per cent. interest. So far 26 garages have been built by this system. When a garage has been built the city's no parking laws imposed in the area virtually guarantee that the garage is fully occupied.

Mr. Barnes's main contribution to the Baltimore traffic problem, however, is in the introduction of electric computers to help regulate the traffic lights. One thousand intersections are controlled by eight computers; 900 radar detectors on mast arms over the street count the traffic flow at various points in the city and the electronic computers work out from 220 possible timing variations the sequence of traffic light signals which will best ease the constantly varying traffic conditions at different parts of the city. Mr. Barnes reckoned that this electronic computer system only cost $100,000 more than an orthodox system. Since introducing it accidents had dropped 46 per cent., and, at maximum density, speeds were now 18 m.p.h. when before they were only 6 m.p.h. Traffic had increased on one main street from 450 vehicles per hour to 1,200 v.p.h.

Mr. Barnes maintained that one of the greatest handicaps to an efficient traffic system was indiscriminate car parking. They had banned stopping on 250 miles of Baltimore's streets. Nevertheless, he maintained that there had to be a limit to car usage. The long term solution for Baltimore was a three-lane bus system, travelling on motor ways (cantilevered over backyards at $3 m. a mile) which would be more rapid than the motor car.

MANAGEMENT

Cardiff Course

A short course in management studies was held in Cardiff recently by the Welsh College of Advanced Technology, the Welsh School of Architecture, and the Department of Building and Structural Engineering.

Mr. Woodbine Parrish, misquoting Napoleon ("There are no bad workmen, only bad managers"), said that in the US the average workman was productive for about 50 minutes out of every hour, but in Great Britain the corresponding figure was nearer 30 minutes. He placed the responsibility for this firmly on the shoulders of management and said that this country was failing to obtain increased production because of its failure to appreciate "the high cost of low overheads." Insufficient planning in the early stages causes muddle, waste and confusion later on.

Architects, quantity surveyors and builders were at the conference in about equal numbers, and Mr. Austin-Smith spoke about the architect's role in management. In his view, the architect is the commander-in-chief who controls strategy and leaves tactics to the man on the ground—in this case the contractor. Giving the contractor's viewpoint, Mr. Cousins, area manager of a Cardiff firm of building contractors, thought that after signing the contract the leadership should pass from the architect to the contractor so that he would be free to organize the job in any way he chose. Both he and Mr. Austin-Smith came up with the idea that there should be two kinds of site meeting, one held by the architect to check progress and sort out queries, and the other held by the contractor to plan and arrange the running of the contract. At the contractor's meeting the architect should merely sit in as an observer.

Mr. Myrddin Williams, Chief Quantity Surveyor in the Swansea Borough Architect's Department, discussed the relations of architects and builders with consultants and quantity surveyors. At present the relationship was confused and unco-ordinated with nobody firmly in charge, and he thought that unless the architect took firm control of the situation, a new man—the co-ordinator—might appear on the scene. A client wishing to build would then appoint a co-ordinator, one of whose first tasks would be to advise on the choice of consultants—electrical, structural, architectural and heating.

Mr. Baden Hellard put the general case for cost planning. The reaction of the contractors to this idea seemed more enthusiastic than that of the quantity surveyors who were heard muttering together that they would need extra fees for the work involved. This seems a genuine problem which sooner or later will have to be solved.

Many contractors present regretted the passing of the old type specification which gave them a means of locating the items measured in bulk in the bill of quantities. It was generally agreed that either annotated bills or schedules of location were essential for efficient building.

Builders made no bones about it that they can never hope to organize contracts and manage them efficiently if vital decisions are left to the last moment, and clients and architects are allowed to change their mind at any time. In their view, "P.C." stood for "postpone consideration."

The general conclusion of the course seemed to be that all the members of the team have a lot to learn about efficient management and that there is a genuine need for management training courses. Mr. Alex Gordon, when summing up, said that it was hoped in Cardiff to start such courses and to integrate the training of the various members of the team so that students would work in the same relationship to each other as they would eventually take up in real life.

HOUSING CENTRE

Does Radburn Work?

Paul Ritter continued his campaign for the Radburn housing layout (his slogan is that it should be "a recognized crime" to make unsafe roads and footpaths) with a whirlwind talk at the Housing Centre last week. If Mr. Ritter would learn to present his material with less dash and more logic he would win more support for his case. But when every slide is presented upside down or back to front, and facts and figures are replaced by a floodtide of eloquence, it becomes very difficult to follow. Mr. Ritter may be right, for example, in claiming that the Radburn layout is cheaper than an orthodox layout, but if so he should give the figures. One wondered, too, at what densities it is possible to design a Radburn scheme that provides a garage per house, and parking for visitors as well.

His audience was strongly with Mr. Ritter in his desire to plan for the complete segregation of vehicles and pedestrians, but less unanimous on the merits of the Radburn layout. By common consent the main problem is the contrast between the pleasant but little used fronts, on the footpaths, and the squalid (or "undignified") but much-used backs, on the vehicular culs-de-sac. Cleeve Barr, who has recently visited some of the 10 British Radburn schemes, confessed that the experience had shaken his confidence in the idea, largely because they had all failed to solve the problem of the fronts and the backs. He told a story about an old lady who wouldn't have a Radburn house at any price because she wouldn't like to be "carried out" through the back door.

Mr. Ritter retorted that there's nothing undignified about being "carried out" along a footpath. But he conceded that most of the British Radburns have failed to solve this problem of backs and fronts. In his view, however, the difficulties can all be overcome without abandoning the Radburn principle of separate footpath and vehicular cul-de-sac access and have been overcome in Coventry's latest Willenhall scheme. The meeting left the writer with the impression that Cleeve Barr's new development group at the MOHLG could do a useful service by promoting a Radburn scheme that attempted both to solve all the problems of layout and to achieve good architecture as well. Mr. Ritter's legitimate plea that Radburns should not be judged by their architecture is understandable.

ABS BALL

All tickets for the ABS Annual Ball at Grosvenor House on December 9 have now been sold and there is, in addition, a waiting list for returned tickets.

The Seestern flyover roundabout, on the urban motor road linking Düsseldorf (in the background) with the West by the Nordbrücke over the Rhine. This scheme which brings the autobahn system to within two miles of the city centre is more fully illustrated on page 582.

URBAN MOTOR ROADS IN WESTERN GERMANY

Report on a British Road Federation Delegation

Has Western Germany, which pioneered the construction of motorways in Europe, now begun to find the answer to the urban traffic problem? In the hope of finding an answer to this question Malcolm MacEwen went with a delegation organized by the British Road Federation to Western Germany last month. Delegates who travel in high speed buses, keeping to a tight schedule in foggy weather between banquets, cannot expect to probe very deeply. But, despite the abundant evidence of German skill in engineering and landscape (to which the pictures on these pages bear witness) and the boldness of their road planning, the delegation was shown no evidence that in town planning and town design Western Germany is any nearer mastering the motor vehicle than we are.

The standard of living and the level of motor-car ownership in Western Germany are not yet as high as they are in Britain, but the rate of increase is very much greater. Private cars have risen in number from 1,129,471 in 1954 to 2,940,037 in 1958 (in Britain they rose from 3,099,547 to 4,548,530), and the official estimate that Western Germany will attain the current British level of one car to every 10 people by 1970 seems to err very far on the cautious side.

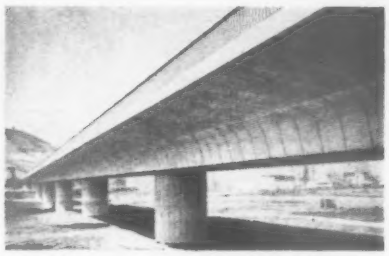
While motorists in Britain look enviously at the autobahnen, the Germans are complaining that the rate of road construction is far too slow, and threatens to check the progress of the motor industry. Dr. Goerner, the head of the German Roads Research Association, told me emphatically that the road construction programme (which is expanding from £260 millions in 1956 to £470 millions in 1966) is being rapidly outstripped by the 18 to 20 per cent. annual increase in motor vehicle registrations.

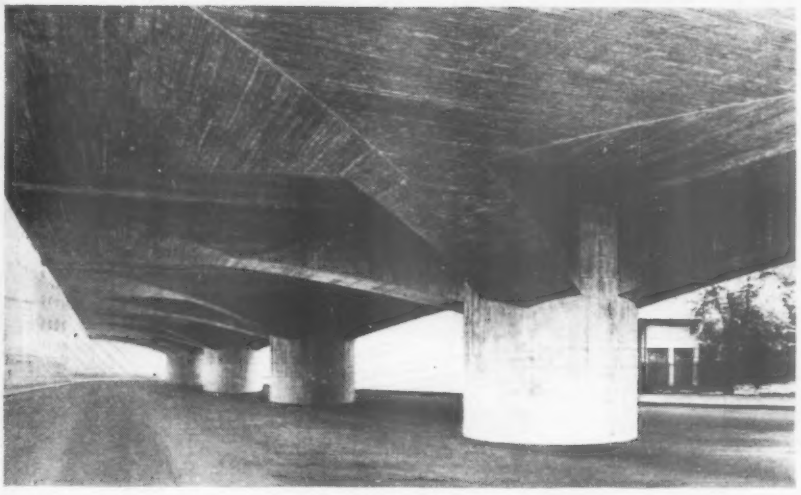
Until the present time the Germans have concentrated on extending the national autobahn system begun by Hitler before the war. By the end of 1958 Western Germany had more than 1,500 miles of autobahn in use, 190 miles were under construction, and over 800 miles planned. One cannot fail to be impressed by the work of the German engineers and landscape architects on these roads, both old and new. The simplicity and lightness of the bridges is well illustrated in these pages. The care taken in planting, the screening of abutments so that overhead bridges seem to leap out of the landscape, the planting of trees on embankments so that the forest sweeps right up to the highway, the unfussy detailing of railings, kerbs, signs and road furniture of every kind is obvious everywhere. Anything so crude as some of the M1 bridges seems to be inconceivable.

The federal autobahns, however were originally designed to give the cities a very wide berth, and the urban problem has been neglected. Even today the German grant system encourages the provision of roads for "through" traffic, and discourages the improvement of the internal communications system within the cities themselves. In Germany, as in Britain, the "through" traffic is only a small proportion of the whole in large cities—16 per cent. in Düsseldorf, only 4 per cent. in Hamburg.

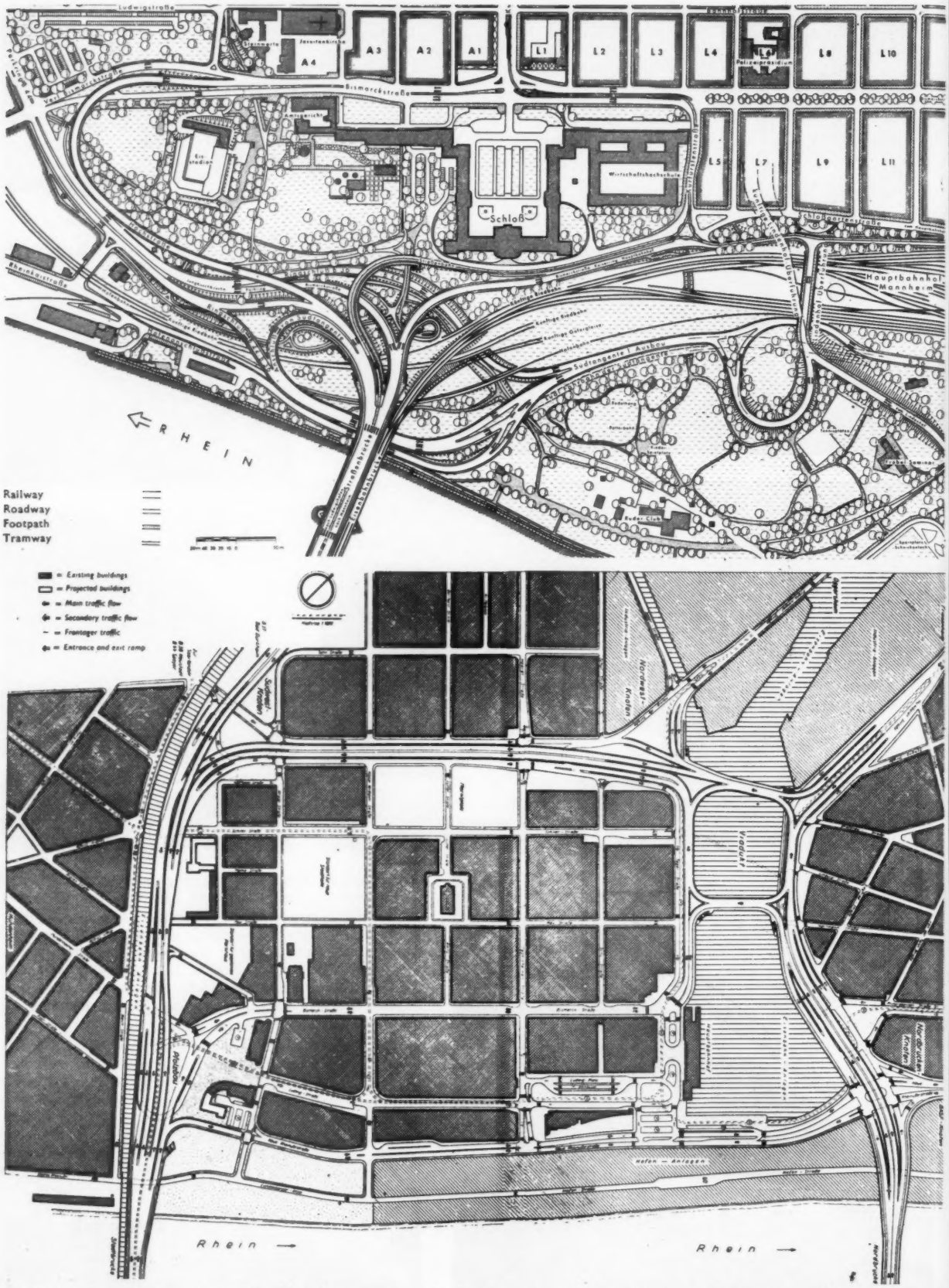
The Germans are now changing their policy to some extent, and a number of urban motor road schemes are planned or under construction. These are designed primarily either to relieve the acute congestion in the central areas by by-passing them, or to bring the autobahn network into the central areas; sometimes one road achieves both aims. At the same time the local authorities are encouraging the building of parking garages by private enterprise on a substantial scale, often by leasing sites to developers at a nominal rent, and are installing parking meters to curb the all-day parker. But these

(Continued on page 583)





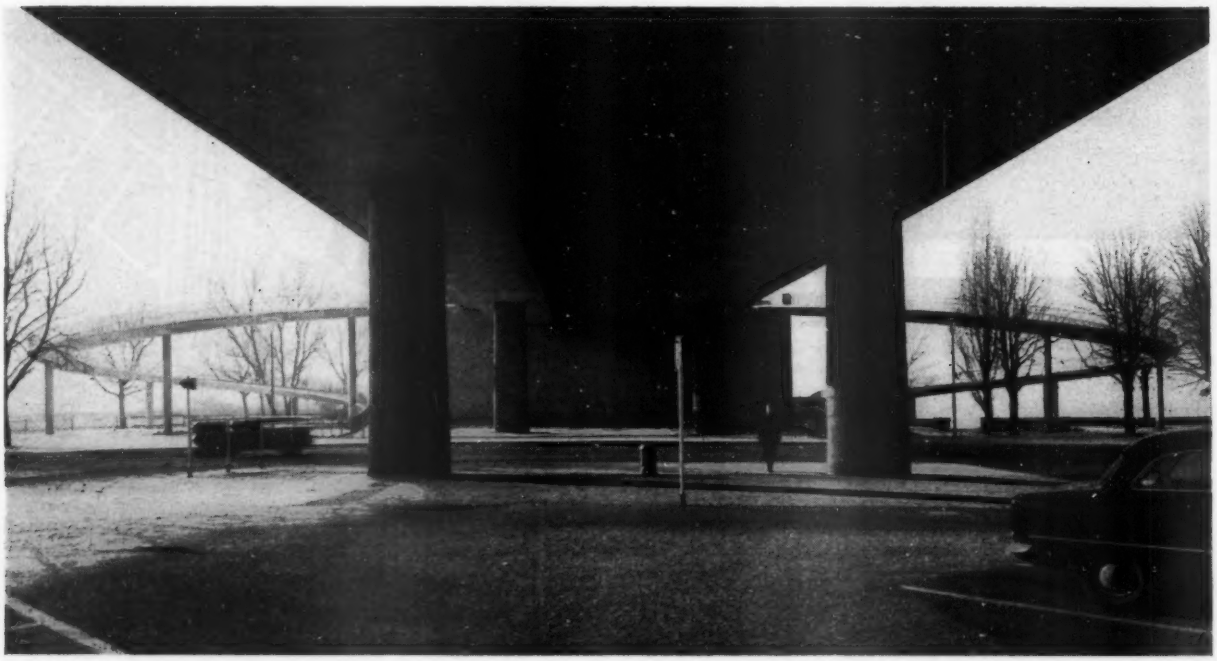
These pictures show a variety of solutions adopted for the elevated road or bridge approach carried on a single row of r.c. columns. Left, from top to bottom: the tramway approach at Mannheim, mushroom-shaped columns supporting a 4-lane highway at Ludwigshaven, and a single carriageway at Düsseldorf. Right, from top to bottom: 4-lane by-pass at Bingen, 4-lane viaduct at Unkelstein, 2-lane approach to Severins Bridge, Cologne, and (below) the experimental Alweg monorail near Cologne.

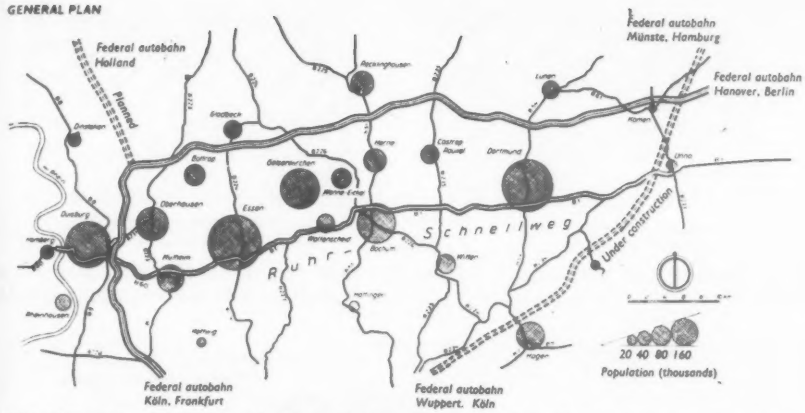


Ludwigshaven on the West bank of the Rhine is connected to Mannheim, on the east, by one bridge, the Stadtbrücke, which also provides the main road link between the Saar and Germany. The plans, on different scales, show (top) the new multi-level approaches being built in the riverside park on the Mannheim side, with separation of road, tram track, footpaths and railways, and (below) the elevated road system that is to encircle the centre of Ludwigshaven from the Stadtbrücke (left) to the future Nordbrücke, and take through traffic west.

Top: a view of the Mannheim bridge approaches under construction, with Ludwigshaven on the other side of the Rhine, and the separate tramtrack in the foreground. This complex of roads discharges its traffic straight into the streets of Mannheim, whereas in Ludwigshaven the intention is to build one elevated road to carry through traffic out of the city, and another to encircle the central area (see plan, opposite). The smaller pictures show, left, close up of the Mannheim approach and Castle; below, left to right, three views of the Ludwigshaven ramps: (a) tram track entering the town under the elevated bridge approach, (b) lorry emerging from underpass, and (c) the elevated roads left unfinished at the point where the road to the west is to join the inner ring road; the complete scheme is expected to take 10 years.

One of the finest engineering works in Western Germany is the Nordbrücke (top, and above left) across the Rhine at Düsseldorf. It is described by the German engineers as " a girder bridge suspended on ties arranged in the shape of a harp." It achieves a wonderful economy of means and purity of line, which are equalled by the detailing seen, above right, in the 370-yds. long elevated approach road on the Düsseldorf side and, below, in the spiral ramps for mothers with prams (or boys with roller skates). The space underneath the road is used for car parking.





The plan, top, of the 39-mile Ruhr Expressway (Ruhr Schnellweg), which is to link the towns of the Ruhr conurbation, shows its connections with the Federal autobahn system. Below, the scale of the Expressway (4 lanes, with tramway in centre) is seen in this excavation in Essen.

Above, "The Picasso Bridge," near Wuppertal, on the new Wuppertal-Cologne autobahn, showing the use of saplings to bind the embankment before planting. Below, bridge carrying an approach road over the motor road at a Cologne intersection.

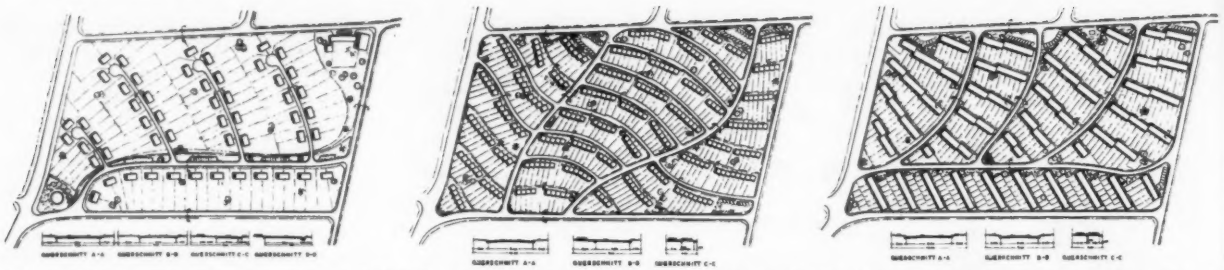
measures, even when allied to more energetic application of traffic engineering principles, do not add up to a policy for dealing with the motor vehicle in the city. A closer look at some of the schemes will show what I mean.

At Mannheim and Ludwigshaven, where the only bridge across the Rhine carries the traffic from the Saar to south Germany, the bridge has been widened and multi-level intersections built at its approaches. On the Mannheim side (Fig. 1) a large area of parkland has been swallowed up by an enormous intersection with separation at different levels of vehicles, pedestrians, trams and three railway lines. The trams and motor vehicles, however, then enter the existing Mannheim street system, which adheres to the pre-war pattern.

In Ludwigshaven, where the engineer is also the town planner, the bridge approach is to be continued as an elevated road, which will encircle the town centre completely, and will be connected to another elevated road to the west. This bold idea, which is being brilliantly executed in its initial stage, makes it possible, by diverting all through traffic to create pedestrian precincts within the city centre, but nothing of the kind seems to be contemplated. Ludwigshaven, like Mannheim, has been rebuilt on the pre-war pattern. The space created on the ground by the elevated road is to be used for roads and car parks, and the building line is to be set back 60 metres from the new road.

The post-war rebuilding of Cologne, while an impressive example of enterprise, is a planning and architectural disaster. It was painfully evident that the desire of private enterprise to rebuild on the old sites (even if in a modern style) had destroyed the possibility of creating a new city within which the pedestrian-vehicle conflict was resolved. The town centre is unpleasantly dangerous and noisy. The principal shopping street is closed to traffic from 10 a.m. onwards, as it was before the war, but it is not even designed for servicing from the rear. The authorities are concentrating on bringing the autobahn into the city centre over the new Severins bridge (an ugly but original structure, in which the deck is suspended from a massive triangular pylon), linking the bridge to the west by improving the existing streets, and improving an outer ring road. Private enterprise is providing parking garages, often linked to shops or hotels, but these appear to be scattered indiscriminately about the city and are not related closely to the points of access to the motor roads.

The Ruhr Expressway will run for 39 miles connecting the Ruhr cities; about a third of it (in rural areas) has been built, and the remainder is to be completed by 1965. Much of it will be in cuttings or on stilts, and in Essen it will pass under the city centre in a tunnel. It will take four lanes of traffic, and two tramlines, but one saw no sign in Essen, for example, that the problems of the centre were being tackled with equal boldness or imagination. As an afterthought vehicles have been excluded from one half of the main street (a length of 100 yards or so), but here as elsewhere the pedestrian



Three alternative housing layouts suggested in the Hamburg traffic plan show that Hamburg's ideas on planning residential areas for the motor car lag behind the imagination shown in the city's decision to plan its transport system as a whole, with the major emphasis on public transport and tube railways.

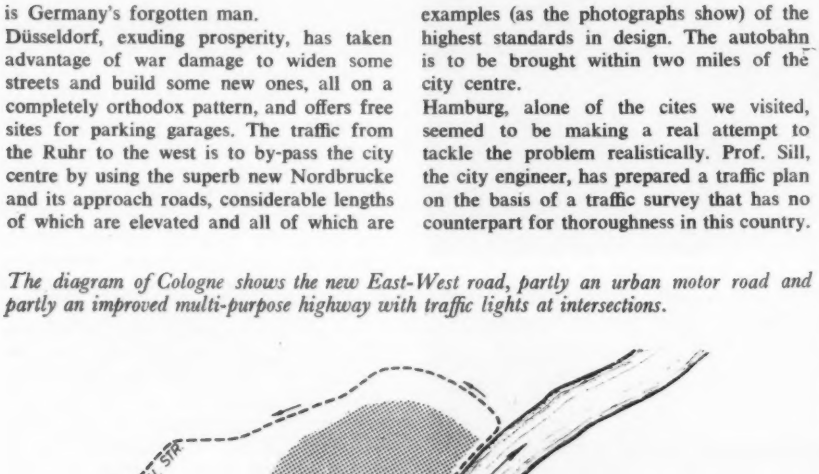
The East-West road in Hamburg (2 kilometres long, 120 ft. wide overall), shown with other road improvements in the plan of Central Hamburg (right) is being developed with shops and offices along the frontages (left), as a multi-purpose road.

is Germany's forgotten man.

Düsseldorf, exuding prosperity, has taken advantage of war damage to widen some streets and build some new ones, all on a completely orthodox pattern, and offers free sites for parking garages. The traffic from the Ruhr to the west is to by-pass the city centre by using the superb new Nordbrucke and its approach roads, considerable lengths of which are elevated and all of which are examples (as the photographs show) of the highest standards in design. The autobahn is to be brought within two miles of the city centre.

Hamburg, alone of the cites we visited, seemed to be making a real attempt to tackle the problem realistically. Prof. Sill, the city engineer, has prepared a traffic plan on the basis of a traffic survey that has no counterpart for thoroughness in this country.

The diagram of Cologne shows the new East-West road, partly an urban motor road and partly an improved multi-purpose highway with traffic lights at intersections.



This shows that it would be wrong to attempt to provide for unlimited use of the private car; 170,000 car parking places would be required if everybody commuted by car. The City Government's policy while providing car parks and improving the road system, is to provide public transport for 75 per cent of commuters. Although public transport is losing money, over £3 million is being spent this year alone on a new tube railway, the completion of which will lead to the elimination of trams in the centre.

But even in Hamburg one saw no sign of any attempt to extend pedestrian precincts. The new East-West Road is simply a 120-ft. wide, six-lane, multi-purpose road carved through the city, with zebra crossings and offices and shops along the frontage.

There must, I think, be some significance in the fact that our party only met engineers; not one landscape architect, architect or town planner (unless he was an engineer) came to explain their contribution to road planning. It was equally significant that only one British architect was in this party, and that every local authority (except Glasgow which sent its chief planning officer and the chairman of its planning committee) sent the chairman of its highway committee and the engineer. Urban road planning, both in Germany and Britain, is treated in isolation, as an engineering problem.

My conclusion is that while the Germans are far bolder, spend more money, and have much to teach us in engineering and landscaping, they have little to teach us in the fields of town planning and town design. I feel sure that if our town planners, architects and engineers were given money and opportunities on the German scale they could probably make better use of them.

technical section

THE INDUSTRY

From the industry this week Brian Grant describes an oil-fired boiler, embedded heating cables, an electric heating element and sliding garage door.

Oil-fired boilers

When so many of the established boiler makers are introducing oil-fired versions with comparatively small outputs for hot water and 100 ft. or so of radiation, it is easy to forget the larger models for full central heating. Hope's have just announced a new model, which is available in five sizes with outputs from 100,000 to 220,000 B.Th.U. per hour, at prices from £195 to £285, though this does not include the cost of the oil tank. The boiler is a sectional cast iron type, well insulated and enclosed in a rectangular stove enamelled case. The burner is a fully automatic on/off pressure jet type with an adjustable boiler thermostat and the usual safety devices. In order to reduce installation costs the refractory block combustion chamber is prefabricated and all main controls are wired at the factory, so that provided the oil tank is in position and an electrical supply available the conversion can be completed in a few hours. Hope's also have a service organization which covers most parts of the country. (*Hope's Heating & Engineering Ltd., Smethwick, Birmingham.*)

Embedded cables for heating

Volex Electrical have recently introduced a full range of special heating cables for embedding in floors, walls or ceilings, as well as specially modified types for horticultural and other uses. The cables consist of a copper or copper alloy conductor with an inner sheath of a flexible heat resistant rubber-like compound to absorb conductor movement and an outer covering of p.v.c. for mechanical strength and protection. Installation costs vary from about £10 to £14 per kilowatt, or about 3s. per sq. ft. of heated area. Cables can be supplied to specified lengths and ratings, but a number of sizes are available from stock, in lengths from 120 ft. to about 1,400 ft. with loadings from 540 to 7,800 watts. Floor temperatures of about 62 deg. F. are usually possible, depending on personal tastes and the type of floor finish, and the manufacturers maintain an advisory service to suggest cable ratings, spacings, floor layouts and control arrangements. (*Volex Electrical Products Ltd., Salford, 6.*)

Electrical convected heating

Inferation Ltd. have evolved a plastic electric heating element which is claimed to be perfectly safe and which can be made in panels or in long lengths. The illustration on the right shows a skirting heating board which has a loading of 60 watts per foot and which costs about £1 per foot run fixed. Wooden board of the same profile is provided to fill in the spaces between panels when the required loading has been reached. The same panels are also used in a combined heater and clothes dryer which sells at £24 5s. including purchase tax and which has a loading of 600 watts. (*Inferation Ltd., 12/13 Copthall Court, London, E.C.2.*)

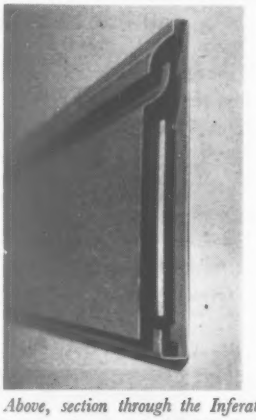
Asbestos cement data

The UAM Group's new Mills-Bullivant catalogue was introduced just before the printers' strike, and was somewhat belatedly noticed here only a few weeks ago. A further instalment dealing with Fort sheet has just been produced, and various improvements have been made in presentation, the drawings improved, while all fixing accessories are now shown on a single fold out sheet so that reference is much simpler. Congratulations to a group intelligent enough to listen to comments and then do something about them. (*UAM Group, Tolpits, Watford, Herts.*)

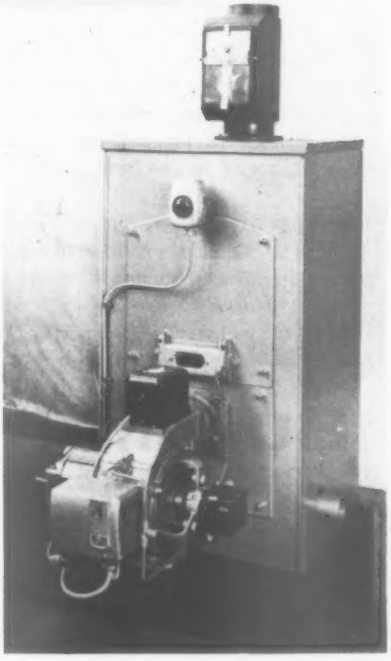
Garage doors

The new Bolton Glydover garage door slides up under the ceiling on nylon pulleys on a curved track, and is spring counterbalanced so that it needs very little effort to lift. It remains balanced in any position and has a rubber cushioning strip at the foot to act as a draught seal. The standard size is 8 ft. wide by 7 ft. high but other sizes can be made to fit any opening. Construction is rustproofed steel. (*The Bolton Gate Co., Ltd., Waterloo St., Bolton.*)

Above, the Bolton Glydover garage door.



Above, section through the Inferation plastic electric heating element. Below, Hope's new oil-fired boiler.



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UDC No.

19 CONSTRUCTION: DETAILS

minor roads and external pavings, 2 sub-base and base

This is the second of four articles by W. Houghton-Evans. From a discussion of the principles of design and the general problems of construction,* the author now moves to more specific details. This article is concerned with foundations and considers, first, the sub-base and then the base. Whilst a sub-base is not always essential, as the author points out, there are good reasons why it should be included where possible and these are set forth. In considering the base, various alternative materials are examined from hardcore, the traditional material, on the one hand, to stabilized soil on the other.

The architect's choice of construction will first be conditioned by the performance he requires. Iron-tyred machinery and animals will rapidly destroy all except concrete. Concrete is relatively expensive, but on a contract where external pavings are small and concrete is being extensively used, it may prove an economical choice. An asphalt contractor employed elsewhere on the works may be able to give a keen price for external pavings in which his firm may specialize, and construction may be designed to take them.

The local authority may be willing to maintain, in which case materials used on adjoining highways would be most appropriate. If the local authority is to adopt, the road will almost certainly be to their specification. The possibility of using industrial waste, demolition, and other less orthodox materials which may be available locally at low cost should not be overlooked. A farmer-client may wish to use his own labour and machines as far as possible. Materials, machinery and labour available, the quantity of work to be undertaken, and its appearance on completion must from the outset be considered.

The sub-base

A sub-base is not always essential but is generally desirable. It acts as a subsidiary foundation, and as it may be of material inferior to and cheaper than the base, a saving may result from its inclusion. It serves also as a previous layer through which water can move into sub-soil drains; as a temporary working surface on a muddy site; as a plane of cleavage between a concrete base and the sub-grade, permitting free temperature movement; and to true-up and act as a cushion to an uneven rocky sub-grade.

Materials generally used are hard clinker, ashes (not "Fly" ash), gravel, crushed brick or concrete rubble, and some shales. Any granular material, neither powdery nor too coarse, chemically inert and unaffected by water, will suffice. With shales this last point is especially important, as many are unsatisfactory in this respect. A minimum thickness after consolidation of 2 in. will do, but as has been pointed out, a greater depth may lead to a saving on the base itself. With the materials noted above, a CBR of about 15 per cent. is usually associated.

After spreading and raking to the correct profile, the sub-base should be rolled in the same manner as the sub-grade. This, and all subsequent rolling, must not exceed that initially given to the formation.

Granular bases

The base may then be formed. Any inert material, capable of stable compaction to a fairly even profile, unaffected by water or frost, and with a CBR not less than 80, may be used. Various materials and methods of laying are as follows:

(*a*) *Pitching or "Telford" bases:* In stony areas pitching may be economical, but this traditional method, where large stones (5 in.-9 in.) are handpacked on their broader ends and blinded with knapped smaller material is likely to be expensive and over-strong for light roads. Hard bricks from demolitions may be used in this manner. Hand-knapping to give an even surface and fill voids has now in the main given way to rolling which has much the same effect. Any stones standing proud of the general level in a manner likely to cause the roller to tilt, must, however, be knapped before rolling commences.

(*b*) *Hardcore or "Macadam" bases:* Hard angular stone, shale, hoggin, hard brick rubble, are all suitable. They should be well-graded and reasonably free from dust. Maximum size should be less than the base thickness. A supplier may be required to deposit samples in accordance with BS812, and slags should accord with BS1047.

The material should be dropped at intervals upon the sub-base, the delivery vehicles "drawing-out" the load during discharge. Segregation in transport of fine and coarse particles should be avoided—either by lightly moistening during loading, or by requiring the separate delivery of the screened finer material which should be filled into the voids of the previously placed coarser fraction.

This construction is essentially similar to that used by

*See AJ November 12, 1959.

technical section

Macadam, who placed 4-inch layers of stones broken down to 2 inch size on a cambered formation. Where machinery is not available, his method, which relied on subsequent traffic for consolidation, may still be used. Care, however, is necessary to ensure that the whole is uniformly traversed by wheel tracks and ruts are not formed.

(*c*) *Wet-mix bases:* Crushed limestone, graded from 2 in. down and mixed with water to render it sufficiently plastic to be placed by a mechanical spreader of the type used for surfacing (a "Barber Greene") is now increasingly used. The mix must be as dry as workability will permit, weather conditions must be favourable, and care must be taken that the base dries out before surfacing. Failure in this last respect can lead to frost damage to the surface or failure of the sub-grade.

(*d*) *Lean-mix bases:* A lean concrete (1:18-24) with all-in aggregate (1½ in. down to sand) may be used in a manner similar to wet-mix. The material may be hand-placed, but mechanical spreading is possible. Care again should be taken to ensure adequate drying out and the mix should be kept as dry as possible.

With all the foregoing, the base must be dressed to the finished profile and compacted to an even-textured stable mass. For this an 8-10 ton roller should be used until no further compaction is obtained. The road is then ready to receive the final surfacing.

Soil-cement bases

An alternative to placing material *on* the soil to improve its capacity is to mix something *in* it. The admixture may be bitumen or Portland cement, and the process is known as *soil stabilization*. The use of bitumen is not likely to be successful in our climate, and it is with the *soil-cement* road that we shall concern ourselves.

Two methods of stabilization are used—"mix-in-place" and "plant-mix"—the latter usually where the native soil is unsuitable and imported material is used.

It is clear that a process which obviates the need to bring large quantities of material to the site may be attractively cheap, and especially on jobs where first cost is a major consideration, the possibility of using it should be considered. Prices as low as 5s. yd. sup. for the base are not uncommon.

Coarse boulder gravels, silts, silty clays, peats and highly organic soils are difficult to stabilize, and heavy cohesive soils may require the addition of coarser granular material such as slag dust to make them workable. It is of course possible with unsuitable soils to substitute suitable imported material.

It is first necessary to ensure that the soil is suitable for treatment, and if so, the treatment necessary. This will involve sampling and testing. If undertaken by a laboratory, the total cost of this may well run into hundreds of pounds, and at first sight this appears formidable. This sum should, however, be related to the total cost of pavings and the saving likely to be effected. Furthermore it should be remembered that preliminary investigation would be sufficient to establish a soil as unsuitable, and for this charges are unlikely to exceed £50, and may be as little as is involved in visual inspection made during one site visit. Samples must be taken at such depths and frequencies as to be representative of the base as a whole, and the testing laboratory may be asked to advise in this. In general, trial holes about 3 ft. deep should be excavated at 100-ft. intervals along the line of the road, and the excavated material sealed into airtight containers. With very consistent soils, intervals of 300 ft. may suffice. Test results will indicate whether the soil is, or can by additives be made, suitable for stabilization; at what moisture contents pulverization and mixing should be carried out; what amount of cement should be used; and how much water should be added before compaction. Copies of test reports should be sent out with all invitations to tender.

An alternative to laboratory testing which may be undertaken by the designer himself is described as follows in an admirable leaflet issued by the Ministry of Agriculture and Fisheries (*Fixed Equipment of the Farm: Leaflet No.* 19; *Soil-Cement Roads;* HMSO. This leaflet also describes in detail how farm equipment may be used in making a soil-cement road.):

Home-testing can be done in two ways: either a small strip of road can be tried out *in situ* or some small samples can be made up "on the bench."

The best way is to be prepared to do both; the samples will show whether there is reasonable hope of the soil being stabilized and, if so, the strip will show what happens in the field. Apart from the result of the test, this method gives . . . a chance to see how the job is done.

A strip one or two yards long by the width of the road is enough, as this area can comfortably be compacted by hand tamping or ramming; there is no room to manoeuvre a roller. After hardening, the ideal test is to allow traffic to run over the strip for some months, preferably throughout the winter. There is, of course, the risk that a few bags of cement and some labour will be wasted, but the cost is still likely to be considerably less than a laboratory fee.

The making up of samples is not difficult; the equipment needed is:

Pestle and mortar, or something similar, in which to pulverize and mix. Kitchen scales weighing down to ½ oz. Watering can with rose. Six old round tins, each of which should comfortably contain 1 lb. soil. (A cocoa tin with a diameter of 2¾ in. and a height of 4¼ in. is a suitable size). Tin-opener. Oil can. Carpenter's hammer with a flat-ended handle. Tinman's snips. Soil, cement and water.

The procedure is as follows:

1. Collect about 7 lb. of soil from the site of the proposed road. The sample should be representative of a layer 6 in. deep after the vegetation has been removed.
2. Pulverize the soil into a fine crumb and weigh out six samples of 1 lb. each.

Architects: John Dudding & Partners, F/A.R.I.B.A., in collaboration with F. Hamer Crossley, Esq., Dipl. Arch. (L'pool), F.R.I.B.A., County Architect.

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Figs. 1-3. Multi-pass method for mix-in-place soil stabilization. Fig. 1 (top). A rotary hoe with a cement hopper attachment mixes the cement with the pulverized soil. (Note in the previous operation the same rotary hoe but without the hopper, was used to scratch up and pulverize the soil.) Fig. 2 (centre). Water is added to the cement soil mixture. Fig. 3 (bottom). A smooth wheeled roller gives a final surface.

3. Into each of three samples thoroughly mix 1½ oz. of cement (10 per cent by weight). There are now three samples of soil-cement mixture and three samples of soil.

4. By adding water, bring one sample of mixture and one sample of soil to the right consistency so that when a handful is squeezed it should just hold together in a cake. It should not be possible to squeeze water out of it, nor must it crumble away when the hand is opened . . .

5. Take one of the remaining samples of mixture and make it rather wetter than the first; take the last sample of mixture and add rather less water than was added to the first. Do the same with the remaining two soil samples. There are now three different moisture contents, A, B, and C, in the six samples, *i.e.*, one of soil-cement-mixture and one of soil at A, one of each at B, and one of each at C.

6. Take the tins and slightly oil them round the inside.

7. Put each of the six samples into a tin and label it; put a little in at a time and ram each layer hard with the end of a hammer handle.

8. Leave the six tins in a cool, dry place for seven days to "cure."

9. At the end of the "curing" period, cut the bottoms out of the tins with a tin-opener and gently tap each sample out with the end of a hammer handle. If a sample refuses to come out, cut down the side of the tin with snips; the snips will score the soil-cement but this does not matter and is not an indication that the sample is a failure.

Common sense should now tell whether the soil can be stabilized or not. If unsuitable, the cylinders will probably have crumbled to pieces during their removal from the tins. If they are quite hard, an eminently suitable soil is indicated. If they are slightly soft so that they can be marked with a finger-nail, but still holding together as cylinders, it is well worth while waiting another seven days. Vegetable matter may be the cause of delayed hardening, and it is possible that the samples will be hard at the end of 14 days. The hardest of the soil samples will show the moisture content at which compaction is best.

10. When hard, soil-cement cylinders should be immersed in water for 24 hours, at the end of which time they should be unaffected.

Wherever the soil changes in the line of the road, the test described above must be repeated.

If the samples have not hardened at the end of 14 days, the failure may be due to organic matter in the soil. It is then worth while repeating the test with the addition of ½ oz. hydrated lime or calcium chloride to each sample.

CBR methods of design are appropriate in determining the thickness of a soil-cement base. Six inches will satisfy as a rule.

Mix-in-place construction proceeds as follows:

Strip top-soil and grade to finished levels, digging out and replacing isolated patches of unsatisfactory material.

technical section

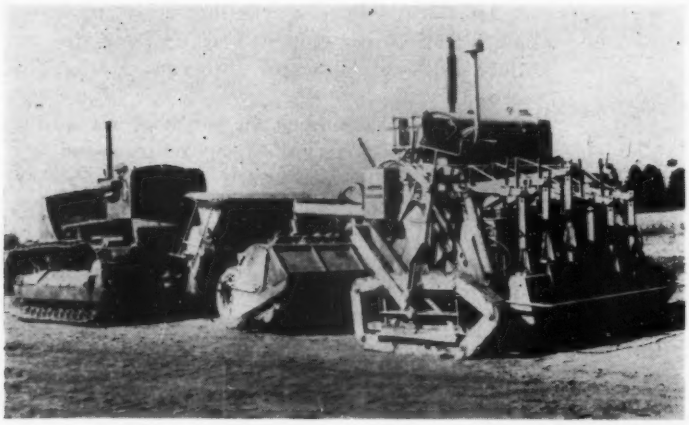


Fig. 4. A train of equipment used for single phase stabilization.

Pulverize soil to fine tilth—for 6 in. finished thickness, to loose depth of 8 in. remove stones greater than 3 in.
Re-grade and compact with light roller.
Check moisture content (simple field instruments are available) and bring to recommended level. Distribute extra water evenly without ponding. Evaporate excessive moisture by continued tilling. With heavy cohesive soils it is better to add all necessary water after mixing in cement.
Mix in water to full depth.
Spread cement: either mechanically or by placing bags at predetermined intervals, breaking open and raking evenly.
Mix until all loose material uniform.
Test moisture content and mix in any additional water required.
Re-grade and compact.
Compaction should continue until the base ceases to yield under the roller. With cohesive soils a pneumatic tyred roller will give better results to start with, finishing with an 8-10 ton smooth-wheeled machine. The base should then be kept free of traffic, covered and cured as for normal concrete work for a period of seven days.
Mix-in-place stabilization may also be effected by the "single-phase" of a train of specialized equipment performing all the above operations in sequence. (Fig. 4).
Plant-mix stabilization employs stationary plant in a manner similar to concrete work. A large mortar-mill is preferred to rotary drum concrete mixers to ensure intimate mixing. Placing may be by hand or mechanical spreader. The same careful control of mix and water content as for mix-in-place stabilization is necessary.
The addition of Portland cement will alone usually be necessary, but test results may have called for calcium chloride where organic matter is present, or for hydrated lime to "break-up" heavy ground.
Soil cement is also suitable for paved areas other than roads. A compacted thickness of 3 in. will generally be satisfactory for playgrounds and footways. In all cases a wearing surface is necessary to prevent abrasion.

The Gas Council on the domestic kitchen

On the following pages is a supplement on the domestic kitchen which is sponsored by the Gas Council. This is the seventh of a series of supplements which have as their object to give a full technical description for architects of the different uses to which gas and coke can be put. Like Information Sheets, these supplements are a journalistic hybrid: they are "advertisements" in the sense that the space they occupy is paid for by the sponsors and that their ultimate object is to foster the greater use of gas; but they are "editorial" to the extent that the means chosen is to provide as much reliable information as possible and that this information has in fact been "approved" by the JOURNAL'S *Technical Editor. We hope that readers will extract and keep these supplements for future reference. For this purpose a special binder can be obtained, free of charge, on application to the Publicity Manager, Gas Council, 1 Grosvenor Place, S.W.1. Alternatively, readers may apply through the business reply folder at the back of this issue. The first six supplements "Domestic Space Heating 1. Fires and unit heaters," "Domestic Space Heating 2. Central heating by gas and coke," "Domestic Water Heating," "Gas Flues," "Coke," and "Flues in Tall Buildings" appeared in the* JOURNAL *for November 29, 1956, April 25, 1957, and September 26, 1957, and April 24, 1958, January 22, 1959, and October 8, 1959 respectively.*

gas supplement

gas supplement

SfB File No.	54
UDC No.	696·2

DOMESTIC KITCHEN

This supplement begins with a discussion on general matters to do with kitchen planning: in particular, on the correct heights of working surfaces and of each piece of equipment and on the amount of permanent ventilation to be provided. Next comes a review of each different type of gas-fired cooking equipment followed by a similar review of gas-fired refrigerators. Attention then turns to home laundry, beginning with a discussion of general planning and passing to a review of gas fired equipment: first, for washing, then for drying. The supplement ends with a suggestion that gas might well help with the problem of refuse disposal.

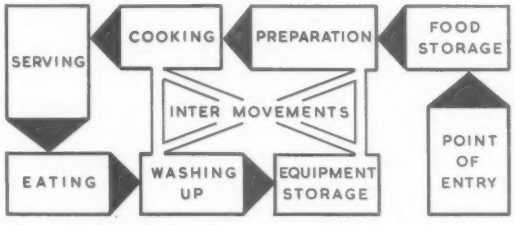


Fig. 1. Sequence diagram.

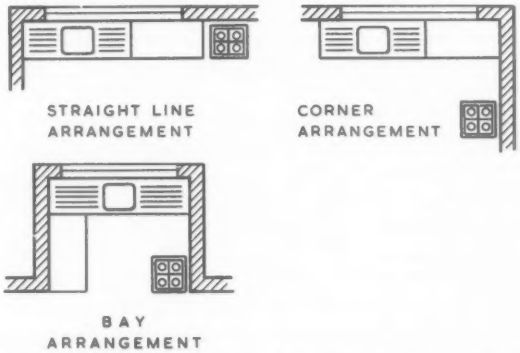


Fig. 2. Simplified diagrams of the three shapes in which the cooker, worktable and sink may be arranged.

The domestic kitchen is often called the hub of the home; certainly a well-planned and labour-saving kitchen lightens and makes more pleasant the daily routine of the housewife and thus contributes in no small way to the comfort and happiness of the family.

Practically every kitchen is used for a number of purposes which may have little bearing on its accepted functions of cleaning, cooking and laundry work, which vary with every family and which must be taken into consideration when planning. Basically, however, there are only three kinds of kitchen: the working kitchen, which is apart from "family" activities; the dining-kitchen, where, in addition to the work, some or all of the meals are eaten; and the living-kitchen, which not only combines the functions of the other two but is also the place where the family carries out its leisure pursuits. In many dining and living kitchens the sink and laundry equipment are housed in an adjoining scullery or utility room so that the "dirty" jobs are not in evidence when the family relaxes.

Recently the Building Research Station found that 75 per cent. of the working time of the average housewife was spent in the kitchen, and that for two-thirds of this time she was actively engaged with some aspect of the meals cycle, in preparing, cooking or serving the food, clearing away or washing up. Thus the arrangement of the equipment and appliances concerned in this particular work cycle should be considered and planned before any of the other purposes for which the kitchen is used, such as laundry work and cleaning. Work should flow consecutively from one stage to another; this is best shown diagrammatically, and the sequence applies equally to the smallest kitchenette as to the largest catering establishment:

Thus the cooker, sink and worktable are the three main pieces of equipment and are used interdependently. They therefore require to be sited close together in such a way that the housewife is never in her own light when working at any one of them. There are three "shapes" in which they may be arranged to achieve this: a straight line, two sides of a cooker, or three sides of a bay.

Once the cooking cycle has been settled the equipment needed by other kitchen processes may be fitted round it, following its own work cycle as far as possible in the circumstances. The washing

machine, for example, should be near the sink, even if it does have to be moved a little way from its storage position to its working position on wash-days.

Working heights

The correct working heights for all kitchen equipment can never be completely standardized; they depend very largely on the individual who is to work at them, and her height in relation to the length of her arms. Ideally, all equipment should be at such a height that it is never necessary to stoop to use it; in practice space limitations make some modification of this rule necessary, but it should still be possible to make sure that the most used pieces of equipment are at the most convenient levels.

To find the ideal working height for an individual she should stand, in her working shoes (½in. heels) upright against the piece of equipment with her arms straight in front of her and her palms flat on the work surface. For some kitchen operations, however, she will need a second level, depending on whether she is working with her arms bent (as in beating cakes) or straight (as in rolling pastry). Both heights, therefore should be available in the kitchen, although this does mean that the popular "continuous worktop" arrangement of equipment has to be discarded.

The average woman stands 5 ft. 3½ in. in her working shoes, and originally the British Standards Institution fixed the standard working height at 36 in. from the ground. It is now generally agreed that this is too high for many women, and fittings and equipment are available with the working surface at a lower level.

Ventilation

Whatever the fuel used by the equipment in a kitchen, the need for adequate ventilation which will ensure reasonable conditions of temperature and humidity during periods of cooking and clothes washing always exists. Although doors and windows if used intelligently could provide a good standard, it cannot be assumed that these will always be open, and some form of permanent ventilation should preferably be installed.

The recommended minimum rate of fresh air supply to kitchens cooking for not more than six persons, given in the Code of Functional Requirements, is 2,000 cubic feet per hour. When calculating ventilator areas to provide this, allowance can be made for adventitious air infiltration through door and window gaps. The following table allows for this, assuming that the equivalent ventilating area of the gaps at the inside wall and doors exceeds that of the windows by an average 6 sq. in., and shows the equivalent ventilating areas to be provided according to the ventilating rate required; the flow rates given are for the ventilators in series on the outside and inside walls. The areas give a guide for provision of natural ventilation under average conditions for the particular type of situation mentioned.

Ventilating rate in cu. ft. per hour according to locality			*Equivalent area of ventilator to be provided (sq. in)*	
Sheltered (Built-up areas)	*Normal (Suburban)*	*Exposed (Country and outskirts of towns)*	*In outside wall*	*In inside wall*
500	990	1,490	15	9
660	1,320	1,980	20	14
820	1,650	2,470	25	19
990	1,980	2,970	30	24
1,160	2,310	3,470	35	29
1,320	2,640	3,960	40	34

In order to calculate the air change necessary to avoid discomfort from humidity and temperature rise and to ensure safe operation of gas appliances the size of the room, the type of appliance and the diversity of usage of the equipment must all be taken into consideration. The introduction of a wash boiler or heated washing machine, for example, requires a higher air change per hour to offset the steam and humidity produced by clothes boiling; if a drying cupboard or tumbler dryer is introduced in addition the problem can become even greater. It is not generally realized that the amount of moisture discharged from one drying cabinet by one load of clothes (9 lb. dry weight) may be anything from 5-10 lb. of water. Air changes from eight up to sixteen changes per hour will be necessary if condensation is to be completely eliminated and reasonable working conditions assured.

As air changes of this magnitude can make the kitchen decidedly uncomfortable when the drying cupboard is not in use some auxiliary ventilation should be considered; this could take the form of a flue from the appliance to the outside air or a small extract fan. The latter, if fixed in an outside wall or the kitchen window, for example, would also assist the removal of cooking smells, vapours, steam, etc. which is a decided advantage. There is no need to provide a hood or duct over the cooker for this purpose; it is far better to ventilate the whole kitchen in a general way and therefore employ the extract fan to much better advantage.

Preferably natural ventilators should be fitted on opposite walls, one external and one internal. To improve air dispersal and avoid draughts one should be at a high level and the other preferably at a low level. The inside louvres should point upwards to deflect any draughts towards the ceiling. The flue accommodating a solid fuel appliance can act as the internal extract ventilator if a ventilator is fitted into it, preferably at high level. If this is done it is necessary to check the operation of the boiler and capacity of the flue to deal with the additional ventilation. There are cases where unused flues exist and these can easily be employed as a ventilator shaft.

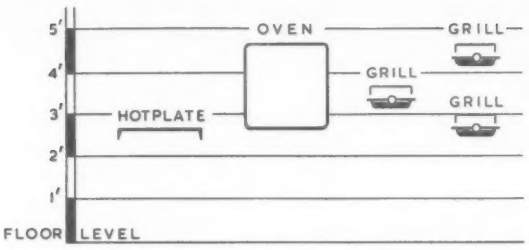


Fig. 3. Ideal positions for individual cooking units.

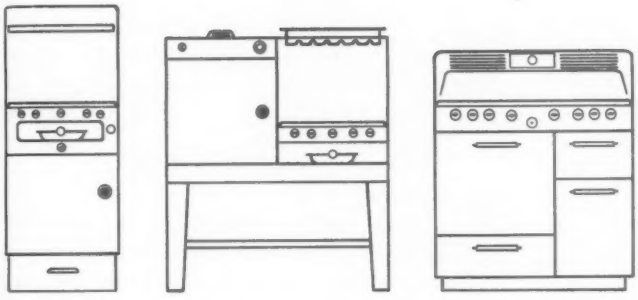


Fig. 4. Vertical cooker (left). Raised oven cooker (centre). Range cooker (right).

The gas cooker in the domestic kitchen

Four basic units are required for the cooking process; the hotplate, which includes the boiling burners, the grill, the oven, and plate warming facilities which may be either a plate rack, a hot closet, a warming cupboard or a warming drawer. Gas cooking appliances consist of one or more, or combinations of all four, of these basic units.

The ideal heights of the individual units for the average (5 ft. 3½ in. in ½-in. heels) woman are as follows:

Hotplate: 32 in. to the top of the working surface.

Oven: 32 in. to the oven floor.

Grill: 38 in. to the pan supports. This position poses many design problems, and cannot generally be used. There are two alternatives which are nearly as good, *i.e.* 50 in. to the pan supports to give easy viewing or 30 in. to the pan supports to give easy manipulation. When these units are installed individually the ideal position for each may be achieved without difficulty, but space and design limitations call for compromises when they are combined together as complete cookers. As the hotplate accounts for three-quarters of the total gas consumption of the cooker it is obviously the most-used part, and should if possible be at the ideal height. This means that some or all of the other units may have to take up secondary positions.

There are three main designs of cooker:

(*a*) *The vertical cooker*, where the units are arranged one above the other. There are several ways of combining the units in this arrangement (see next section): the grill may be in either of the two alternative positions already discussed, but the oven may not be quite as conveniently placed. In many cases the hotplate itself will have to be 36 in. from the ground so that the grill and oven below are not too low for comfort.

(*b*) *Raised oven cookers*, where the units are more or less in their ideal positions with the base of the oven side by side with the top of the hotplate.

(*c*) *Range cookers*, which give a large working area at hotplate level, but where the oven will not in consequence be in the ideal position.

It is difficult to give more than a very general guide on the size of cooker required for a given number, because the cooking habits of any particular family vary greatly; for instance, a large family with simple meal requirements will be adequately served by a standard vertical cooker, while a small family with more elaborate tastes will need the extra hotplate burners and space on a range cooker. As a rough guide, however, the capacity of the cooker should be adequate for the full requirements of the household including occasional extra demands, and a family of from three to six persons can be catered for adequately by a cooker with a four boiling burner hotplate, a grill, and an oven of from 1,500 cu. in. to 2,500 cu. in. in capacity (oven dimensions are included in a table at the end of this section).

There is a very wide range of gas cooking appliances and one will be found to fit every requirement. A short description of each kind follows: for approximate dimensions of each, reference should be made to the table at the end of the section.

Table cookers

(*a*) *Boiling burner or ring.* A single boiling burner may be fitted to a flexible connection of approved design for use either as extra cooking equipment or as a useful accessory for the bed-sittingroom. No tap is provided on the appliance as it is undesirable to leave gas in flexible tubing when the appliance is not in use. The plug-in control between the tubing and the main gas supply is used as the control and the appliance is thus disconnected when not in use.

(*b*) *Hotplate.* This appliance is not normally portable, and should be rigidly fixed to the main gas supply. If a flexible fixing is unavoidable the connection ends and flexible tubing must be of the heavy duty armoured type. Hotplates may have from two to four boiling burners, and some of the larger ones may be built-in to other equipment.

(*c*) *Hotplate with grill.* The conditions for fixing are the same as those for the hotplate. The appliance takes up the same amount of space as the hotplate but provides a much more flexible service.

(*d*) *Breakfast cooker.* This appliance is rigidly connected to the main supply. It consists of two or more

Fig. 5. Boiling ring.

Fig. 6. Hot plate.

Fig. 7. Hotplate with grill.

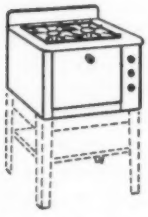


Fig. 8. Breakfast cooker.

boiling burners, a small oven, and a grill. The grill may be an integral part of the cooker, or may be completely removable when the full capacity of the oven is required.

(*e*) *Separate grill.* Separate grills are often used to supplement the service given by an ordinary cooker.

Small cookers

Small cookers are intended for one- or two-person families who do very little cooking, or for installation where space does not allow for a standard model. They are not suitable for small families where the numbers are likely to increase. Small cookers consist of an oven, two or more boiling burners, and a grill. Some are fitted with a shut-down cover which fits over the hotplate when the cooker is not in use; this arrangement is useful where there is no separate kitchen and the cooker is installed in the living-room or bed-sitting-room.

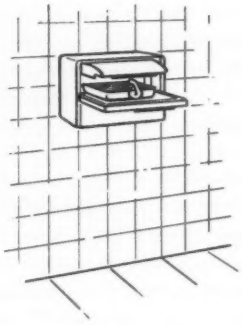


Fig. 9. Separate grill.

Fig. 10. Small cooker.

Full size vertical cookers

These contain a hotplate with four or more boiling burners, a grill, an oven, and platewarming facilities; the units may be arranged in a number of combinations.

Vertical cookers are available in various widths from 1 ft. 9 in. (to fit in with British Standard requirements for kitchen fitments) up to just over 2 ft. 6 in.; thus all needs from the flat to the boarding house are considered.

Raised oven cookers

These are double the width of the normal vertical cooker but the overall heights and the arrangement of the units may vary; the grill in particular may be placed in one of several positions. Storage cupboards or pot racks are often incorporated in the design. A slight disadvantage in this arrangement is that the high oven side limits the ease with which pans may be manipulated on the hotplate.

Range cookers

Range cookers are either double or one-and-a-half times the width of the normal vertical cooker. The hotplate may be at one of several levels and may include extras, such as a griddle plate, which as well as its main purpose also provides extra simmering facilities. There may be one or two ovens, either similar in size, or one larger than the other; if there is only one oven it must be remembered that this kind of

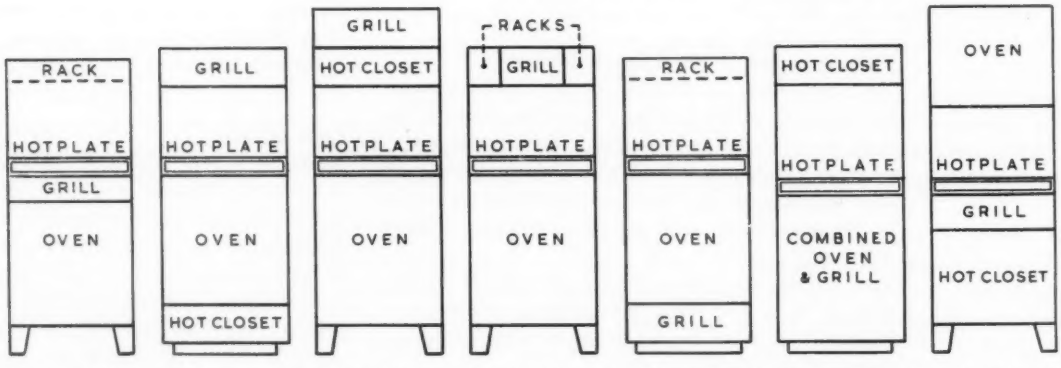
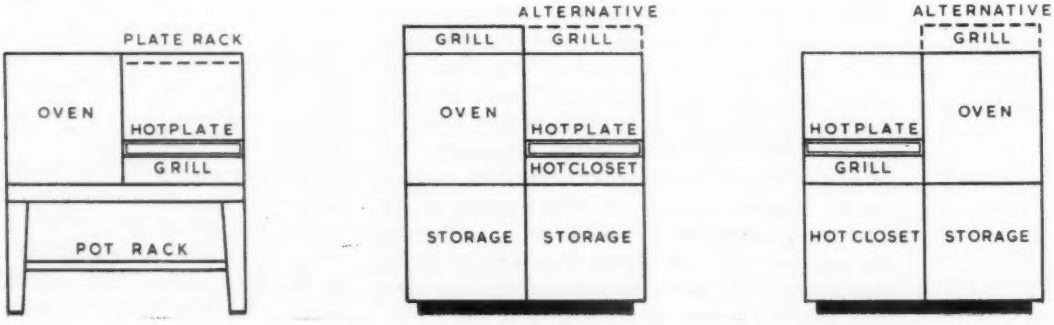


Fig. 11. Diagrammatic arrangements of units to make up vertical cookers (above).

Fig. 12. Diagrammatic arrangements of units to make raised oven cookers (below).



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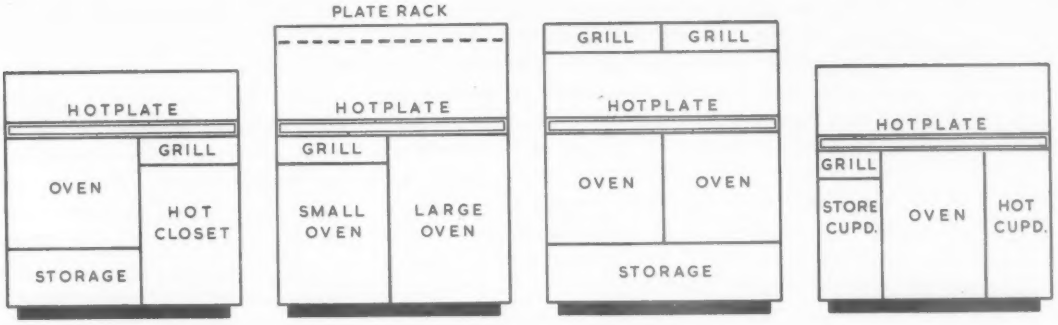

Fig. 13. Diagrammatic arrangements of units on double size range cookers.

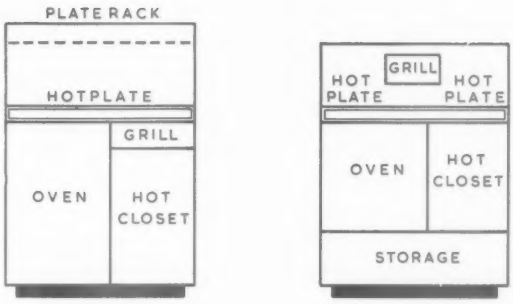

Fig. 14. Diagrammatic arrangements of units on one-and-a-half range cookers.

range is simply an ordinary domestic cooker with certain added facilities and that although it provides an increased and much more flexible domestic service it is not large enough to fulfil the requirements of boardinghouses and small catering establishments as are cookers with double-ovens.

Dimensions of representative samples of the range of domestic cookers

	Overall dimensions in in.				*Oven size in in.*					
	Ht. to hotplate	*Height*	*Width*	*Depth*	*Best cooking area Height*	*width*	*depth*	*Maximum cooking area Height*	*Width*	*Depth*
Boiling ring	—	3½	10¼	10¼	—	—	—	—	—	—
Hotplate	—	4	18½	11½	—	—	—	—	—	—
Hotplate with grill	7⅜	12½	19	18½	—	—	—	—	—	—
Breakfast cooker	13	13	20½	13½	6½	9	9	6½	13½	12½
Separate grill	—	14½	21½	5½	—	—	—	—	—	—
Small cooker (no stand)	19½	23½	18½	18½	9½	11	9½	9½	13¾	13½
Standard vertical cooker	36½	53½	22	22	14	13½	10½	14	16	11½
Large vertical cooker	36½	58½	22¾	25	15½	14	11½	15½	17	13
Boardinghouse vertical cooker	36½	61	31½	28	17½	18	13	17	18	13
Raised oven cooker	32½	48½	45	22½	16	14½	10	16	17	11
Range 1½ size	35¾	47	35½	22½	18	12⅝	12⅝	18	17	16
Range full size	36½	44½	38½	24¾	15¾	14½	10	15¾	17	11
Separate oven (b.i.)	—	26¾	21¼	22½	16	14½	10	16	17	11

Overall width includes lighter elbows if provided. " Best " cooking area is that over which good cooking results can be obtained. Maximum cooking area is the amount of usable space in the oven; using this may mean a slight falling off in evenness of heat distribution with some kinds of food.

Features of modern gas cookers

So far the gas cooker has only been discussed very generally, and some mention of the features which go to make up modern cookers must be made in order to give a complete picture of the equipment available today. Not all the features appear on every cooker, but it can be seen that any particular requirement may be met out of the variety of designs at present on the market.

Ignition. Automatic ignition is becoming common on all sizes of cookers: from now on no new cookers will appear on the market without hotplate ignition, and already some are available with ignition to all burners. Automatic ignition provides a convenience service, and fully automatic cookers no longer require a lighter elbow at one side, and therefore can be more easily fitted into a run of kitchen fitments.

Time control. With automatic ignition to all burners it is also possible to provide time-control mechanisms, which enable the oven to be preset to come on and go off in the housewife's absence. Time-control mechanism is already available on several of the more expensive models.

Timers. On many cookers, even on those without automatic ignition at present, four- or five-hour " pinger " timers are available.

Lights. Strip lighting is sometimes supplied above the cooker hotplate, and a light has been introduced into the oven itself on one model.

Safety taps. All taps controlling burners which do not light automatically are now of the " push-in-and-turn " variety which makes it impossible for the burner to be knocked on accidentally.

Hotplate burners. Hotplate burners which light at all rates, and which are easy to clean and difficult to clog with spillage are appearing on many of today's cookers.

Griddles. At least one cooker incorporates a griddle on the hotplate which can be used either for griddle cakes and scones, bacon, eggs and other fried foods, and also as an auxiliary simmering burner which will

accommodate several pans at one time.

Grills. The high-level grill has contributed considerably towards easier cleaning for the cooker hotplate. As the grill has been removed from under it, the hotplate cannot become heated and therefore grease and spillage, instead of burning-on, remain semi-liquid and are easy to wipe off. The fear of some people that fat will splash into their eyes while working at a high-level grill is unfounded; fat splashes upward rather than outward and is burned away when it comes in contact with the hot grill frets.

Front flues. Modern cookers may be fitted flush against walls so that they do not break the line of equipment in the kitchen. This has been made possible by bringing the oven flue out at the front, around the hotplate level, instead of at the back as in earlier models. This also eliminates wall staining as the food vapours and grease from the oven are disseminated into the room and not directed on the wall.

Drop doors. An oven with a drop door is particularly useful when the cooker has to be fixed in such a position that a side-opening door would prevent light from reaching the oven. The door also forms a useful shelf on which dishes may be rested while their positions in the oven are being altered or while they are being attended to during cooking Drop doors do, however, have the slight disadvantage that they make the back of the oven a little less accessible for cleaning for people with short arms.

Glass doors. These are always popular with certain sections of the public although their usefulness is probably not so great nowadays, as the oven thermostat has removed most of the guesswork from cooking. One design of door consists of two sheets of toughened glass held in a frame with an air space between for insulation: the other has a solid outer half which can be opened independently of the plate glass inner half when viewing food. The glass will only steam up during the first few moments when the oven is lit; after it is heated all condensation vanishes and during the cooking process the glass remains clear.

Back burner ovens. A single oven burner across the back of the oven has now virtually replaced the older design which had a burner down either side. This means that the entire width of the oven is available and dishes may be placed side by side on a shelf instead of one behind the other as in side burner models. Where automatic oven ignition is not available provision is made for lighting the burner through a flash tube from the front of the oven, so that it is not necessary to reach into the oven with a match.

Easy clean oven roofs. The easily cleaned oven roof is a new feature being introduced on modern cookers; the roof is the most difficult part of the oven to clean and also becomes dirtier than other parts. On some models the roof is completely removable, while on others it is hinged at the front and can be freed from the back so that it lets down for cleaning.

Governors. Modern cookers are unaffected by changes in mains gas pressure as they are all fitted with governors which only allow a constant pressure of gas to the cooker. This has meant that all gas rate controls can be eliminated, and has thus simplified the design of the burners.

Finishes and colours. Gas cookers are finished in vitreous enamel; basically they are white or cream with colour accents on taps and trims, or on small pieces of the cooker itself. Plastics, coloured anodised aluminium, polished aluminium, and chromium plate are also used for accents and decoration.

Separate units. Something has already been said about the advantages of fixing individual units in a kitchen instead of complete cookers. At present there are several "split" cookers on the market designed to be built-in at will; in the future it is expected that other developments will come, including individual boiling burners which may be sunk wherever they are required into worktops. The "split cookers" at present available are, as their name implies, the oven and hot plate (with grill) of a standard cooker, split into two units and especially designed for building into kitchen fitments.

Installation of gas cookers

Average figures for the space requirements of the range of gas cooking equipment are given in the Table on page 594.

Unless cookers are built-in to other fitments a space of 4-6 in. should be left on either side of them to allow for cleaning; this will also provide for any lighting device that may be fixed to a cooker which has not fully automatic ignition. A clear space of at least 3 ft. should be left between the cooker hotplate and any permanent fitment above the grill, while high-level and independent grills should have a clear space of at least 1 ft. 6 in. between the top of the grill and any permanent fitment. Cookers should not, if possible, be fixed in corners or against tall fitments because these will restrict the free positioning of saucepans on the hotplate; built-in appliances should be provided with means to prevent spillage falling between the sides of the cooker and the adjoining fitments. When a cooker is in use the temperatures of the adjacent surfaces will not exceed 150 deg. F., therefore no special precautions to prevent over-heating of surrounding equipment are necessary.

Cookers must be installed in accordance with manufacturer's instructions; in almost every case the correct pipe size is $\frac{1}{2}$ in. B.S.P. An isolating main cock should be avoided on domestic cookers.

Rigid connections are advisable in all circumstances, but if the cooker is specially required to be movable it should be fixed only with armoured heavy duty tubing and connections. It should be pointed out that cookers fixed on flexible connections may not always be properly level after they have been moved, and that there is also the danger that the cooker may be used by the housewife to raise herself after she has been attending to the oven and will be pulled over on top of her. This, in fact, is a danger with all flexibly connected full-size cookers, and is not confined to those which use gas.

gas supplement

Fig. 15. Free standing refrigerator (left). Built-in at floor level (centre). Built-in at eye level (right).

The gas refrigerator

All gas refrigerators work on the absorption principle, which means that there are no moving parts to go wrong, and no vibration troubles which may shorten their life. They are completely silent in operation, low in capital cost (particularly the smaller models) and have an economical running cost. Installation is simple and any servicing will be carried out by the Gas Board. Gas refrigerators may be free-standing or built-in. The free-standing models range from 1.7 to 7.6 cu. ft. in capacity; up to 3.5 cu. ft. capacity their total height is under 36 in. and they are therefore provided with flat tops for use as working surfaces or parking areas; some have removable "tray" tops which have many uses in the kitchen.

Built-in refrigerators come in the 1.7 in. to 2.7 cu. ft. capacity range, and can either fit under draining boards or be fixed at any required height in the range of kitchen fitments. Doors are designed to open from right or left and integral flint lighters are provided for easy ignition. Special ducting arrangements are made to permit free flow of air across the unit and to dispose of the flue products at the front of the appliance.

The following table gives details of the range of refrigerators available, including their outer dimensions:

Choosing the refrigerator

Although the popular trend appears to be towards very large refrigerators these are not always necessary for the average family; their space is often not used to the best advantage, and may even be used to store fruit, tins, etc., which keep equally well in a larder. Households which do a lot of entertaining will probably need a model in the 4 to 7.6 cu. ft. range, but the smaller sizes will meet the demands of the average household very adequately. Refrigerators should never supersede the larder or ventilated food cupboard; they should only be used for goods which will deteriorate if not stored under cool conditions.

Refrigerator "furniture" varies with the model; some contain egg racks, cheese and butter compartments, dishes and containers. The larger ones have interior lights and frozen food compartments.

Siting the refrigerator

The ideal site for the refrigerator should be somewhere convenient both from the point of entry into the kitchen and from the preparation worktable. Consideration should be given to freedom from draughts, firm and level flooring, a minimum clearance of 6 in. above the flue for free-standing models, good visibility into the cabinet, and reasonable clearance for the open

Details of gas refrigerators

Capacity in cu. ft	*Overall dimensions in in.*			*No. of ice trays*	*Type of refrigerator*
	Height	*Width*	*Depth*		
1·7	35 1/8	20½	21½	1 (12 cubes)	Free-standing
1·7	31⅞	21	20⅛	1 (14 cubes)	Built-in
2·2	36¼	20⅞	22¼	2	Free-standing
2·3	36⅛	22 1/16	21⅞	3	Free standing
2·6	32¼	21⅛	25	1	Free-standing
2·7	34 1/16	21⅛	23½	1 (14 cubes)	Built-in
3·6	46½	24½	26½	3 (10 cubes)	Free-standing
3·75	38¼	22¼	26	1 (14 cubes)	Free-standing
4·0	41½	22½	24	3 (12 cubes)	Free-standing
5·0	53¾	27½	27½	4 (16 cubes)	Free-standing
7·6	60½	31	29¾	5 (14 cubes)	Free-standing

door. They should not normally be fitted in larders or closed cupboards because of the lack of ventilation.

Lighting and controlling the refrigerator

Some refrigerators are lit directly down the flue by holding a light above it. Others have integral flint ignition; in this case no space need be left at the side for the hand to reach in for lighting, but for those without integral ignition this must be done in order that they may be lit without discomfort.

All refrigerators are provided with a thermostat; at normal temperatures the setting is usually either 3 or 4, but when the air temperature is very hot or very cold the thermostat must be altered accordingly to compensate for the change in temperature.

Installation

In modern refrigerator design the gas controls are not accessible from the front of the cabinet, but are at the back with the unit. To instal the appliance the connection must be prepared with the refrigerator out of position and completed once it has been sited. A gas cock should be supplied to the installation as one is not normally supplied to the refrigerator itself.

When access is possible from below the supply can be run and the control cock fitted underneath the cabinet, provided that the cock is easy to reach. If this is difficult, or if access from below is not possible, the cock should be fitted externally on the supply near the refrigerator. If necessary the supply must be run to a point adjacent to the appliance, and another run back from it: the two supplies are then connected by the cock after the refrigerator has been placed in position.

Gas and home laundry

Practically everybody washes some personal garments at home, and many housewives habitually do the whole weekly wash. Only 40 per cent of all households send part of their wash to the commercial laundries, generally consisting of the heavier items, such as sheets and bath towels, which are difficult to dry and iron at home. Laundrettes are also playing their part, but even so there is a considerable and growing demand for laundry facilities in the domestic kitchen. This is met in the simplest form by providing a wash boiler or washing machine alone. Ideally this should be placed next to the sink, but in small kitchens this position may interfere with the cooking cycle; provided the connections are so placed that the appliance can be moved to the sink on wash days it is often more convenient to store it in another part of the kitchen.

When full laundry facilities are required either in the kitchen itself, in an adjacent scullery or utility room, or in small washhouses such as are found in flats, planning becomes more important, although the laundry cycle is more flexible than the cooking one. Generally the machine should be next to the sink; the sink, if used solely for laundry, should be 15 in. deep, and a second, shallower sink should be available for rinsing: a draining board, on which stain removal and other pre-treatment is carried out, is an advantage. If outdoor drying is required the whole laundry cycle should be sited as near as possible to the back door; an indoor drying cupboard should form part of the group as a whole, but its precise location is not important.

Ironing facilities should also be considered, although many housewives prefer to iron in the "leisure" parts of the house where they can be with the rest of the family. Ironing boards should be rigid in use, as wide as possible, and adjustable to several heights, including one suitable for the worker who prefers to sit while ironing. Rotary irons and pressers should be placed at a table so that they are at the right height for the seated worker, and for those who iron sheets and other large articles an ironing table is necessary. The ventilation of the laundry section is important and has already been discussed; flooring should be water-resistant and easily washed down, and walls and ceilings treated so as to reduce condensation. A drain-away on floor level is an advantage.

Washing equipment

Today the importance of the temperature at which garments are washed is realised as being greater than either the detergent used or the agitation, although both are essential. Temperatures for the wash vary from 100 deg. F. to 160-180 deg. F. for washing, and go up to 212 deg. F. for boiling; the gas-heated washing appliance, with its infinitely flexible heat control and capacity for reaching any given temperature quickly and holding it indefinitely provides the whole range of temperatures and makes the housewife independent of the domestic hot water

Fig.
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supply, which may not meet her requirements at the higher temperatures.

The range of equipment described below caters for all requirements from the small table wash boiler to the fully powered machine.

Washboilers

The gas washboiler developed naturally from the old-fashioned wash copper. Modern washboilers are neat, and occupy very little space in the kitchen. Most of them are small enough to be stowed away under draining boards or work tables when not in use. There are small table models, particularly useful for the baby's wash; full size rectangular pans with rounded corners which are economical in space, because the pan and outer case are one and the same; or circular pans fitted into a rectangular case, which may go under kitchen fitments or be free standing. All boilers are lit from a flash tube, so that it is not necessary to kneel on the floor to light the burner, and most have viewing mirrors through which the flames may be seen without having to bend down. A special feature on some models is a turn-down position for the gas tap so that a constant temperature, once reached, may be maintained without further adjustment. The capacities of full-sized pans are normally 5 to 7 lb. dry weight of clothes at a time, depending on the size of pan.

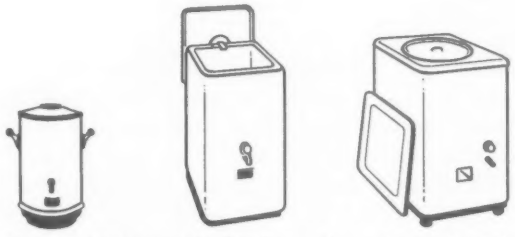


Fig. 16. Table model (left). Pan and case in one (centre). Pan with outer case (right).

Washboilers with wringers

The ordinary washboiler becomes much more useful when it is supplied with a wringer; some are sold with wringers already fitted, while on others they are available as extras. The width of the wringer rollers varies from 10 in. to 16 in.; even the shortest ones will deal adequately with a blanket or double sheet. Wringers are generally designed to fold away after use either into the pan or down the back of the boiler, but they may fold on top of the lid under a table-top or be removed altogether for storage. The provision of a footrest at the base of the boiler to steady it during wringing is a useful feature of some appliances.

Convertibles

It is possible to buy lids fitted with paddles, and a handle by which the paddle can be turned, for fitting into the tops of most washboilers. This converts them, in essence, into hand-operated washing machines, and doubles their usefulness. The amount of energy needed to agitate the paddles is slight, and the dirt removal is very good.

Fig. 17. Hand agitator for convertible wash boilers.

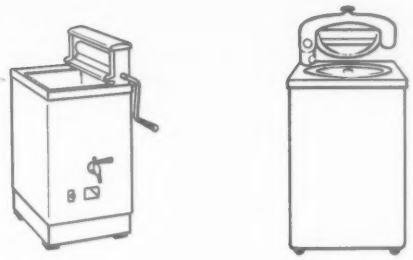


Fig. 18. Simple washing machine (left).

Fig. 19. Large model washing machine (right).

Washing machines

The gas-heated washing machine is either partly or fully powered by electricity, which means that it is a labour-saving and very flexible appliance which gives the maximum of agitation at the optimum temperatures for each washday load. In its simplest form it is electrically agitated but wringing and emptying are done by hand. The next stage still has a hand wringer, but electricity drives the agitator and pumps away the water. The hose through which the water is pumped can often be fixed to the sink tap to help in filling the machine. Finally, there are large models which have power-driven agitators, pumps and wringers. Those in the first two categories are approximately the same size as washboilers, and can be stored under kitchen fitments; the larger ones are higher, however, and are therefore free-standing pieces of equipment. Capacities rang from 3½ to 9 lb. dry weight of clothes according to the size of the machine and/or the type of agitation; the most popular method of agitation is the reciprocating paddle, which fits over a central spindle in the base of the pan, but spinners, tumblers, and forced water movement are also employed and give good dirt removal.

Combination appliances

At present there is only one gas-heated combination appliance on the market; it consists of a washing machine and a spin dryer side by side in the same case. Although the floor area taken up by this appliance is greater than that required by other machines, it is a great convenience to have the two sections close together and so avoid water spillage, lifting, etc. The capacity of this machine is from 3½ to 4 lb. dry weight of clothes, depending on the bulk of the articles in the

Fig. 20. Combination washing machine and spin dryer.

gas supplement

wash. This is also the capacity of the spin dryer.
In the table below the spread of dimensions over the range of gas-heated washing equipment is given: in some cases several machines are available with the same dimensions. The figures refer to the appliances when shut down ready for storage.

Installation and fixing
Washboilers and convertibles are very simple to install, as they only require to be connected by a flexible tube to a plug point in the main supply. Washing machines also need a 3-pin plug and properly earthed socket; the loading required varies with the machine.

Dimensions of gas washing equipment

	Pan capacity up to 7 gals.			*Pan capacity over 7 gals.*		
	Height, in.	*Width, in.*	*Depth, in.*	*Height, in.*	*Width, in.*	*Depth, in.*
Table boiler	21¼	16¼	17			
Wash boilers	28	22½	23½	28½	16½	20½
	28¼	16¼	20	28½	21	22½
	28½	19½	22½	31	18½	21½
	28¾	17	20			
	29	15¼	18			
	29¼	16	19			
	29½	17½	22½			
	29½	20	20½			
	30¼	16¼	18½			
	30¼	16¾	20¾			
Washboilers with wringers, convertibles	28½	15½	18	36	21½	22¾
	30¼	16¼	18½	37	18¾	21½
	32½	19	21½			
Handwringer, tap emptying washing machine	30	20¾	21¾			
	29½	24½	20½			
Handwringer, power pump washing machine	29½	24½	20½	30½	16¾	18¾
Power driven completely				34¾	32½	21
Combination machine	30¾	32½	21			

Drying equipment
The vagaries of the British climate make the provision of indoor drying facilities a highly desirable feature of the domestic kitchen; these, however, are all too often overlooked, even in modern dwellings where no outdoor drying is possible.
While recognising that the "spin dryer" is part of the answer to the problem, only the lightest materials are completely dried by it, and most garments still require a certain amount of further drying before they are ready for ironing. A gas-heated dryer or drying cabinet will do this in a very short time, or else will dry completely from the wet state, after the clothes have gone through a wringer, in a longer time. These times depend to a certain extent on the composition of the load and the way it is arranged in the dryer.

Fig. 21. Airing cupboard heater.

Ventilation
With any drying process using heated air it is clearly desirable either to provide ventilation direct to the outside or to ensure ventilation for the drying room itself and this has already been discussed. Where room ventilation is not adequate, full-size drying cabinets may be ventilated directly to the outside air, and means for attaching a suitable length of circular duct are generally available on them; they may also be ventilated into vertical flue ducts, as long as the material from which the ducts are made will stand up to the moist air during the initial stages of drying.
Various sizes of domestic drying equipment are available to meet differing household requirements.

Airing cupboard heaters
These small heaters give a slight but steady quantity of convected heat; they may either be used as background heaters, or be installed in a cupboard and used for airing ironed and finished laundry. They are particularly useful where drying accommodation is small, or where the wash is normally dried out of doors. Airing cupboard heaters do not require flues, but must be fixed and connected rigidly to the gas supply.

Towel rail heaters
Although these heaters are primarily intended for bathrooms they also have many uses in the kitchen; they not only provide a certain amount of background warmth but can be used for drying kitchen cloths, etc., and for airing small articles. They are low-rated and economical in use and do not require flueing; they should, however, be rigidly fixed.

Fig. 22. Towel rail heater.

Fig. 2
dryer.

gas supplement

Fig. 23. Portable dryer.

Portable dryers

These are small heating units with a series of rails above them which are either enclosed in a case or by a cover of some suitable fabric. They are useful for drying the light wash, personal garments and the entire baby-wash; they are not suitable for drying heavy articles because their low rating will make the drying time over-long, and the rail space also is insufficient for such a load. Portable dryers do not require a flue, and are connected to the main supply by a flexible tube and a plug-in cock.

Small fixed dryers

These appliances are roughly half the height of the normal cabinet and will give a satisfactory service to homes where the larger household articles are sent out to the laundry or laundrette. Medium-weight materials will dry in two to three hours from the wet wrung state; very light articles can be dried in a shorter time, but much depends on the size of the articles in the load and their distribution in the dryer. The dryers normally have flat tops, which provide a useful extra parking surface in the kitchen when they are not in use.

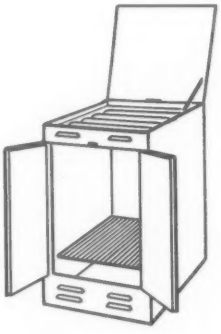


Fig. 24. Small fixed drying cabinet.

Free-standing drying cabinets

Full-sized drying cabinets are designed to take a complete washing machine load (about 7 lb. dry weight) at a time and to dry it completely in one or two hours; the time to reach "ironing-dryness" is, of course, considerably less. The cabinets are thermostatically controlled to give several heats, from airing through warm and medium temperatures to hot, so as to provide the different conditions required by various fabrics. They should be rigidly connected to the main gas supply, and care must be taken to ensure that they are adequately ventilated.

Fig. 25. Free standing drying cabinet.

Built-in drying cabinets

These are similar in performance and in ventilation and fixing requirements to the free-standing models; they are available with one side and the front frame and door, or with the front frame and door alone, so that they may be built into a corner of a room or into a prepared recess. Space and capital cost are thereby saved. This type of assembly is most suitable for installation at the time when a house is built.

The following table gives average dimensions of the range of drying equipment so that some idea of the space required for them may be obtained.

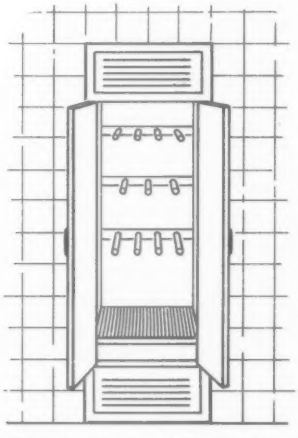


Fig. 26. Built-in drying cabinet.

	Overall dimensions in in.			*Hanging space in in.*			*Equivalent length of clothes line*
	Height	*Width*	*Depth*	*Height*	*Width*	*Depth*	
Small cabinets	36	16	21	25	14½	20	8 ft.
	36	22½	22	25½	20½	20	10 ft.
Free-standing cabinets	71	21	19	41	20½	17½	13 ft.
	72	27	24	48	23	21	20 ft.
	71	30½	19	43	29½	17½	19 ft.
	72	54	24	48	46	21	40 ft.
Built-in cabinets	84	27	24	60	24	22	21 ft.

gas supplement

Refuse disposal

The problem of domestic refuse disposal, always difficult, has been made increasingly so in recent years with the introduction of modern space- and water-heating methods which have to a great extent done away with open fires and domestic boilers. The cost of local authority refuse services is already high, and labour for the work is increasingly difficult to obtain; alternative methods must be sought, particularly in tall blocks of flats which present the further problems of the provision of space for chutes and collecting bins, and the danger to health which is always present when refuse is allowed to accumulate.

Gas incineration is the answer to this modern problem; the small incinerators originally designed for sanitary purposes in cloakrooms, hospitals, etc., have already proved efficient in domestic installations. In flats, especially in tall blocks, they are best flued into a common duct, using mechanical extraction, rather than into single flues. A slightly larger free-standing version of this kind of incinerator is now available for domestic purposes in kitchens.

From this start special domestic incinerators which are completely smokeless and odourless, fitted with safety controls and automatic timers, have been developed. Shortly a large model will be available, and later it is expected that a smaller version will also be produced. These will eliminate the necessity to keep any household refuse which may become objectionable, and leave dustbins free for tins and bottles, which do not attract flies to the same degree.

Other services in the kitchen

Although space- and water-heating have been dealt with comprehensively in previous supplements a few words on special kitchen applications might be useful here.

Space heating

A hot kitchen is never desirable, but some form of background heating should be available where no constantly burning solid fuel appliance is installed. There are many activities carried on in kitchens which do not involve appliances producing heat, and the housewife under such conditions is often forced to use the cooker as a heater. This is uneconomical. Small radiators, or portable fires which may be fixed high on a wall or in some other place where they do not interfere with the flow of work in the kitchen provide a satisfactory and much-appreciated service here.

Water-heating

When the kitchen hot water is not obtained from a central source but is an independent supply, the gas sink water heater gives an efficient and economical service. It may be either of the instantaneous or storage variety, both of which are described in the water-heating supplement. The boiling water instantaneous sink heater is particularly effective in the kitchen, where it will replace the kettle.

Gas is a modern fuel adapting itself and its appliances to the needs of modern life; new techniques and designs are developing all the time, and it is quite possible that by the time this supplement is produced something new will already be on the market. The services of the Gas Boards are always at the disposal of the architect to help him keep up to date with new developments.

SIGHTHILL HEALTH CENTRE — *designed by the Department of Health for Scotland.*

Electric floor warming at the Sighthill Health Centre

Sighthill was designed as an Experimental Centre under the National Health Service Act. The building forms a hollow square round a central courtyard. The north wing holds administrative departments on the ground floor and dental theatres on the first floor. The south wing houses the joint services departments. The east wing comprises child welfare services and the west wing is divided into six medical suites.

Fully controlled warmth

The building is heated by electric low temperature underfloor radiant heating. This is thermostatically controlled and designed to maintain against an outside temperature of 25°F. the following inside temperatures: surgeries, recovery and X-ray rooms 70°F.; passages and lavatories 60°F.; kitchen 52°F.; other rooms 65°F. Electrical intake is "off peak" and available between 7 p.m. and 7 a.m., and 11 a.m. and 3 p.m.

Loadings

Total loading amounts to 262 kW and is designed for off-peak operation. This load comprises 232 kW embedded in the concrete floors and 30 kW in concealed wall panels. The total floor area of the building is 35,000 sq. ft.

A variety of floor finishes tested

Floor finishes laid were: wood block, cork tile, thermoplastic, mastic asphalt, Caithness stone slabs and terrazzo. All these have given very satisfactory service under heated floor conditions.

Results

The installation has been running for over five years and the average annual consumption for floor warming purposes is 418,960 units costing £1,400.

Thermograph records were taken during the winter 1955/56. These show that when, in February 1956, the mean daily outside temperature was 22.6°F., the maximum drop in inside temperature during the cut-off period was only 2.6°F. Even under these extreme conditions the internal air temperature did not fall below 60°F.

Issued by the
Electrical Development Association, 2 Savoy Hill,
London, W.C.2. Telephone: TEMple Bar 9434.

INTERIOR OF PETER ROBINSON'S STRAND SHOP

The building consists of four sales floors (from lower ground floor to second) and two for offices above. The sales floors are designed to give as great an impression of space as possible and to present the goods for sale in a reasonably restrained setting (below). The atmosphere is in contrast to the eye catching sparkle and crispness of the external display windows (above). On the lower ground floor are the soft furnishings and fabrics. In the fabric section (right) material is displayed on easily movable rollers, and where semi-recessed lighting has been used it has been designed to give a certain amount of horizontal light for the proper showing of fabrics.

Coats and suits are on the first floor and are hung in simple mahogany racks. These are arranged around the walls and columns which are also mahogany faced (above). A noticeable feature of the store is the attention that has been given to the lettering of the various signs. The store guide panels (right) which are strategically placed inside and outside the doors to the various departments, are unusually neat and clear due to good typography by Ronald Ingles. The designers of the general interior scheme for this Fry, Drew, Drake and Lasdun building were Misha Black and Alexander Gibson of Design Research Unit.

CAR SHOWROOM IN HAMMERSMITH

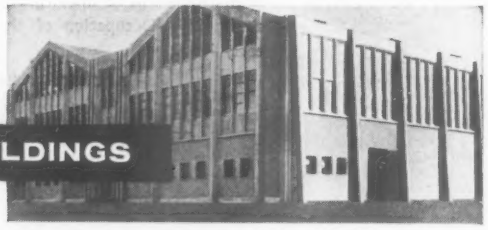
This car showroom and hire department in King Street, Hammersmith, has been remodelled by John Bruckland, who has taken the chance offered by a slight enlargement of the premises to turn two separate lock-up shops into a single showroom (above, left) linked by an open staircase with the car hire department and garage in the basement (above, right, and below). The architect has tried to give it a more spacious air by providing an overall translucent ceiling and considerable use of mirrors. Colouring is black, white and light grey. More colour has been used in the hire department below, where chequered floors, wall cupboards, seats and curtains produce a rather restless brightness which is perhaps the right mood in which to hire a car. (Shopfitting contractor, F. W. Clifford Ltd.)

MS

DRI-SIL

silicone masonry treatments protect...

...NEW BUILDINGS



Central Engineering Works for Bryant & May Ltd by Beecham Buildings Ltd, Shipston-on-Stour, Warwickshire. Architects: Hastie, Winch & Kelly.
All prefabricated concrete components used in the construction of this building are treated with a water-repellent solution based on DRI-SIL 29.

...OLD BUILDINGS

All Saints Church, Hastings, mainly 14th century but contains older walling, part prehistoric. With passage of time the penetration of water through the walls has become more prevalent, resulting in the usual decay and fungus. Water penetration has been stopped with DRI-SIL silicone solution. (By courtesy of the Rector and Consultant Architect).

DRI-SIL silicone masonry treatments

- ★ Protect buildings from the damaging effects of weathering.
- ★ Keep buildings cleaner because water-borne dirt is less liable to penetrate into the surface pores.
- ★ Prevent staining and streaking.
- ★ Do not block the pores of building materials, thus do not inhibit "breathing".
- ★ Improve the thermal insulation of buildings by preventing the absorption of moisture by the walls.

...BRIDGES & ROADS

Highway overpass after a rain storm. The treated part of the concrete fascia (right) has not absorbed the water and is much more visible than the untreated section on the left. Silicone treatments also prevent spalling or scaling due to frost action on concrete road surfaces.

THESE FIRMS SUPPLY WATER-REPELLENT MASONRY TREATMENTS BASED ON DRI-SIL. IT IS IMPORTANT TO NOTE THAT TREATMENTS SHOULD CONTAIN 3 TO 5% ACTIVE SILICONE BY WEIGHT FOR SATISFACTORY PERFORMANCE ON MOST SUBSTRATES.

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British Paints Ltd, Newcastle-upon-Tyne 2
Cambridge Timberproofing Laboratories Ltd, Trumpington
Chemical Building Products Ltd, (Dept. DS3), Hemel Hempstead
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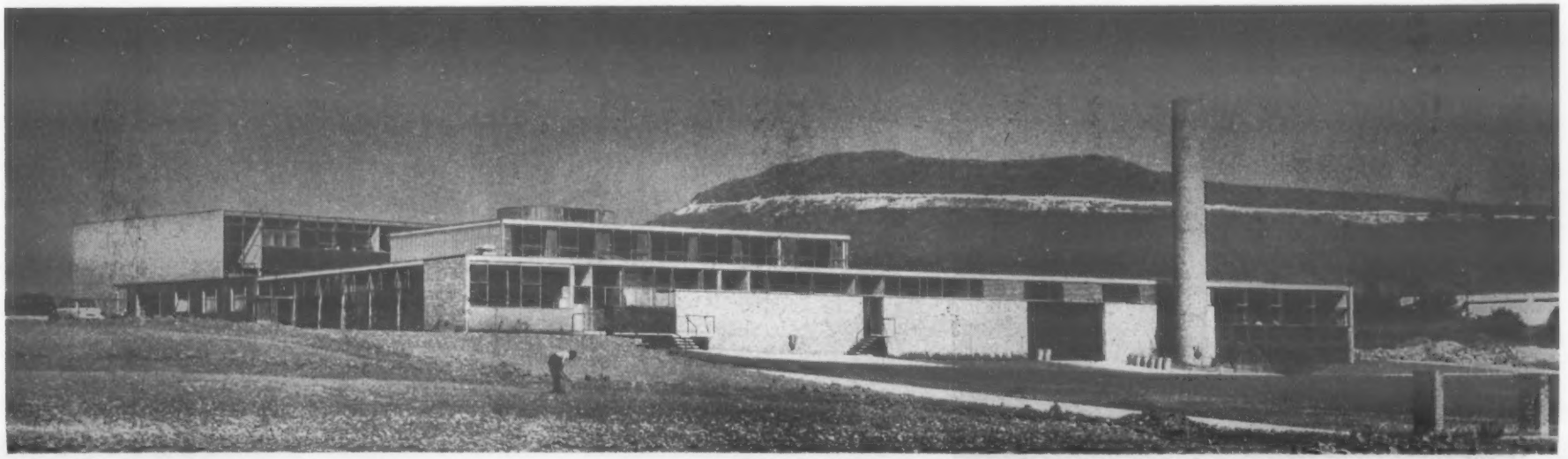
The Architects' Journal for November 26, 1959 [605

SECONDARY SCHOOL

at HILLSIDE SECONDARY SCHOOL FOR BOYS
FOLKESTONE, KENT
designed by ELIE MAYORCAS
in collaboration with E. T. ASHLEY SMITH, Kent County Architect
assistant architects L. E. TATUM, JOHN HOILE, MICHAEL POLLARD
quantity surveyors C. JOHN MANN & SON, YEOMAN & EDWARDS, who prepared this cost analysis
consultants (mechanical and electrical services) J. STINTON JONES & PARTNERS

The building illustrated forms the first instalment of a four form entry secondary modern school for boys. The school caters at present for 360 boys. This number will be increased to 600 when the gymnasium and additional classrooms and workshops have been built.

The school from the approach road. The block in the foreground contains the hall, space for the gymnasium to be built later (to the right of the hall) changing rooms, and dining room and kitchen, etc. Behind is the two-storey teaching block, which will be extended to the left in the second instalment.



building illustrated

APPRAISAL: The building of schools by instalments usually involves the extension of each type of accommodation provided initially. This complicates the architect's task by adding yet another set of factors to those to be weighed up in the search for a fair compromise between educational and technical requirements. This is particularly so in the case of small schools, which would normally be housed under one roof; later instalments will almost always involve the extension of existing buildings, with consequent inconvenience to the school and additional expense. In larger schools, additional accommodation may be provided in separate blocks on the periphery of the school.

At Folkestone, the architect has rightly not allowed these transient problems to prejudice the final scheme. No attempt has been made to group the additional accommodation in one part of the site, but two of the three additions consist of virtually independent blocks.

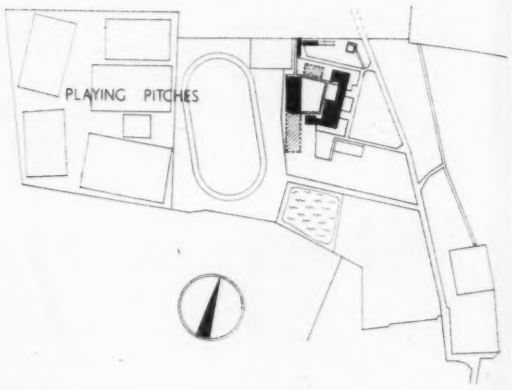
The client's brief was contained in two sets of instructions, the first, being requirements particular to this school, are given below under the heading of client's requirements. The second set apply to all secondary schools built for the Kent Education Committee and are contained in a large loose leaf manual. The instructions cover many aspects, both major and minor, of school building and are the fruit of many years' experience, but their usefulness seems limited because no reasons are given for the pronouncements. This must lead to a blind following of the rules, which will result in codified, rigid designs from which all innovations, and hence any progress, is barred. For instance, assembly halls in secondary schools are required to have a clear height of 18 ft. It is difficult to believe that this is an invariable requirement, but even if it is, it seems unlikely that the effect of using exposed spaceframes was foreseen; the additional 5 ft. of headroom detracts from rather than adds to the assembly hall at Folkestone.

The school is situated in dominant surroundings and the buildings are well sited. Lying at the foot of a strong line of chalk hills, the blocks run along the contours of land that falls away at right angles to this line. One block has been set at a slight angle to the other, thus opening up the courtyard to the distant southern face of the hills, and at the same time, making a more sensitive relationship between the hills and the building as seen from the approach road.

Within the building, however, the general arrangement of spaces seems less satisfactory. Although the double banked rectangular teaching block is undoubtedly an extremely economical form of building, it does not easily permit differentiation of the types of teaching space contained within it. A room lit from one side may be acceptable for a classroom, but is limiting as a library and dull for a laboratory. Moreover, it is difficult to make anything more of the central corridor than a place of congestion and bustle.

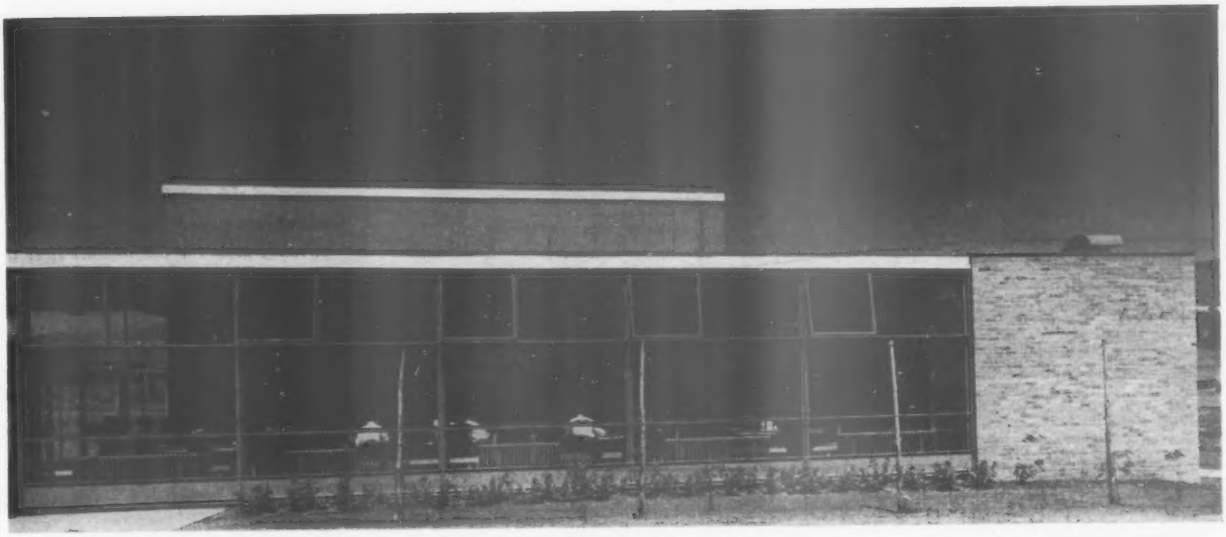
The structure consists of a steel frame with precast concrete floor slabs and felt covered strawboard roof decking. A number of cladding materials have been used, of which the curtain walling developed by the architect compares favourably with most of the commercially produced systems.

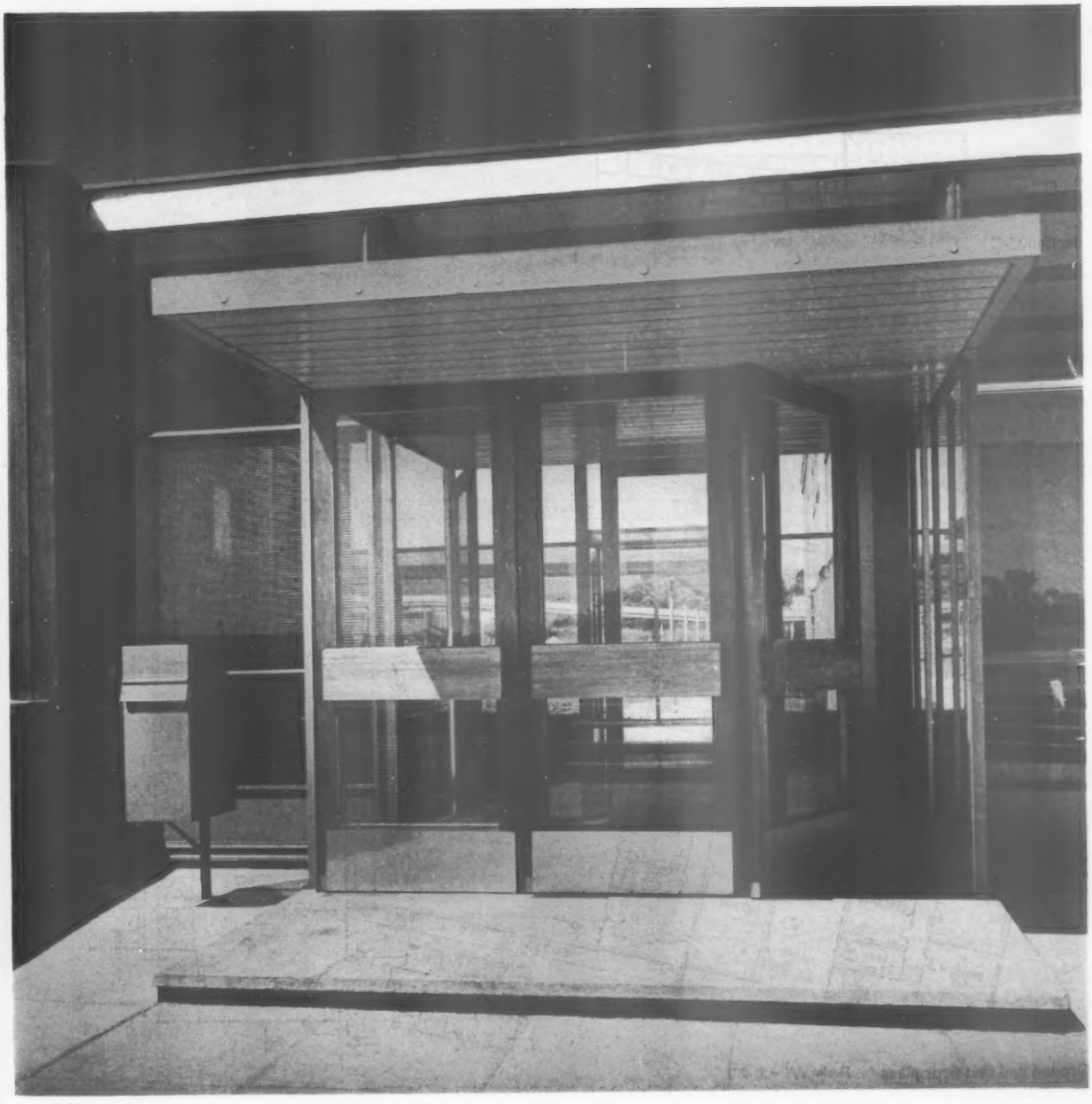
Opposite page, top: View from south of the dining space with hall behind. This shows the generally simple well-detailed external treatment. Bottom: main entrance. The porch roof is carried back into the entrance hall, and contains concealed lighting. The slim vertical tube inside the open door acts as a rainwater pipe. On the extreme left can be seen the vertical timber cladding of the staff wing. This treatment is carried right round the wing, both internally and externally, and thus creates a sense of enclosure and privacy.



Site plan

Staff wing.

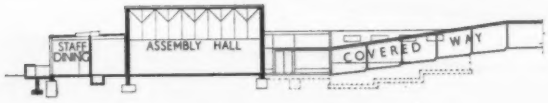




building illustrated

Section A-A

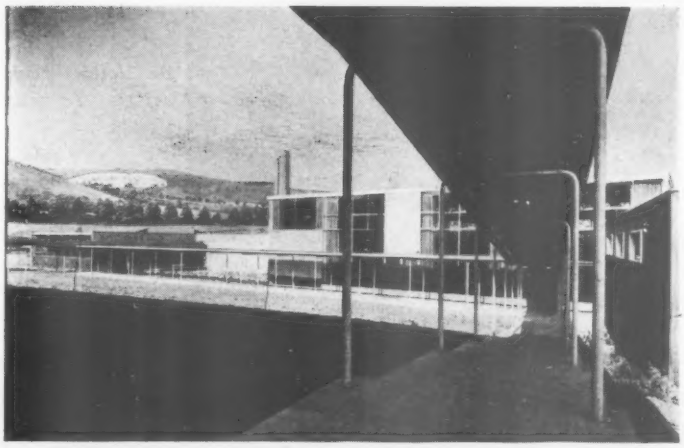
Section B-B

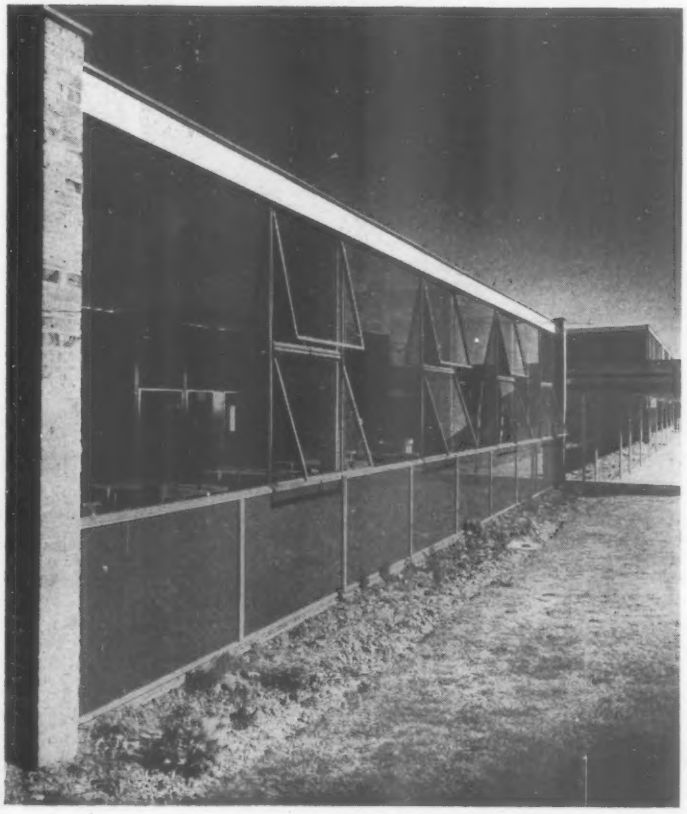


Section C-C

Opposite page, top: the courtyard from south-west corner, showing the hall and the space where the gymnasium will be. This building illustrates the least satisfactory aspect of this instalment. The courtyard has covered ways on three sides. These are virtually useless in wet weather since the rain drifts through th m and they detract from the appearance of the buildings. The school would prefer one fully glazed covered way. Centre: the teaching block from the north-east corner of the court-yard. Bottom: the woodwork shop.

Ground and first floor plans [Scale: 1/16" = 1' 0"]





analysis

CLIENT'S REQUIREMENTS

A four-form secondary school for 600 pupils replacing a previous boys' secondary school, to be erected in two instalments, of which the present buildings comprise Stage I (providing a two-form entry school of 360 " cost places "). It was required that classrooms should be on two floors, with direct access from corridors to each room and corridor communication between all classrooms on the same floor.

PLANNING AIMS

The clients desired a plan that would help in breaking the school down into smaller units. So each year's entry will be allocated to form bases in one section of the teaching wing, with separate lavatories and cloakrooms and individual storage for books, games and kit, conveniently placed in relation to the bases.

SITE

The site has extensive and interesting views, and a fall of approximately 25 ft. across from west to east. The main approach road is from the east. Previously this area was a clay pit and brickyard, and there was a local tip here for many years, so a great deal of levelling and filling work involved the movement of some 17,000 cu. yds. of material. It was also necessary to import 3,500 cu. yds. of good loam to supplement the earth stripped and saved on site, and to carry through an extensive fertilizing programme. Deep drains had to be installed prior to beginning this levelling work, to take the water from a number of springs and, after levelling, normal land drainage has been carried out, including mole drainage.

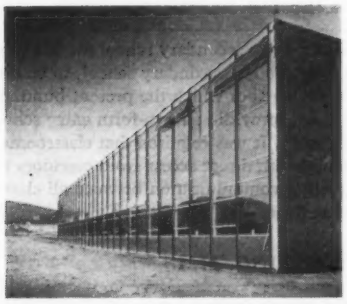
As a result, the new school was provided with a playing field of six acres, with three winter pitches, cricket table, high and long jump pits, a six-lane grass running track of four laps to the mile and four concrete practice wickets, surfaced with ruberoid, in addition to two soccer pitches on an existing playing field adjoining.

The cost of this new playing field is estimated at £8,200, of which over £3,000 was spent on provision of top soil and materials and £300 on levelling works. Though costs are high, the work has transformed a derelict waste piece of land into what will be a first class amenity.

The ground contours of the site had a major influence on the disposition of the buildings, which have been so placed as to minimize the amount of work below ground. The teaching wing, with classrooms facing east and west has been located on the highest point of the site on a level ridge, while the communal block is on the lower slopes to minimize road works to the various entrances.

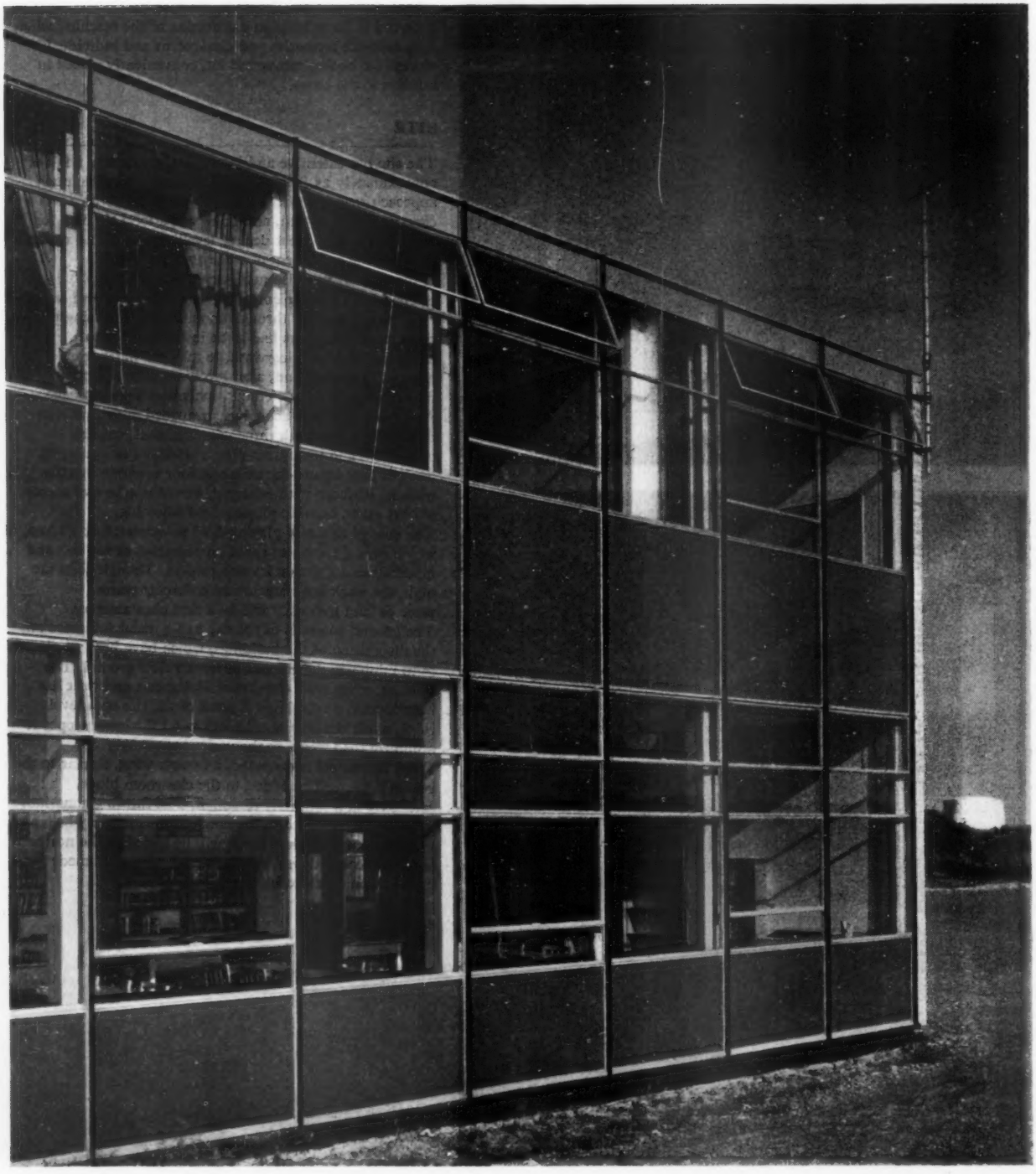
When the school is extended, a further wing, similar to the existing one, will be added to the classroom block, extending in a southerly direction. The future gymnasium will occupy the space to the north of the assembly hall, and an additional workshop block will be added to the northern leg of the covered way. Allowance has also been made for the addition of a kitchen in the future.

building illustrated



Left and below: the teaching block.

Opposite page, top: the central corridor in the teaching block. This shows the disadvantages of double banking; the congested but apparently endless space, which serves no other purpose than that of circulation. Centre : careful detailing of internal doors. Bottom: the art room.



analysis

SUMMARY

Ground floor area: 18,385 sq. ft.
Total floor area: 26,800 sq. ft.
Type of contract: Competitive tender.
Tender date: January 18, 1956.
Work began: April, 1956.
Work finished: April, 1958.
Tender price of foundations, superstructure, installations and finishes: £85,477.
Tender price of direct contracts:
Mechanical services: £13,009.
Electrical services: £4,492.
Contingencies, services contracts: £690.
Tar paving of playgrounds: £1,683.
Net cost, excluding external works and playing fields: £99,954.
External works, including drainage beyond collecting manhole: £9,980.
Total: £109,934.
Special cost for new playing fields: £8,200.

	s	d
Preliminaries and insurances		9¼
Contingencies	2	6¾
Work below ground floor level	6	2

Mass concrete stanchion bases and strip footings to brick walls.
6-in. reinforced concrete ground slab, reinforced with fabric (4·32 lb. per sq. yd.) laid on building paper on hardcore fill to make up levels.
Brickwork in special purpose sand lime bricks in 1–3 cement mortar faced with second hard yellow stock facing bricks.
Damp proof course: Hessian-based, lead-cored bituminous felt.

STRUCTURAL ELEMENTS

Frame or load-bearing element — 6 6¾

Steel frame, part exposed and painted, partly cased with concrete (150 cu. ft.) and partly cased with timber, expanded metal and plaster (323 sq. yds.).
(Note that the cost of expanded metal and plaster are given under " Finishes.")

External walls — 2 9½

Partly solid and partly 11-in. cavity in class B sand lime bricks in mortar (1 : 2 : 9 composition) faced generally with second hard yellow stock facing bricks. 45 sq. yds. finished with black quarry tiles.
The detached circular tapered boiler chimney stack, 6 ft. 6 in. o.d. at base and 53 ft. 6 in. high from foundation, is faced with dark stock facing bricks and lined with insulating bricks.
Administration wing has studded and 1-in. cedar weather boarding.
Note that curtain walls are included under " Windows " below.

$$\text{Ratio: } \frac{\text{solid walls}}{\text{floor area}} = \frac{0\cdot302}{1}$$

Windows — 9 0½

Purpose-made galvanized steel windows, part opening. Lower panels in curtain walling filled with concrete block and vitreous slab, or with vitreous slab with asbestos insulation board backing.
In the administration block there are 10 horizontally pivoted timber windows.

$$\text{Ratio: } \frac{\text{windows}}{\text{floor area}} = \frac{0\cdot404}{1}$$

building illustrated

The woodwork room. The exposed partition blocks and beams give this room the right character.

Above: external view of assembly hall. The ground level window lights a store under the stage. The loose pebbles on this side of the covered way form the open top of a land drain. Below: inside the assembly hall, used also as a gymnasium.

analysis

	s	d
External doors		5½
2 pairs double doors of purpose-made galvanized steel.		
1 steel roller shutter, 8 ft. × 8 ft.		
1 single cedar f.l.b. door in cedar frame.		
1 single softwood f.l.b. door in softwood frame.		
1 pair double.		
2 single flush doors in softwood frame.		
1 single f.l.b. door of African mahogany in African mahogany frame.		
1 pair double, and 1 single in two halves.		
3 pairs casement doors in African mahogany with metal frame.		
2 sets of 3 ditto.		
Total of single doors, 6; total of double doors, 9 pairs.		
(Note that both outer and inner doors of draught lobby at main entrance are counted as " external doors," and that metal frames for wooden doors are included for cost under " windows.")		
Ratio: $\frac{\text{doors}}{\text{floor area}} = \frac{0{\cdot}021}{1}$		
Upper floors	1	4½
6-in. precast r.c. slabs with 10-ft. span and 60 lb. per sq. ft. superload. 800 sq. yds.		
5¾-in. ditto with 7 ft. 6 in. span and 100 lb. per sq. ft. superload. 61 sq. yds.		
Staircases		8
2 staircases, 4 ft. wide with total rise of 12 ft. 1½ in.		
1, 3 ft. 6 in. wide, total rise, 2 ft. 9 in.		
1, 3 ft. 6 in. wide, total rise, 3 ft.		
1, 3 ft. 6 in. wide, total rise, 2 ft. 6 in.		
1, 3 ft. wide, total rise, 3 ft.		
No. of staircases, 6.		
Roof construction	2	2¼
Boiler room: 5-in. precast r.c. with 10-ft. span and 30 lb. per sq. ft. superload, 129 sq. yds.		
Two-storey block: 2-in. strawboard slabs on pressed steel tee supports, 1,449 sq. yds.		
Single-storey block: 2-in. ditto on wood bearers, 123 sq. yds.		
Hall: 2½-in. aluminium decking on steel bearers (of which cost is included under " frame " above), 120 sq. yds.		
Administrative building: 2½-in. ditto on wood bearers, 330 sq. yds.		
Total area of roof, 2,151 sq. yds.		
Rooflights		9½
11 rooflights and 1 canopy with a total area of 1,590 sq. ft., consisting of patent glazing on wood curbs or bearers.		
Cost includes glazing.		
Glazing (other than rooflights)		7¾
24-oz., 32-oz., ⅛-in., ¼-in. g.w. cast, ¼-in. polished plate, ¼-in. g.w.p.p., ¼-in. obscured.		
(*Note:* cost includes glazing of internal doors and screens.)		
Total of structural elements: 24s 5¾d		

analysis

PARTITIONS AND FITTINGS

	s	d
Internal partitions	1	6½
Half brick walls in common sandlime bricks.		
P.f.a. blocks, 2½ in., 3 in. and 4 in. thick.		
1½-in. reinforced terrazzo partition.		
Steel demountable partition and racks.		
Screens		6½
1 folding and sliding partition, 23 ft. 6 in. × 8 ft. 0⅛ in.		
(Cost includes sliding gear and track.)		
1 ditto, measuring 47 ft. 6 in. × 9 ft. 9½ in.		
Metal windows in borrowed lights (84 sq. ft.).		
Internal doors	1	0½
4 single 1⅜-in. BS flush fire resisting doors.		
16 single 1-in. blockboard flush doors.		
1 pair double ditto.		
2 pairs double 1-in. blockboard flush doors faced with ⅛-in. steel-faced asbestos panel, lipped with aluminium angle.		
1 single 2-in. softwood f.l. and b.		
5 pairs double ditto.		
3 single 2-in. softwood casement doors.		
2 single 2-in. softwood trap doors.		
46 single 1⅜-in. B.S. flush doors.		
1 double ditto.		
8 pairs 2-in. African mahogany casement doors.		
Ironmongery		9½
Floor springs to 32 doors.		
Satin anodized aluminium furniture on principal doors.		
Fittings	6	3½
Gym equipment, light baffles and diffusers and troughs for light fittings.		
Curtain tracks, including stage curtain and gear, and blackout blinds.		
Cloak, changing and drying room equipment.		
Cat ladders.		
Shelving, cupboards, display boards.		
Benches, bench tops, fume cupboard, plan chests.		
Kitchen equipment (apart from cooking equipment, provided under a separate contract).		
Fixing only of cooking equipment, and all teaching and workshop equipment, etc., supplied by County Education Authority.		

Total of partitions and fittings: 10s 2½d

FINISHES

Floor finishes 3 9½

Type of finish	*Area in sq. yds.*	*Price per sq. yd.*
Thermoplastic tiles	945	15s 5¾d
Hardwood block and strip	1,505	34s
Granolithic, 1 in.	397	10s 4d
Ditto, 1¼ in.		11s 5d
Ditto, 2 in.		14s 8d.
2-in. precast concrete flags	4	17s 9d
Clay tesselated tiles	28	44s 6d
Precast terrazzo tiles	11	58s
Cement sand and paving	16	4s 6d

	s	d
Wall finishes (including stanchions)	1	0½
Fair-faced brick	366 sq. yds.	
Yellow stock facing bricks	7	
Fair-faced p.f.a. block	774	
⅜-in. plaster board and skim coat plaster	93	
½-in. insulation board	89	
Plaster	2,466	
Cement and sand plain face	21	
Waterproofed ditto.	62	
White glazed tiles	36	
Ceiling finishes (including beams, etc.)	1	3½
Suspended 2-ft. × 2-ft. insulation board panels	1,030 sq. yds.	
½-in. plasterboard and skim coat plaster	102	
Plaster	190	
Cement and sand plain face	166	
Roof finishes	2	2
2-layer bituminous felt	45 sq. yds.	
3-layer ditto. with ½-in. granite chippings	1,500	
3-layer ditto., ditto. on 1-in. insulating board	605	
Decorations	2	0
Ceilings and walls generally, 2 coats emulsion paint, or 1 coat emulsion paint and 1 coat chlorinated rubber paint.		
Other walls, some papered, elsewhere, 2 coats semi-gloss paint.		
Structural steel, generally, 1 coat chlorinated rubber aluminium paint; where exposed, 1 additional coat and 1 coat chlorinated rubber-based enamel.		
Metalwork, generally, primer and 2 coats, internally and externally.		
Softwood, prime and 3 coats, internally and externally.		
Hardwood, oil and wax polish internally, oil and twice varnished externally.		
Cedarboarding externally is untreated.		

SERVICES

External plumbing	0	1½
3-in. and 4-in. spun iron caulked joints. 3-in. and 4-in. enamelled steel.		

analysis

Sanitary fittings — s 1, d 3½

Type of fitting	*No. of each type*
Sinks	29
Lavatory basins	30
H.L. W.C.s	3
L.L. W.C.s	3
Drinking fountains	5
W.C.'s with flushing troughs	9
6 ft. slab urinal	1
7 ft. 6 in. urinals	3
Foot bath	1
4-in. glazed stoneware half-round floor channel	11-ft. run
6 in. ditto, ¾ round floor channel	248-ft. run

Hot and cold water installation — 3 8½

Heating and hot water are supplied from boilers in the boiler house, through hospital type radiators and mechanical convector heaters. Control is by motorised valves and thermostats which control the heating in various parts of the building.
Control of the hot water to the run-through showers is by blenders and to individual showers by mixers.

Heating and ventilation — 6 0½

Internal temperature: 62 deg. F.
Air changes per hour: 1½.
" U " of walls: 0·3 to 0·7. " U " of roof: 0·25.

Gas installation — 5½

47 points.

Electrical installation — 3 5½

Type of point	*No. of each type*
Light points	262
Switch sockets	57
Power points (for motors, fans, etc.)	29
Fire alarm contacts	9
Fire alarm bells	7

Total of Services = 14s. 11½d.

Drainage (to collecting manhole) — 2 8½

Rainwater drains, second quality stoneware; soil drains standard stoneware.
R.W. and soil drains under buildings, cast iron.

Playgrounds — 2 5½

External works and ancillary buildings
Drains beyond last collecting manhole, covered ways, cycle shed and groundsman's store.
Entrance gates, piers and noticeboard. Mains for water, gas and electricity, roads, paths and external steps and paving. External crawlway for services.
per sq. ft. of floor area =
£99,954 (net cost excluding external works) / 26,800 sq. ft. (measured within external walls) = **74s. 7½d.**

COST COMMENTS

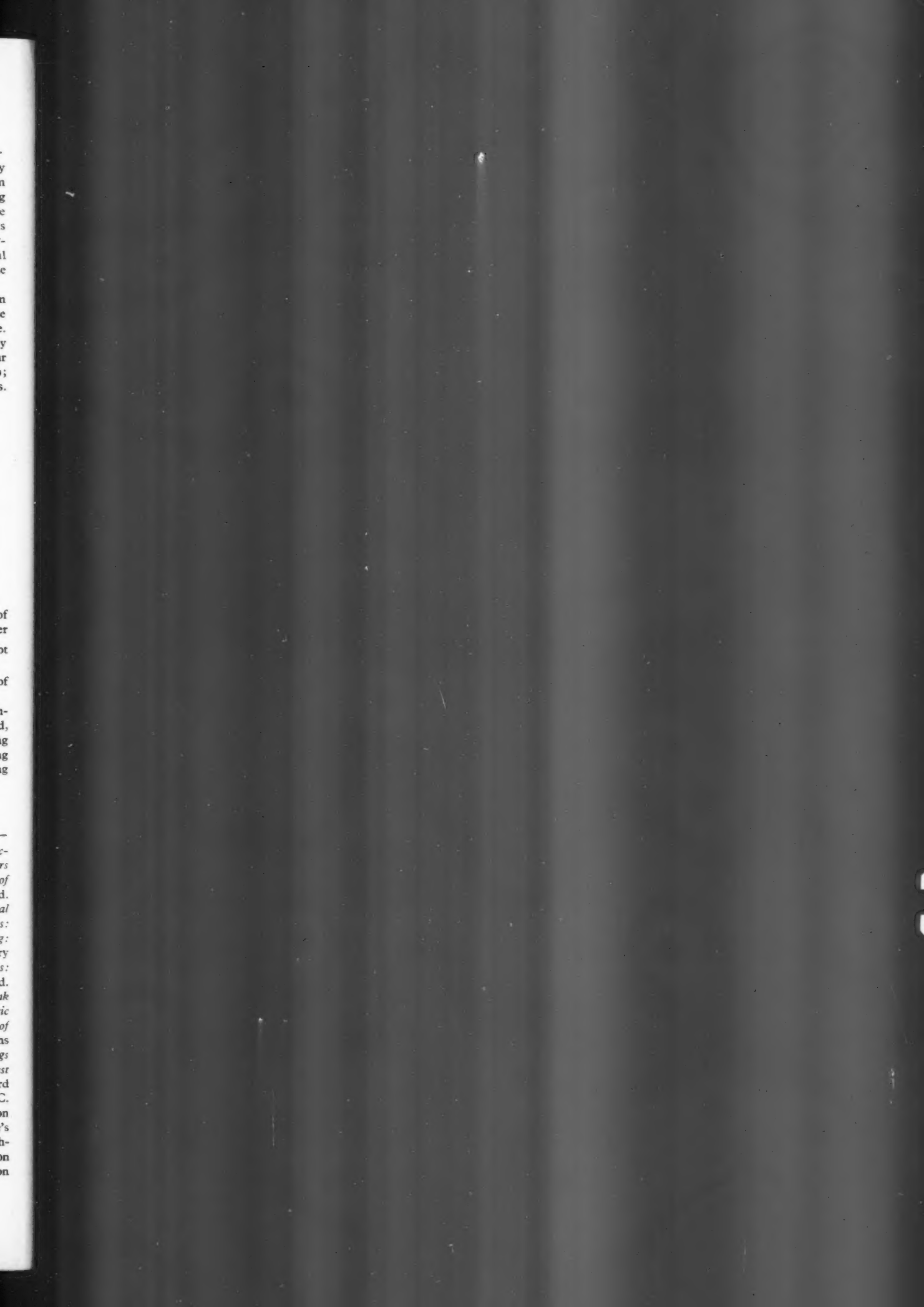
The erection of a building in two instalments, especially when working to a tight budget, always provides a problem of delicately dividing the total allowed cost, while enabling the first part of the building to work satisfactorily while the second part is being built. In educational projects the targets are clearly defined by " cost places." In this case the allowance is set at 360 cost places by £264, while the actual number of pupils is only 300, the difference being the Ministry of Education allowance for instalment building.
Normally services take a higher proportion of costs in instalment schemes, because the bulk of equipment and the boiler house have to be provided in the first phase. Examination of the costs at Hillside shows no outstandingly expensive group of elements, and comparison with similar secondary schools (Falmouth, AJ, February 26, 1959; Dawley, AJ, August 20, 1959) shows no great dissimilarities. Here is how the costs have worked out:

	s.	*d.*	*Per cent*
Preliminaries and insurances		9¼	1·04
Contingencies	2	6¾	3·43
Sub-structure	6	2	8·27
Structural elements	24	5¾	32·81
Partitions and fittings	10	2½	13·68
Finishes	10	3¾	13·8
Services	14	11¾	20·08
Drains to nearest collecting manhole	2	8½	3·64
Playgrounds	2	5	3·25
	74	7½	100

The purpose designed windows at 9s. 0½d. per sq. ft. of floor area, with ratio of 0·404 is equivalent to a cost per sq. ft. of window of $\frac{9\cdot0\frac{1}{2}\text{d.}}{0\cdot404}$, or 22s. 4d., which is not expensive, bearing in mind the cost of standard systems of curtain walling.
One unusual aspect of the site was the amount of earth-moving and reinstatement and reclamation of derelict ground, amounting to a cost of £8,200. The choice of a site requiring such an outlay reflects the shortage of available building land, and must have added to the architect's planning problems.

CONTRACTORS

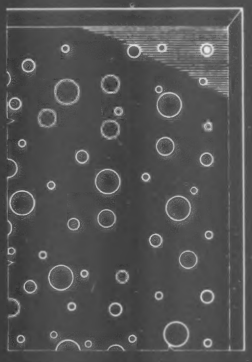
General contractors: R. J. Barwick. *Sub-contractors: Structural steelwork:* R. W. Sharman Ltd. *Metal windows, doors and rooflights:* Morris Singer Co. Ltd. *Aluminium roof decking and bitumen felt roofing:* D. Anderson & Son Ltd. *Heating and hot water:* M. W. Longley Ltd. *Electrical installation:* Troughton & Young Ltd. *Suspended ceilings:* Sundeala Board Co. Ltd. *Thermoplastic tile flooring:* Neuchatel Asphalte Co. Ltd. *External metal ducts:* Canterbury Sheet Metal Works Ltd. *Hardwood block and strip floors:* Vigers Bros. Ltd. *Roller shutters:* Shutter Contractors Ltd. *Tar paving works:* P. A. Barden & Sons Ltd. *Chain link fencing:* Boulton & Paul Ltd. *Suppliers: Bar and fabric reinforcement:* G.K.N. Reinforcements Ltd. *Precast r.c. roof and floor units:* Truscon Ltd. *Sanitary fittings:* Stitsons Sanitary Fittings Ltd. *Cloakroom and changing room fittings and ironmongery:* Childs Constantine & Co. Ltd. *Precast terrazzo lavatory partitions, stair treads and landings:* Standard Lavements Co. Ltd. *Gearing to sliding folding doors:* P. C. Henderson Ltd. *Metal radiator shelf brackets:* Woodson Engineering Co. Ltd. *Plastic letters and card holders:* Dale's (Lettering) Ltd. *Stage curtain track:* Super Theatre Furnishings Ltd. *Metal balustrading, entrance gates:* Woodson Engineering Co. Ltd. *Bicycle racks:* Lockerbie & Wilkinson Ltd. *Blackout blinds to rooflights:* Accordo Blinds Ltd.



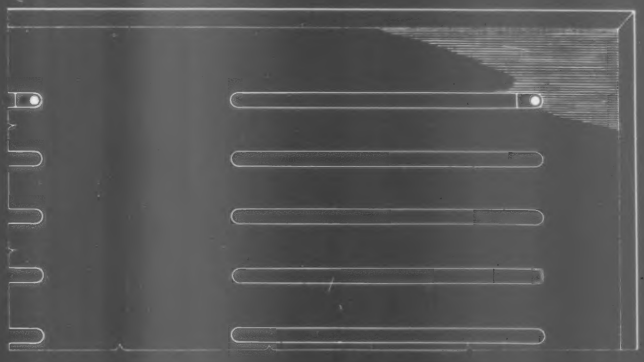
ACOUSTICS | PRODUCTS

The Architects' Journal Library of Information Sheets 740. Editor: Cotterell Butler, A.R.I.B.A.

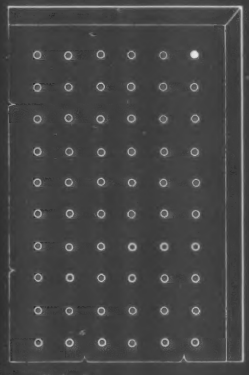
standard



random



slotted

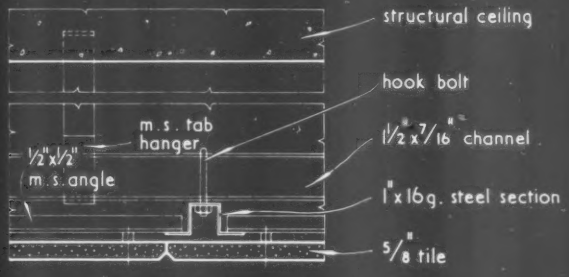


small hole

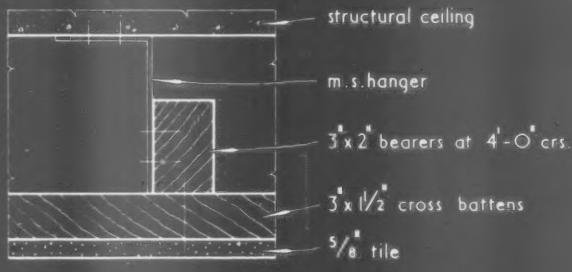
type of tile	airspace (in.)	frequency (cycles per second)							
		125	250	320	400	500	1000	2000	4000
standard, with backing of glass-fibre tissue	6•	0·25	0·55	0·65	0·65	0·70	0·35	0·25	0·20
	3•	0·25	0·40	0·60	0·60	0·65	0·50	0·35	0·30
	1•	0·20	0·30	0·55	0·65	0·65	0·60	0·35	0·25
standard, with 1" glass-fibre backing	6•	0·30	0·65	0·70	0·70	0·80	0·45	0·40	0·30
	3•	0·30	0·50	0·65	0·70	0·80	0·60	0·40	0·35
	1	0·30	0·45	0·65	0·70	0·80	0·70	0·45	0·40
random, with backing of glass-fibre tissue	6•	0·25	0·60	0·70	0·70	0·75	0·45	0·35	0·25
	1•	0·20	0·40	0·65	0·70	0·70	0·75	0·45	0·35
random, with 1" glass-fibre backing	6•	0·35	0·65	0·75	0·75	0·80	0·60	0·45	0·40
	1	0·25	0·50	0·65	0·75	0·75	0·80	0·60	0·45

• free airspace

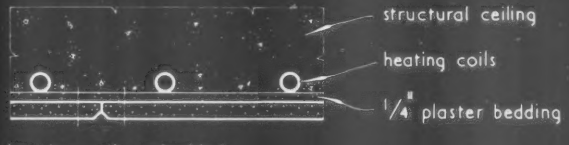
RANGE OF TILES AND TABLE OF SOUND ABSORPTION FIGURES.



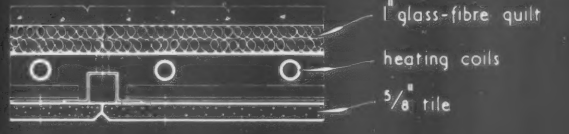
METAL FIXING SYSTEM.



FIXING BY METAL AND TIMBER SUSPENSION.

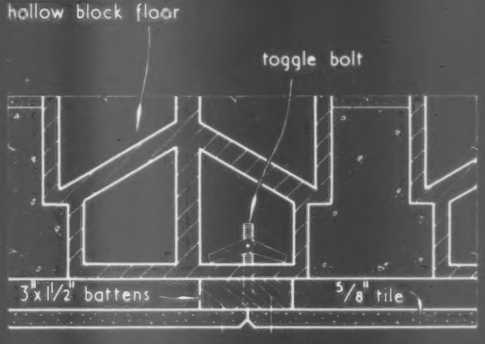


heating coils embedded



heating coils suspended

HEATED CEILINGS.



FIXING TO HOLLOW BLOCKS.

·SUPACOUST· ACOUSTIC TILES. Manufacturer : Petradene Ltd.

27.C3 ·SUPACOUST· ACOUSTIC TILES

This Sheet describes Supacoust tiles which are available in a range of patterns for fixing to all types of ceiling for sound absorption.

Description

The tiles are of hardened gypsum plaster, perforated in several different standard patterns, as shown in the drawings on the face of the Sheet; other designs can be supplied to the architect's individual requirements. The face of the tiles is tooled except in the case of the small hole pattern which is smooth. Fixing holes for screws are provided at each corner, and intermediately on the larger tiles. The tiles are normally backed with a sheet of glass-fibre tissue or, if required, they can be backed with 1-in. glass-fibre insulation cut to size and covered with a thin polythene sheet.

Sizes

Standard: 24 in. by 24 in., 24 in. by 24 in. (divided into 12 in. by 12 in. squares). 24 in. by 20 in., 24 in. by 18 in., 24 in. by 14 in., 24 in. by 12 in., 20 in. by 20 in., 20 in. by 16 in. 29¼ in. by 21 in., 23½ in. by 22½ in., 30 in. by 15 in. } ⅝ in. thick

Small hole: 12 in. by 12 in. by ½ in.

Random: 24 in. by 24 in., 24 in. by 36 in., 30 in. by 30 in., 23¾ in. by 23¼ in., 20 in. by 20 in., 23¾ in. by 23¾ in. (not milled). } ⅝ in. thick

Slotted: 24 in. by 24 in. by ⅝ in.

Other sizes may be obtained to order.

Weight

The tiles weigh 2¾ lb. per square foot.

Installation

The drawings on the lower face of the Sheet show typical applications of the tiles. The tiles are fixed in all cases by screwing through the holes provided. The first detail shows a metal fixing system obtainable from the manufacturer and the details on the right show suspension by timber bearers and battens from metal straphangers and fixing by battens and toggle bolts to hollow blocks. The tiles can be used for heated ceilings, as shown on the left, the pipes being embedded in the soffit or suspended. For ventilation purposes, to take into or extract air from a plenum chamber, the backing can be omitted from selected tiles. Any type of light fitting can be incorporated in Supacoust suspended ceilings: various manufacturers, e.g. General Electric Co. Ltd., Ekco-Ensign Electric Ltd., Harris & Sheldon (Electrical) Ltd., produce standard fittings to modular sizes.
The tiles are readily demountable for access to services.

Sound Absorption

The table on the face of the Sheet gives sound absorption figures for two types of tile with and without a 1-in. backing of glass fibres, and with different airspaces.

Fire Resistance

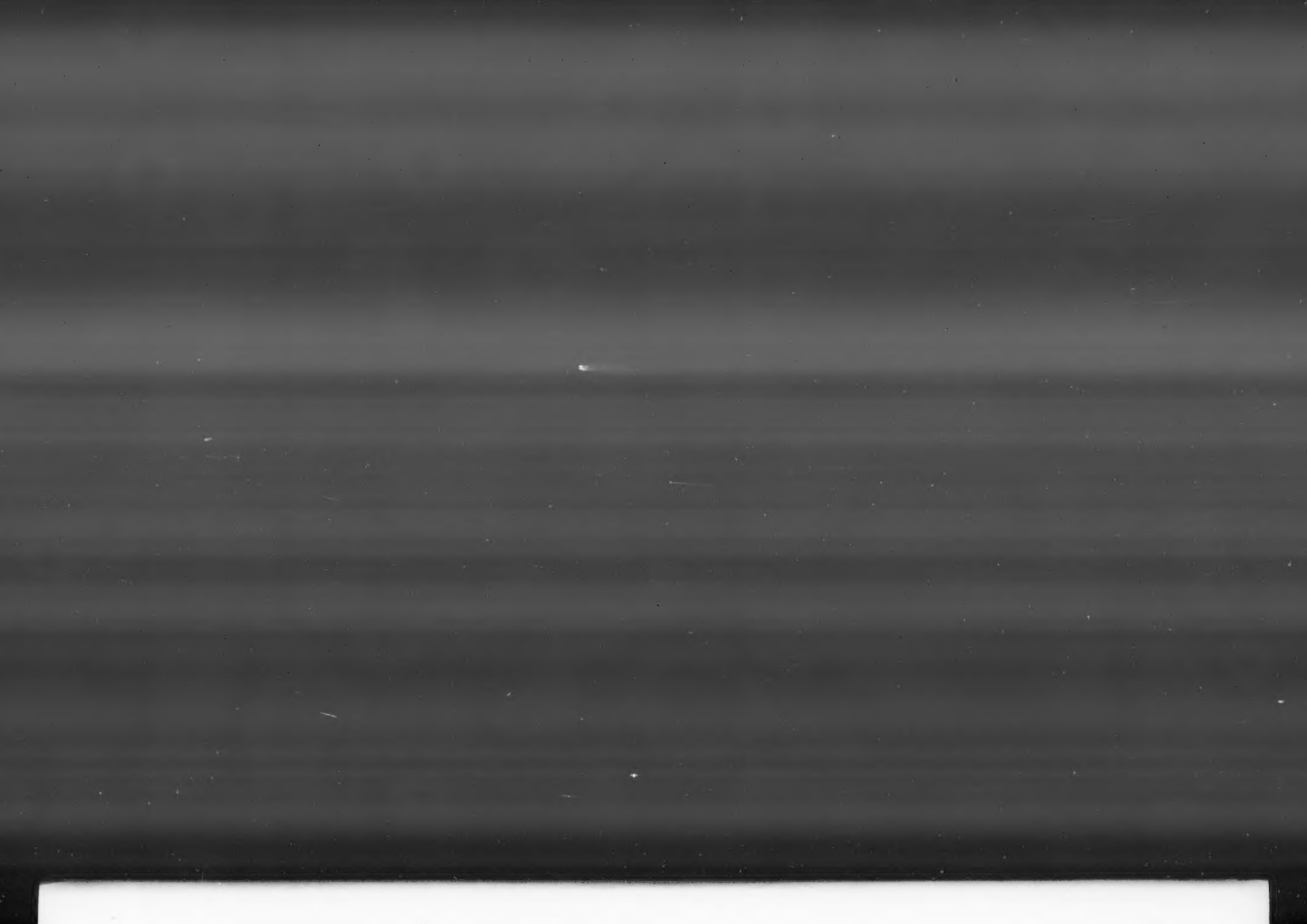
The tiles are non-combustible with a Class 1 spread of flame rating tested in accordance with B.S.476:1953.

Further Information

The manufacturer maintains a technical advisory service available to deal with acoustical problems and prepare layouts.

Compiled from information supplied by:

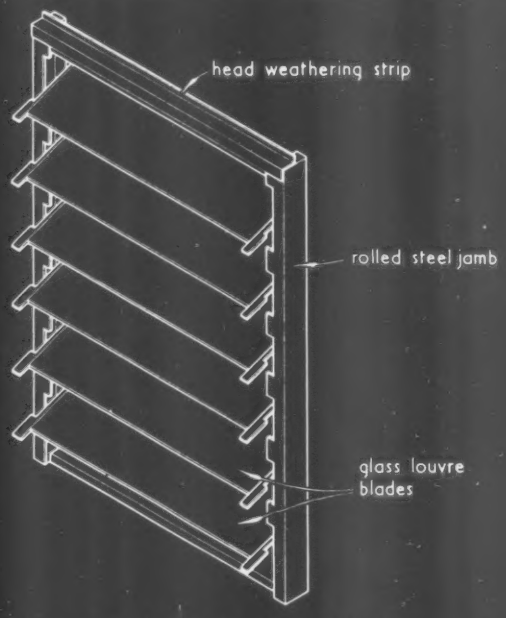
Petradene Limited.
Address: 7-8, Hobart Place, London, S.W.1.
Telephone: Sloane 8196.



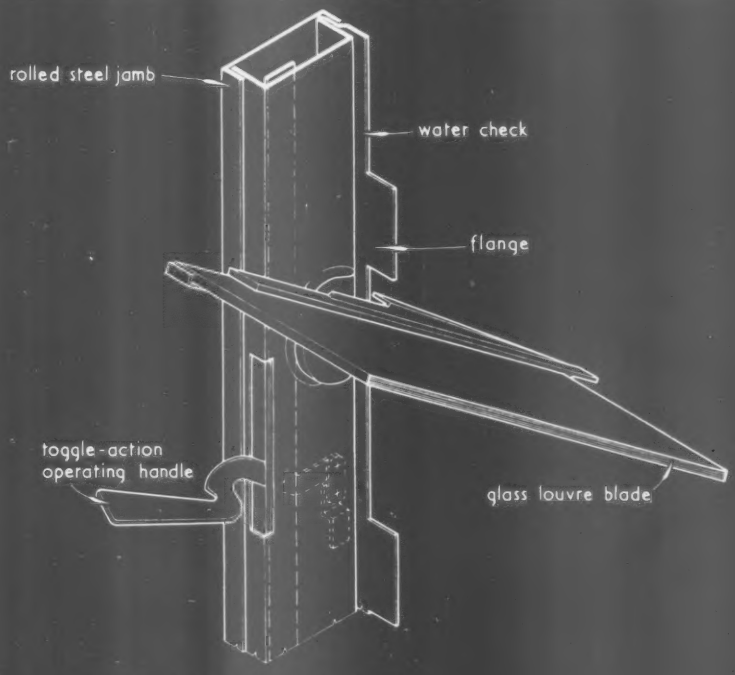
VENTILATION | NATURAL | LOUVRES

30.D22

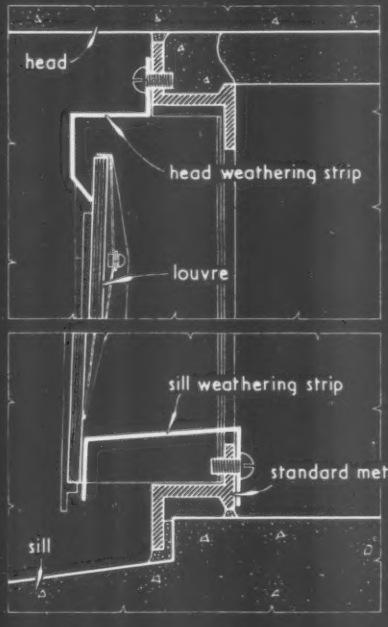
The Architects' Journal Library of Information Sheets 741. Editor: Cotterell Butler, A.R.I.B.A.

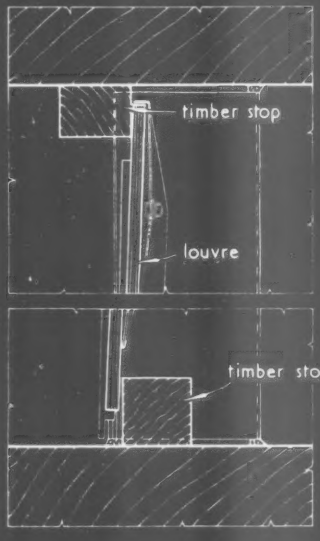


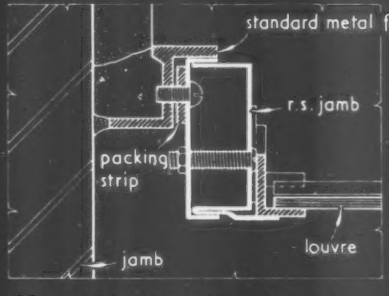
ISOMETRIC SKETCH OF TYPICAL LOUVRE.



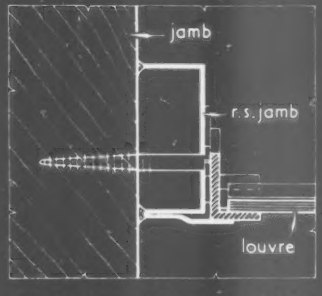
SKETCH OF OPERATING HANDLE.



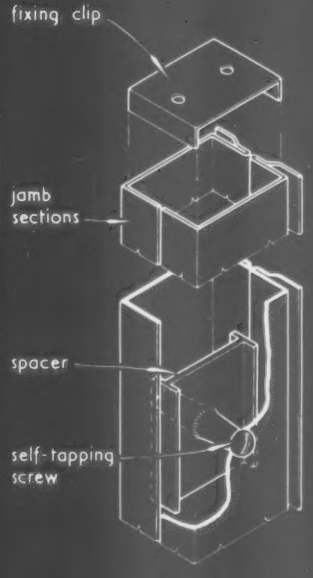




APPLICATION TO METAL FRAME.



APPLICATION TO TIMBER FRAME.



DETAIL OF MULLION FIXING.

FENESTRA GLASS LOUVRES. Manufacturer: The Crittall Manufacturing Co. Ltd.

30.D22 ·FENESTRA· GLASS LOUVRES

This Sheet describes Fenestra glass louvres which can be installed in metal or timber frames as complete windows or in conjunction with other glazing. They give complete ventilation and are entirely weatherproof even under extreme conditions.

Construction

The louvre consists of 18 g. galvanised rolled steel jambs with die-cast zinc-alloy bearers to take 6-in. wide glass blades from 32 oz. to $\frac{1}{4}$ in. thick. The blades are held by spring clips to prevent rattling and lap $\frac{1}{2}$ in. Each blade closes under and over a flange which projects from the watercheck on the jamb. One toggle-action operating handle is supplied as standard, but an extra handle can be fitted, if required, to enable two parts of the louvres to operate independently. The blades can be held open at any angle up to 5° beyond the horizontal, the last-named position greatly increasing the air flow. Where the louvre is to be used with standard metal windows, it is obtainable, for small extra cost, with head and sill weathering members and jamb covers prepared for application to metal frames. Fixing clips and spacers are available for coupling the jambs to form mullions.

Sizes and Types

For application to timber frames: The louvres are obtainable in heights from 1 ft. $5\frac{1}{2}$ in. to 6 ft. 6 in. in $5\frac{1}{2}$-in. increments (i.e. the width of one blade minus $\frac{1}{2}$-in. lap). The four larger sizes are fitted with two operating handles.

For use with standard metal windows: Single louvres are obtainable 2 ft. $0\frac{3}{4}$ in., 3 ft. $0\frac{3}{8}$ in., 4 ft. 0 in., 4 ft. $11\frac{5}{8}$ in. high by 1 ft. 8 in., 2 ft. $0\frac{3}{4}$ in. wide.
In addition two or three louvres can be coupled side by side within standard metal frames. Double assemblies are 2 ft. $0\frac{3}{4}$ in., 3 ft. $0\frac{3}{8}$ in., 4 ft. 0 in., high by 3 ft. $3\frac{1}{4}$ in., 4 ft. $0\frac{3}{4}$ in., 4 ft. $10\frac{1}{2}$ in. wide and 4 ft. $11\frac{5}{8}$ in. high by 3 ft. $3\frac{1}{4}$ in., 4 ft. $0\frac{3}{4}$ in. wide. Three-louvre assemblies are 2 ft. $0\frac{3}{4}$ in., 3 ft. $0\frac{3}{8}$ in., 4 ft. 0 in. high by 6 ft. $0\frac{3}{4}$ in. wide.
The four alternative heights have 4, 6, 8 and 10 glass blades, respectively.

Fixing

Application to timber frames: The jamb fitted with the operating handle should be fixed first, screwing it firmly to the side of the opening. The opposite jamb should be held by one untightened screw at the top so that the bottom of the channel can be adjusted. The glass blades are then placed in position by sliding them between the bearers at each side. The louvres are then closed and the unfixed side adjusted until all the louvres are close and firm across the window opening: the second side is then finally secured. The timber stops shown in the drawings on the face of the Sheet are screwed into position so that they just touch the blades of the louvre when closed: the use of a mastic caulking material under the bottom stop is recommended.
Where mullions are to be fitted, the outer jambs are fixed first and the mullion fixing clips at head and sill screwed into position. The spacers are fixed into the channel which has the operating handle and this channel is placed in the fixing clips at head and sill first: the other channel is then applied and the two screwed together.

Application to standard metal frames: The channel sections to which are welded full-length 14 gauge galvanised steel packing strips are screwed into the side rebates of the standard metal frame as shown in the first section on the lower face of the Sheet, so that the packing strips fit against the rebates. The jamb sections are then fixed and the head weathering applied to the outer face of the window frame, ensuring that it is firmly seated on the jambs, and mullions if any. The sill weathering strip is screwed to the inner face of the frame so that it forms a stop for the lowest blade of the louvre. Mullions are assembled as described under *Application to timber frames.*

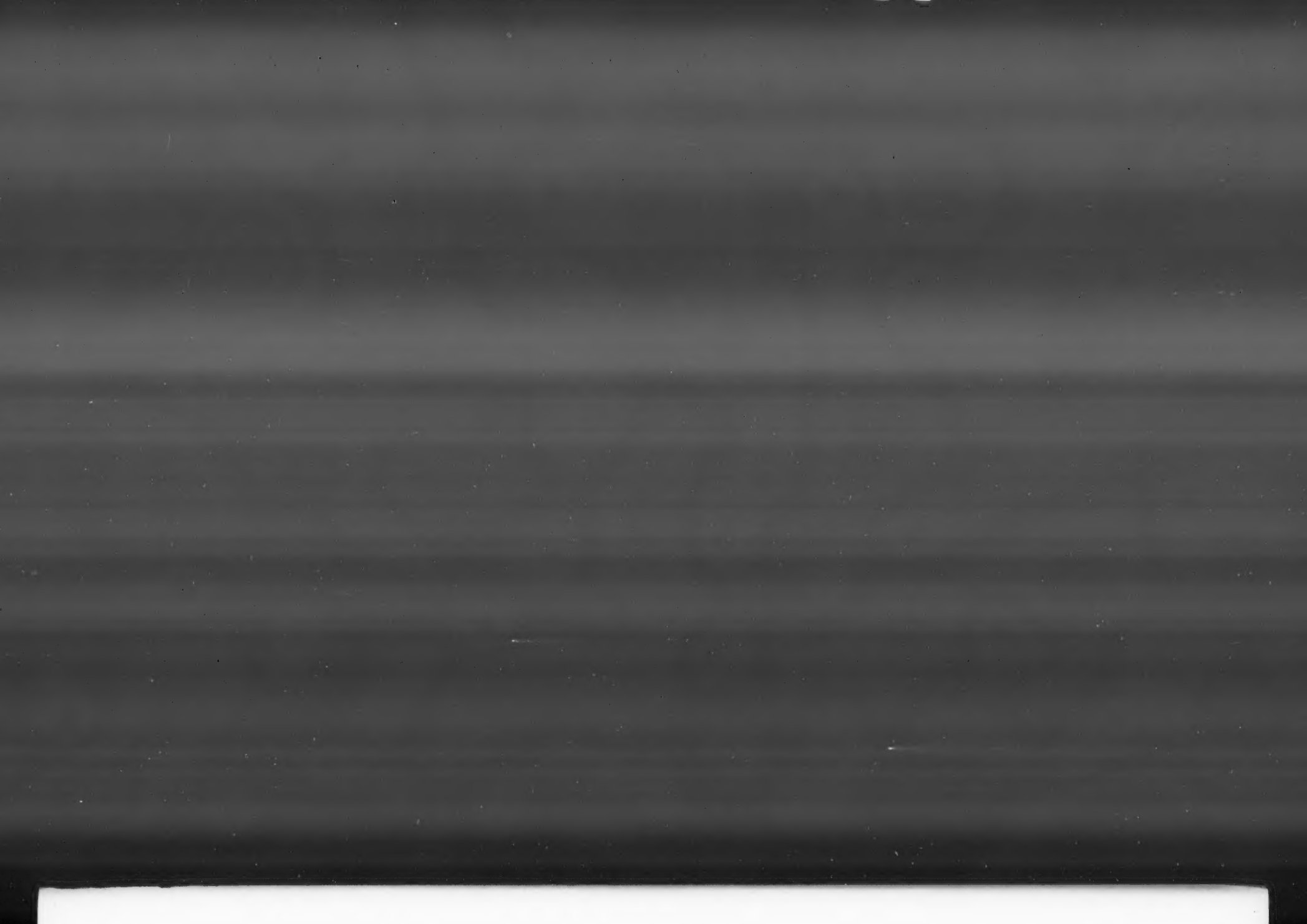
Glass: The glass for the louvre blades should be not less than $\frac{5}{16}$ in. thick (32 oz.) or more than $\frac{1}{4}$ in. 32 oz. glass blades should not exceed 2 ft. 6 in. in length and $\frac{1}{4}$ in. should not exceed 3 ft. 0 in. Arrises should be ground.

Finish

Jambs, bearers, handles, etc., are finished with one coat of aluminium paint. Head and sill weatherings are galvanised.

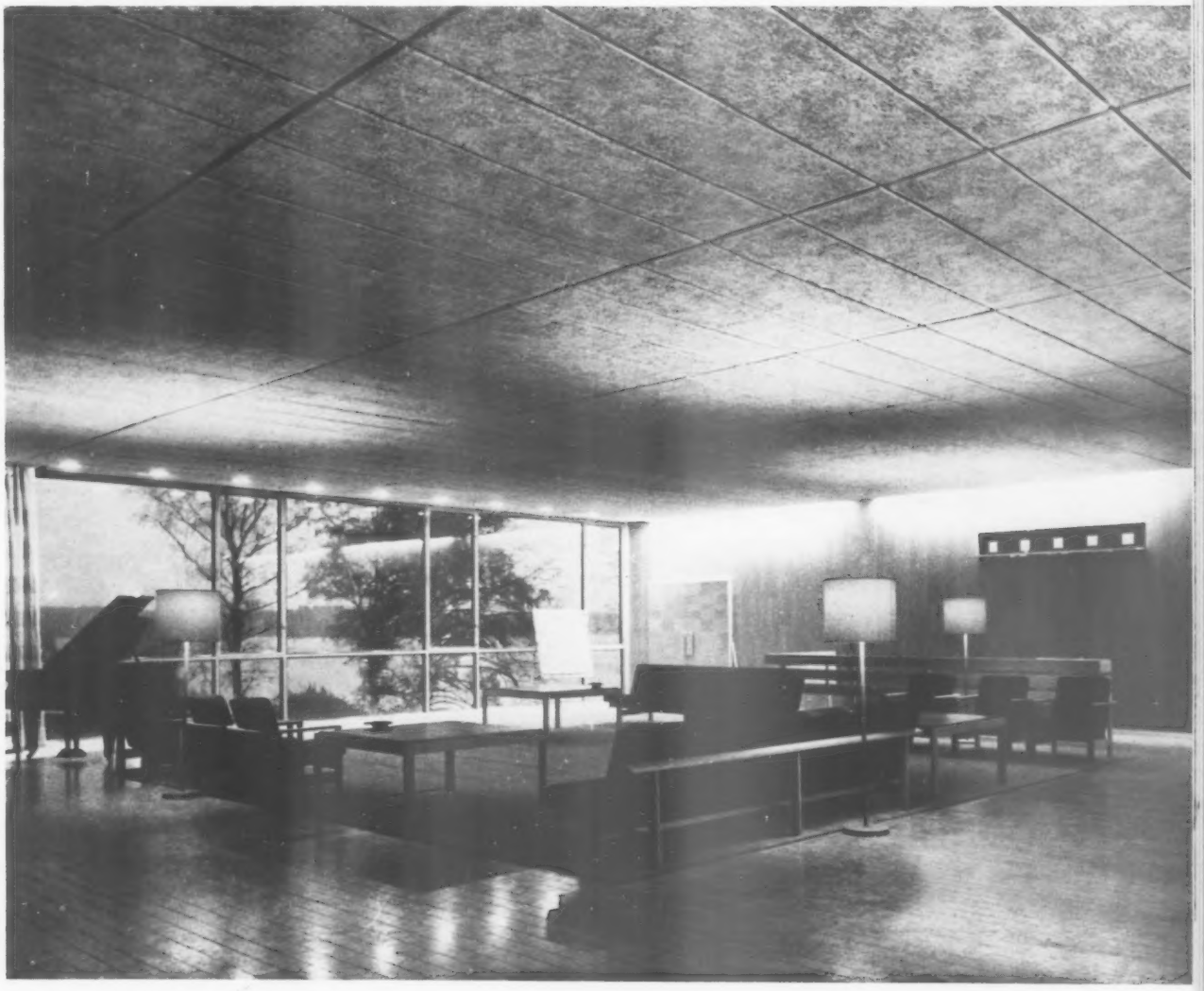
Compiled from information supplied by:

The Crittall Manufacturing Company Limited.
Address: Manor Works, Braintree, Essex.
Telephone: Braintree 106.
London Office: 210, High Holborn, London, W.C.1.
Telephone: Holborn 6612-9.



CEILING: TRAINING CENTRE IN STOCKHOLM

Anders Tengbom, architect (material supplied by Alice Mylo)

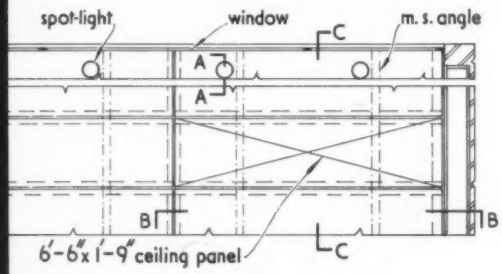


This ceiling in the main assembly room is of suspended woodwool slabs screwed to longitudinal battens. An air space is left between the ends of the slabs at the cross battens, the air passing through ventilating domes in the concrete roof. Fluorescent tubes are concealed round the ceiling perimeter and spot-lights and a curtain track are recessed above the window. The slabs are whitewashed, the longitudinal battens being printed white and the cross battens, grey.

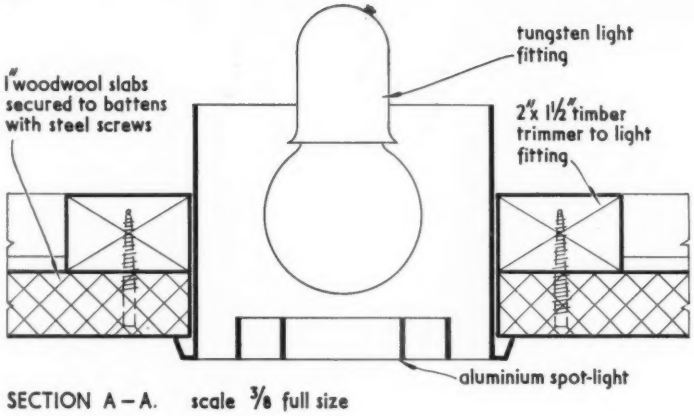
working detail

CEILING: TRAINING CENTRE IN STOCKHOLM

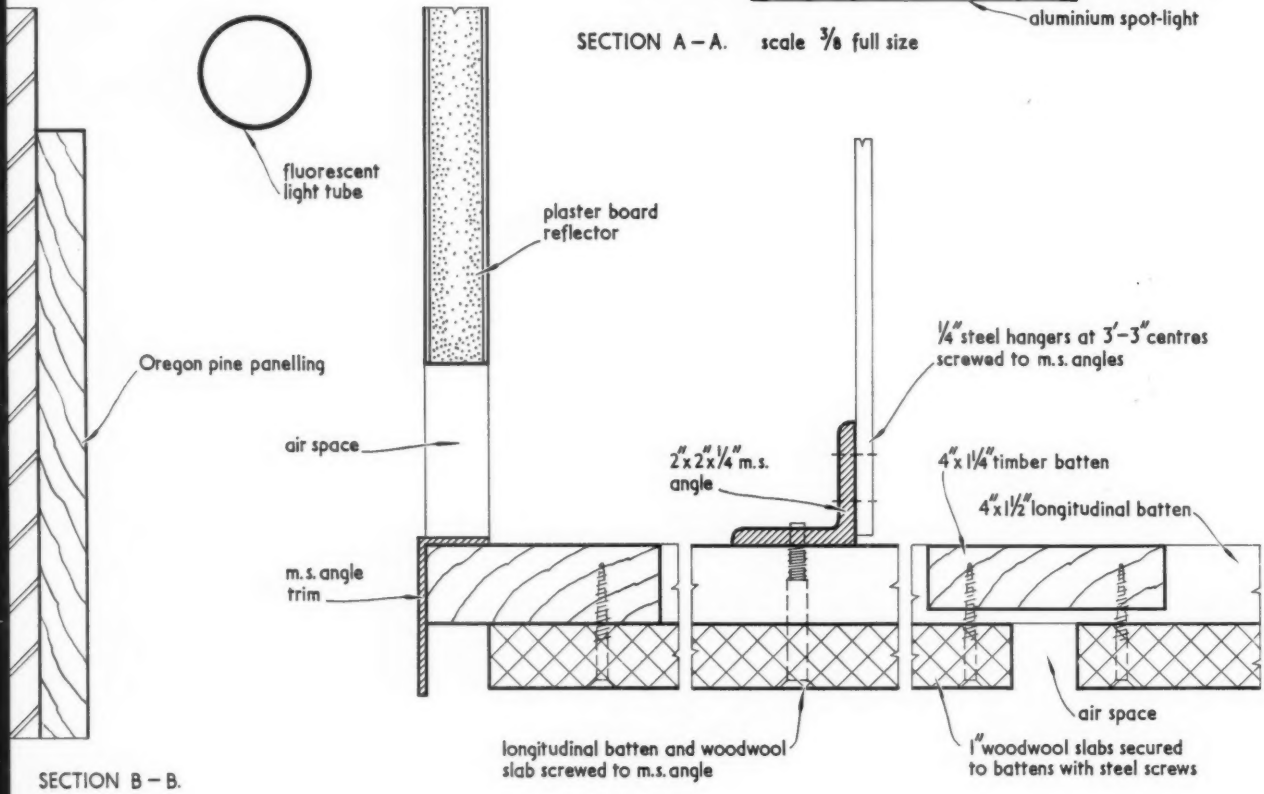
Anders Tengbom, architect (material supplied by Alice Mylo)



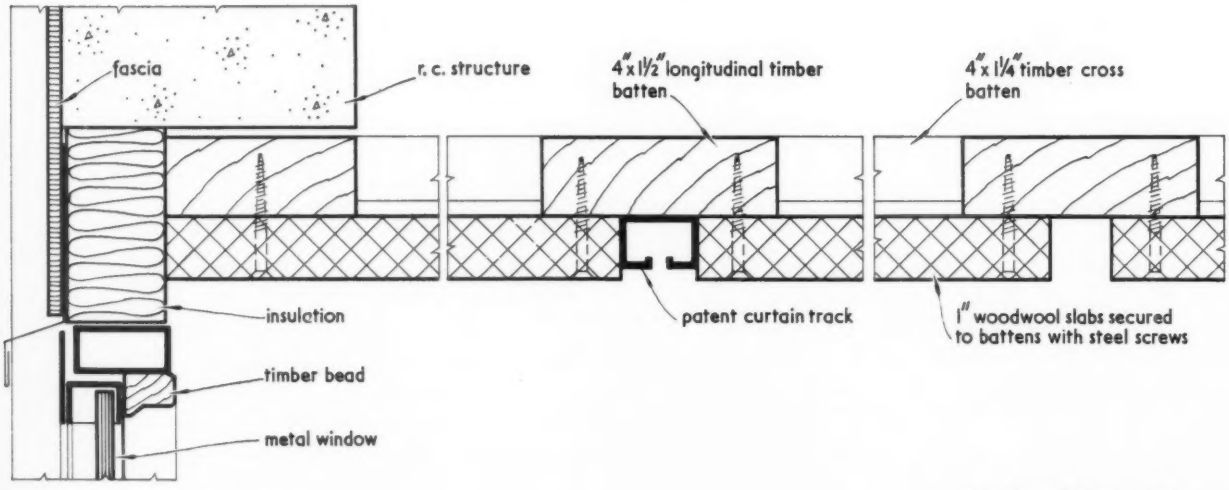
REFLECTED PLAN. scale 1/4" = 1'-0"



SECTION A–A. scale 3/8 full size



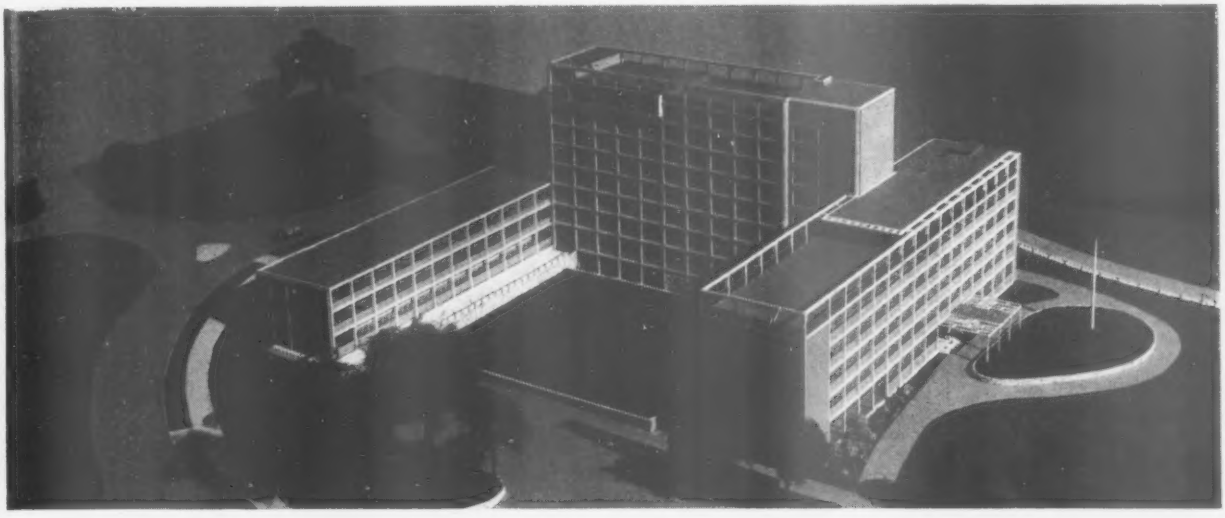
SECTION B–B.



SECTION C–C. scale 3/8 full size

note: figured dimensions in feet and inches are approximate

AIR MINISTRY METEOROLOGICAL OFFICE AT BRACKNELL



A model of the new Air Ministry meteorological office designed by H. A. Snow and K. H. Choate of the Ministry of Works architects division. The building is planned in three distinct interconnected blocks grouped around a central court. The three-storey block (left of picture) contains the Instrument Division and consists mainly of laboratories. Across the court from this is a five-storey block housing the administrative offices. The tall block linking these two is for the forecasting, research and communications divisions and a training school. A lift shaft at the junction of the two taller blocks serves both. It is intended to publish a full report of this building with a cost analysis in the AJ when the building is completed.

38.*H2. REFERENCE BACK*

Readers are asked to note the following amendments. Ronuk Emulsion should be replaced throughout by New Ronuk Plastic Emulsion and Ronuk Concentrated Wax by Ronuk Wax. Table on face of Sheet, under "New Floors, Concrete," amend Ronseal to Ronseal Coloured Seal. "Maintenance, Hardwood block and strip," delete "every 4 to 6 months"; "Concrete" add "New Ronuk Plastic Emulsion should be applied for a gloss finish if desired"; "Quarry tiles, etc.," add "The floor should be periodically maintained with New Ronuk Plastic Emulsion"; "Non-magnesite, etc.," delete "every 3 to 4 months" and substitute "when necessary"; "Rubber," delete "every 3 to 4 months" and substitute "less frequently." Delete "or asphalt" from end of footnote to table. Reverse of Sheet, under heading "Ronseal," add "Ronseal Coloured Seal is available in red or green, specially formulated for concrete and similar surfaces. Coverage: 25 to 30 sq. yd. per gallon." Under heading Ronuk Emulsion (now New Ronuk Plastic Emulsion), "Description" should read "This is an emulsion of plastic resins in a water base for polishing thermoplastic . . ." and to the end of the paragraph should be added "It requires no buffing as it dries to a bright surface."

Announcements

PROFESSIONAL

K. W. Paterson, M.C.D., B.Arch., A.R.I.B.A., A.M.T.P.I., has commenced as a part-time lecturer and studio instructor at the Liverpool University School of Architecture, but is also continuing in practice as hitherto with his partner, J. S. Macaulay, M.C.D., B.Arch., A.R.I.B.A., A.M.T.P.I., under the style of Paterson & Macaulay, 83, Wirral Gardens, Bebington, Cheshire (telephone Bromborough 3016).

Peter Hing & Jones of 121, Colmore Row, Birmingham, 5, have opened a London office at 20, Grosvenor Place, London, S.W.1 (telephone Grosvenor 1390), where Richard Vanderplank, A.R.I.B.A., recently taken into junior partnership, will be in residence.

Robert R. Bye, F.R.I.C.S., and R. Gibson, A.R.I.C.S., previously of Raglan Squire & Partners, have commenced practice at 1, Hobart Place, London, S.W.1 (telephone Sloane 9842).

Arthur F. Sewell, A.R.I.B.A., has moved to new offices at 1, Warwick Road, Carlisle (telephone Carlisle 2-6398).

Stuart Bentley, F.R.I.B.A., A.M.T.P.I., Chief Architect of the Dunlop Rubber Co. since 1946, has been appointed Consultant Architect to **Semtex Ltd.**

TRADE

The Key Engineering Co. Ltd. have opened a London office at Blackfriars House, 19, New Bridge Street, London, E.C.4.

British Insulated Callender's Cables Ltd. have appointed R. A. Turpin as Manager of their Exeter branch on the retirement of H. F. G. Bicker.

Richard Crittall & Co. Ltd. have acquired the business of Maddock & Wright Ltd. Under a reconstruction of the Board of Maddock & Wright Ltd., W. J. Holmes continues as a Director and is joined by W. R. Cox and A. W. Powley of Richard Crittall & Co. Ltd.

The Unit Construction Co. Ltd. have appointed G. T. Taylor to succeed J. C. Blackmore as Regional Manager for the North-West Region.

Englewood Ltd. has moved its Head Office to 70, Coombe Road, New Malden, Surrey (telephone Malden 8244). The Luton branch of this firm is now under the management of H. V. Lynn.

R. Bateman will be representing Sherwoods Paints Ltd. in parts of Hertfordshire, Buckinghamshire, Middlesex and Berkshire.

Powell Duffryn Ltd. have formed a new subsidiary company called Powell Duffryn Modulair Ltd. which will market the Dravo space heater.

G. B. Elphicke is now Deputy Chairman and Managing Director of the Fawcett Construction Ltd. and G. Ball is the London Manager.

The Coal Utilization Council, West Middlesex Committee, have set up a demonstration centre in the Twickenham Road (opposite the West Middlesex Hospital) for the benefit of householders affected by Isleworth's first smoke control area. It will be open on Wednesdays 2.30 p.m.—5 p.m. and Saturdays 10 a.m.—12.30 p.m. for five months.

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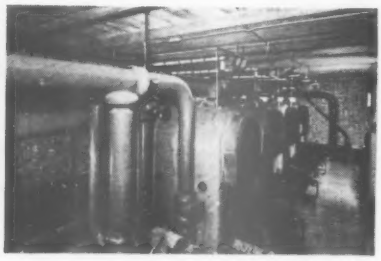

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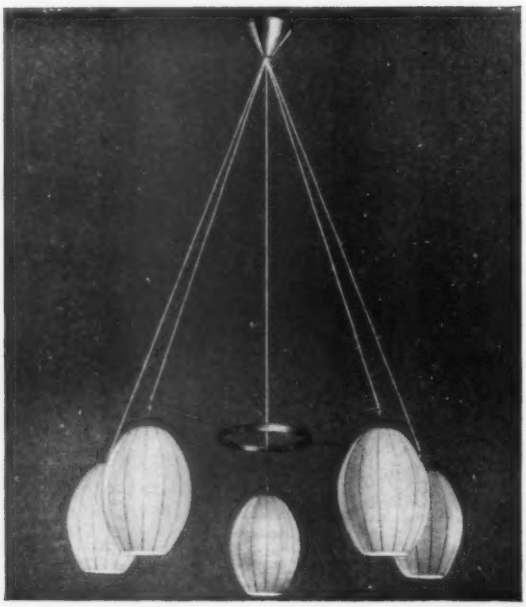

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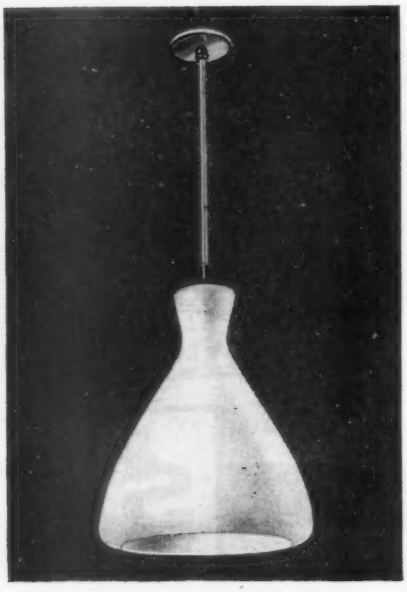

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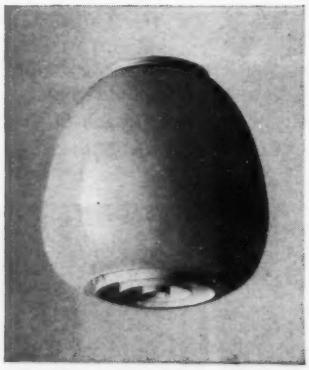

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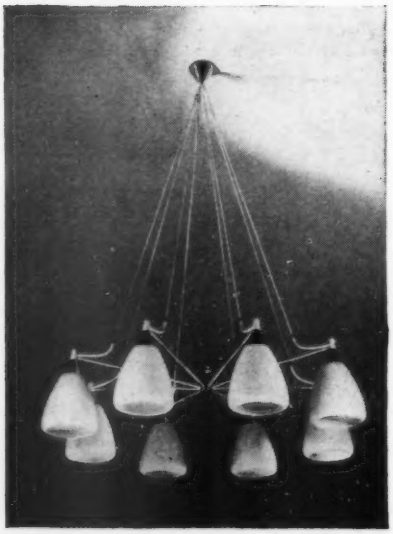

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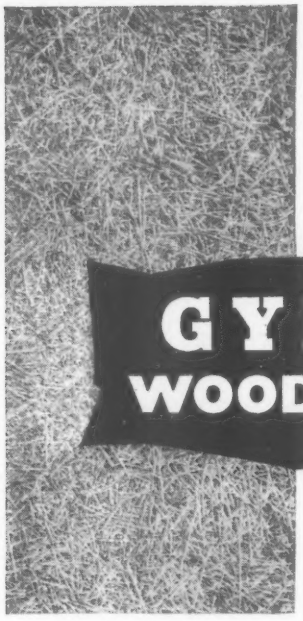

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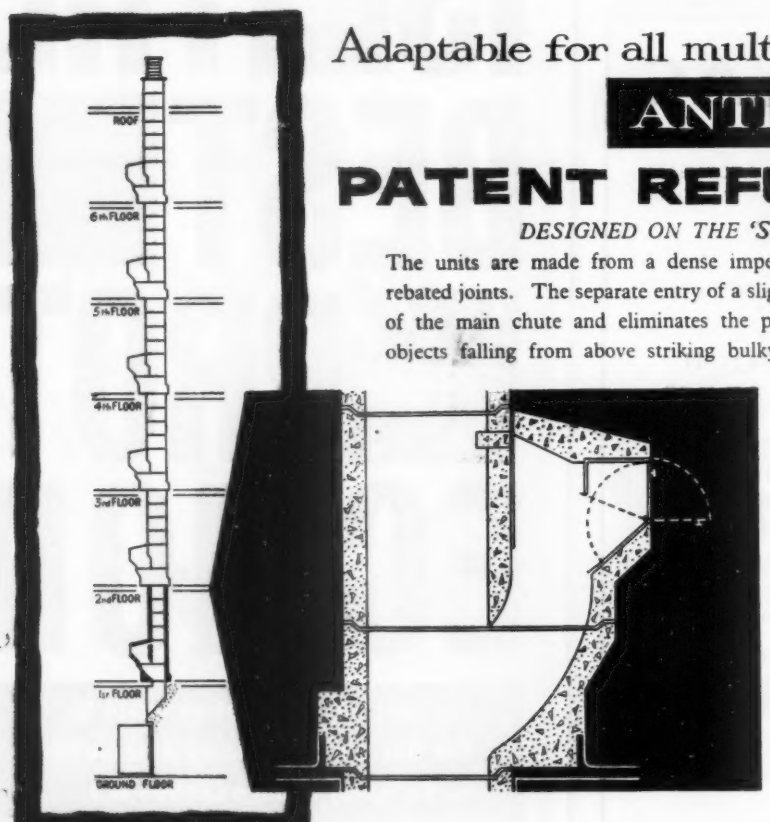

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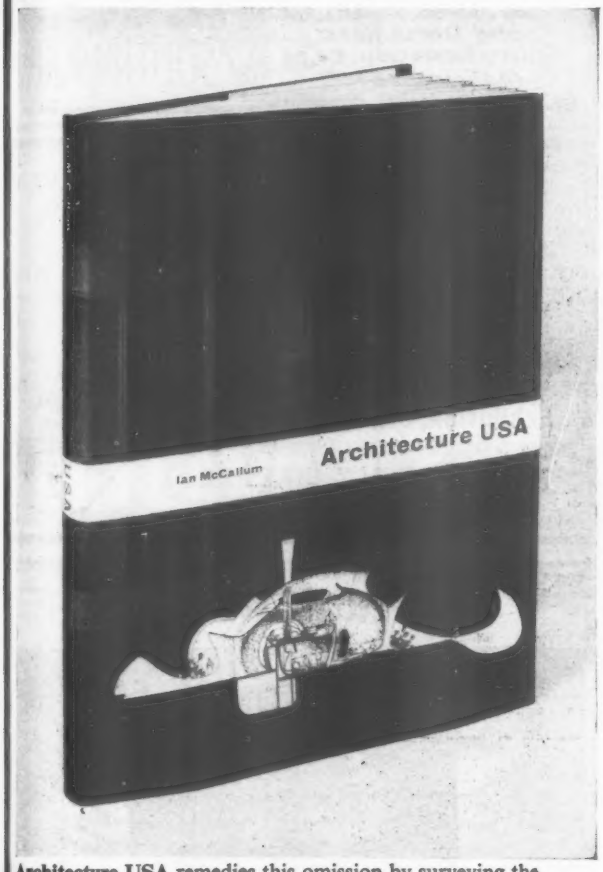
Architecture USA by Ian McCallum

SINCE 1950 AMERICA, a land of opportunity and a land of achievement, has attained a dominant place in world architecture. But it has remained largely unknown territory for want of a book that sets out to map the whole field.



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Grade A.P.T.I. (£610 × 30(4) × 35—£765).

ASSISTANT QUANTITY SURVEYOR
Grade A.P.T.IV (£1,065 × 55 × 50(2)—£1,220).

ASSISTANT QUANTITY SURVEYOR
Special Classes Scale (£785 × 40(6) × 45—£1,070).

Candidates must be suitably qualified and experienced.

The appointments will be subject to the provisions of the Local Government Superannuation Acts and the National Joint Council's Scheme of Conditions of Service so far as adopted by the Council. Medical examination.

Applications, stating age, qualifications and experience, with the names of two referees, should be submitted to the Borough Architect, 30, Alexandra Street, Southend-on-Sea, by 14th December, 1959.

Canvassing will disqualify. Any candidate who is related to member or officer of the Council is required to disclose the fact.

ARCHIBALD GLEN,
Town Clerk.
6858

DIRECTOR OF HOUSING STUDY
required for the Metropolitan Halifax-Dartmouth Area

This study will examine, over a period of three years, the housing situation in the city of Halifax, the town of Dartmouth, and that part of the County within the Metropolitan Area, with particular reference to the quantity and quality of housing in relationship to the present and future needs of this area; it will also make recommendations for future action.

Applicants should possess a degree in Community Planning, Architecture, Social Science, or Engineering, should have experience in conducting detailed surveys of housing requirements and must have the ability and experience to relate the results to regional planning proposals. The part of Director will carry an annual salary of between $8,000 and $10,000 dollars commensurate with qualifications and experience.

For further information and application forms please write to: D. J. Bird, Director of Community Planning, Department of Municipal Affairs, Halifax, Nova Scotia. 6777

BOROUGH OF BEXLEY
ASSISTANT ARCHITECT

Applications are invited for this appointment at a salary according to qualifications within Grade APT.III (£880 to £1,065 per annum) or Special Scale (£785 to £1,070 per annum) plus London Weighting.

Candidates should have experience in school and housing projects.

Form of application and conditions of appointment are obtainable from the Borough Engineer, West Lodge, Broadway, Bexleyheath, Kent, to whom completed applications must be returned by the 1st December, 1959. The Council may be prepared to assist in the provision of housing accommodation.

Canvassing will disqualify.

ARTHUR GOLDFINCH,
Town Clerk.
6879

NATIONAL COAL BOARD
EAST MIDLANDS DIVISION
ARCHITECTS AND ARCHITECTURAL ASSISTANTS

Applications are invited for superannuable posts with the National Coal Board, East Midlands Division, on the staff of the Divisional Chief Architect at 69, Lower Parliament Street, Nottingham.

SALARY SCALES

ARCHITECTS, GRADE 2, £815 × £30—£1,125. Open to Corporate Members of the R.I.B.A. with wide practical experience.

ARCHITECTURAL ASSISTANTS, GRADES 1 & 2. £715 × £25—£850 (exceptionally £1,000). £595 × £25—£710.

Qualifications: Preferably Intermediate R.I.B.A., although regard will be paid to good practical experience.

The work of the department provides excellent experience in the design and construction of large Welfare and Industrial Buildings.

Applications within 14 days, giving age and full details of qualifications and experience, to:—
Divisional Chief Staff Officer,
National Coal Board, East Midlands Division,
Sherwood Lodge, Arnold, Nr. Nottingham. 6903

ARCHITECTURAL ASSISTANTS
REQUIRED BY
MINISTRY OF WORKS

For employment in London. Keen and enthusiastic Assistants of Intermediate R.I.B.A. standard are required for the design of interesting and varied types of buildings in all parts of the world. The salary range is from £560 (at age 21) to £980. Starting pay according to age and experience. 5-day week. 3½ weeks annual leave. Good prospects of promotion and permanency. Permanent posts are pensionable and the pension scheme is non-contributory. Apply, giving details of age, training and experience to: E. Bedford, C.B., C.V.O., A.R.I.B.A., Chief Architect, Ministry of Works, Abell House, Room 435, John Islip Street, London, S.W.1. 6466

BILLINGHAM URBAN DISTRICT COUNCIL
APPOINTMENT OF
CHIEF ARCHITECTURAL ASSISTANT—
Special Grade (£785—£1,070 p.a.).

Applications are invited from persons with suitable qualifications and experience. Extensive town development is taking place within the Urban District and the appointment offers opportunity of interesting work. The commencing salary will be in accordance with qualifications and experience; housing accommodation is available.

The appointment is subject to the National Scheme of Conditions of Service and the Local Government Superannuation Acts. Applications stating qualifications and experience together with the names of two referees must be delivered to the undersigned by the 4th December, 1959. Canvassing will disqualify.

FRED M. DAWSON,
Council Offices, *Clerk of the Council.*
Haverton Hill. 6873

COUNTY BOROUGH OF BARNSLEY
BOROUGH ENGINEER & SURVEYOR AND PLANNING OFFICER'S DEPARTMENT
APPOINTMENT OF PLANNING ASSISTANT AND JUNIOR ARCHITECTURAL ASSISTANT

Applications are invited for the following appointments:

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

(*b*) TEMPORARY JUNIOR ARCHITECTURAL ASSISTANT (Grade A.P.T. I, £610—£765).

The commencing salaries in both cases will be fixed within the appropriate Grades according to experience and qualifications.

For appointment (*a*) candidates must hold a recognised Diploma in Town Planning and/or be A.M.T.P.I. and should have had previous experience in town planning and development control.

Post (*b*) is suitable for a young man in his early architectural training and offers a good opportunity for gaining sound practical experience.

The appointments will be subject to (*a*) the Scheme of Conditions of Service for A.P.T.C. staff; (*b*) any other general conditions of service in operation within the Corporation from time to time; (*c*) one month's notice on either side and (*d*) to the Local Government Superannuation Acts, for which purpose the successful candidates will be required to pass a medical examination.

Housing accommodation can be provided if necessary and 50 per cent. of removal transport expenses will be paid in approved cases.

Applications, stating age, present and previous appointments, qualifications, experience, etc., together with the names of two persons for reference, should reach the Borough Engineer, Town Hall, Barnsley, by Wednesday, 2nd December, 1959.

Canvassing will disqualify.

A. E. GILFILLAN,
Town Clerk.

Town Hall,
Barnsley.
November, 1959. 6815

CITY OF CANTERBURY

Applications are invited from persons who have passed the Final Examination of the R.I.B.A. for the appointment of an ASSISTANT ARCHITECT. Special scale (£785—£1,070). The commencing salary will be fixed within the scale according to qualifications and experience.

Applicants should have had varied experience and be capable of good detailing and presentation.

The Council are prepared to make housing accommodation available if required.

Applications, together with the names of two referees, must reach the City Architect & Planning Officer, Mr. John L. Berbiers, F.R.I.B.A., A.M.T.P.I., not later than Tuesday, 1st December, 1959.

Canvassing will disqualify.

J. BOYLE,
Town Clerk.

Municipal Buildings,
Canterbury. 6769

BOROUGH OF EALING

1. ARCHITECTURAL ASSISTANT, A.P.T. IV (£1,095—£1,250 inclusive). Must hold recognised architectural qualifications.

2. JUNIOR ARCHITECTURAL ASSISTANT, A.P.T. I (£610—£765 plus London weighting). Must have passed Intermediate R.I.B.A. or its equivalent.

Full particulars and application forms from Borough Engineer, Town Hall, Ealing, W.5.

Closing date 30th November, 1959.

E. J. COPE-BROWN,
Town Clerk.
6775

BOURNEMOUTH EDUCATION COMMITTEE
BOURNEMOUTH MUNICIPAL COLLEGE OF ART

Applications are invited for the post of Lecturer in charge of the Architecture Department, to begin as soon as possible after 1st January, 1960.

Salary in accordance with the Burnham Scale: £1,370 to £1,550, plus allowance for degree or equivalent, training, etc.

Applicants should hold the Associateship of the Royal Institute of British Architects, and have had teaching experience.

Particulars and application form from W. R. Smedley, Chief Education Officer, Town Hall, Bournemouth. 6875

WARWICKSHIRE COUNTY COUNCIL
COUNTY ARCHITECT

Applications are invited for the post of County Architect. The salary will be £3,465 per annum, rising, subject to satisfactory service, by three annual increments of £135 to a maximum of £3,860 per annum. The appointment will be subject to three months' notice on either side and to the Conditions of Service of the Joint Negotiating Committee for Chief Officers of Local Authorities.

Candidates must be members of the Royal Institute of British Architects, and preference will be given to those having had experience with large public authorities.

The appointment will be subject to the provisions of the Local Government Superannuation Acts, 1937-1953, and the successful candidate will be required to pass a medical examination.

Applications, on forms obtainable from the undersigned, must state the names and addresses of not more than three persons who have knowledge of the applicant and his work and to whom reference can be made. They should be returned to the Clerk of the Council, Shire Hall, Warwick, in a sealed envelope marked "County Architect," so as to reach him not later than first post on Monday, the 7th December.

L. EDGAR STEPHENS,
Clerk of the Council.

Shire Hall,
Warwick.
6th November, 1959. 6783

NANTWICH URBAN DISTRICT COUNCIL
ENGINEER & SURVEYOR'S DEPARTMENT
APPOINTMENT OF ARCHITECTURAL ASSISTANT, A.P.T. I

Applications are invited for the appointment of Architectural Assistant on the temporary staff in the Engineer & Surveyor's Department. Salary in accordance with Grade A.P.T. I (£610—£765). The appointment will be for at least two years.

Applicants should have served articles or received architectural training and have reached the Intermediate standard of the R.I.B.A.

The appointment will be terminable by one month's notice on either side and will be subject to the Local Government Superannuation Act, 1937 and of the National Scheme of the Conditions of Service.

Housing accommodation will be available if required. Applications to be sent to Mr. E. H. Bailey, F.R.I.C.S., M.I.Mun.E., Dip.T.P. (Manchester), A.M.T.P.I., Engineer & Surveyor, Brookfield House, Nantwich, stating whether married or single; details of training, experience; past and present appointments together with the name of two referees, not later than 30th November, 1959.

D. T. EVANS,
Clerk of the Council.

18th November, 1959. 6960

THE STEWARTRY OF KIRKCUDBRIGHT COUNTY COUNCIL require ASSISTANT ARCHITECTS on salary scale £795 by £35 to £1,075 per annum. There are also vacancies for Architectural Assistants on salary scale £605 to £735 per annum. Placing on salary scales will be in accordance with qualifications and experience. A local authority three-apartment house is available for letting to one successful applicant. Applications giving age, qualifications and details of previous experience and the names of two referees to be lodged with the County Clerk, County Offices, Kirkcudbright, not later than 14 days from the appearance of this advertisement. 6978

BOROUGH OF FINCHLEY
TEMPORARY ARCHITECTURAL ASSISTANT
HOUSING AND TOWN PLANNING DEPARTMENT

Salary within Special Grade (£785 × £40 approx.—£1,070). London weighting additional.

Candidates must have had practical experience in the preparation of working drawings and detailing for new developments and conversions.

The National Scheme of Conditions of Service and the Local Government Superannuation Acts apply and medical examination required.

Applications, stating age and full particulars of qualifications and experience, with the names of two referees, to the Borough Housing Officer, The Avenue, Finchley, N.3, by first post on 2nd December, 1959.

R. M. FRANKLIN,
Town Clerk.

Municipal Offices, N.3. 6784

LONDON COUNTY COUNCIL

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

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

ARCHITECT'S DEPARTMENT
QUANTITIES DIVISION

Opportunity for interesting and rewarding careers in various branches of quantity surveying. Applications invited, particularly from newly qualified SURVEYORS, for following types of work:

Junior taking-off/working-up.

Approximate estimating and assisting in cost planning.

Pricing bills of quantities for estimates comparable with tenders.

Preparation and settlement of final accounts for major building contracts including interim valuations.

Measurement of minor works, schedule accounts, etc.

General technical duties and working-up.

Salaries up to £1,135. Application form and further particulars from Hubert Bennett, F.R.I.B.A., Architect, London County Council, County Hall. (2286) 6383

CITY OF CARDIFF

Applications are invited for the vacant post of TOWN PLANNING ASSISTANT, Special Grade (£85—£1,070 per annum), in the City Surveyor's Department.

The appointment is subject to the National Scheme of Conditions of Service, the Local Government Superannuation Acts, the passing of a medical examination and termination of employment by one month's notice on either side.

Applications in suitably endorsed envelopes should be received by me not later than the 4th December, 1959 and should state age, experience, qualifications, present salary and names and addresses of three referees.

S. TAPPER JONES,
Town Clerk.

City Hall,
Cardiff.
November, 1959. 6901

COUNTY BOROUGH OF PRESTON
APPOINTMENT OF ASSISTANT ARCHITECTS
(Special Grade £785—£1,070)

Applications are invited for the above mentioned appointments in the Borough Surveyor's Department.

Candidates must be Registered Architects and Corporate members of the R.I.B.A. The programme of works is large and varied and appointments afford opportunities for good experience.

The National Scheme of Conditions of Service and Local Superannuation Acts apply, and the successful applicants will be required to pass a medical examination.

Forms of application can be obtained from the undersigned, to whom they must be returned, completed, not later than 7th December, 1959.

W. E. E. LOCKLEY,
Town Clerk.

Municipal Building,
Preston. 6894

CITY OF BATH

Applications are invited for the appointment of an ARCHITECTURAL ASSISTANT at a salary within the Special Grade (£785—£1,070 per annum). Applicants should have passed Parts I and II of the R.I.B.A. Final Examination. The programme of building works is extensive and interesting and the appointment affords an opportunity for good experience.

The Council is prepared to provide housing accommodation if required.

Applications giving details of age, experience and qualifications together with the names and addresses of three referees, should be addressed to the City Planning Officer and Architect, 7 North Parade Buildings, Bath. The last day for the receipt of applications is Saturday, 5th December, 1959.

JARED E. DIXON,
Town Clerk.

Guildhall,
Bath.
13th November, 1959. 6888

COUNTY BOROUGH OF BLACKPOOL

Applications are invited (by 8th December, 1959) for the following appointments:—

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

ARCHITECTURAL ASSISTANTS, A.P.T. II (£765—£880) or A.P.T. I (£610—£765).

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

CIVIL OR MUNICIPAL ENGINEERS, Special Grade (£785—£1,070), A.P.T. II (£765—£880).

CLERK OF WORKS (Architectural), Miscellaneous V (£650—£715).

These appointments offer opportunities for experience on a large and varied programme of Capital Works.

Particulars and application forms (please state which post) available from Borough Surveyor (Arthur Hamilton, B.Sc., A.R.I.B.A.), P.O. Box 17, Municipal Buildings, Blackpool. 6942

NATIONAL COAL BOARD
EAST MIDLANDS DIVISION

QUANTITY SURVEYOR, Grade I, required on the permanent staff of the Divisional Quantity Surveyor at 69, Lower Parliament Street, Nottingham.

Salary within the scale £1,125 × £40—£1,475 according to qualifications and experience.

Candidates should be professionally qualified and experienced Quantity Surveyors.

Applications giving age and full details of qualifications and experience, within 14 days to: Divisional Chief Staff Officer, National Coal Board, East Midlands Division, Sherwood Lodge, Arnold, Nr. Nottingham, quoting S.V. No. 1020. 6988

HAMPSHIRE COUNTY COUNCIL
DEPUTY AREA PLANNING OFFICERS,

A.P.T. IV (£1,065—£1,220) required for (*a*) N.W. Central Area centred on Winchester and (*b*) N.E. Area centred on Basingstoke. Candidates should be Corporate Members of the T.P.I. and preferably of another appropriate professional body also, and have had all-round planning experience, especially in Development Control in the Planning Department of a Local Authority. Assistance given with removal and other expenses in approved cases.

Applications, stating age, education, qualifications and experience, together with a copy of one testimonial and the names of two referees, should reach the Clerk of the County Council, The Castle, Winchester, by 7th December. 6930

BOROUGH OF WEMBLEY
APPOINTMENT OF SENIOR TOWN PLANNING ASSISTANT

A.P.T. IV (£1,065—£1,220 plus "weighting")

Applications are invited from persons who have obtained a Final professional qualification appropriate to practising Town Planners.

The appointment is subject to the Council's Conditions of Service and to the passing of a medical examination. A five-day week is in operation.

Applications disclosing any relationship to a Member or Senior Officer of the Council, giving the names and addresses of three referees, stating whether able to drive, and quoting reference "C" must reach the Borough Engineer and Surveyor, Town Hall, Wembley, by the 7th December, 1959.

Housing accommodation not provided. Canvassing disqualifies.

KENNETH TANSLEY,
Town Clerk.

Town Hall,
Wembley,
Middlesex.
13th November, 1959. 6929

ARGYLL COUNTY COUNCIL
COUNTY ARCHITECT'S DEPARTMENT

Applications are invited for the following appointments:—

(*a*) CHIEF ASSISTANT ARCHITECT. Salary £1,235 per annum.

(*b*) ASSISTANT ARCHITECT. Salary £795 × £35—£1,075 with appropriate placing.

Applicants must be qualified architects who have had experience in the design and construction of modern school buildings and housing. For post (*a*) applicants must be capable of taking charge of large building projects and of supervising assistant staff.

The posts are superannuable.

Housing accommodation will be made available if required.

Applications, stating post applied for and giving age, experience and qualifications, along with the names of two referees, should be lodged with the County Architect, County Offices, Dunoon, by 28th November, 1959.

A. D. JACKSON,
County Clerk.

6899

ARCHITECT

SCOTTISH SPECIAL HOUSING ASSOCIATION LIMITED, 24, invite applications for the superannuable post of ARCHITECT, Grade II to assist Regional Architect in preparation of large scale housing layouts and site supervision. Salary scale £780—£1,135 per annum with placing for age on entry up to £990 at age 31. Application forms with full particulars from the Secretary, 19, Palmerston Place, Edinburgh, 12. 6922

CHISLEHURST AND SIDCUP URBAN DISTRICT COUNCIL
PERMANENT CLERK OF WORKS

Applications invited from experienced Clerks of Works having sound knowledge of the building trades and able to take levels, set out and keep site records.

Salary grade Miscellaneous VI (£745—£805 inclusive (commencing at £785. A Casual User car allowance will be paid.

Local Government Superannuation Acts apply.

Written applications, with copies of two recent testimonials, to the Clerk, Council Offices, Sidcup Place, Sidcup, by 7th December, 1959. 6989

BURGH OF KILMARNOCK
BURGH ARCHITECT'S DEPARTMENT

Applications are invited for the following appointments:—

(*a*) DEPUTY BURGH ARCHITECT. Salary £1,150 × £50 to £1,250 per annum. Council House available for letting if required.

(*b*) ARCHITECTURAL ASSISTANT. Salary Executive Grade IV, £805 × £20 to £865.

Applicants for appointment (*a*) must be qualified and experienced Architects.

Applicants for appointment (*b*) should have passed the Intermediate examination of the R.I.B.A. and should have had good office experience. Both appointments are subject to N.J.C. conditions, and the successful applicants will require to pass a medical examination for superannuation purposes.

Applications giving full details of training and experience, should, along with copies of testimonials, be lodged with the Burgh Architect and Town Planning Officer, 64a, Bank Street, Kilmarnock, within 10 days of the date of this advertisement.

W. L. WALKER,
Town Clerk.

Council Chambers,
Kilmarnock.
November, 1959. 6987

BOROUGH OF STAFFORD
APPOINTMENT OF ARCHITECTURAL ASSISTANT

Applications are invited for the appointment of an Architectural Assistant on the permanent staff at a salary in accordance with the Grade A.P.T. I —£610—£765 per annum. Commencing salary according to experience.

A number of interesting projects have been approved in principle by the Council including a new Crematorium, large-scale additions to the Public Library, a new Sports Pavilion and a large programme of housing.

Housing accommodation will be provided by the Council if required and assistance given with removal expenses.

Applications, stating age, experience and qualifications, together with the names of two referees, are to be sent to Mr. T. H. Higson, B.Sc., A.M.I.C.E., Borough Surveyor, Mount Street, Stafford, not later than the 1st December, 1959.

T. BROUGHTON NOWELL,
Town Clerk.

16th November, 1959. 6945

COUNTY BOROUGH OF ROCHDALE

Applications are invited for the post of ARCHITECTURAL ASSISTANT on Special Classes grade (£785—£1,070 p.a.). The successful applicant, if fully qualified, will be offered housing accommodation.

Applications, stating age, qualifications, experience and names of two referees, to Borough Surveyor, Town Hall, Rochdale, by 5th December.

Canvassing will disqualify. Relationship to any member or senior official of the Council must be disclosed. Appointment subject to medical examination. 6946

RUTLAND COUNTY COUNCIL
APPOINTMENT OF ARCHITECTURAL ASSISTANT

A.P.T. Grade II, Salary £765—£880 per annum.

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

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

Particulars of age, experience and qualifications, with names of two referees, should be sent to T. Brian Kennedy, A.R.I.B.A., M.T.P.I., County Architect and Planning Officer, Catmose, Oakham, Rutland not later than Monday, 7th December, 1959.

A. BOND,
Clerk of the County Council.

County Offices,
Catmose,
Oakham, Rutland. 6937

CARMARTHENSHIRE COUNTY COUNCIL
COUNTY PLANNING DEPARTMENT

Applications invited from suitably qualified and experienced persons for appointment as JUNIOR PLANNING ASSISTANT (A.P.T. I). Appointment superannuable and subject to medical examination.

Applications giving details of age, qualifications and experience with names and addresses of two referees to be received by undersigned by 2nd December, 1959.

W. S. THOMAS,
Clerk of the County Council.

County Hall,
Carmarthen. 6924

COUNTY BOROUGH OF DERBY
BOROUGH ARCHITECT'S DEPARTMENT

(*a*) SENIOR ASSISTANT ARCHITECT. Special Grade (£785—£1,070 per annum). Qualifications: A.R.I.B.A.

(*b*) JUNIOR ARCHITECT. General Division (£210—£595 per annum). Qualifications: Probationer R.I.B.A. Or ASSISTANT ARCHITECT. A.P.T. Grade I (£610—£765 per annum). Qualifications: Intermediate R.I.B.A.

(*c*) JUNIOR QUANTITY SURVEYOR. General Division (£210—£595 per annum). Qualifications: Student member R.I.C.S. with previous experience in Quantity Surveyor's Office. Or ASSISTANT QUANTITY SURVEYOR. A.P.T. Grade I (£610—£765 per annum). Qualifications: Intermediate R.I.C.S. with good experience in working up Bills of Quantities and Final Accounts, measuring on site and taking off for small works.

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

Forms of application obtainable from and to be returned to the Borough Architect, The Council House, Corporation Street, Derby, not later than Monday, 14th December, 1959.

G. H. EMLYN JONES,
Town Clerk.

17th November, 1959. 6951

BOROUGH OF REIGATE

ARCHITECTURAL ASSISTANT required on Grade A.P.T. I (£610 to £765 p.a.). Commencing salary according to qualifications and experience. Intermediate examination R.I.B.A. desirable. Housing accommodation provided, if necessary, for married man. Application forms obtainable from Borough Surveyor, Town Hall, Reigate, to be returned by 10th December, 1959.

HEBER DAVIES,
Town Clerk.

Town Hall,
Reigate.
2nd November, 1959. 6911

LEEDS COLLEGE OF ART
SCHOOL OF ARCHITECTURE AND TOWN PLANNING
ARTHUR LOUIS AARON V.C. SCHOLARSHIP

The Management Committee invite applications for this Scholarship of £250, open to past or present students, who, at the time of taking up the award, hold the Diploma in Architecture of the School. The Scholarship is awarded for travel and study in Architecture.

Applications should reach the Clerk to the Leeds School of Architecture and Town Planning, 43*a*, Woodhouse Lane, Leeds 2, from whom further details may be obtained, by 31st December, 1959.

GEORGE TAYLOR,
Chief Education Officer.

Education Department,
Calverley Street,
Leeds, 1. 6905

BOROUGH OF SWINDON
BOROUGH ARCHITECT'S DEPARTMENT

Applications are invited for the undermentioned posts and applicants should have the qualification shown, or an equivalent qualification.

The department is engaged in a large and varied development programme, including housing schemes, neighbourhood shopping centres, civic works and industrial buildings.

Housing accommodation may be offered.

(*a*) ASSISTANT ARCHITECT, A.P.T. Special Scale (£785 to £1,070), Final R.I.B.A.

(*b*) JUNIOR ASSISTANT ARCHITECT, A.P.T. II (£765 to £880), Intermediate R.I.B.A.

(*c*) ASSISTANT QUANTITY SURVEYOR, A.P.T. Special (£785 to £1,070), Final R.I.C.S.

(*d*) JUNIOR ASSISTANT QUANTITY SURVEYOR, A.P.T. II (£765 to £880), Intermediate R.I.C.S.

Applications, on forms to be obtained from the Town Clerk, Civic Offices, Swindon, should be returned by 11th December, 1959. 6967

BOROUGH OF JARROW

Applications are invited for the following appointments:—

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

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

(*c*) ENGINEERING ASSISTANT. Salary Grade A.P.T. I.

Details and application forms obtainable from the Borough Engineer, Town Hall, Jarrow, Co. Durham. Completed applications must reach the undersigned not later than Monday, 7th December, 1959.

M. L. ROTHFIELD,
Town Clerk.

6921

METROPOLITAN BOROUGH OF SOUTHWARK

Applications are invited for the following permanent posts:—

ARCHITECTURAL ASSISTANTS
A.P.T. I (£640 to £795 p.a.),
or A.P.T. II (£795 to £910 p.a.).

Vacancies in design groups dealing with mixed housing and other development. Applicants should possess Intermediate R.I.B.A. for A.P.T. II.

If under 26 years of age, the salaries will be £10 per annum less.

The Council has a large programme of housing development on sites already available, or scheduled for clearance within the next ten years. In addition, a number of public building projects are envisaged, including new public baths within the Elephant and Castle Development Area.

Council's Conditions of Service of Officers and Superannuation Scheme apply. Medical examination. No housing. Canvassing will disqualify. Further particulars from the undersigned. Closing date 4th December, 1959.

E. J. PITT,
Town Clerk.

Southwark Town Hall,
(near Elephant & Castle Underground Station),
Walworth Road, S.E.17. 6934

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD

Applications are invited for the appointment of a DEPUTY ARCHITECT to the Board, generally in accordance with Whitley Council conditions of service. The Board is undertaking a considerable programme of hospital development which is expected to increase during the next few years.

Salary scale (under review) £1,415 × £55 (4) × £35 (1)—£1,670 plus London weighting allowance of £50 p.a.

Applicants must be Registered Architects having passed the requisite examinations and have had considerable practical experience of the planning and construction of hospitals and public buildings. Applicants must be capable of acting for the Regional Architect over the whole range of the services for which he is responsible.

Applications should include age, experience, present and past appointments and the names of 3 referees and should be sent to the undersigned at 40, Eastbourne Terrace, London, W.2, by not later than 11th December.

E. G. BRAITHWAITE,
Secretary.

6966

MOUNTAIN ASH URBAN DISTRICT COUNCIL
APPOINTMENT OF TEMPORARY ASSISTANT ARCHITECT

Applications are invited for the above appointment in the Architect's Department, at a salary in accordance with A.P.T. Grade 1 of the National Scheme of Conditions of Service (£610 × £30—£765 per annum).

Applicants should have good general experience in Housing and should preferably have reached Intermediate R.I.B.A. standard.

The appointment will be superannuable, subject to one month's notice on either side and the successful applicant will be required to pass a Medical Examination.

Applications stating age, qualifications and experience, accompanied by copies of two recent testimonials must reach the undersigned not later than 3rd December, 1959.

R. GWYNNE RICHARDS,
Clerk of the Council.

Town Hall,
Mountain Ash.
16th November, 1959. 6889

CUMBERNAULD DEVELOPMENT CORPORATION

LANDSCAPE ARCHITECT required within the Department of the Chief Architect and Planning Officer. Possession of A.I.L.A., or a diploma in landscape architecture and a qualification in architecture, and the ability to take a project through to completion are essential.

The successful applicant will work as a member of mixed teams of architects, planners, engineers and quantity surveyors on a variety of development projects. The post offers scope for interesting and original contributions towards the landscape problems of this hilltop town.

The salary scale is £1,065 to £1,220 with initial placing in accordance with qualifications and experience.

Assistance with housing where appropriate.

Application forms may be obtained from the General Manager, Cumbernauld House, Cumbernauld, Glasgow. Completed forms should be returned not later than 14th December, 1959. 6902

COUNTY BOROUGH OF SOUTHAMPTON
BOROUGH ARCHITECT'S DEPARTMENT

Applications are invited for the following permanent posts:—

(a) SENIOR ASSISTANT ARCHITECT, Grade A.P.T. IV (£1,065—£1,220).
(b) SENIOR ASSISTANT ARCHITECT, Special Grade (£785—£1,070). Experience in School major projects an advantage.
(c) ARCHITECTURAL ASSISTANT, Grade A.P.T. I (£610—£765).
(d) JUNIOR ARCHITECTURAL ASSISTANT, General Division (£210—£595), commencing salary according to experience.
(e) SENIOR QUANTITY SURVEYOR, Special Grade (£785—£1,070).

Applicants should possess appropriate qualifications and should state their housing needs and commencing salary required.

Application forms from the Borough Architect, Civic Centre, Southampton, returnable by 7th December, 1959. 6917

CORPORATION OF THE CITY OF ABERDEEN
TOWN PLANNING DEPARTMENT

Applications are invited for the following appointments:

(a) SENIOR PLANNING ASSISTANT, to take charge of the technical planning branch of the department. The salary scale for this post is £1,085 rising by annual increments to £1,235 per annum.

(b) PLANNING ASSISTANTS (2), for general planning duties in connection with development control. The salary scale for each post is £795 rising by annual increments to £1,075 per annum.

(c) JUNIOR PLANNING ASSISTANT. The salary scale for this post is £605 rising by annual increments, subject to qualification bars, to £865 per annum.

Applicants for posts (a) and (b) should possess a recognized qualification. Placing will be in accordance with qualifications and experience.

Applications by letter, with usual particulars and names of two referees, should reach the Director of Town Planning, 5 Bon-Accord Crescent, Aberdeen, on or before 7th December, 1959.

The Corporation may be prepared to assist in the provision of housing accommodation.

J. C. RENNIE,
Town Clerk.

Town House,
Aberdeen.
12th November, 1959. 6911

COUNTY BOROUGH OF ROTHERHAM
ARCHITECTS

Applications are invited for the following appointments:—

(a) ARCHITECTURAL ASSISTANTS, A.P.T. I (£575—£725) to Special Grade (£750—£1,030).
(b) SENIOR ASSISTANT ARCHITECT, A.P.T. IV (£1,065—£1,220).

Candidates for (a) are required to have passed Parts I and II of the R.I.B.A. Final examination and (b) to be Associate Member of the R.I.B.A. with good general experience in design and construction. The commencing salary in the grades will be according to capabilities and experience.

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

Applications to be endorsed "Architects," stating age, qualifications and details of experience, together with names of two referees, should be received by me not later than Tuesday, 8th December, 1959.

Canvassing will disqualify.

JOHN S. WALL,
Town Clerk.

Municipal Offices,
Rotherham. 6918

BOROUGH OF HENDON
BOROUGH ENGINEER AND SURVEYOR'S DEPARTMENT
DEPUTY CHIEF ASSISTANT ARCHITECT

Applications are invited for the above appointment which is in Lettered Grade B, i.e., £1,310 rising by annual increments to £1,485 per annum.

Applicants should be Associate Members of the Royal Institute of British Architects and have had wide experience in design, preparation of sketch plans, working drawings, specifications, estimates and supervision of works in progress.

Pensionable Post. Subject to National Scheme. Medical examination. Appointment terminable by one month's notice on either side.

Applications stating age, qualifications and experience, together with the names and addresses of three referees, much reach the Borough Engineer and Surveyor, at the under-mentioned address by 21st December, 1959.

Canvassing will disqualify.

R. H. WILLIAMS,
Town Clerk.

Town Hall.
Hendon, N.W.4. 6909

BOROUGH OF WALTHAMSTOW
BOROUGH ARCHITECT'S DEPARTMENT

Walthamstow is a municipal borough within the County of Essex, population 114,000, rateable value £1,747,737. It is a progressive authority and there is a large programme of interesting architectural and redevelopment schemes to be undertaken.

Applications are invited for the undermentioned vacancies on the permanent staff of the Borough Architect:

(1) TWO SENIOR ASSISTANT ARCHITECTS
A.P.T. IV (£1,065—£1,220).
(2) ASSISTANT ARCHITECT
A.P.T. III (£880—£1,065).
(3) THREE ASSISTANT ARCHITECTS
A.P.T. I/II (£610—£880).
(4) SENIOR ARCHITECT—PLANNER
A.P.T. IV (£1,065—£1,220).
(5) ASSISTANT QUANTITY SURVEYOR
A.P.T. IV (£1,065—£1,220).
(6) THREE ASSISTANT QUANTITY SURVEYORS
A.P.T. II (£765—£880).
(7) TWO JUNIOR QUANTITY SURVEYORS
General Division (£210—£595).

The above salaries do not include the London Weighting allowance.

Applicants for (1), (2), (4) and (5) must be professionally qualified and have had extensive experience. Applicants for (3) and (6) should have the appropriate qualification.

The Council will make 100% advances to successful applicants for house purchase in this or adjoining boroughs.

Application forms may be obtained from the undersigned.

Closing date: 14th December, 1959.

G. A. BLAKELEY
Town Clerk

Town Hall, Walthamstow, E.17. 6984

LINDSEY (LINCOLNSHIRE) COUNTY COUNCIL

Vacancy on permanent staff for ASSISTANT ARCHITECT, Grade A.P.T. IV, £1,065—£1,220. Must be A.R.I.B.A. and capable of controlling large and interesting scheme. Commencing salary within the grade dependent upon experience.

N.J.C. Conditions of Services. Canvassing will disqualify. Candidates must disclose in writing whether to their knowledge they are related to any Member or Senior Officer of the Council.

Applications giving age, qualifications, experience, present post and salary, and the names of two persons to whom reference can be made to be sent not later than 8th December, 1959, to the County Architect, County Offices, Lincoln. 6970

COUNTY BOROUGH OF ST. HELENS

Applications are invited for the following appointments in the Architectural Section of the Borough Engineer's Department:—

(a) SENIOR ARCHITECTURAL ASSISTANT A.P.T. Grade IV (£1,065—£1,220). Housing accommodation if required.
(b) ARCHITECTURAL ASSISTANT A.P.T. Grades II-III (£765—£1,065).
(c) ARCHITECTURAL ASSISTANT A.P.T. Grades I-II (£610—£880).

The commencing salaries will be fixed within the grades according to qualifications and experience.

The successful applicants will be required to work upon an interesting programme of work consisting of multi-storey housing projects, central redevelopment schemes, municipal offices, hostels, clinics, occupation centre, library, and other projects.

The appointments will be terminable by one month's notice and will be subject to the Local Government Superannuation Acts, Medical examination and N.J.C. Service Conditions.

Applications giving the names of two referees must be forwarded to the undersigned not later than Monday, the 14th December, 1959.

Applicants must reveal relationship to any member or senior official of the Council.

Canvassing will disqualify.

M. WARD, M.I.MUN.E., M.T.P.I.,
Borough Engineer.

Town Hall
ST. HELENS. 6925

WEST SUFFOLK COUNTY COUNCIL
Planning Assistant (Research)

Applications are invited for the appointment of a PLANNING ASSISTANT (Research) in the County Planning Department. Salary within Special Grade of the National Scales (£785—£1,070 p.a.) according to qualifications and experience. Applicants should be university graduates with an honours degree in Geography or Economics or qualified Planning Assistants with experience in research work and development plan procedure and in each case should have had at least five years' experience (including the period spent on theoretical training). Duties include collation of statistical material and investigation of problems connected with population, industry and housing, and work on the review of the county development plan and town maps. N.J.C. Service Conditions; car allowance; post pensionable; medical examination.

Application forms obtainable from the County Planning Officer, Shire Hall, Bury St. Edmunds, to be returned as soon as possible. 6929

BOROUGH OF CROSBY
CAPITAL WORKS PROGRAMME
ARCHITECTURAL ASSISTANT

Applications are invited for the appointment of an ARCHITECTURAL ASSISTANT in the Borough Engineer's Department at a salary within the range A.P.T.I. to Special Grade (£610 to £1,070) according to qualifications and experience.

The successful applicant will be engaged mainly upon works of a capital nature, including the construction of a new swimming bath.

It is the Council's policy to assist in the provision of housing accommodation upon satisfactory proof of need.

Applications on forms obtainable from the Borough Engineer at the address below must be received, suitably endorsed, as soon as possible.

Canvassing directly or indirectly will disqualify.

HAROLD O. ROBERTS,
Town Clerk.

Town Hall,
Waterloo,
LIVERPOOL, 22.
November, 1959. 6928

ARGYLL COUNTY COUNCIL
ARCHITECTURAL ASSISTANT

Applications are invited for the post of ARCHITECTURAL ASSISTANT in the County Architect's Department, Dunoon. The salary scale will be Executive III-IV (£735—£865 per annum) with placing according to qualifications and experience. The post in superannuable.

Applicants must have had a general architectural training, be capable of surveying, levelling, preparing detailed drawings and specifications and have had experience particularly in connection with housing and schools.

The successful applicant will be given the tenancy of a four apartment council house if required.

Applications stating age, experience and qualifications and giving names of two referees to be lodged with the County Architect, County Offices, Dunoon, not later than 5th December. 6919

BOROUGH OF REDCAR
APPOINTMENT OF CLERK OF WORKS
MISCELLANEOUS GRADE IV £590×£20=£650

Applications are invited for the above appointment to supervise all types of building and engineering works.

Applicants must have worked in a supervisory capacity.

Housing accommodation will be provided and the Council will consider contributing towards removal expenses.

Applications on the forms obtainable from the undersigned must be returned before noon on Friday, 11th December, 1959.

H. CALDWELL,
Town Clerk.

Municipal Buildings,
Redcar.
November, 1959. 6983

COUNTY BOROUGH OF EAST HAM
BOROUGH ENGINEER'S DEPARTMENT

Applications are invited for the following temporary appointments:—

SENIOR ASSISTANT ARCHITECT, Grade IV, £1,065—£1,220.

ARCHITECTURAL ASSISTANT, Grade II, £765—£880.

London weighting is paid in addition, and salaries in excess of the minima may be paid according to qualifications and experience. The appointments are for work on a new Technical College and are expected to be for a period of not less than three years.

Further details and application forms returnable by 11th December, 1959, from the Town Clerk, Town Hall, East Ham, E.6. 6964

BOROUGH OF WILLESDEN
BOROUGH ENGINEER AND SURVEYOR'S DEPARTMENT

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

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

ASSISTANT ARCHITECT within Grade A.P.T. II (£765—£880 p.a.).

ASSISTANT ARCHITECT within Grade A.P.T. I (£610—£765 p.a.).

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

The Council is unable to assist with housing accommodation.

Forms of application and conditions of appointment may be obtained from the Borough Engineer & Surveyor, Town Hall, Dyne Road, Kilburn, N.W.6. Applications to be returned to the undersigned not later than 9 a.m. on Tuesday, 15th December, 1959.

R. S. FORSTER,
Town Clerk.

November 18, 1959. 6918

SHEFFIELD REGIONAL HOSPITAL BOARD

Applications are invited for the following posts on the Board's Architectural staff:—

ASSISTANT ARCHITECTS—candidates must be Registered Architects and have passed the requisite examinations. Salary (at present under review) within scale £730—£1,055 per annum according to age and experience.

ARCHITECTURAL ASSISTANT—candidates should have passed the Intermediate Examination of the R.I.B.A. or an examination giving exemption therefrom. Salary (at present under review) commencing within scale £545—£630 rising to £765 per annum.

DRAUGHTSMAN—for general drawing office duties, including tracing. Candidates must have had suitable training, including three years' technical experience in architectural, surveying or engineering drawing. Salary (at present under review) within scale £445 at age 21 or over rising to £660 per annum.

Appointment is subject to Whitley Council terms and conditions of service, to the National Health Service (Superannuation) Regulations and to one month's notice on either side. Applications, stating age, experience, together with the names of three referees, should be sent to the Secretary to the Board, Old Fulwood Road, Sheffield 10, not later than 11th December, 1959. 6915

NORTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD

W. G. PLANT, DIPL. ARCH. (LIVERPOOL), F.R.I.B.A.,
REGIONAL ARCHITECT

EXPANSION OF ARCHITECTS' DEPARTMENT

The Board is engaged in an expanding programme of hospital development, and the undermentioned appointments offer to Architects exceptional opportunities of gaining experience in designing and supervising the construction of hospital buildings, and to Quantity Surveyors experience in a wide, varied and interesting field; most of the building work is designed and supervised by the Board's own staff which is now being substantially enlarged, and those appointed will be expected to accept a considerable degree of responsibility.

Own car may be used for visiting hospitals, etc., for which adequate mileage allowance paid. Posts pensionable and excellent prospects of promotion. Previous hospital experience is NOT essential. All salary scales now being reviewed.

PRINCIPAL ASSISTANT ARCHITECT

Salary £1,245—£1,470 (new entrants commence at minimum). Applicants must be registered Architects having passed the requisite examinations and must be good designers, capable of preparing working drawings and specifications for and undertaking site supervision of all types of building projects. The person appointed will be required to control the work of a group of Architects working as a team.

ASSISTANT ARCHITECTS

Salary according to age and experience up to a maximum of £1,105. Applicants must be registered Architects having passed the requisite examinations, and must be good designers, capable of preparing working drawings and specifications for, and undertaking site supervision of, all types of building projects, under limited supervision.

SENIOR ASSISTANT QUANTITY SURVEYORS

Salary £1,100—£1,295 (new entrants commence at minimum). Candidates must be Corporate Members of the Royal Institution of Chartered Surveyors (Sub. Div. III Quantities), or, in certain circumstances, Associate Members of the Institution of Quantity Surveyors. The duties comprise taking off and working up, specification writing, site surveys and measurements, valuations for certificates, preparation of estimates and final accounts. The work covers a wide and interesting field of traditional and modern construction, alterations and adaptations, drainage and site development schemes.

ASSISTANT QUANTITY SURVEYORS

Salary according to age and experience up to a maximum of £1,105. Candidates must be Corporate Members of R.I.C.S. (Sub. Div. III Quantities) or in certain circumstances Associate members of the Institute of Quantity Surveyors. The duties comprise site measuring, taking off and estimating (all under supervision), working up and final accounts.

QUANTITY SURVEYING ASSISTANTS

Salary £555—£795. Applicants must have passed the Intermediate Examination of the R.I.C.S. (Sub. Div. III Quantities). The duties comprise generally assisting in the Quantity Surveyor's Section, both in the office and on building sites, with some opportunity for taking off, under supervision. Some facilities may be provided for training.

Application forms from Secretary, North East Metropolitan Regional Hospital Board, 40, Eastbourne Terrace, W.2. 6913

Tenders Invited

5 lines or under, 15s.; each additional line, 2s. 6d. Box Number, including forwarding replies, 2s. extra

BOROUGH OF EALING
ERECTION OF A GOLF PAVILION AT HORSENDEN HILL, GREENFORD

Tender documents obtainable from Borough Surveyor, Town Hall, Ealing, W.5, upon payment of £5 returnable on receipt of a *bona fide* tender.

Tenders must be delivered to the Town Clerk, Town Hall, Ealing, W.5, not later than 9 a.m. on the 30th December, 1959.

E. J. COPE-BROWN,
Town Clerk.
6895

WANSTEAD AND WOODFORD CORPORATION

Applications are invited for the following established appointments in the Borough Engineer and Surveyor's Department, the salaries indicated being exclusive of London Weighting.

These appointments are urgently required to deal with capital works of area reconstruction, town hall development and a large civil engineering programme, including improvements to trunk and county roads, sewage disposal works reconstruction, main drainage, recreation ground construction and estate development.

1. Chief Planning Assistant A. P. T. V. (£1,220-£1,375)

2. Senior Assistant Engineer A. P. T. V. (£1,220-£1,375)

3. Senior Assistant Engineer A. P. T. IV. (£1,065-£1,220)

4. Assistant Engineer A. P. T. II. (£765-£880)

POST 1 The successful applicant will control the Town Planning Section and must hold the final examination of the Town Planning Institute, whilst an additional architectural or engineering qualification will be advantageous. Applicants will be preferred who have experience in urban redevelopment with a local authority in addition to routine control of development.

POSTS 2 & 3 Applicants must hold recognised professional qualifications and some previous experience in design and construction of highway works will be advantageous.

POST 4 Applicants should have passed the intermediate examination of a recognised professional institution and also preferably have had some years' practical experience in the service of a local authority.

The starting salary for all appointments will be fixed in accordance with the experience of the successful applicants. Casual user car allowances are payable in respect of Posts 1, 2 and 3, but housing accommodation is not offered, although this question is at present under review by the Council.

Forms are obtainable from, and must be returned to the undersigned, not later than first post on 9th December, 1959.

L. S. JEFFERY,
Borough Engineer and Surveyor.

Municipal Offices,
High Road,
Woodford, E.18.

Architectural Appointments Vacant

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

ARCHITECTURAL ASSISTANTS required in busy City office. Assistants should be capable of carrying through schemes from sketch stage to final construction. Mainly Office and Residential buildings in London area. Varied and interesting projects. Long-term engagement to right person. £1,300 per annum, plus luncheon vouchers and car expenses. Five-day week. Applicants must be capable of producing sketch schemes of contemporary buildings, and preparing Working Drawings. Box 6932.

ARCHITECTURAL ASSISTANTS, Intermediate to Final standard, with some office experience, required for interesting work in West End Office. Plenty of scope for responsibility and experience. Telephone for appointment to MAYfair 9554, or write with particulars to Box 6123.

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

EXPERIENCED ARCHITECTURAL ASSISTANTS required, one Qualified and one of at least Intermediate standard, for Branch Office, Birmingham, engaged on a varied and interesting programme of Commercial projects. The positions are pensionable and a five-day week is in operation. Applications, giving full particulars, to G. S. Hay, F.R.I.B.A., Chief Architect, Co-operative Wholesale Society Ltd., 1, Balloon Street, Manchester, 4. 4307

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

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

BUSY and expanding practice requires Final standard ASSISTANT of initiative, and ability to handle varied work. Box 6538.

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

BOOTH, LEDEBOER AND PINCKHEARD, 17-20, Mason's Yard, Duke Street, St. James's S.W.1. require ASSISTANTS in salary range £750—£1,100 p.a. Tel. TRA. 1866. 5957

ERIC FIRMIN & PARTNERS require Senior ASSISTANTS for work on industrial and commercial projects. Five-day week. Luncheon Vouchers. Salary by arrangement. Please apply 8 Holborn Circus, E.C.1. CITy 8811. 6684

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

QUALIFIED ASSISTANT ARCHITECTS required, minimum three years' office experience, preferably in London. Salary according to ability and experience. Theo. H. Birks, 38, Portland Place, W.1. LAN 7236. 5966

INTERMEDIATE standard ASSISTANTS required, minimum two years' office experience. Salary according to ability. Theo. H. Birks, 38, Portland Place, W.1. LAN 7236. 5966

SENIOR AND JUNIOR ARCHITECTURAL ASSISTANTS and DRAUGHTSMEN required for multiple company's Architect's Department. Please reply stating age, experience and salary required to Box 6369.

ARCHITECTURAL ASSISTANTS, Senior and Junior, required by firm in High Wycombe for commercial and industrial schemes. Scope for responsibility and experience. Five-day week. Write Box 6636.

JOHN H. D. MADIN, Chartered Architect, 83/85 Hagley Road, Birmingham 16, has further vacancies for Senior and Intermediate ASSISTANTS. Suitable Senior Assistants would be required to take full responsibility for large scale interesting projects. 6416

TREHEARNE & NORMAN, PRESTON & PARTNERS, have vacancies for ARCHITECTS and ASSISTANTS with imagination and designing ability to assist with important new developments in the London area. Apply in confidence to 83, Kingsway, London, W.C.2. (HOL. 4071.) 6429

GOLLINS, MELVIN, WARD & PARTNERS are looking for staff to work on the design of hospital, University and office projects. Age and experience are less important than enthusiasm and interest in architecture. Five-day week, quarterly bonuses, pension scheme. Ring WELbeck 9991 for appointment. 6829

EXCELLENT opportunity for Senior and Intermediate ASSISTANTS in a permanent and progressive appointment with Midland firm of Architects who are working on large projects of an advanced type of design, including comprehensive development schemes, multi-storey office buildings, multi-storey flats, shopping centres, schools, banks, public houses and industrial projects. Apply Box 6415.

SENIOR ASSISTANT required of Intermediate/Final standard in Croydon office. Varied practice of interesting work. Good draughtsman and sound knowledge of construction essential, together with ability to manage jobs. Five-day week. Salary according to experience. Apply, giving all particulars, to George Lowe & Partner, 4, High Street, Croydon 3608/9. 6444

H. A. HALPERN & ASSOCIATES require first-class ASSISTANT with at least five years' office experience and exceptional knowledge of building construction. Must be able to operate with minimum supervision from sketch stage to contract on Supermarkets in new developments and conversions. Apply with full particulars of experience and salary required to H. A. Halpern & Associates, Cumberland Chambers, , Edgware Road, Marble Arch, London, W.2. 6458

THREE qualified ARCHITECTURAL ASSISTANTS with office experience required for (a) Industrial Work, (b) School Contracts, (c) large housing scheme abroad. Assistants will be expected to take the responsibility of running and supervising these contracts. Salary according to age (limit 35) and experience. Apply to J. M. Austin-Smith & Partners, 29 Sackville Street, London, W.1. 6565

SENIOR ASSISTANTS urgently required for busy City office engaged in industrial and commercial work. 5-day week. Luncheon Vouchers. Salary up to £1,200 according to experience. Box 6554.

JAMES A. ROBERTS, A.R.I.B.A., requires Intermediate and Final standard ASSISTANTS, salary range £750—£1,200 depending upon ability, experience, and personality. Interesting and varied work with scope for initiative and responsibility. Please write: 86, New Street, Birmingham, 2. 6699

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

SENIOR QUALIFIED ARCHITECTS and ASSISTANTS of Intermediate standard required for London Architects Department of Ind Coope Ltd. Varying and interesting work on hotels and public houses, including interiors and furnishings. Seniors, age 25/40 must have good design sense and be able to take charge of projects. A capacity for good perspective and presentation drawing an advantage. Intermediate Assistants must be competent draughtsmen with sound knowledge of construction. Pension scheme, five-day week, Lunch Vouchers. Write with full particulars and salary required to Company Architect, 160, St. John Street, E.C.1. 6669

ARCHITECTURAL or SURVEYING ASSISTANT required of Intermediate or Final standard with some office experience. Apply: Victor Bloom & Partners, Architects, 12, Gloucester Place, W.1. HUN. 2069. 6661

ARCHITECTURAL ASSISTANT required in South Coast office. Hospital experience an advantage. Write with details of training and salary required. Box 6709.

ARCHITECTURAL ASSISTANTS required for City Office. Good Draughtsmen, previous office experience and sound knowledge of construction. Varied and interesting work. Apply stating age, experience and salary required to Box 6745.

HENRY C. SMART & PARTNERS require experienced ASSISTANT for School and other projects. Write stating age, experience and salary required to 120 Moorgate, London, E.C.2. 6746

HENING & CHITTY, F.R.I.B.A., A.M.T.P.I., require experienced Staff. Write full particulars 30 Percy Street, W.1. 6730

IVOR WARNER requires an ASSISTANT of Intermediate standard at his London office, 57 Shelton St., W.C.2. Write for an interview. 6836

ARCHITECTURAL ASSISTANTS required for several large contemporary projects. Intermediate standard or equivalent. Salary scale, £600 to £800 according to experience. Superannuation scheme. Five-day week. Please write giving full particulars to Johns, Slater and Haward, F./A.R.I.B.A., 32, Foundation Street, Ipswich. 6837

VERNER REES, LAURENCE & MITCHELL require ASSISTANTS for work on University projects. Please telephone PARk 3900 for interview or write to 38 Holland Villas Road, W.14. 6838

QUALIFIED ARCHITECT and ARCHITECTURAL ASSISTANT required for expanding practice, able to work on own initiative. Would be required to work in the first instance at Main Office in Dumfries. Apply, stating age, salary, experience, and when available to M. Purdon Smith and Partners, 31 Castle Street, Dumfries. 6793

SENIOR AND JUNIOR ARCHITECTURAL ASSISTANTS required for general practice which includes Office Blocks, Schools, Churches, etc. Appointment to commence immediately or within next two months. Apply in writing to Sir Giles Scott, Son & Partner, 9 Gray's Inn Square, London, W.C.1. 6840

YORKE, ROSENBERG & MARDALL require ASSISTANTS. Apply in writing to 2 Hyde Park Place, London, W.2. 6934

ARCHITECTURAL ASSISTANTS required now in small but busy West End Office. Although not essential experience of working in the London Area would be an advantage. Applicants will have the opportunity of handling their own jobs from sketch stage to final completion. Salary (up to £950) according to experience. Box 6763.

ARCHITECTURAL ASSISTANT (Intermediate standard) required in Architect's Department of London Brewery Company. Must be good draughtsman. Write stating age, experience, salary required. Box 6762.

ARCHITECTURAL ASSISTANT required, salary £650—£900 according to experience. M. R. Hesketh, 8 Acresfield, Bolton, Lancs. Tel: Bolton 10221. 6764

GOTCH AND PARTNERS OF LONDON AND BRIGHTON require Junior and Intermediate ASSISTANTS for varied projects in both offices. Salary according to ability and experience, and reviewed half yearly. Write for an appointment to 8 City Road, Finsbury Square, London, E.C.1, or phone Monarch 3235. 6765

JUNIOR ARCHITECTURAL ASSISTANT required in Wembley. Write stating age, experience and salary required. Box 6788.

ASSISTANTS of Intermediate or equivalent standard, required for office in South Kensington. Interesting and varied work, offering scope for initiative, responsibility and opportunities for design. Commencing salary up to £800 per annum, according to qualifications. Five-day week. Apply R. Mountford Pigott & Partners, KENsington 1242. 6776

THE TILLING ASSOCIATION LIMITED have vacancies for both qualified and unqualified ARCHITECTS with design and constructional ability and administrative experience. The work includes large and small scale commercial and industrial development. Luncheon facilities. Starting salaries within the range of £800—£1,200 p.a. according to qualifications and experience. Apply, preferably in writing, or by telephone, to Alan A. Briggs, F.R.I.B.A., 10 Fleet Street, London, E.C.4. Telephone No. City 4400. 6786

ARCHITECTURAL ASSISTANT required in Wembley. Experience in design and construction of industrial buildings and office blocks. Write stating age, experience and salary required. Box 6787.

ARCHITECTURAL ASSISTANT of Intermediate standard or thereabouts required for varied work on housing and industrial building. Applicant should be capable of undertaking projects with a minimum of supervision. Write giving full particulars of experience and salary required to Shepperdson & Dixon, 2 Museum Street, Ipswich. 6779

ARCHITECTURAL ASSISTANT, Intermediate standard, required for varied work including churches, community buildings, housing, etc. Pension Scheme. Possibility of house. Apply Selby J. Clewer, F.R.I.B.A., Bournville Village Trust, Birmingham 30. 6790

ASSISTANT of Intermediate or Final standard required in small busy London office with varied and interesting projects in hand. Good opportunity for initiative. Please telephone Holborn 1550 or write to Box 6841.

ARCHITECTS. Qualified Men or Women required. To run church, school, and industrial projects from sketch design to completion. Experience in private practice an advantage. Starting salary £800 to £1,200 or more for above-average ability. Progressive outlook. Also: ARCHITECTURAL ASSISTANTS. Students seeking valuable experience welcomed. Encouragement to develop responsibility. Every assistance towards qualifying. Fees paid for approved courses of study. Starting salary £600 to £850 according to ability. Weightman & Bullen, Architects, 76, Rodney Street, Liverpool 1. Five-day week, bonus and pension scheme. 6818

ASSISTANT ARCHITECTS required for varied practice. City centre. R.I.B.A. and Intermediate standard. Apply in writing to Oxley and Russey, 91, Pinstone Street, Sheffield 1, Yorks. 6798

SENIOR and JUNIOR ASSISTANTS with contemporary outlook required for expanding practice engaged on interesting and varied work including large projects. Quarterly bonuses, five-day week and three weeks' annual holiday. Salary by arrangement. Apply in writing or telephone:—Kenneth Anns & Partners, 1, Lincoln's Inn Fields, London, W.C.2. Tel.: HOL. 3031, CHA. 7443. 6878

ASSISTANTS of Intermediate and Final standard required for large and small educational jobs, some overseas; at first in London and later in Guildford office. Write to Frank Rutter, F.R.I.B.A., 2 Finchley Road, London, N.W.8. 6719

A COMPETENT ARCHITECTURAL ASSISTANT required for small but busy London office. Able to take charge of work generally. Phone PADdington 9344 or 5952. 6933

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ARE required immediately to work under the direction of the Chief Architect and also the four District Architects of
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District Architect, F. W. Woolworth & Co., Ltd., Armour House, Lord Street, Liverpool, 2.
District Architect, F. W. Woolworth & Co., Ltd., Crown Site Building, 26/40, Kensington High Street, London, W.8.
District Architect, F. W. Woolworth & Co., Ltd., 47/49, King Street, Dudley, Worcs. 6801

ARCHITECTURAL ASSISTANTS wanted with experience in Design and/or Detailing. Good salary and working conditions. B.S.P. Industries, Ltd., Maxwell Road, Elstree Way, Boreham Wood. ELStree 3511/7. (Ref. 182.) 6813

ARCHITECTS urgently required by expanding and progressive Company. B.S.P. Industries Ltd., Maxwell Road, Elstree Way, Boreham Wood. Phone ELStree 3511/7. (Ref. 183.) 6814

ARCHITECTS require SENIOR ASSISTANT (R.I.B.A. Final standard) for Birmingham Office, preferably with experience in school and hospital design. Alternate Saturdays free. Salary by arrangement. Box 6816.

ARCHITECTURAL ASSISTANT required in progressive office in Kingston-on-Thames. Salary range £750—£1,000 p.a. Reply by letter to Donaldson & Co., 75 London Road, Kingston-on-Thames. 6824

W. S. ATKINS & PARTNERS, Consulting Engineers, require qualified ARCHITECTS and ARCHITECTURAL DRAUGHTSMEN in their Architectural Department to work on major industrial projects. Conditions of service include a 5-day week and superannuation scheme. Applications should be addressed to the Personnel Manager, 158 Victoria Street, S.W.1. 6827

ARCHITECTURAL ASSISTANTS required by Hasker & Hall, L/F.R.I.B.A., for senior and intermediate positions in their offices in London and Warwickshire. Good salary, with scope for initiative and responsibility. Write to 13 Welbeck Street, W.1, or telephone WEL. 0061 or Knowle (Birmingham) 3502. 6724

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SMALL London Office with general practice requires ASSISTANTS with a minimum of two years' experience to assist running contracts. Write experience and salary required to Box 6715.

ARCHITECT'S Office with modern approach to design requires ASSISTANTS of Intermediate and Final standard, London or Reading, for interesting and varied work. Good salary. Eric G. V. Hives and Sons, 80, Wimpole Street, Cavendish Square, W.1, and 46, Queen's Road, Reading. Apply in first instance to Reading. Telephone 55484/5. 6717

ARCHITECTS with busy practice in Brighton require ASSISTANTS with practical experience for varied work. Salary up to £750 per annum. Five-day week, pension scheme, etc. Box 5848.

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CHIEF ASSISTANT to Staff Architect required by leading London Shopfitters. Preferably qualified, interested in contemporary design and particularly in retail store development. Box 6952.

MORRIS DE METZ, F.R.I.B.A., requires an experienced ARCHITECTURAL ASSISTANT for a large interesting office building in London; drawing office on site. Salary up to £950. Tele.: HUNter 2581. 6935

ASSISTANT ARCHITECT required for British Transport Hotels and Catering Services, located London. R.I.B.A. qualifications or equivalent degree preferable. Apply in writing, giving full personal details, to Officer for Personnel, Hotels and Catering Services, St. Pancras Chambers, London, N.W.1. 6961

FARMER AND DARK require experienced ARCHITECTS, all levels. Offices, Laboratories, Factories, Schools, etc. Apply in writing, stating salary required. Romney House, Tufton Street, S.W.1. 6962

THREE ASSISTANTS required for long established Architectural practice in Yorkshire on public and private work. Must have contemporary outlook and be able to work on own initiative and preferably be car drivers. Housing accommodation will be provided. Apply, giving full particulars and salary required, to Box 6963.

DENNIS S. LICHTIG requires experienced ASSISTANT for interesting work in his new Loughton office. The appointment offers good prospects for a keen man. Three minutes' walk from Central Line tube station. Five-day week. Salary range £700—£1,000. Apply to 24, Spareleaze Hill, Loughton, Essex, or phone Loughton 5864. 6971

LOUIS DE SOISSONS, PEACOCK, HODGES, AND ROBERTSON have immediate vacancies in their London office for Senior and Junior ASSISTANTS. Write, stating age, salary and experience to the above at: 3, Park Square Mews, Upper Harley Street, N.W.1. 6972

TAUNTON: ARCHITECTURAL ASSISTANT, experienced in housing work, required to take prominent part in large scale private housing projects and other interesting work. Please write, giving details of experience, qualifications, salary required and age, to Kenneth Steel & Hadley Coleman, A/A.R.I.B.A., Chartered Architects, 7, The Crescent, Taunton. 6973

ARCHITECT'S ASSISTANT required in Birmingham Office for preparation of working drawings, specifications, etc., for domestic work to be carried out in the Herefordshire area. Ability to drive a car and experience in other types of work an asset. Salary according to experience. Pension scheme. Box 6975.

ARCHITECT'S ASSISTANT required in busy Birmingham Office with variety of work. Previous office experience essential. Salary according to experience. Pension scheme. Box 6976.

SENIOR SURVEYING ASSISTANT for Agent of Private Estate, Camberwell. Applicants should have passed R.I.C.S. Final or Intermediate (III B) or have equivalent practical experience. Use of car provided. Ability to deal with War Damage and Dilapidation Claims an advantage. Salary by arrangement. Application forms from Box 6974.

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ARCHITECTURAL ASSISTANTS of Intermediate standard required for interesting contemporary commercial work. Experience in Industrial Office desirable but not essential. Ability to prepare working drawings and 3-in. details. Permanent progressive appointment. Apply, stating salary required, to P. L. Howells, Esq., A.R.I.B.A., Chief Architect, Cow & Gate Ltd., Guildford, Surrey. 6936

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RALPH TUBBS, 46, Queen Anne Street, W.1, requires young qualified ASSISTANT ARCHITECT with both imagination and experience. Please apply by letter with brief particulars. 6939

SMALL congenial office in Grays Inn requires SENIOR ASSISTANT, Final standard, with office experience preferably with pubs. Capable of running own jobs from start to finish. £1,000 p.a. or more according to experience, plus overtime if required. Five-day week. Phone HOLborn 9687. 6947

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LOUIS DE SOISSONS, PEACOCK, HODGES, & ROBERTSON, have immediate vacancies in their Welwyn Garden City office for Senior and Junior ASSISTANTS. Write, stating age, salary and experience, to the above at: Midland Bank Chambers, Howardsgate, Welwyn Garden City, Herts. 6891

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ARCHITECTS both Intermediate and Final standard required for variety of interesting work in both Bridgend and Port Talbot offices. Salary according to qualifications and experience. Only architects with a keen interest and knowledge of contemporary design need apply. J. Morgan Harries, M.A., B.Arch., A.R.I.B.A., Chartered Architect, 40 Caroline Street, Bridgend. 6907

ARCHITECTURAL ASSISTANTS required to work on varied and interesting projects. Office experience desirable. Salaries according to experience. £600—£1,000 p.a. Five-day week. Apply in writing or telephone Covell & Matthews, 34 Sackville Street, London, W.1. REGent 2291. 6979

ADAMS, HOLDEN & PEARSON require SENIOR ARCHITECTURAL ASSISTANTS and ASSISTANTS not less than R.I.B.A. Intermediate Standard. The work includes Hospitals, Commercial Buildings and Laboratories. Apply giving age, qualifications, experience and salary required to 38, Gordon Square, W.C.1. 6981

ARCHITECTURAL ASSISTANTS required in West End. Should be capable of preparing ¼" scale drawings and details from sketch plans. Box 6980.

ARCHITECTURAL ASSISTANTS, Intermediate standard, required in London Office with varied practice. Interesting projects. Five-day week. Write, giving particulars of age, experience, etc., to Box 903, c/o 7, Coptic Street, W.C.1. 6986

BIRMINGHAM CO-OPERATIVE SOCIETY LIMITED.—ARCHITECTURAL ASSISTANT required. Intermediate to Final standard. Some experience in modern shopping would be an advantage. Salary by arrangement. Apply to Personnel Officer, Birmingham Co-operative Society Ltd., Castle Street (off High Street), Birmingham. 6994

ARCHITECTURAL ASSISTANT required—Intermediate standard with office experience—for varied and interesting work. Write, stating experience and salary required, to Parkinson and Mull, F/A.R.I.B.A., A.M.T.P.I., Whitwell Chambers, Ferrars Road, Huntingdon. 6993

ENERGETIC young ARCHITECTURAL ASSISTANT required. Paul Mauger, Gavin, Mathers & Mitchell, 31, Church Street, Welwyn, Herts. 6992

ARCHITECTURAL ASSISTANT up to Intermediate standard required for busy general practice. Write stating age, experience and salary required, to Earp, Badger & Harrison, A/A.R.I.B.A., Guild Chambers, Scholars Lane, Stratford-on-Avon. 6991

WORCESTER Architects require competent ASSISTANTS, preferably of Intermediate standard with previous office experience, for varied busy practice. Write, stating age, salary required and experience, to Llewellyn Smith & Waters, 33, Foregate Street, Worcester, or to 103, Old Brompton Road, London. 6990

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BASIL SPENCE & PARTNERS require qualified MEN with at least two years' office experience and Final standard ASSISTANTS with about five years' experience. Write to 48, Queen Anne Street, W.1, stating experience and salary required. 6904

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IF you are not a qualified architect but consider yourself a good ARCHITECT or ARCHITECTURAL DRAUGHTSMAN and require an interesting and progressive appointment with a firm of architects, whose offices are in London, please write, stating ability, experience and salary required, to Box 6928.

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POWELL & ALPORT require ASSISTANT in their Croydon office. Salary according to experience in range £600—£850, plus bonus. Write stating age, experience and salary required. 6926

ARCHITECTS.—Two ASSISTANTS required, one qualified R.I.B.A. or equivalent, one R.I.B.A. Intermediate standard, both with good general experience. Salary by agreement, pension scheme available. Apply to Brierley, Leckenby & Keighley, F/A/A.R.I.B.A., 10, Lendal, York. 6917

ARCHITECTURAL ASSISTANT required in Sheffield Office. Must be qualified with at least 12 months' experience. State experience and salary required. Box 6923.

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STRUCTURAL ENGINEER required to take charge of Consulting Department in a large Architects' Office. Sound structural knowledge and imaginative outlook a necessity. Apply stating experience and salary required to Box 6613.

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SHOPFITTING DRAUGHTSMAN required by SELFRIDGES to prepare drawings for further store extensions. Excellent working conditions, five-day week. Applicants up to 50 years of age will be considered and applications should be made in the first instance by letter addressed to the Staff Manager, Selfridges Ltd., 400, Oxford Street, W.1, stating age, experience and present salary. 6957

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ARCHITECTURAL DRAUGHTSMAN up to Intermediate Standard required for firm in Westminster. 5-day week—bonus and pension schemes. Telephone ABBey 1122 for appointment. 6920

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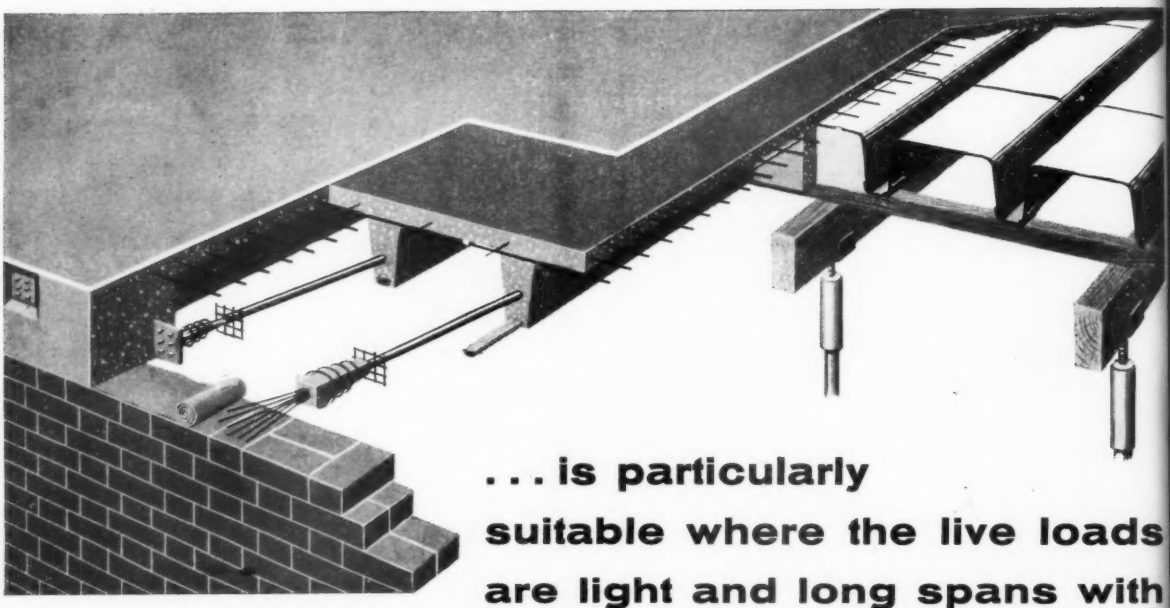

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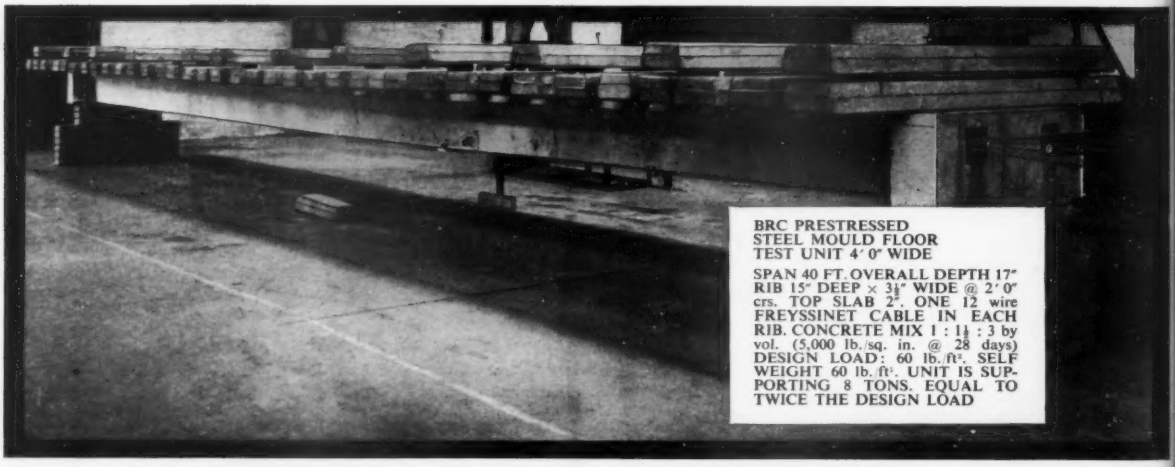

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