THE ARCHITECTS' JOURNAL

standard contents

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

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THE ARCHITECTURAL PRESS

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

AA	Architectural Association, 34/6, Bedford Square, W.C.1.	Museum 0974
AAI	Association of Art Institutions. Secy.: W. Marlborough Whitehead, "Dyneley," Castle Hill Avenue, Berkhampstead, Herts.	
ABS	Architects' Benevolent Society. 66, Portland Place, W.1.	Langham 5721
ABT	Association of Building Technicians. 1, Ashley Place, S.W.1.	Victoria 0447-8
ACGB	Arts Council of Great Britain. 4, St. James' Square, S.W.1.	Whitehall 9737
ADA	Aluminium Development Association. 33, Grosvenor Street, W.1.	Mayfair 7501/8
ARCUK	Architects' Registration Council. 78, Wimpole Street, W.1.	Welbeck 2915
BAE	Board of Architectural Education. 66, Portland Place, W.1.	Langham 5721
BATC	Building Apprenticeship and Training Council. Lambeth Bridge House, S.E.1.	Reliance 7611, Ext. 1706
BC	Building Centre. 26, Store Street, Tottenham Court Road, W.C.1.	Museum 5400
BCC	British Colour Council. 13, Portman Square, W.1.	Welbeck 4185
BCCF	British Cast Concrete Federation. 105, Uxbridge Road, Ealing, W.5.	Ealing 9621
BCIRA	British Cast Iron Research Association. Alvechurch, Birmingham.	Redditch 716
BDA	British Door Association. 10, The Boltons, S.W.10.	Fremantle 8494
BEDA	British Electrical Development Association. 2, Savoy Hill, W.C.2.	Temple Bar 9434
BIA	British Ironfounders' Association. 145, Vincent Street, Glasgow, C.2	Glasgow Central 2891
BID	Building Industries Distributors. 52, High Holborn, W.C.1.	Chancery 7772
BINC	Building Industries National Council. 11, Weymouth Street, W.1.	Langham 2785
BOT	Board of Trade. Whitehall Gardens, Horseguards Avenue, Whitehall, S.W.1.	Trafalgar 8855
BRS	Building Research Station. Bucknalls Lane, Watford	Garston 4040
BSA	Building Societies Association. 14, Park Street, W.1.	Mayfair 0515
BSI	British Standards Institution. British Standards House, 2, Park St., W.1.	Mayfair 9000
BTE	Building Trades Exhibition. 32, Millbank, S.W.1.	Tate Gallery 8134
CABAS	City and Borough Architects Society. C/o Johnson Blackett, F.R.I.B.A., Civic Centre, Newport, Mon.	Newport 65491
CAS	County Architects' Society. C/o F. R. Steele, F.R.I.B.A., County Hall, Chichester.	Chichester 3001
CCA	Cement and Concrete Association. 52, Grosvenor Gardens, S.W.1.	Belgravia 6661
CCP	Council for Codes of Practice. Lambeth Bridge House, S.E.1.	Reliance 7611 Ext. 1284
CDA	Copper Development Association. 55, South Audley Street, W.1.	Grosvenor 8811
CIAM	Congrès Internationaux d'Architecture Moderne. Doldertal, 7, Zurich, Switzerland	
COID	Council of Industrial Design. 28, Haymarket, S.W.1.	Trafalgar 8000
CPRE	Council for the Preservation of Rural England. 4, Hobart Place, S.W.1.	Sloane 4280
CUC	Coal Utilization Council. 3, Upper Belgrave Street, S.W.1.	Sloane 9116
CVE	Council for Visual Education. 13, Suffolk Street, Haymarket, S.W.1.	Reading 72255
DGW	Directorate General of Works, Ministry of Works, Lambeth Bridge House, S.E.1.	Reliance 7611
DIA	Design and Industries Association. 13, Suffolk Street, S.W.1.	Whitehall 0540
DPT	Department of Overseas Trade. Horseguards Avenue, Whitehall, S.W.1.	Trafalgar 8855
EJMA	English Joinery Manufacturers' Association (Incorporated). Sackville House, 40, Piccadilly, W.1.	Regent 4448
EPNS	English Place-Name Society. 7, Selwyn Gardens, Cambridge.	
FAS	Faculty of Architects and Surveyors. 68, Gloucester Place, W.1.	Welbeck 9966
FASS	Federation of Association of Specialists and Sub-Contractors, Artillery House, Artillery Row, S.W.1.	Abbey 7232
FBBDO	Fibre Building Board Development Organization, Ltd. (Fidor), 47, Princes Gate, Kensington, S.W.7.	Kensington 4577
FBI	Federation of British Industries. 21, Tothill Street, S.W.1.	Whitehall 6711
FC	Forestry Commission. 25, Savile Row, W.1.	Regent 0221
FCMI	Federation of Coated Macadam Industries. 37, Chester Square, S.W.1.	Sloane 1002
FDMA	The Flush Door Manufacturers Association Ltd., Trowell, Nottingham.	Ilkeston 623
FLD	Friends of the Lake District. Pennington House, nr. Ulverston, Lancs.	Ulverston 201
FMB	Federation of Master Builders. 26, Great Ormond Street, Holborn, W.C.1.	Chancery 7583
FPC	The Federation of Painting Contractors, St. Stephen's House, S.W.1.	Whitehall 3902
FRHB	Federation of Registered House Builders. 82, New Cavendish Street, W.1.	Langham 4341
GPDA	Gypsum Plasterboard Development Association, 11, Ironmonger Lane, E.C.2.	Monarch 8888
GC	Gas Council. 1, Grosvenor Place, S.W.1.	Sloane 4554
GG	Georgian Group. 2, Chester Street, S.W.1.	Belgravia 3081
HC	Housing Centre. 13, Suffolk Street, Pall Mall, S.W.1.	Whitehall 2881
IAAS	Incorporated Association of Architects and Surveyors. 29, Belgrave Square, S.W.1.	Belgravia 3755
ICA	Institute of Contemporary Arts. 17–18, Dover Street, Piccadilly, W.1.	Grosvenor 6186
ICE	Institution of Civil Engineers. 1, Great George Street, S.W.1.	Whitehall 4577
IEE	Institution of Electrical Engineers. Savoy Place, Victoria Embankment, W.C.2.	Temple Bar 7676
IES	Illuminating Engineering Society. 32, Victoria Street, S.W.1.	Abbey 5215
IGE	Institution of Gas Engineers. 17, Grosvenor Crescent, S.W.1.	Sloane 8266

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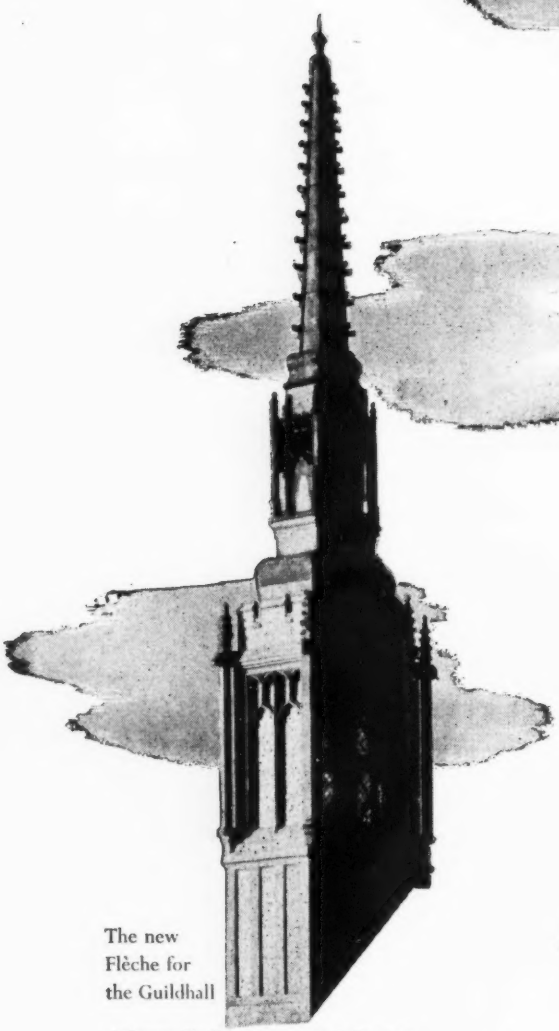

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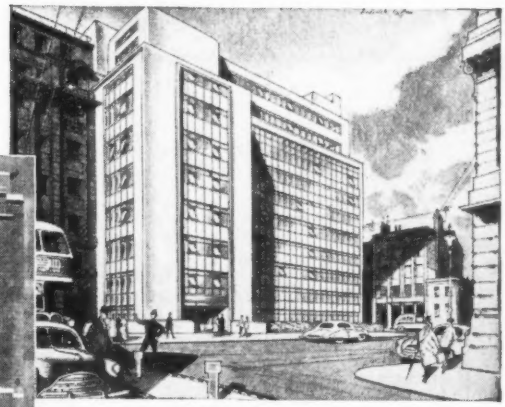
Consulting Engineer : Messrs. Bylander & Waddell



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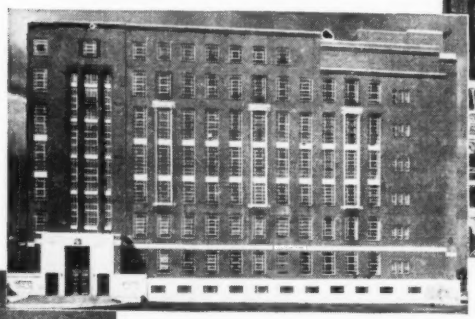

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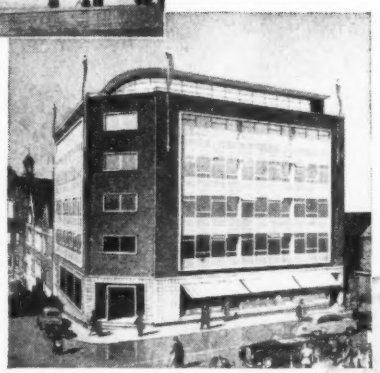

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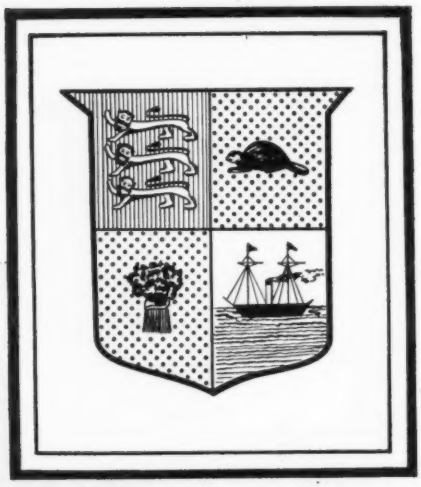

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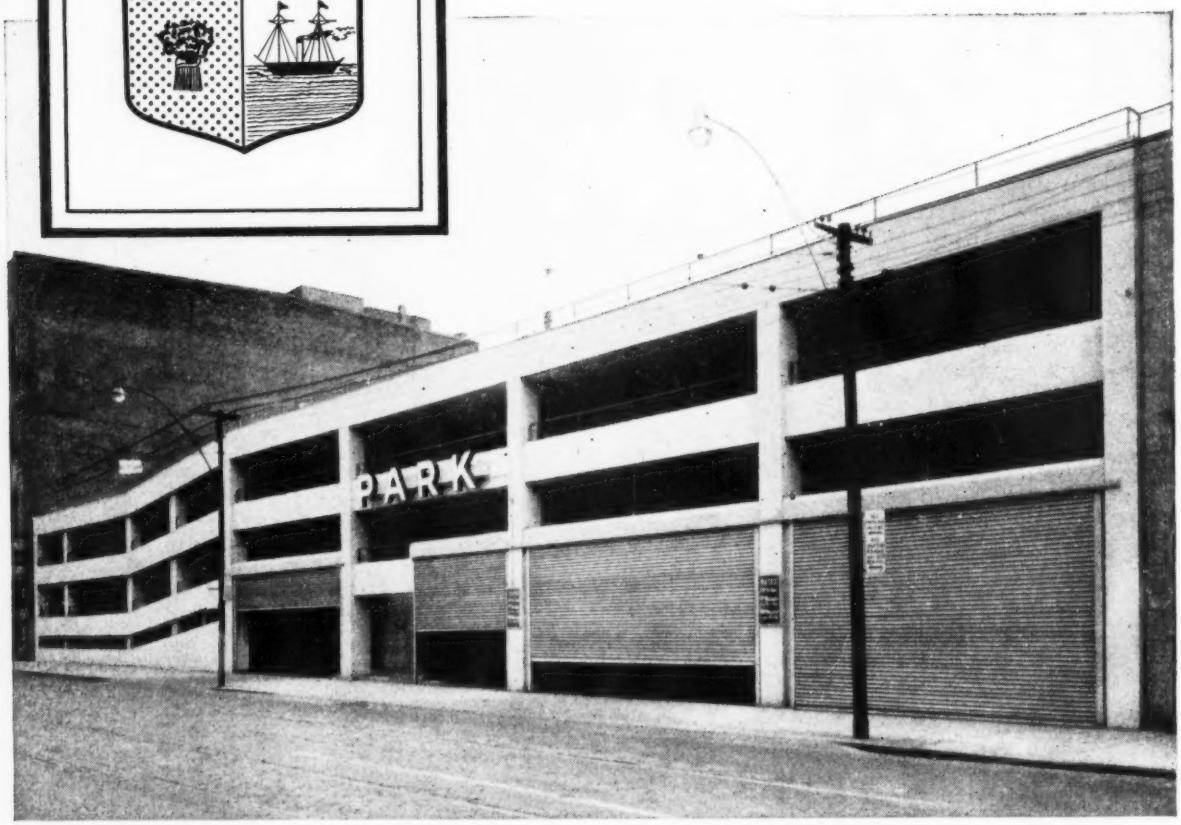

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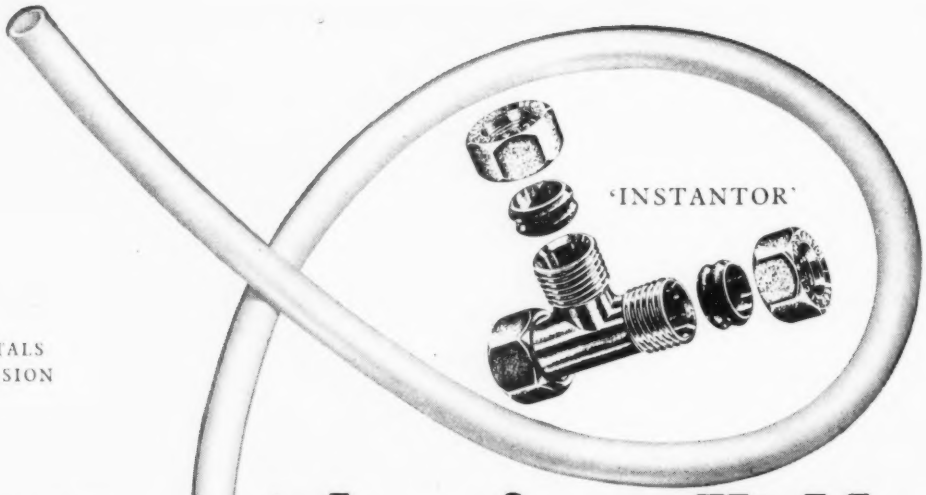

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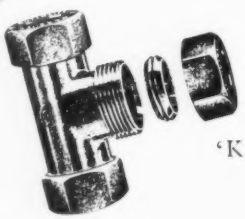

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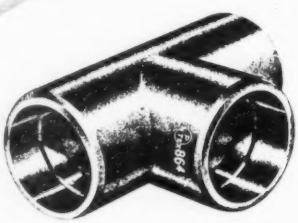

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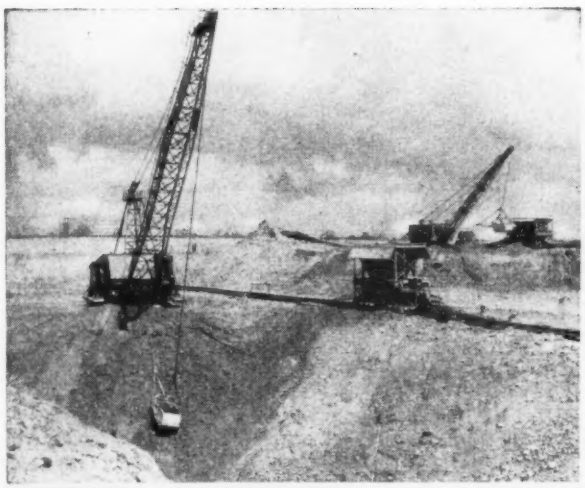

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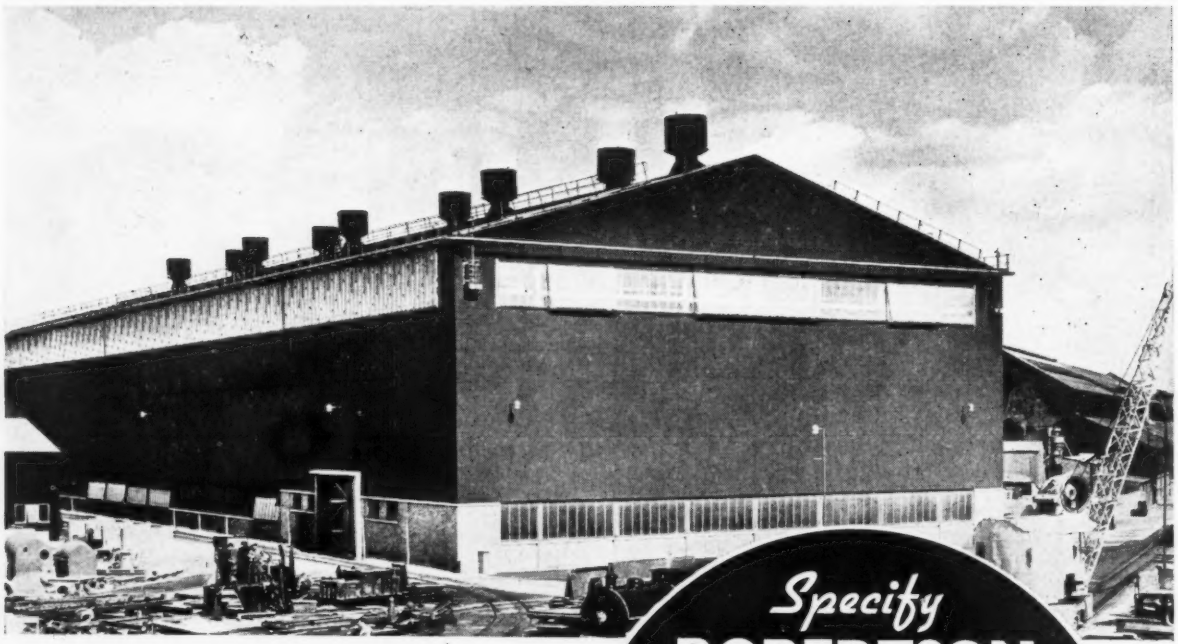

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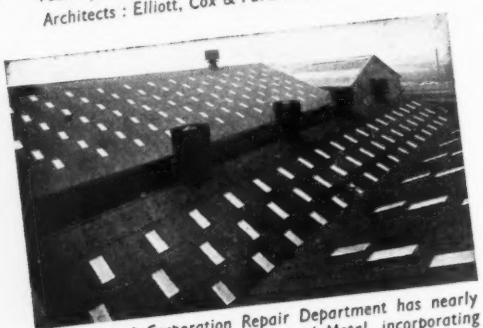

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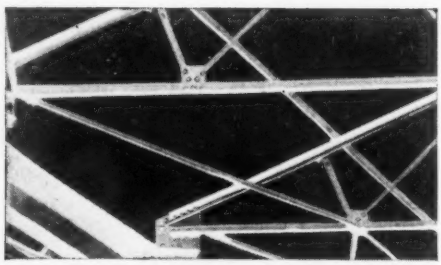

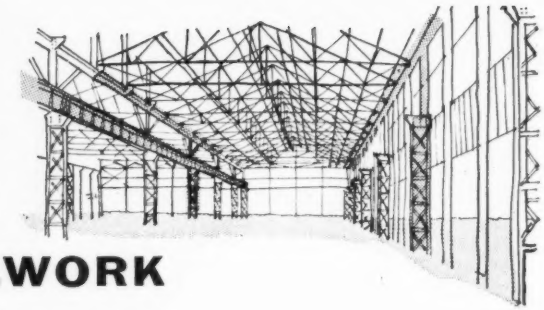

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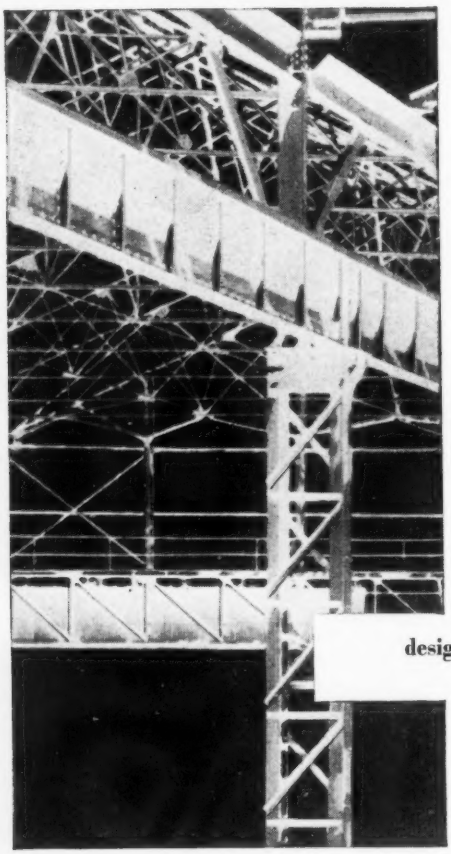

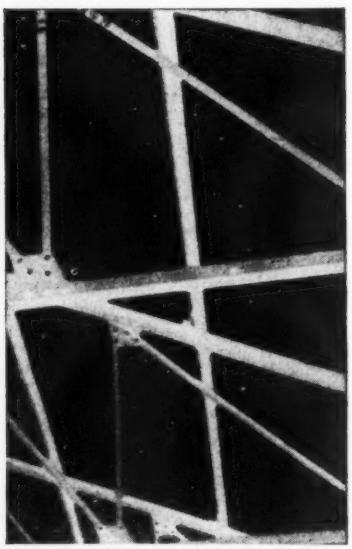

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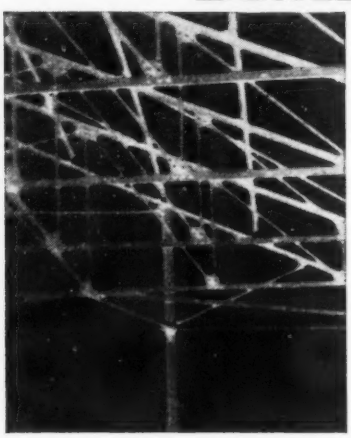

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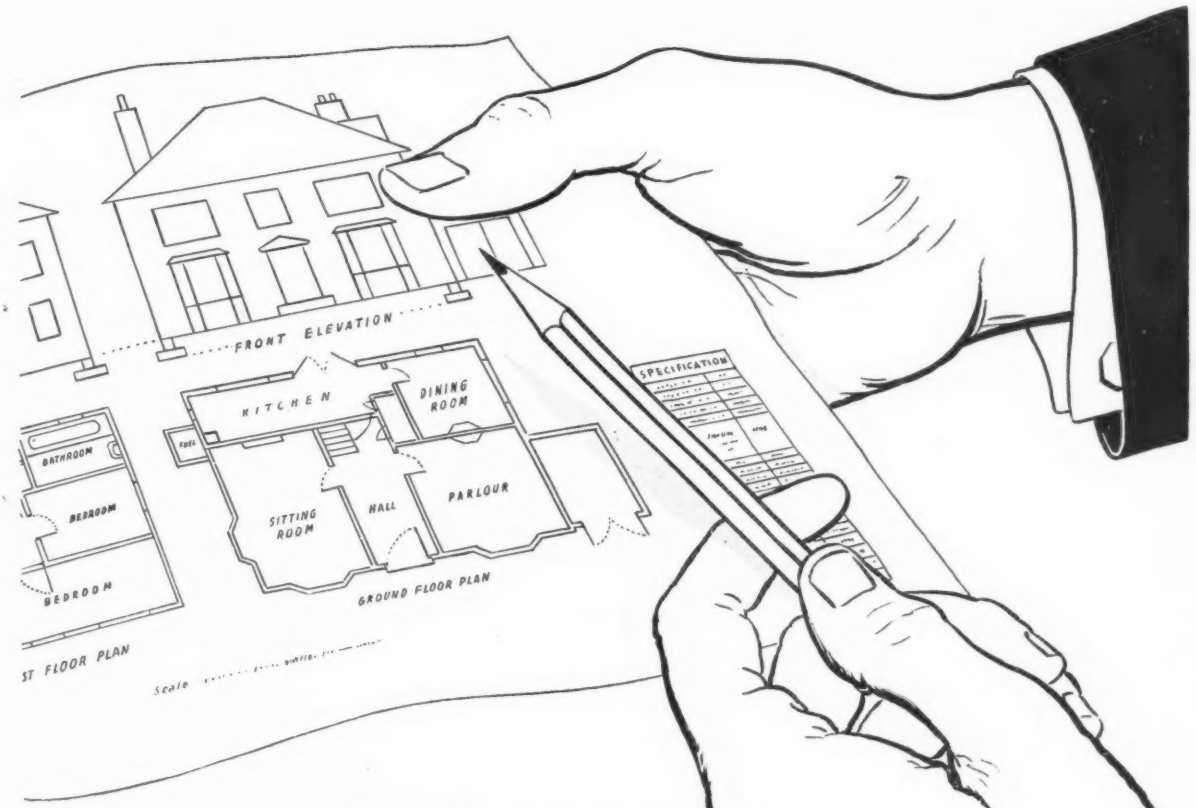

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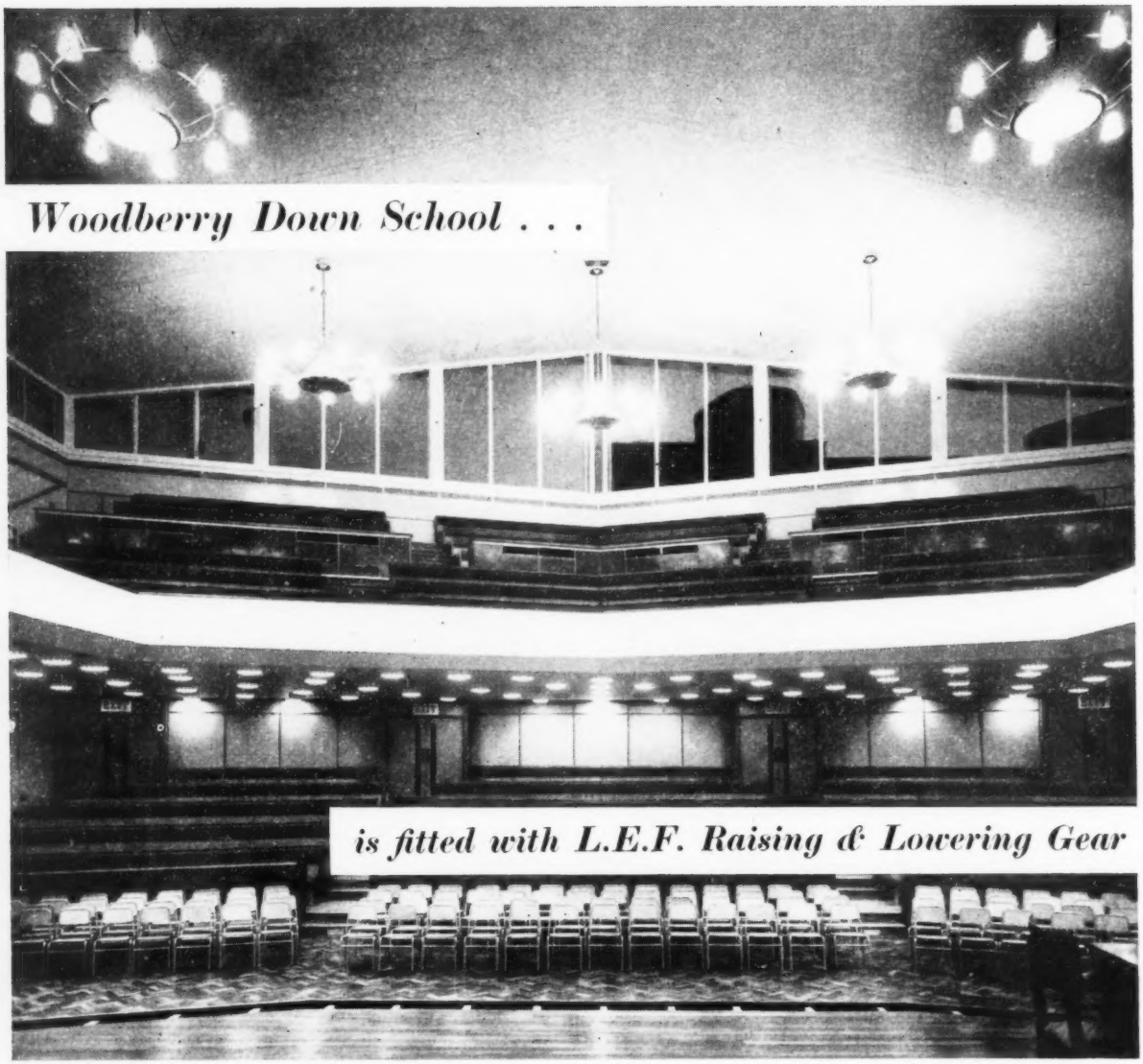

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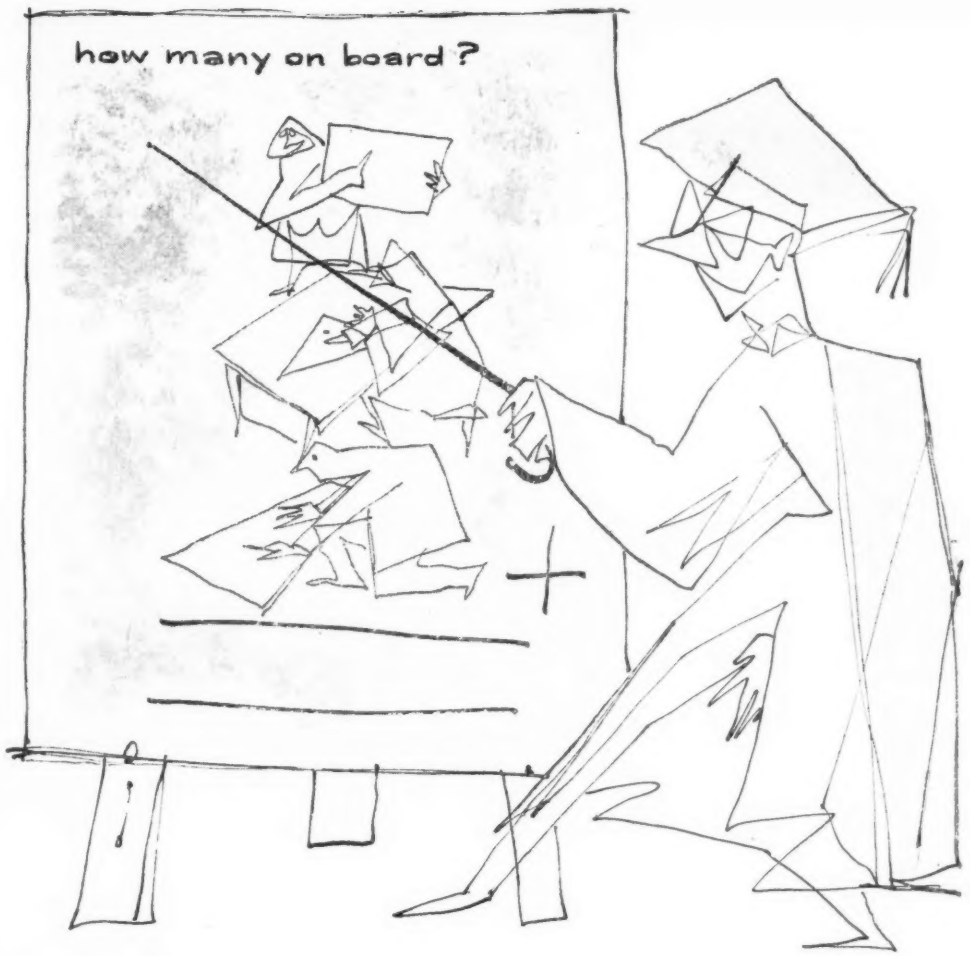

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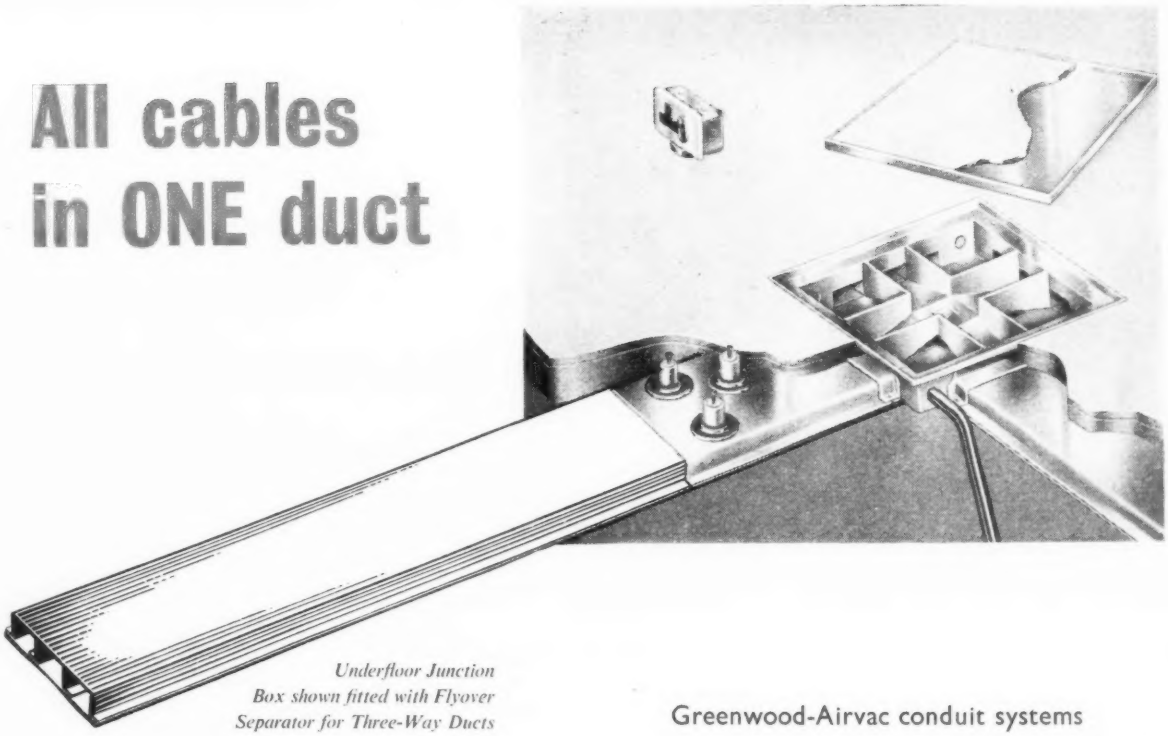


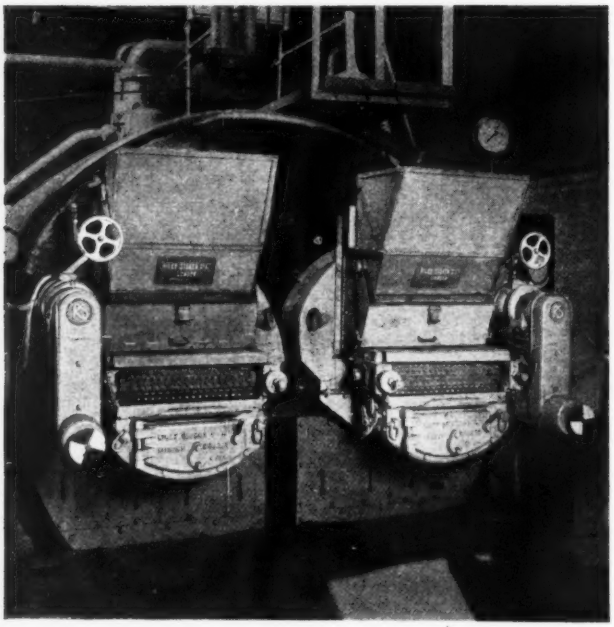
Underfloor Junction Box shown fitted with Flyover Separator for Three-Way Ducts

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

Unilever Ltd., Hesketh House, Portman Square, London, W.1. Another recent Greenwood-Airvac Conduit underfloor installation.

Greenwood-Airvac *conduit systems*

GREENWOOD'S AND AIRVAC VENTILATING COMPANY LTD
Patentees, Designers and Manufacturers of Ventilating Equipment and Electrical Conduit Systems
BEACON HOUSE, KINGSWAY, LONDON, W.C.2. CHAncery 8135/6/7. 'Airvac', London



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CHAIN GRATE STOKER

The Riley Type 'T' Chain Grate Stoker has been developed specially to burn efficiently, and in sufficient quantities, small sized low grade coals which are high in ash content.

For Horizontal Shell-type Boilers

The stoker body is of rigid fabricated steel box structure, with zonal air control.

The grate surface is formed of die-cast links of heat resisting cast iron and high individual strength.

All links, except for the two rows of heavy side links, are of equal thickness and are disposed to ensure that air spacing is uniform across the grate.

Odd links can be replaced easily without withdrawing the stoker from the boiler.

Refractory lined furnace flue extension incorporates air ducts and peep-hole door.

Geared motor drive for A.C. or D.C. supply.

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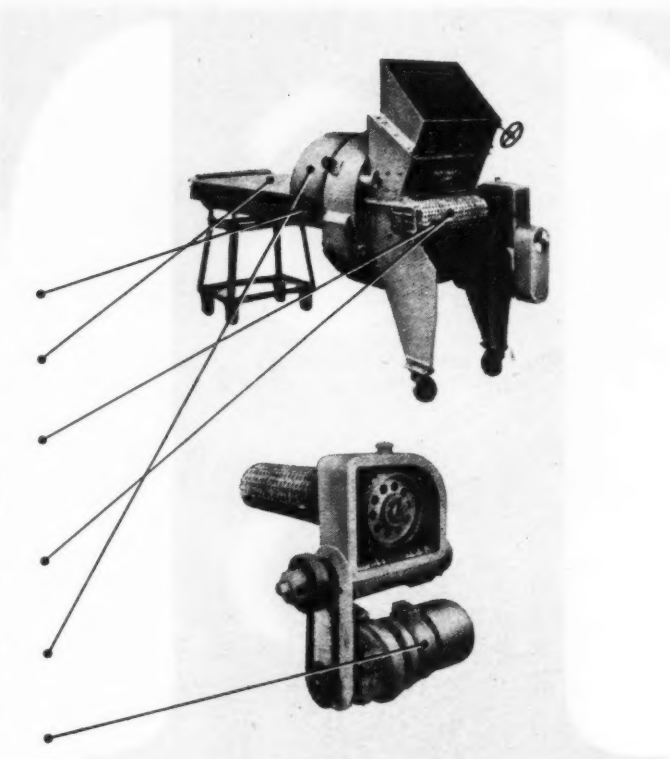

See us at Stand D.22, Factory Equipment Exhibition, Earls Court, April 29—May 4.

RILEY (IC) PRODUCTS LIMITED

One of the International Combustion Group of Companies.

NINETEEN WOBURN PLACE · LONDON · W.C.1 · TELEPHONE: TERMINUS 2622

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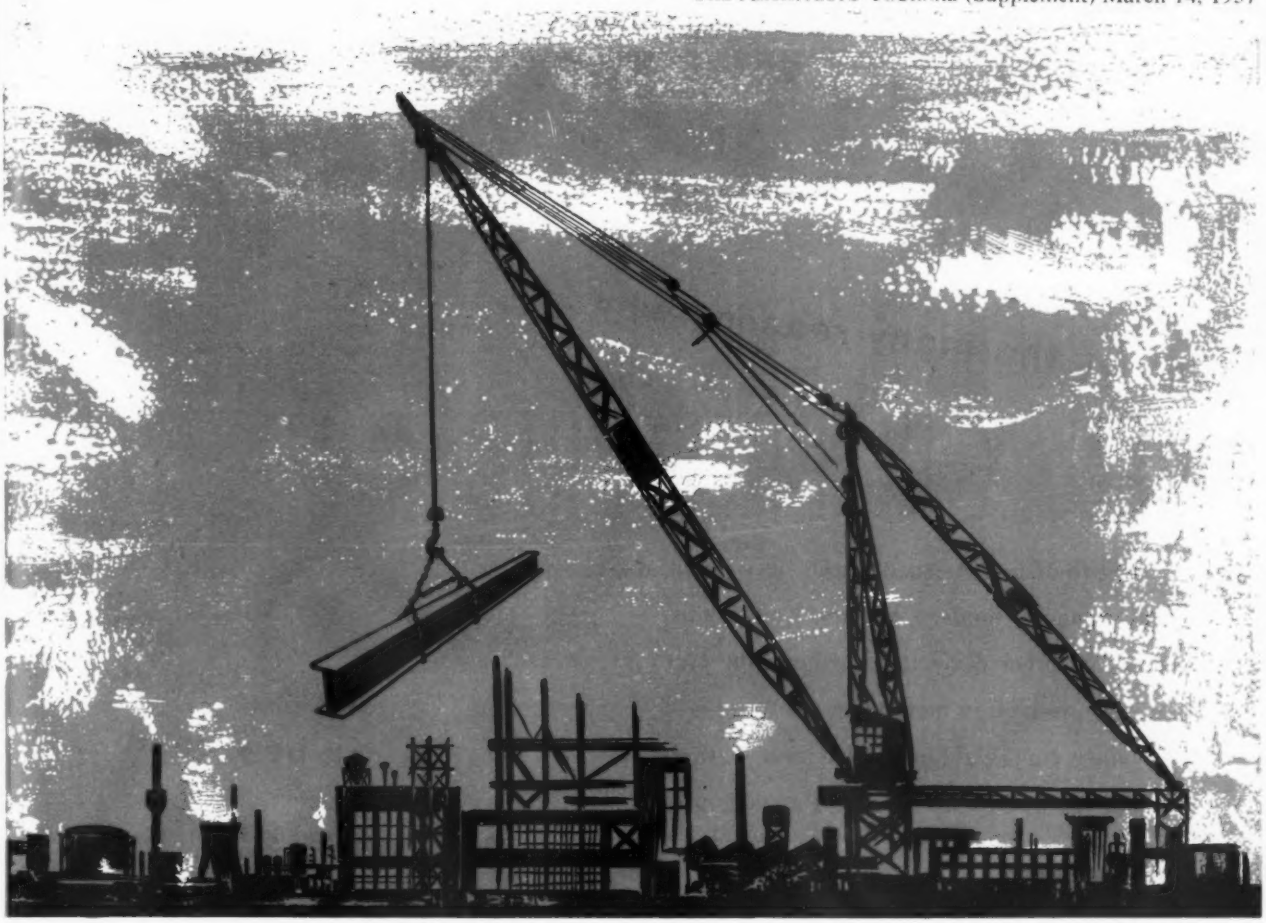
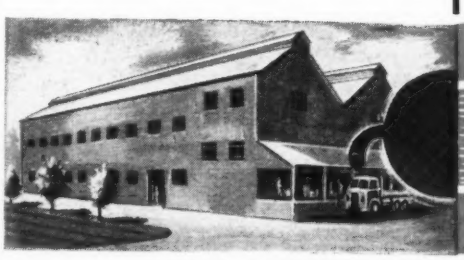


from small beginnings

'Tis said that " mighty things from small beginnings grow." So it is with big constructional undertakings. See the foundations laid ! Watch the fabricated steel framework going up ! Come to think of it, that's where we come in. As specialists in the fabrication and erection of all types of steel structure we can offer an unsurpassed, comprehensive and speedy service. A service that is all-embracing and includes designing, estimating, templating, welding, rivetting, in fact every stage of the job right through to the actual erection on site. If it's a question of fabricated steel structures, you'll do well to get in touch with Cook & Co. Their technical staff is always at your service.



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CONSTRUCTIONAL ENGINEERS & CONTRACTORS

ALEXANDER HOUSE, 62 CLAPHAM ROAD, LONDON S.W.9

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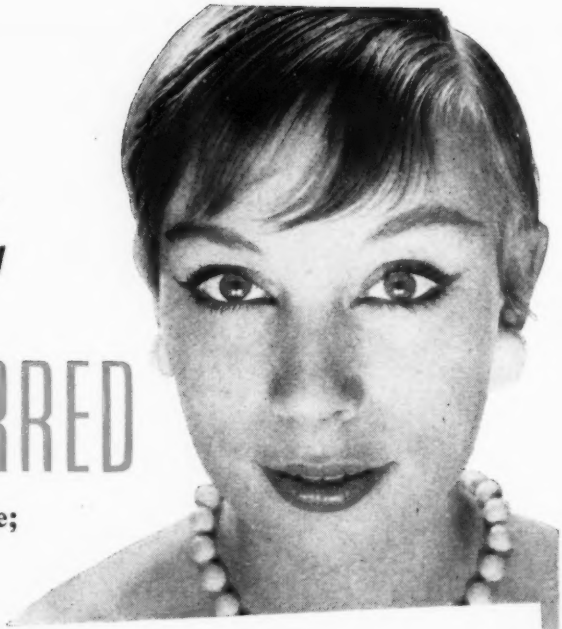
'Eye Appeal'...

one of the many reasons why

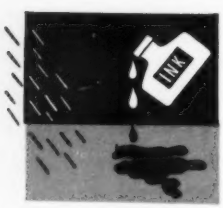
PANAX IS PREFERRED



A long life of unblemished beauty in spite of abuse; a wide range of modern colours, woodgrains, linens, and other decorative designs; the fact that new production methods make it possible to produce Panax at a low price level... these are some of the many reasons why Panax is preferred.

Panax can be seen in

- Homes and Hotels
- Hospitals and Schools
- Factories and Offices
- Ships and Aircraft
- Restaurants and Shops



Will not stain

Resistant to heat

Wipes clean instantly

PANAX is a high pressure melamine laminated plastic surfacing. It is completely non-porous, will stand much abuse without damage, is resistant to heat, acids, abrasion, and will not stain. Dirt, no matter how fearsome, can be removed by wiping the surface with a damp cloth.

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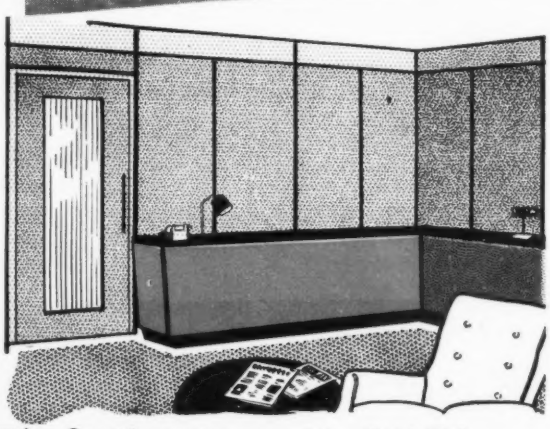

***Enquiries will receive prompt attention. Samples sent on request to Dept:* Pxl**

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THE ALL-PURPOSE SURFACE!

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The whole of the design and development of fixtures, fittings, layouts and buildings was carried out by the Development Office of Fine Fare Limited. The refrigerated cabinets have been developed by Prestcold in collaboration with that office.

A special refrigeration problem?

Call in Prestcold —as Fine Fare did

When Fine Fare designed their big new supermarket stores, they chose Prestcold refrigeration to keep the food fresh. And to meet the needs of this new form of selling, we collaborated closely with Fine Fare Ltd. in designing a completely new range of refrigeration equipment. This is typical of the way we work. While our standard equipment suits most purposes, we are constantly being asked to find the answers to completely *new* problems. In this way we have built up an unrivalled fund of ideas and specialised knowledge of the refrigeration difficulties of many industries and businesses. And of architects. We are always glad to collaborate with architects on refrigeration-building projects. We are at *your* service. And we are as near to you as your telephone.

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MANUFACTURERS OF REFRIGERATING MACHINERY
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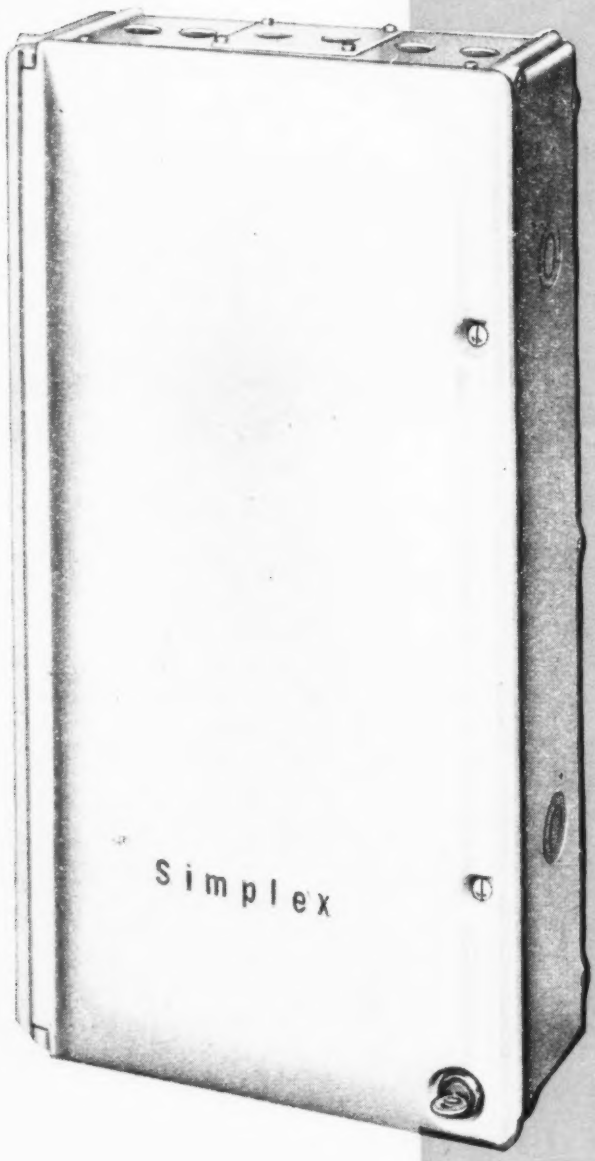

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fuse boards
15 & 30 amp
500 volt

surface or flush

Regent switchgear by

Simplex

Ask for publication SW2068

Simplex Electric Co Ltd
Oldbury Birmingham and branches
A COMPANY

CHAIR model 424 designed by N. K. Hislop. The legs are in Sycamore finish and it is upholstered in a new Tibor Deep Texture "Seville" in Natural colouring. Produced by Gimson & Slater Ltd., Walton Street, Long Eaton. CARPET "Cortina" designed in the Mediterranean mood by Tibor Reich, F.S.I.A. for the Equerry (Regd.) range of Wilton filling. This *easy-to-live-with* pattern is available in shades of Tropic Turquoise/Black and Azalea Red/Black. Produced by S. J. Stockwell & Co. (Carpets) Ltd., 16 Grafton Street, London, W.1. FABRIC "Niza" — Tibor's latest Texture-print on slub satin-faced cotton in exciting new colour combinations. This curtain fabric is one out of the range of four new designs which are designed to blend with Stockwell carpets and Tibor Deep Textured upholstery fabrics. Produced by Tibor Ltd., Stratford-on-Avon.

VESPER

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Piping Hot Water

AT A FARTHING A GALLON

When specifying for *any* buildings . . . single dwellings, estates or flats . . . you will find the new Flavel National instantaneous sink gas water heater efficient and economical, whether used alone, or in addition to a solid-fuel boiler system. A National in the kitchen eliminates the need for fires when the weather is warm, and ensures a constant supply of really hot water—instantly available at any time of the day or night, all the year round.

THE FLAVEL NATIONAL

Instantaneous Sink Gas Water Heater

★ Provides a full half-gallon of piping hot water every minute.

★ A broken feed type heater, with all working parts totally enclosed. Designed for wall fixing, it works equally well on both hard and soft water.

★ Slim, easily detachable one-piece steel case finished in sparkling, clean-at-a-wipe cream or white vitreous enamel.

★ The removal of a single knurled nut enables the heat exchanger to be unhooked and cleaned in less than five minutes.

★ 12 non-clogging Bray burner jets. Rating: 35,000 B.Th.U/hr. Connections: gas ½″ B.S.P.; water ⅜″ B.S.P.

★ Height 25¼″, width 8½″, depth 7¾″, weight 20½ lbs. 6″ spout supplied as standard, but 9″ 12″ or 18″ spouts are available.

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For fuller details, you are invited to write to Flavels. Their Architectural Advisory Bureau is always ready to give expert advice and information about all Flavel gas appliances . . . solid-fuel grates, boilers, cooker/water heaters, gas-heated clothes-dryer, water heaters, fires and cookers.

SIDNEY FLAVEL & CO. LTD., LEAMINGTON SPA. TELEPHONES: (SALES) 3091 AND (WORKS) 8700. TELEGRAMS: FLAVELS

"Of course, I want Wednesbury Tube!"

A wartime film on enemy mine detection began: 'You cannot fail to identify a TmiZ 35' But some people could — and suffered by their failure.

Similarly when you say "Copper Tubing" you probably think of Wednesbury, quality-controlled, copper tubing. And very often you will get it. But make sure. For domestic use or in manufacture (refrigerators, for example) specify Wednesbury.

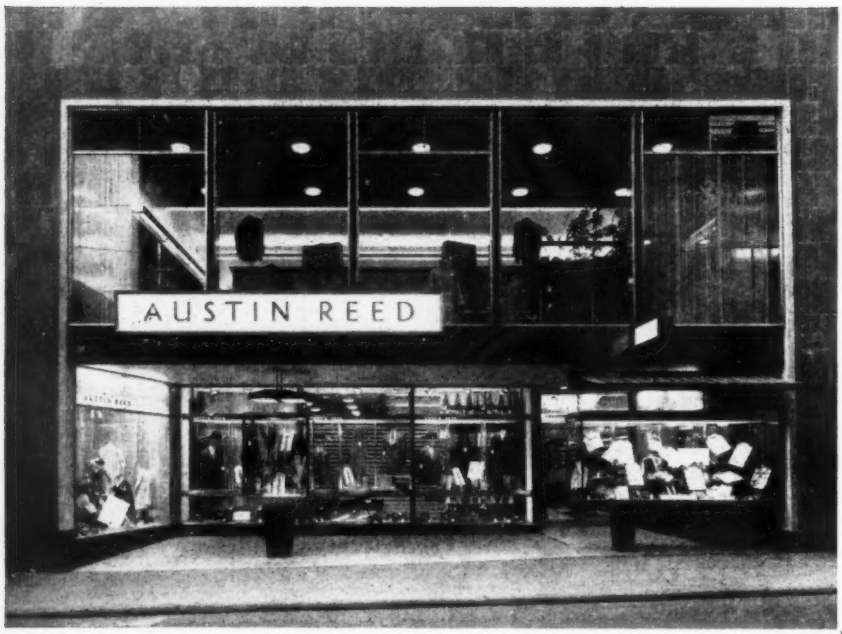
choose WEDNESBURY TUBE

Obtainable from your local stockist or builders' merchant

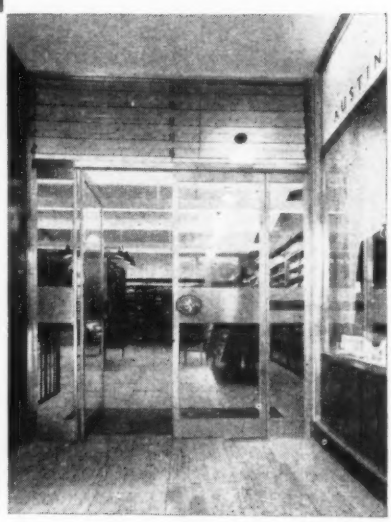
THE WEDNESBURY TUBE CO. LTD, BILSTON, STAFFS

Associated Company, Glynn Bros. Ltd, London and Manchester

AUSTIN REED · LIVERPOOL



The shopfront and interior of these new premises were constructed by our organisation to the designs and under the direction of Westwood Sons & Harrison, FF.R.I.B.A.



OUR DESIGN AND TECHNICAL SERVICE IS READILY AVAILABLE TO ASSIST IN THE DEVELOPMENT OF ALL TYPES OF DECORATIVE SCHEMES.

Harris & Sheldon Ltd.

The organisation with a background of 75 years experience.

BIRMINGHAM LONDON GLASGOW

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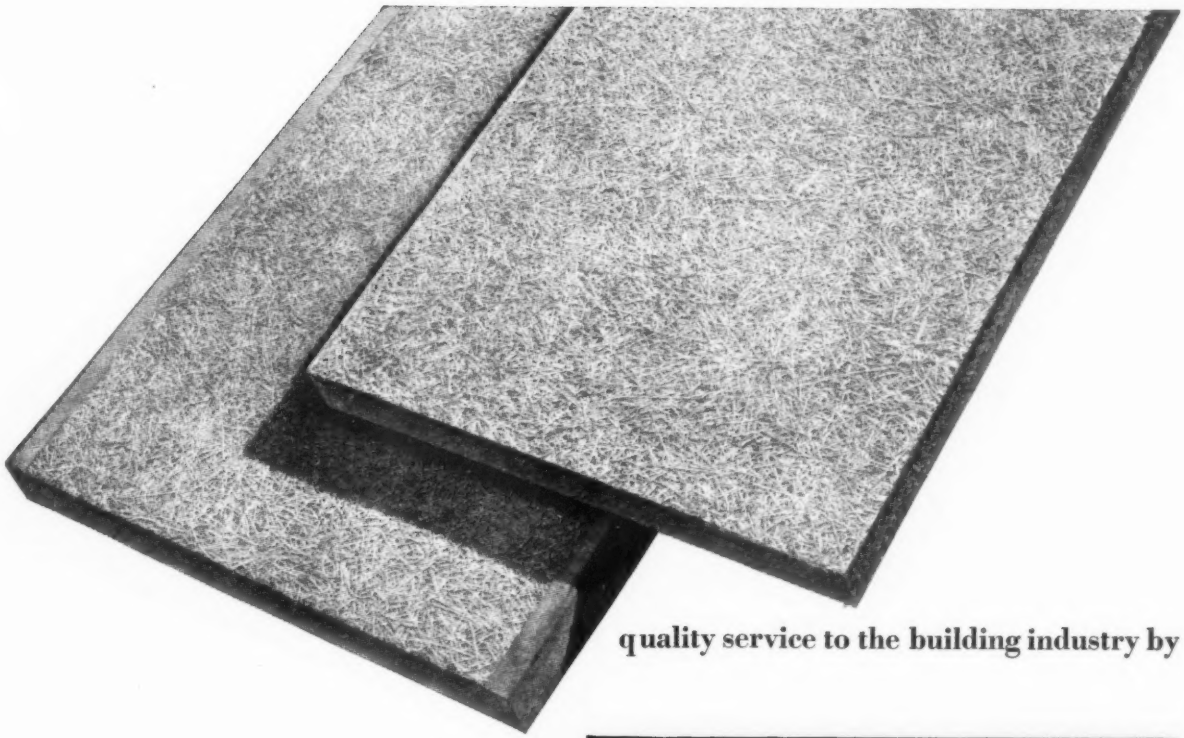

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Stellith wood wool slabs and channel reinforced roofing slabs offer many advantages, including exceptional structural strength, light weight, excellent heat insulation and sound absorption properties, easy handling, cutting and fixing and effective resistance to fire and moisture. Their many uses include:—

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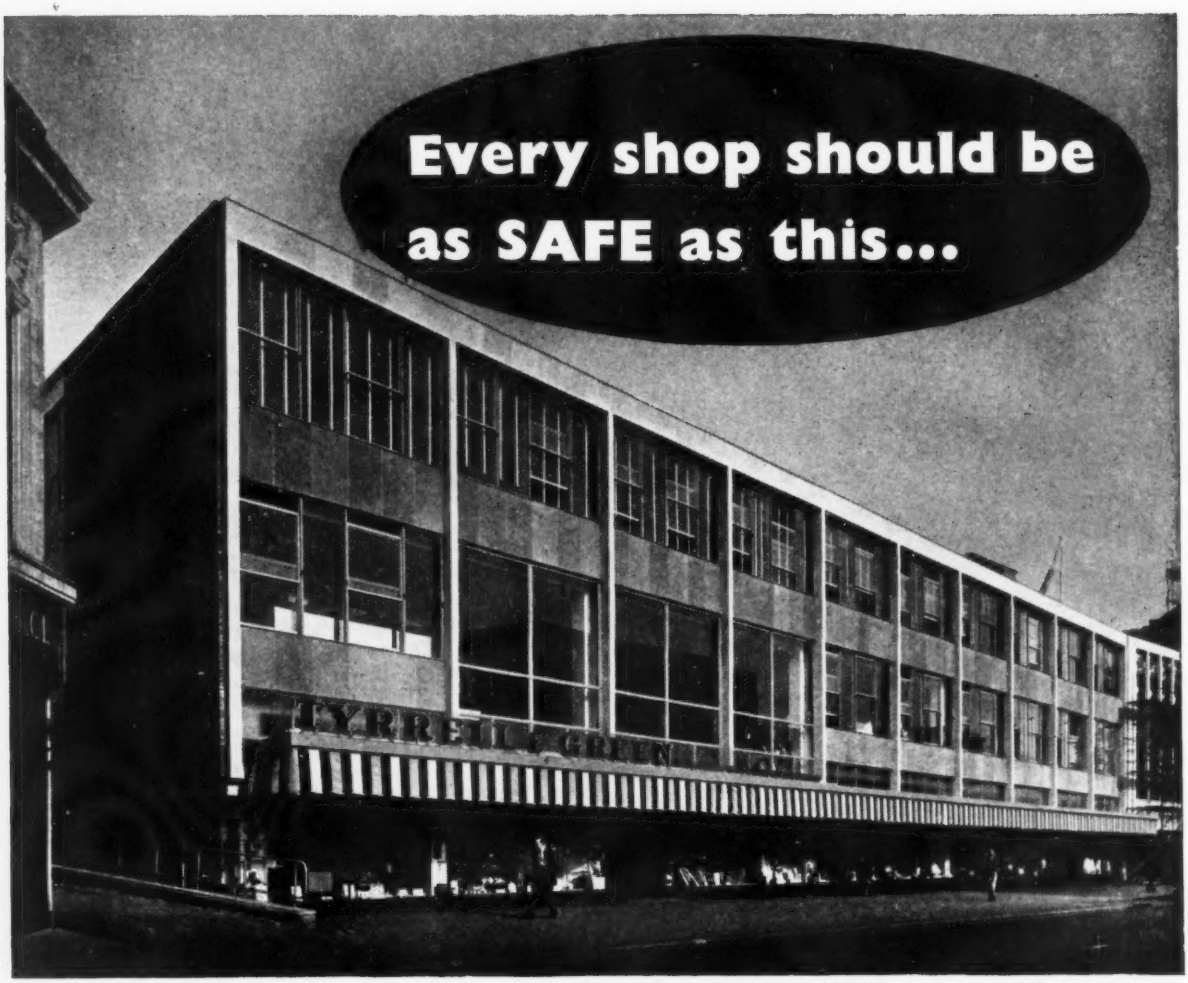
Technical information sheets on the above and other uses of STELLITH available on request to:—

***STELLITH** **wood wool slabs and channel reinforced roofing slabs**

STELLA BUILDING PRODUCTS LTD.
Tudor Avenue, North Shields, Northumberland. *Tel: North Shields 1474/5*



Architects: Yorke, Rosenberg & Mardall. Photograph: Architectural Review

Tyrrell & Green's will be *really* safe from fire. This latest feature of Southampton's post-war reconstruction has a complete A.F.A. Automatic Fire Alarm System. With sensitive detectors throughout the building and a direct connection to the Fire Station, it is ready to call the Brigade to the exact spot *within minutes of outbreak.*

This fully-approved system, which qualifies for valuable insurance rebates, is described further in our booklet "If you had a fire tonight". Please write for your copy.

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ASSOCIATED FIRE ALARMS LIMITED

Claremont Works, Claremont Road, London, E.17 *Telephone: Larkswood 8373-4*

Branches throughout Great Britain

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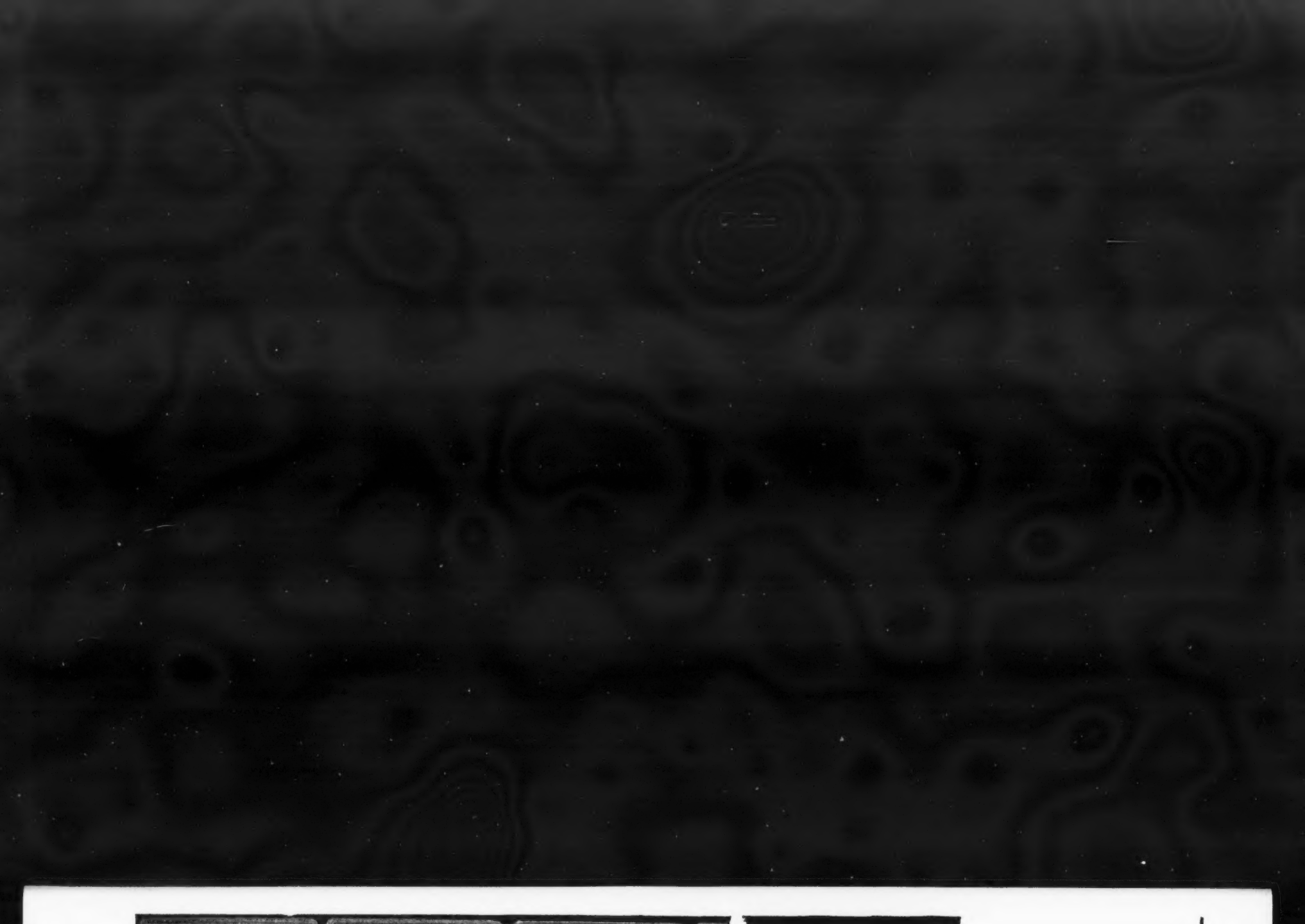

Whatever its shape or size, a building today is certain to need colour; colour outside to catch the sunshine and gladden the eye, colour inside for walls, ceilings and floors. Cementone No. 1 *Permanent* Colours for Cement are economical in use, attractive to look at; specially designed for cement rendering and concrete work, composition floors, and similar applications for buildings of every kind.

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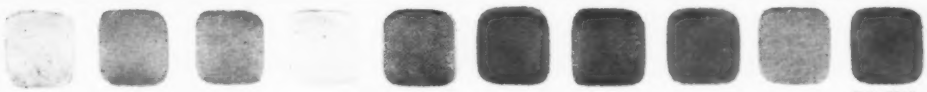
10 standard shades and black, which can be intermixed to form a variety of colours in white or Portland cement.



T.A. 9295

FOR THE NEW VAUXHALL PLANT AT LUTON

VIEW OF ONE SECTION OF THE VAST NEW WORKS (TOTAL FLOOR AREA 1,500,000 sq. ft.) SHOWING 48", 36" and 30" UNITS

BROOKS HOT-DIP GALVANIZED FAN-POWERED UNITS PROVIDE THE VENTILATION.

The installation of BROOKS Fan-Powered Roof Extract and Input Units at the new £30 million Vauxhall Plants is typical of the many construction projects on which BROOKS are currently engaged.

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MAY WE SEND YOU DETAILS OF BROOKS VERTICAL JET UNITS?

For high velocity discharge of smoke, fumes or airborne dust above roof level.

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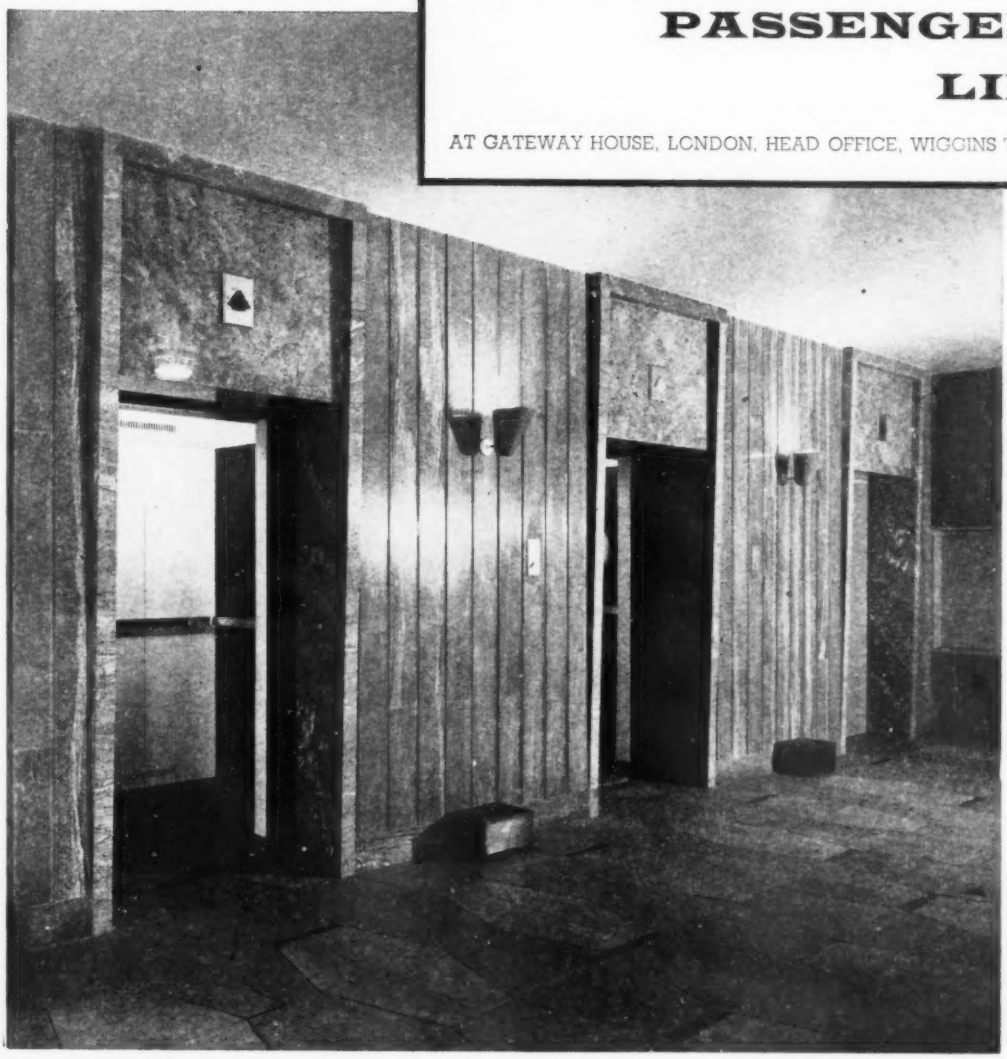
ELECTRIC PASSENGER LIFTS

AT GATEWAY HOUSE, LONDON, HEAD OFFICE, WIGGINS TEAPE GROUP

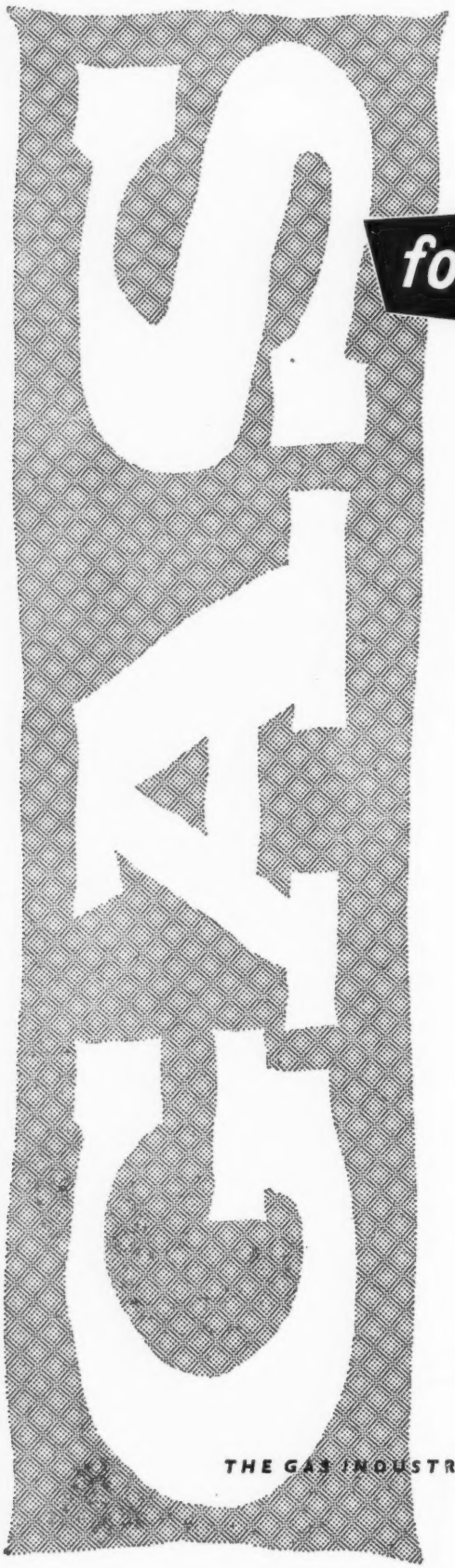


The installation consists of five high speed passenger lifts consisting of one bank of Triplex control and one bank of Duplex control.
Two panel bi-parting power operated doors are fitted to car and landing entrances. One of the Triplex control lifts is fitted as a Fireman's lift to comply with the requirements of the London Fire Brigade.

Architects: Messrs. Trehearne and Norman Preston & Partners.
Contractors: Messrs. Trollope & Colls Ltd.

HAMMOND & CHAMPNESS LTD.

Gnome House, Blackhorse Lane, London, E.17 Telephone: LARkswood 1071



for smokeless heat –

By usefully harnessing three-quarters of the heat value in coal the Gas Industry offers two refined smokeless fuels, coke and gas. In addition the chemical engineering process of gasmaking simultaneously converts the potential smoke in coal into useful products like coal tar and pitch—and without these, expensive chemical imports would be necessary. Each of the Area Gas Boards offers expert advice to architects, building authorities and all engaged in providing smokeless heat. The advice is based upon the pooled knowledge of all the Area Gas Boards and the users of coke and gas in other countries.

consult your area gas board

THE GAS INDUSTRY MAKES THE BEST USE OF THE NATION'S COAL

The Gas Council, 1 Grosvenor Place London, S.W.1

Church heating

The Church of England alone is responsible for some 15,000 churches of varying character and more than 10,000 of them were built before the nineteenth century.

There is obviously no one solution to the heating of so many different buildings. Shall it be continuous or intermittent heating? Will it be radiant or convected heating? However, the Heating Engineer at your Area Gas Board can give expert advice on any space-heating problem from his accumulated knowledge and past experience.

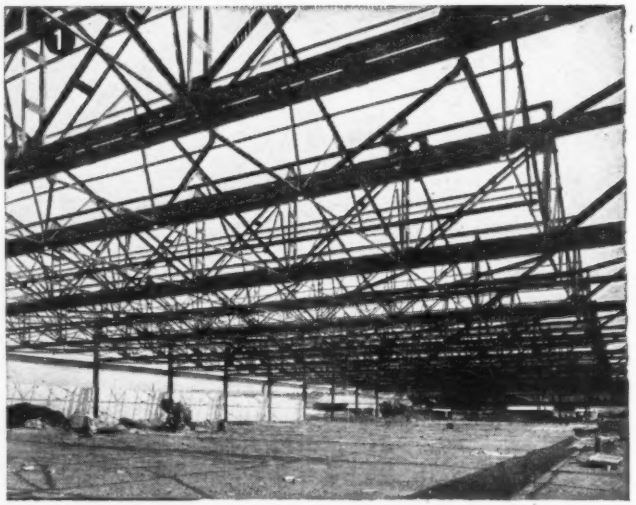
***WHATEVER YOUR BUSINESS*—The Gas Industry appreciates the needs of individual consumers for prompt service and for advice which accords with the customer's special circumstances and requirements. Each Area Gas Board offers efficient service to users of gas-fired equipment and can give expert advice based upon the pooled knowledge of all the Boards and of gas users in other countries.**

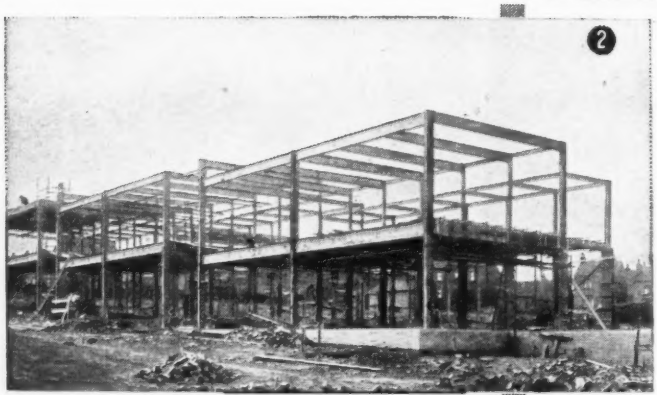
—CONSULT YOUR AREA GAS BOARD

ISSUED BY THE GAS COUNCIL

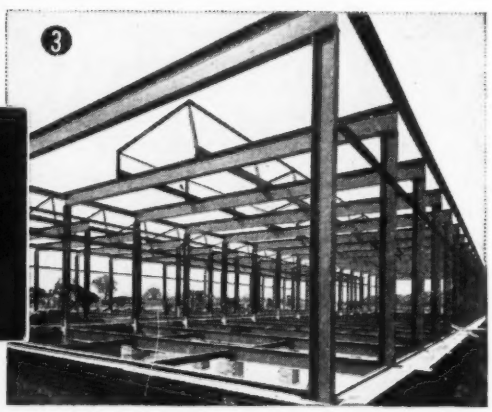
THE GAS INDUSTRY MAKES THE BEST USE OF THE NATION'S COAL

Design
Fabrication
Erection





1. New factory building for Messrs. William Cooke & Co. Ltd. of Rotherham. 300 ft. x 120 ft. span.
2. The County Primary School, Crosland Moor, Huddersfield.
3. College of Further Education, Grimsby, in course of erection. Stage 1.
4. The completed College. Stage 1.



Structural Steelwork by AUSTINS

VULCAN
ESTABLISHED 1850

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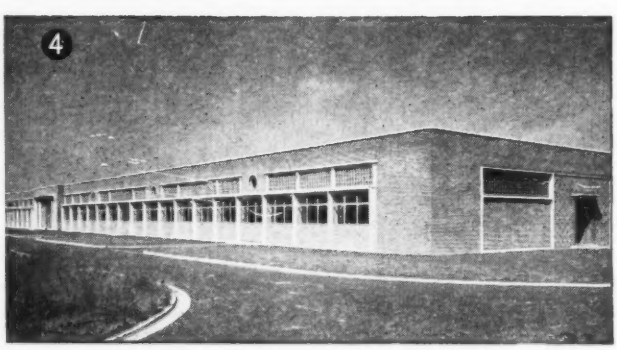
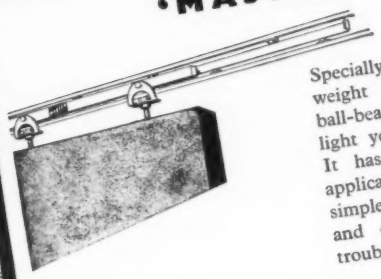


Coburn

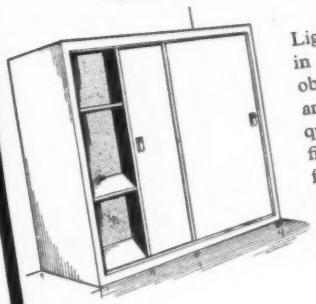
right
for every place
and purpose
THE SLIDING DOOR GEAR

'MASTER' GEAR



Specially designed for light-weight interior doors, this ball-bearing sliding gear is light yet remarkably strong. It has a wide variety of applications, is simple to install and completely trouble-free.

'CUBBARD' GEAR



Light in weight, quiet in operation and unobtrusive in appearance; designed to suit quality or utility doors fitting into the rear face of the joinery. Maximum door weight recommended is 50 lb.

'OVER-THE-TOP' GEAR

Finger-tip control by perfect counter-balancing. Completely weather-proof and draught-proof, ensured by weather stripping on inside of door and jamb. Standard set operates doors up to 8ft. high and up to 250 lb. weight. Simple to install and maintenance free.

—and for the heavier job!

STRAIGHT SLIDING GEAR

The most popular and widely used of all sliding gears. It can be used on single, double or triple tracks. A wide variety of applications may be assembled from the various components available.

FOLDING GEAR

May be used for exterior and interior folding and sliding doors, screens and windows. It is particularly suitable when side walls may not be used.

'ROUND-THE-CORNER' GEAR

The perfect gear for garages, warehouses and similar buildings where it is required to run the doors round the corner, so that they are positioned against a side wall when open.

Gauge for gauge, Coburn is still the strongest load-bearing track made. Improvements in trolley and component design are continuous, besides developments in metallurgy and finish. A practical advisory service is also available. All of which explains why Coburn has been confidently specified by architects for the last 50 years!

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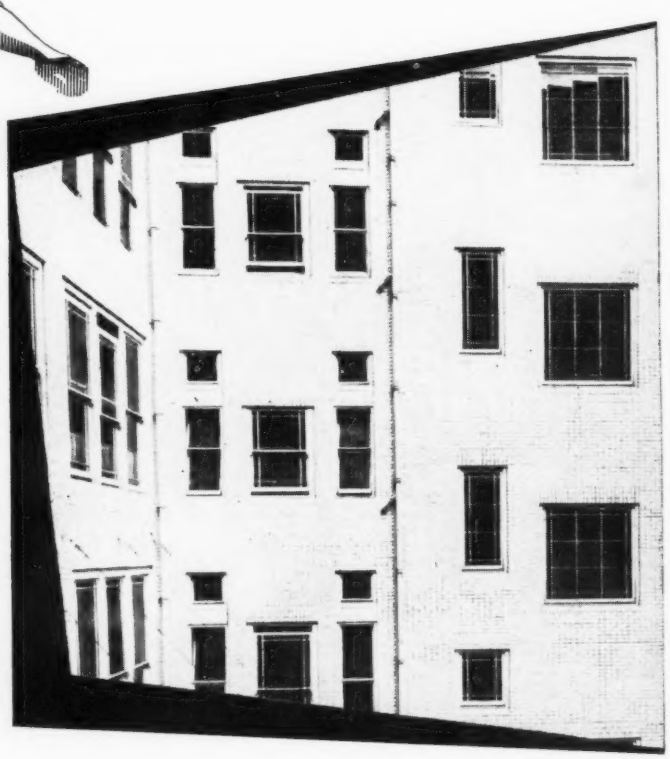

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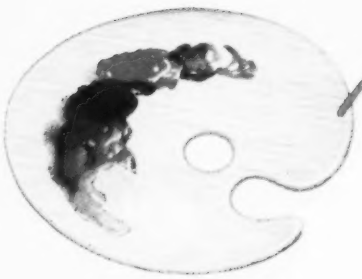

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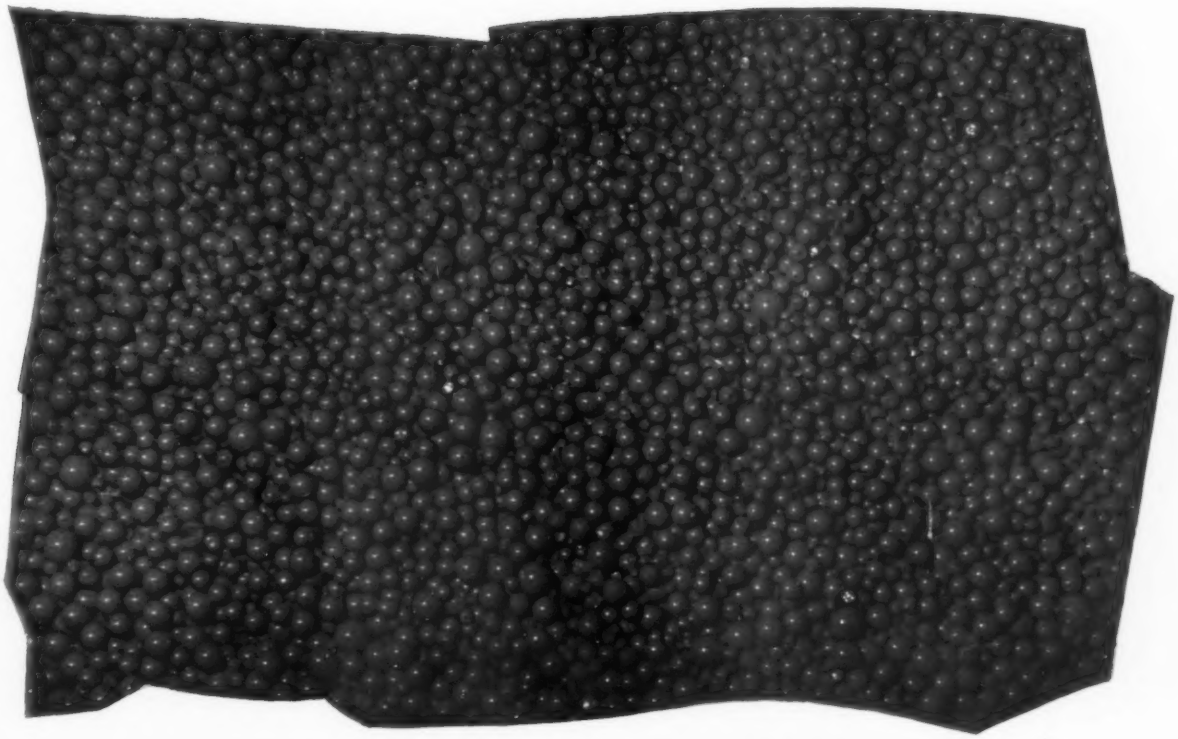

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DOMESTIC HEATING IN THE UNITED KINGDOM

I.P.W.A. Booklet A.10 is a reprint of Paper 22, Central Heating Systems, as presented at the Institute of Fuel Conference held in London on May 1st and 2nd, 1956.

Booklet A.10 has 16 pages with 14 small illustrations, mainly $\frac{1}{8}$in. scale plans showing six different heating schemes, radiator, skirting, floor and ceiling systems designed to suit the heat requirements of a representative semi-detached two-storey house which was selected by Building Research Station as a basis for estimating the total capital costs incurred, including attendant builders' work, with different forms of heating and hot water supply. These costs are given in the booklet. The text discusses the results of house heating experiments at Abbots Langley, the case for central heating, temperatures required in living rooms, kitchens and bedrooms, the characteristics and amenities of different systems, with brief reference to blocks of flats and the possibility of small " district heating " schemes for groups of houses.

Members of IPWA are primarily concerned with larger installations and may not be well placed to undertake contracts for single houses at competitive prices, but are able to do so for blocks of flats or groups of 50 or more identical houses.

Booklet A.10 is available free of charge on completing and returning the reply-paid enquiry form at the end of this issue of the Journal.

See Sample page opposite

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System 6. Hollow-ceiling Heating.

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During the past year or so much research has been done on the application of this form of heating to various types of ceiling, plaster, asbestos and metal, mainly with a view to its use in large buildings to meet dry construction or acoustic requirements. From the work already done on small pilot installations it is evident that the method has attractive features for house-heating.

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The panel layout and pipe-runs shown in Figs. 5 and 5A could be used with hollow-ceiling heating. Indeed, with the use of higher-temperature water some simplification is possible. For example, the ceiling panel over the landing and the hall-floor panel could be omitted in

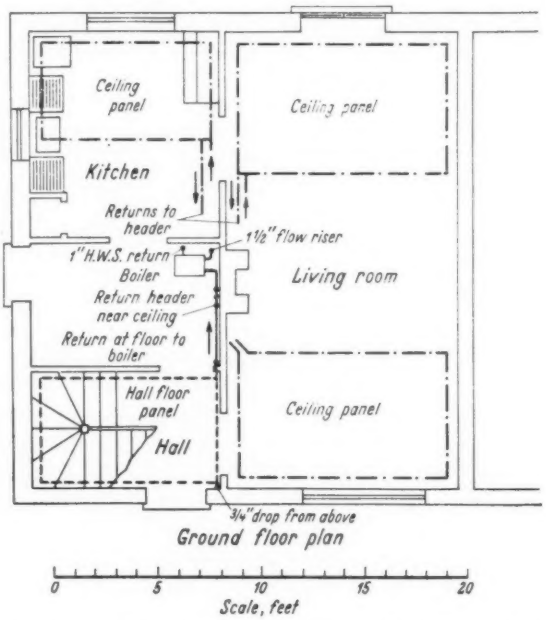

FIG. 5.—*System 5, embedded ceiling panels (ground floor).*

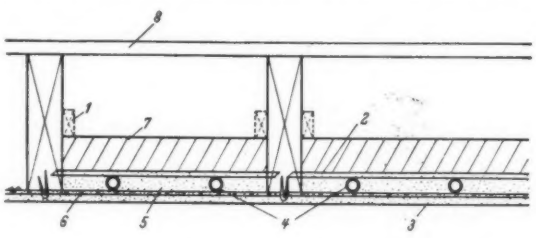

FIG. 5B.—*System 5, embedded ceiling panels, showing method of laying pipes.*

1. *Fillets, required if pugging to be applied from below.* 2. *1¼ in. × ¼ in. flat bars cut into joists.* 3. *Floating and setting coats.* 4. *Pipes at centres to suit joist spacing, wired to flat bars.* 5. *Pugging.* 6. *Expanded-metal lath.* 7. *Insulation.* 8. *Floor boards.*

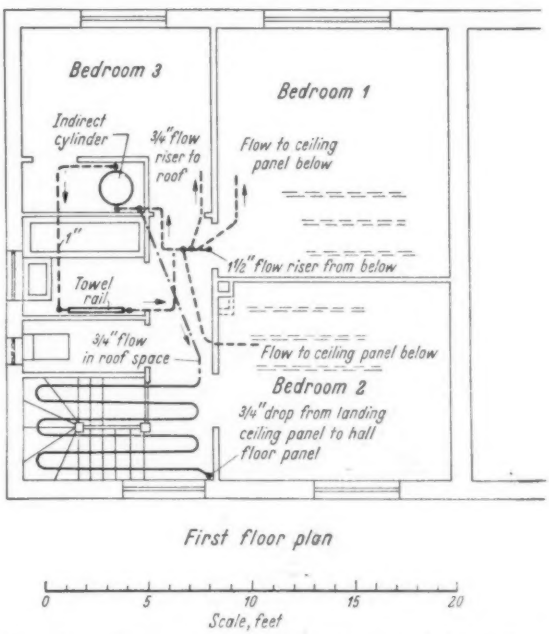

FIG. 5A.—*System 5, embedded ceiling panels (first floor).*

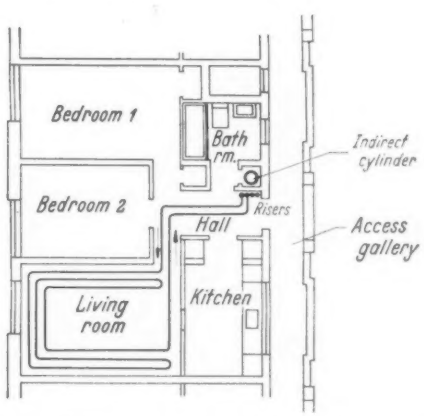

FIG. 6.—*System 5, embedded panels in a block of flats.*

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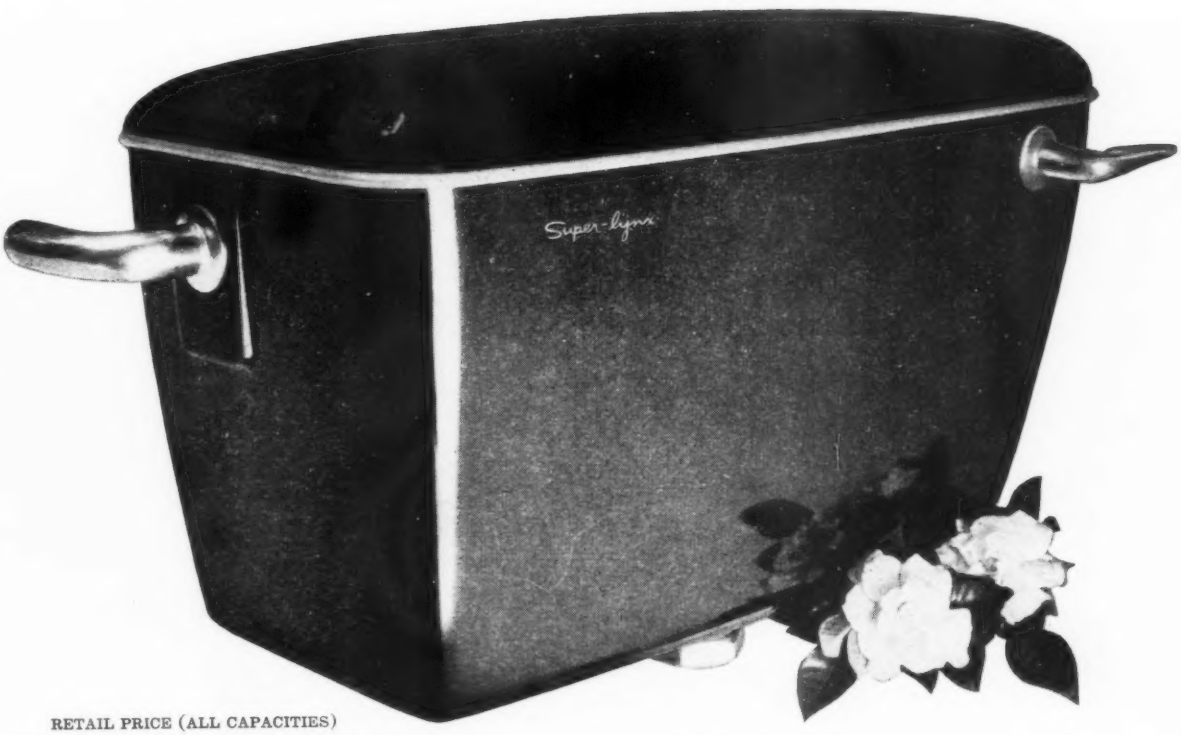

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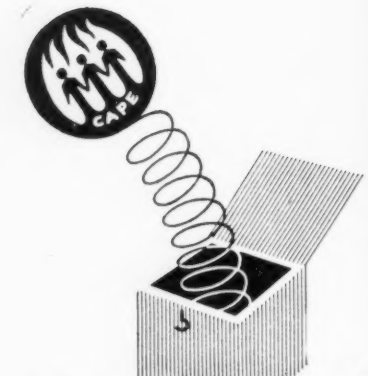

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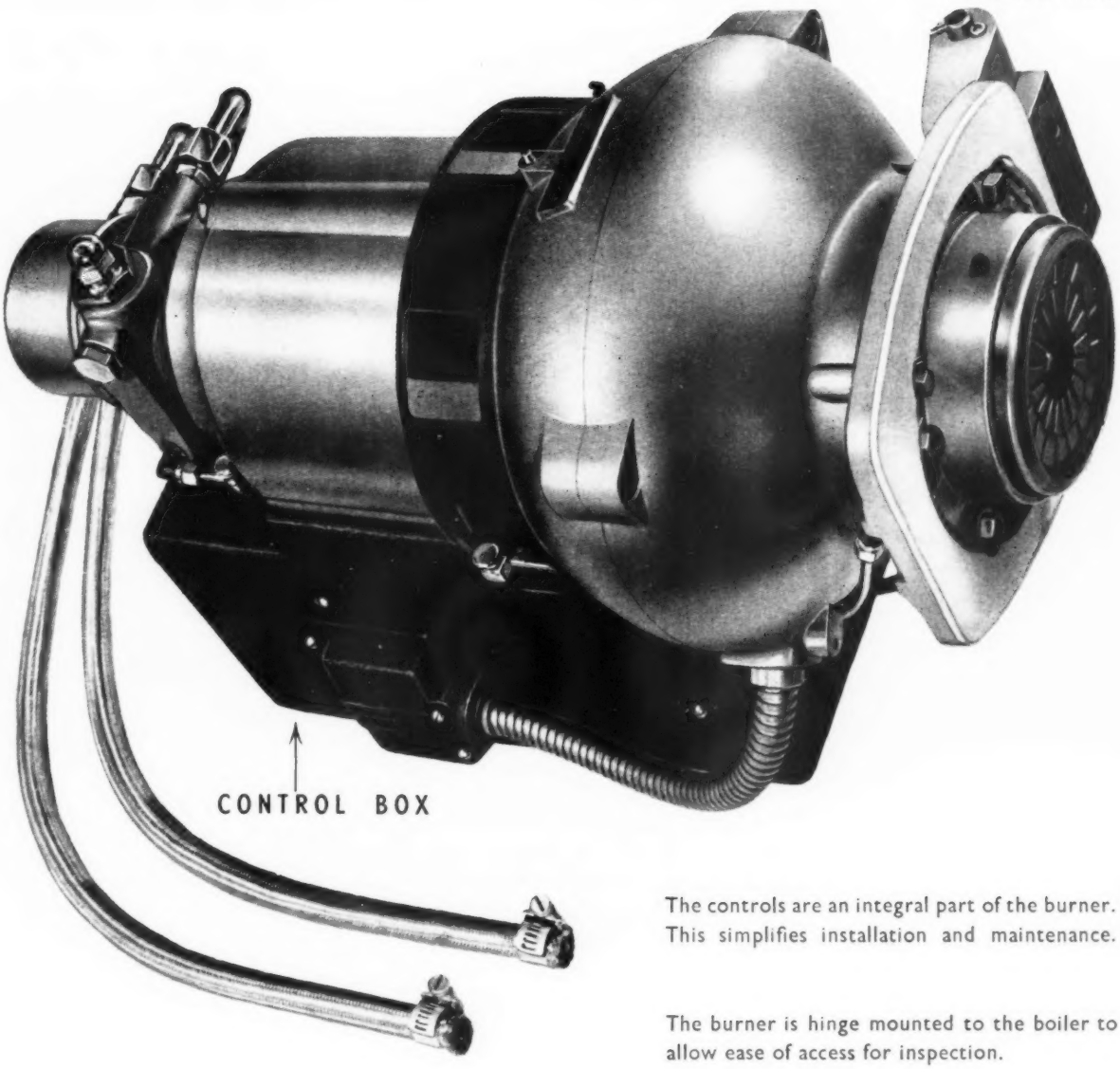

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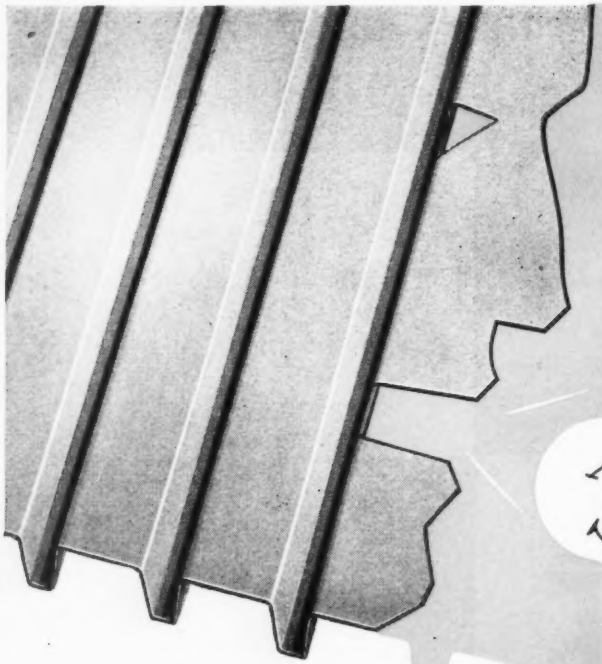

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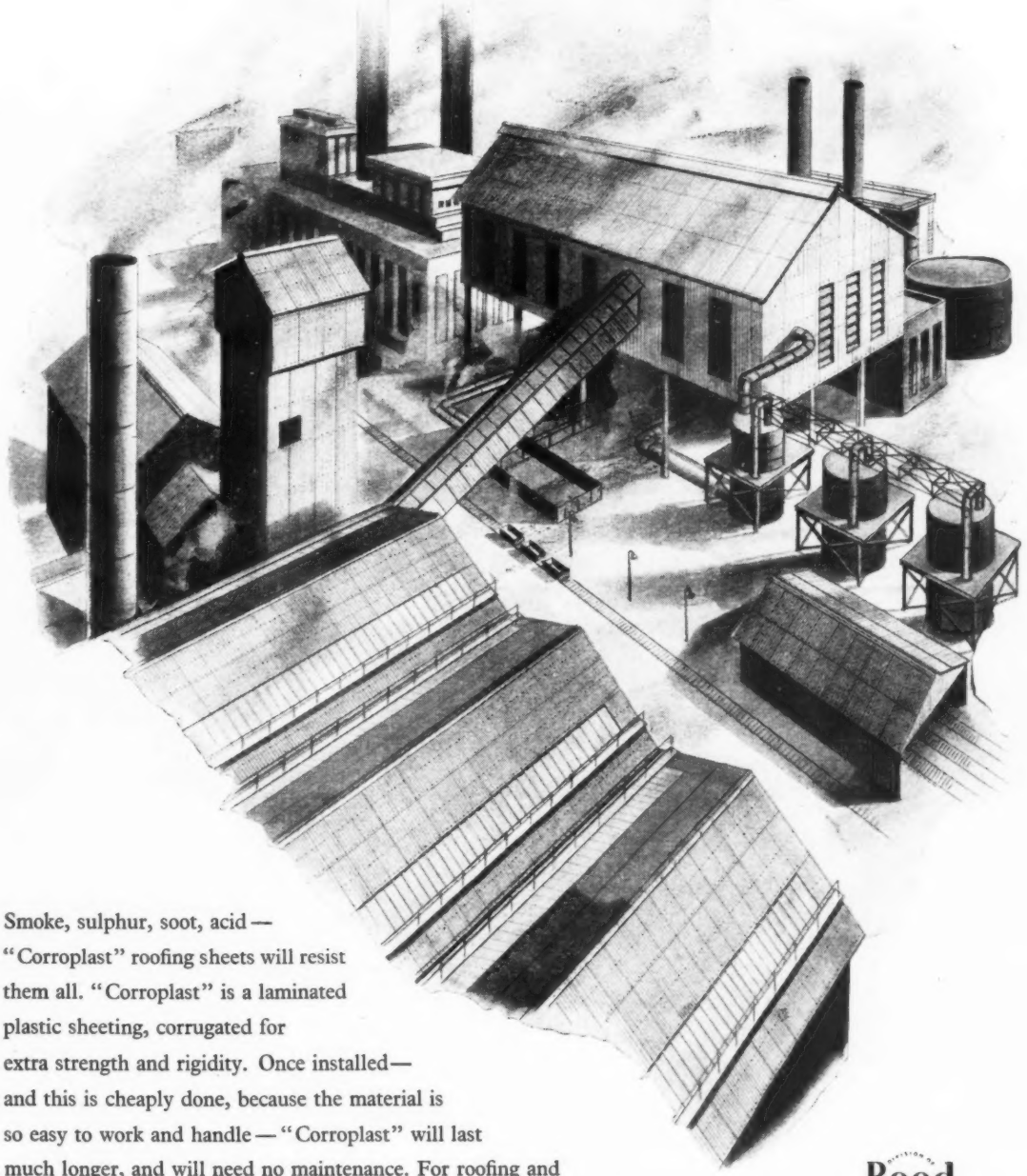

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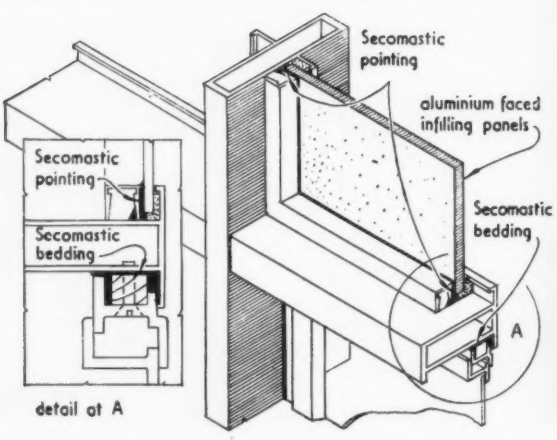

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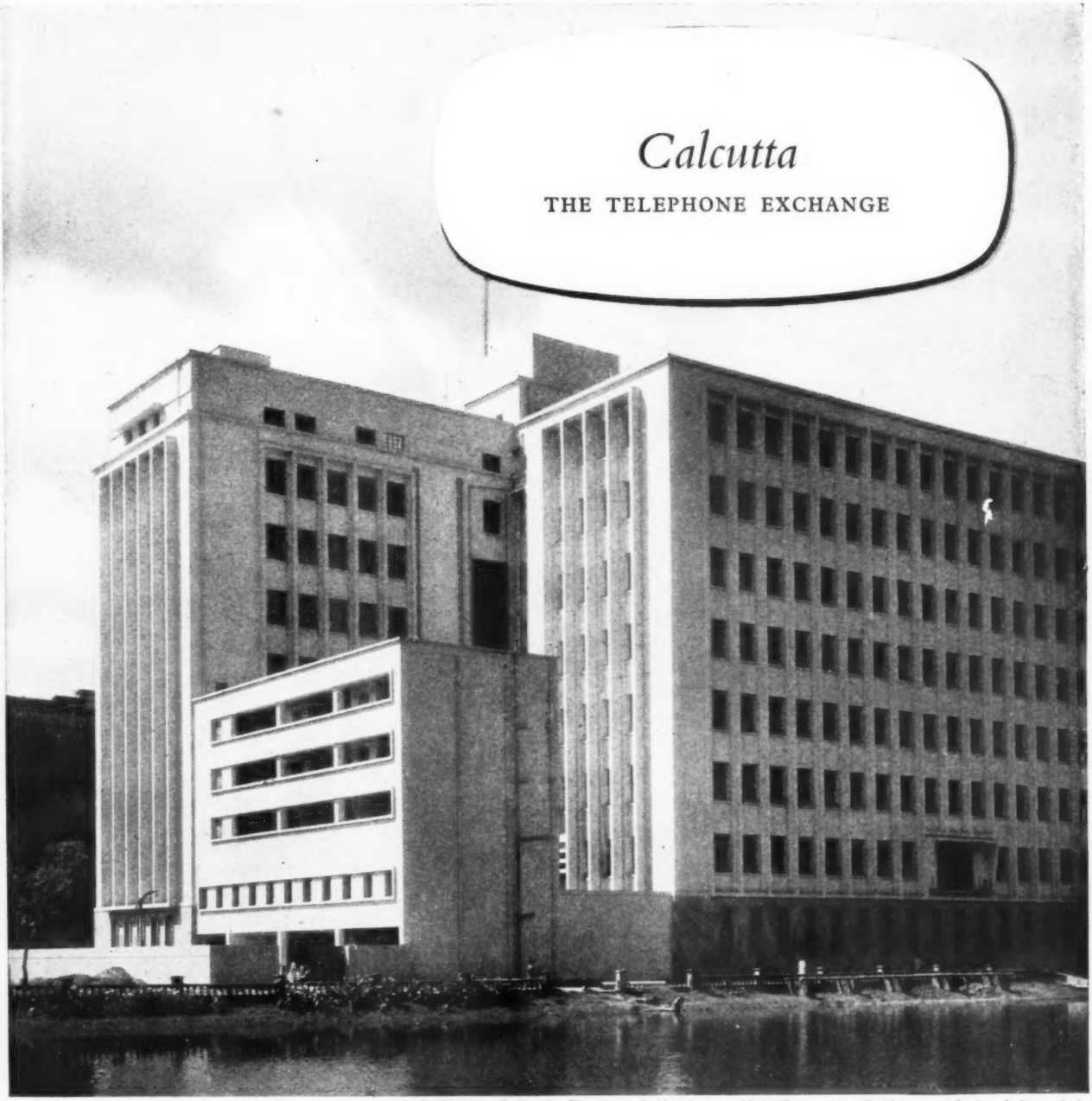

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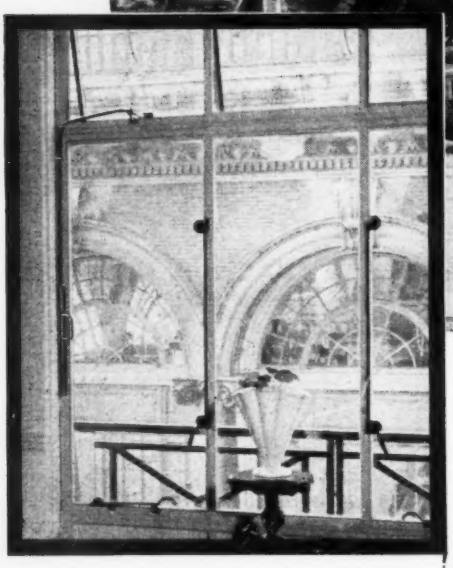

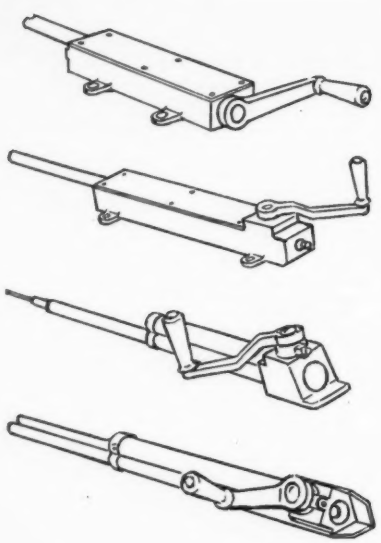

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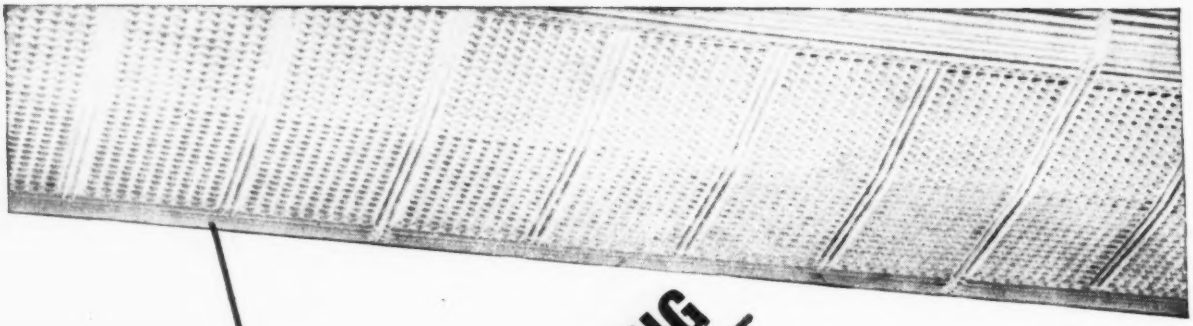

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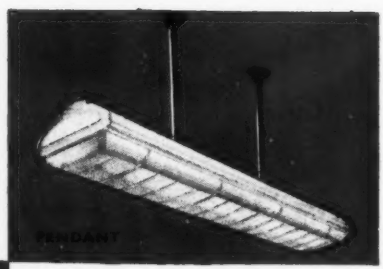

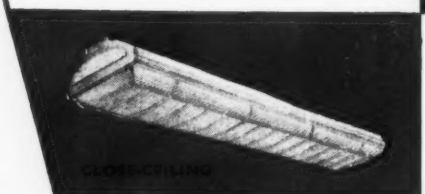

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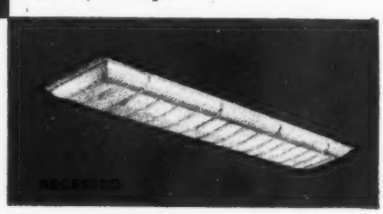

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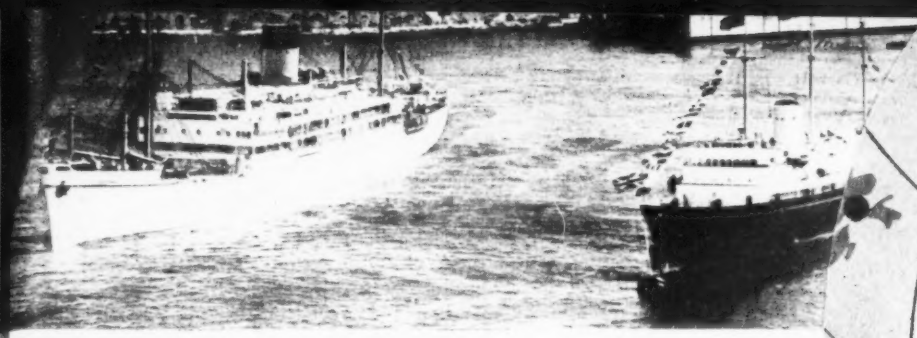

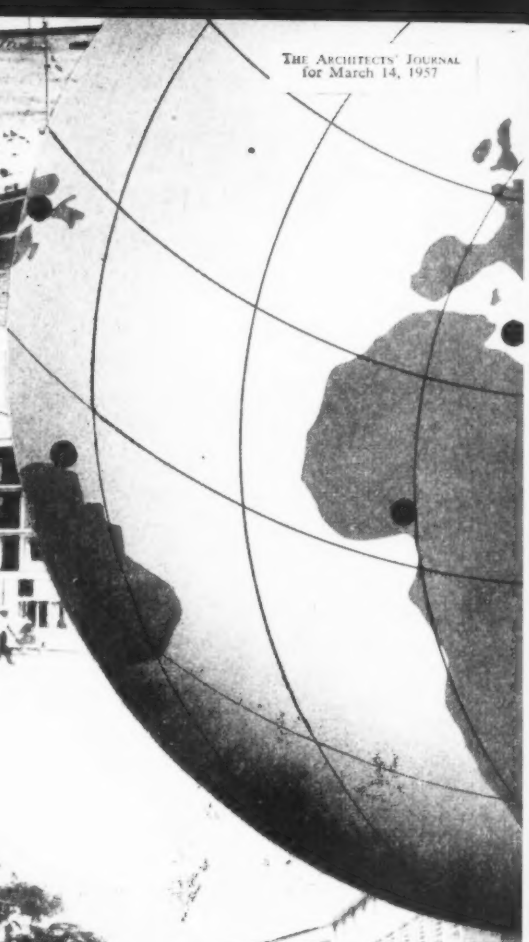

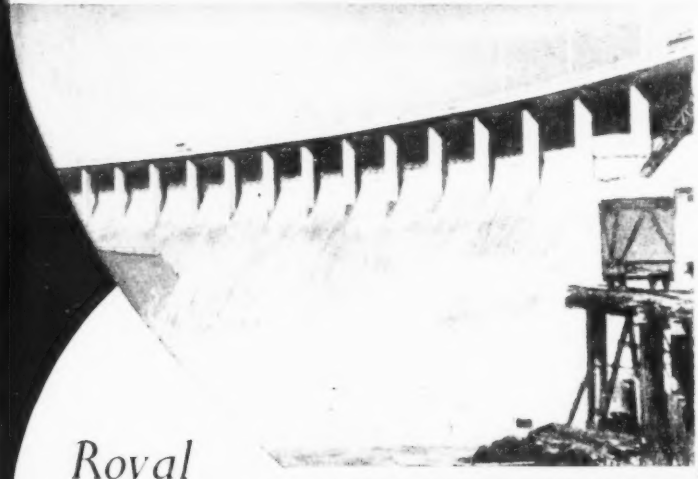

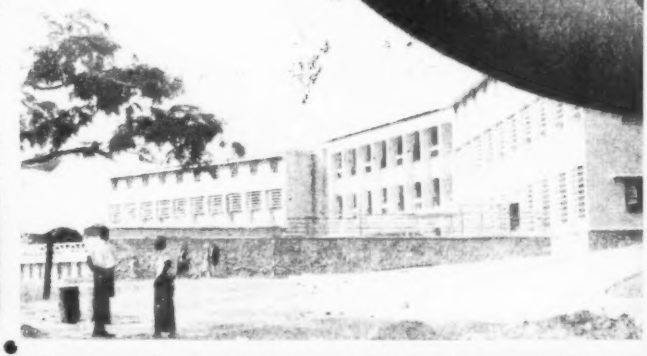

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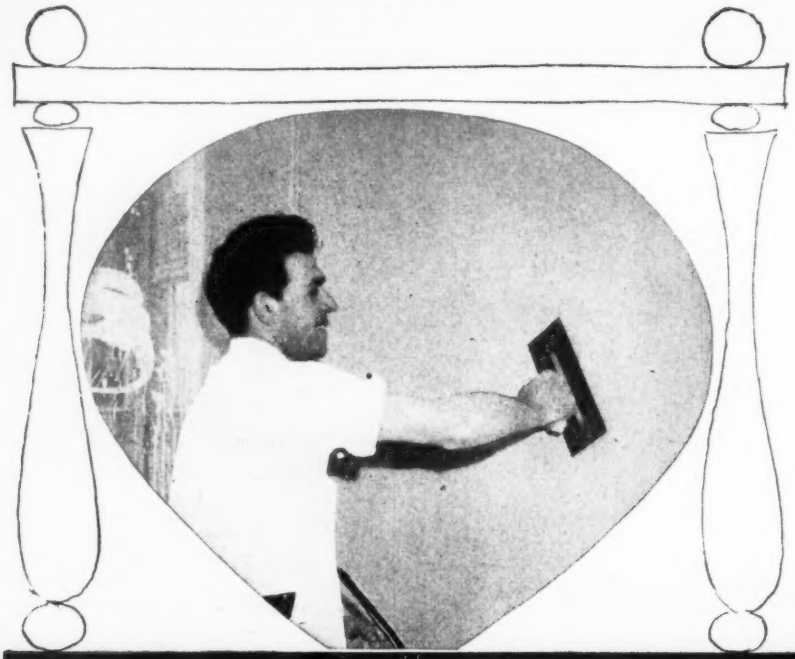

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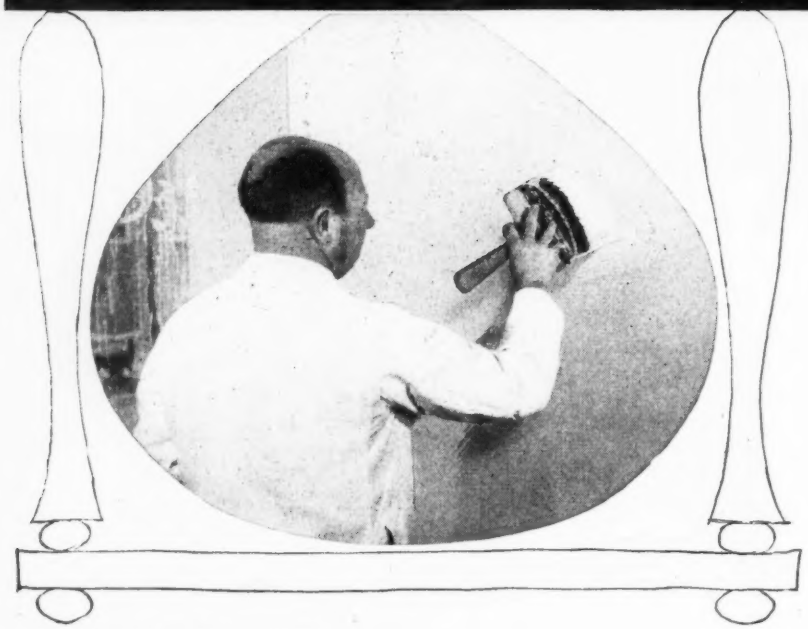

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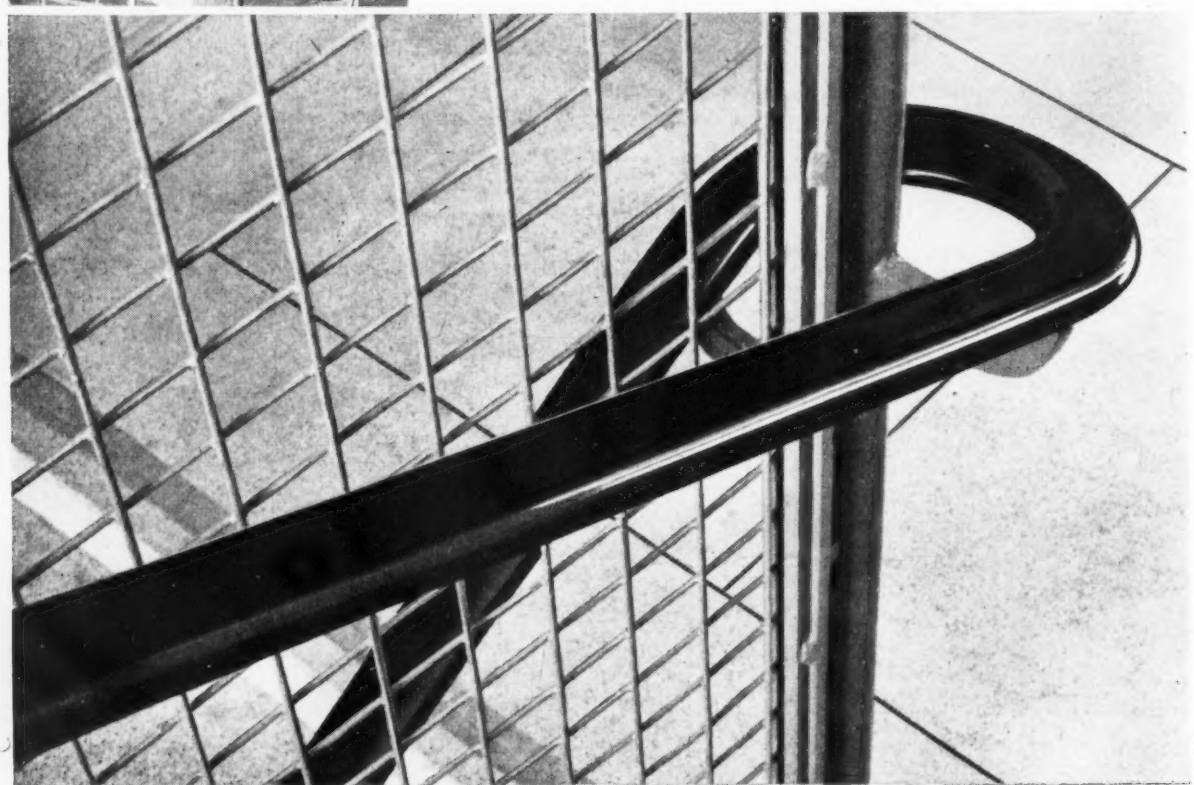

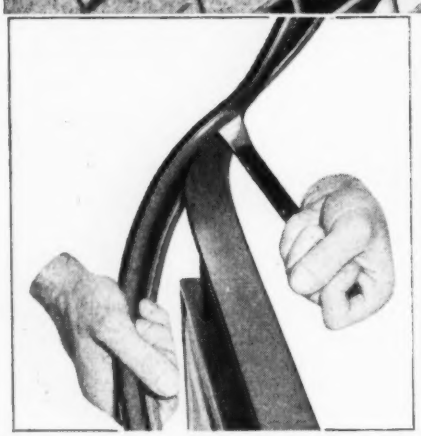

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THE ARCHITECTS' JOURNAL

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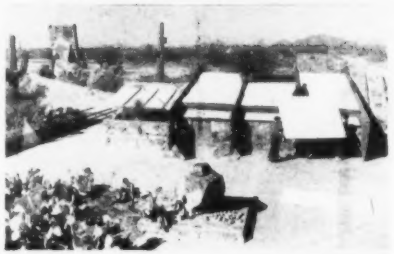
NOT QUITE ARCHITECTURE

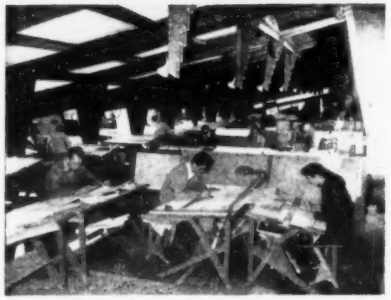
IDEAL HOMES, 1957

Last year, if I may mention it casually, I was with Lloyd Wright in Shepherds Bush. And now I have enriched the memory of that experience by finding truly-organic architecture in the Hammersmith Road. It clings, tumour-like, to the facade of Olympia; and it will remain there until the end of the month. This architecture—it consists of two two-sided spec-type houses—reflects the natural pattern of its environment; it is a growth with its roots in an Ideal Home-loving public. When I saw it I reflected—pausing only to browse in the art section of the Hammersmith library—on one of the Master's epigrams. "Buildings perform their highest function in relation to human life within and the natural efflorescence without. . . ." After one glance at the efflorescence I decided to settle for the human life. But it seemed to be expiring over every available flat surface. A small queue was waiting, demi-shoeless, beside a furniture stand where someone had thoughtlessly displayed the slogan, "Sitting is Believing." A sophisticated assistant turned away, defeated, from a wizened little Believer who was jammed well down in a chair called the Upright Hostess ("ask for *sin*-teak"?), and wondered if she could help Madam, who had just settled in the Mobile Conversation Chair. (What*ever* does it do?) But Madame had immobilised conversation with one of "our special luncheon boxes."

*

How wise of the designer of Sanderson's stand to suspend a culturally-decorative cello, spike downwards, over the only chair in view. And how sensible of Chippendale's Workshops to rope off their "bedroom in the French manner." But why was everyone so drawn to it. Does the Ideal Home-lover find more significance in a lonely rose on a frilly bed than in all James Gardner's floral wheels, which revolve laboriously in the Exhibition's centrepiece? Never mind, at least we had the *Daily Mail's* word for it that this odious device had helped to "banish the dwarfing effect of the featureless immensity." And the rest of Mr. Gardner's work, though a little too typical, was gay enough. Not that any designer could have competed with the Gold Pavilion, where a mesmerised





The Not-So-Dead-End Kids

Last summer Frank Lloyd Wright visited us and added one more aphorism to the collection he has been giving us for as long as we can remember. Architecture, he told us, had reached a dead end by going up a one-way street. Nevertheless, he is now back in his winter quarters in Taliesin, working optimistically on the current forty apprentice architects who have chosen to be his disciples and to learn which street has the liveliest ending. Here are some recent exclusive pictures of the headquarters, set in a landscape which is described vividly in the Architectural Press publication, *An American Architecture** —a book of " statements dealing with architecture as Mr. Wright has experienced it." The large picture shows some of the buildings (" there could be no obvious symmetry in this great desert "). The right-hand strip of pictures show: top, apprentices putting a new roof of canvas on their work-room; centre, students at work (they do a 6 a.m.-4 p.m. day); and bottom, students learning " through observation, association and practice." While the photographer, Charles Herbert, of Camera Press Ltd., was at Taliesin he took the picture on the left, which he claims to be not a Thing from Outer Space but a student making a photographic progress report. More illustrations on page 383.

* 84s.

horde shuffled slowly round £1,000,000 of gold ingots and a worried-looking section of the British Legion. "This stand must be a lot of trouble," I said to one of the custodians. "Course it is," he said: "they *will* keep leaning on them rails and bending 'em."

*

Around the pavilion a few dozen people sat staring at the topmost ingots, their evil thoughts sweetened by the strains of an Ideal Garden quintet "supervised" by a Miss Mabel Willis-Browne. As I scanned their itching eyes I wondered how they might use an ingot or two. Would they go in for Art? If so they could make a start upstairs with a painting-by-numbers outfit and dash off "Two Genuine Oil Paintings." Or would they go to the "Village of Progress" and decide to buy a house—usefully defined for them by the *Daily Mail* as "an organised human habitation"? And if so, would they choose the spec. building which was "designed economically in every meaning of the word," whatever that meant; or would they be sufficiently attracted by the Canada Trend House (architects, Wells and Hickman) or the competition-winning house (by D. W. Oliver) to have an architect-designed building. If so a copy of the *Daily Mail's* "Book of House Plans" would do them little harm. (There is more good stuff in it than usual, though I was alarmed to read, in a description of clients who had used an architect that "they both have a keen sense of humour.")

*

Nor would the public be harmed by the 400 failed house-competition designs on the top floor. There are not nearly as many spec-style designs here as you might fear. "Not at all bad," said an Edwardian youth to his girl friend, thumbing J. Fletcher-Watson's well-lawned, yew-hedged haven. Another couple—non-yew types?—ignored it and moved along to study a darkly-colour-washed design. "It's good though, isn't it?" said the girl, "the way he gets that stormy look, I mean." An older couple fought their way in with evident eagerness. I moved nearer to them. "By gum, that's better," said the man, leaning on a beautifully-rendered perspective; "it's the coolest place in the whole sweating building."

*

All good clean fun. Or was it? There were three little things I was surprised to find in a family exhibition. One was a pram called "La Ronde." Another was a bedroom charade depicting automation in the home, in which the relationship between the characters was a little ambiguous. (*Why* did She give Him a cup of tea and an electric shaver, and then put his clothes away in the wardrobe?) And then there was that Windmill girl in the catalogue advertisement who, though scantily clad in only one newspaper, was generously holding out another so we could read it. The headline, believe it or not, was TOGETHER AGAIN. "Well Dad, I suppose if Windmill girls read about Her Majesty and the Duke, this Revudeville show you keep on about must be all right. . . ."

KENNETH J. ROBINSON

The Editors

ARCHITECTURAL ECONOMICS FOR THE STUDENT?

ON pages 389-394 we print a report of a four-day course on architectural economics for senior students held recently by the Birmingham School of Architecture. The aims were: to see what studies of this subject might be included in the regular school curriculum; and to prepare for the school's next "live project"—a housing scheme which, under staff supervision, students will design with special attention to costs.

Birmingham was the first (and so far as we know still is the only) school to arrange for students to design real buildings for real clients. Now it has become the first to introduce the vital subject of cost control. We congratulate Douglas Jones—director of the school—and his staff on this pioneering work, and are glad to have helped to arrange the recent course.

We have always believed that architectural education's too isolated, and gives students an incomplete and unbalanced knowledge of the factors which determine—or should determine—space planning and constructional design. Economic factors are the most serious omission—an omission often defended on the grounds that cost control and architectural quality are incompatible. This question is too complex to be argued here—but the most damaging consequence of the belief is the very limited public confidence that architects have commanded. The profession is now just beginning to realize the need for cost control, and to take an interest in methods of providing it. But, with the exception of Birmingham, the schools of architecture take no interest; they are behind, where they should be ahead, of the profession. If cost control methods are learnt in his educational phase, they can become part of the architect's creative thinking. If they are learned later on, they tend to remain a separate function, unrelated to architectural quality.

Which will be the next school to follow Birmingham's lead?

THE HIGHEST IN THE LAND

It is typical of this country's liking for caution and compromise that over and above the legislation which ensures that only the qualified may call themselves architects, and which guarantees

that every design for a building must be submitted to at least one, if not two or more, authorities, there should be introduced a supreme body, with virtually no power save that which can be engendered by having the power to delay action. We refer, of course, to the Royal Fine Art Commission, the fourteenth report of which, for the years 1955 and '56 was published recently. There can be nothing but praise for the members of the Commission who give a great deal of their time for no reward save that incalculable one of knowing that by their efforts much abuse of towns and countryside is prevented, or at least hampered. They must have derived great satisfaction from the news that a comprehensive plan is to be prepared for the London University precinct, an area which has been one of their particular concerns.

The criticism now current of the control of elevations under the '47 Act applies also to the RFAC. One cannot get good design by committee work. The RFAC can only prevent or hamper certain extreme features in a design from being built. (It is significant that in this report about one quarter of the items recorded are matters in which the RFAC's opinions have been ignored or overruled.)

The RFAC, who can only demand to see a design if they learn of it in time—runs the risk of being merely a sop to the public conscience on design. All too often buildings are described as " having been accepted by the RFAC " when what has really happened is that the RFAC, as an advisory body, have had no further criticism to make—which is not quite the same thing. Does the presence of the RFAC allow the public to ignore its responsibilities as regards design? We believe it may. There are two alternatives: either to increase the size, organization and scope of the RFAC (as is vaguely suggested in its report); or to abolish it. The latter course could only be taken if a radical departure from present building procedure was made: first, if all proposed buildings and other development schemes be made public, so that interested bodies and individuals would have the opportunity to protest against, or acclaim, the design; second, if all buildings were designed only by architects; and third, if the RIBA and the allied societies adopted a stricter attitude—enforced by disciplinary action—towards architect members, with regard to design and professional competence.

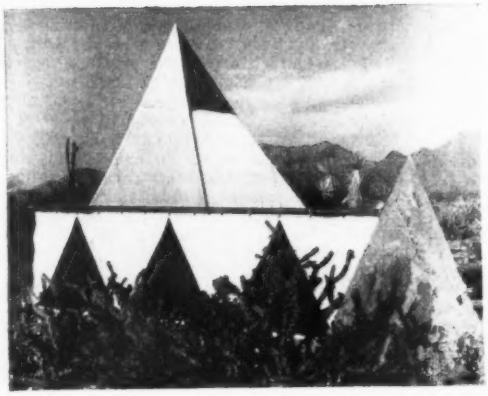
FILE THIS WEEK

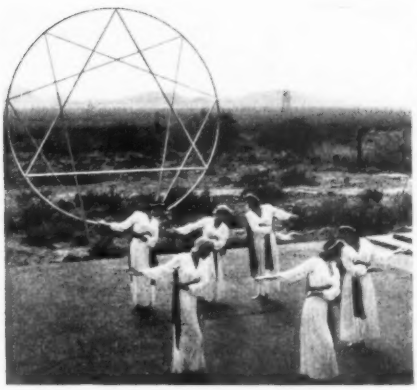
TPI DINNER

It is unfortunate, for those who care about such details, that there is not a decently-designed dining room capable of seating the numbers inevitable at such functions as professional annual dinners. A colleague who recently endured the garish sparkle of the Dorchester (the RIBA's dinner) suffered the more intimate pastel pleasures of the Savoy last week when the TPI held its annual dinner there. There were less people, of course, than at the RIBA's function, and the occasion was correspondingly less formal. Max Lock obligingly thumped out the National Anthem (twice) when the loyal toasts were drunk, and after the speeches everyone adjourned, at President Maurice Hellier's request, for tea.

*

The principal speaker was Peter Smithers, MP, the Parliamentry private secretary to the Secretary of State for the Colonies. This tall, good looking, young man spoke eloquently and charmingly, and at some length on hardly anything at all. He recognized that the Colonial Office could have a part to play in planning, and admitted to actually employing a planner on the Colonial Housing Advisory staff. The difficulty which confronted him was to decide how much planning was required, and indeed, when to stop. He





Two more pictures from Arizona (see page 380). No one lays in at Taliesin: students are out of their tents—which they surround with their own landscaping—in time to get down to work at 6 a.m. And before they steal back again they are expected to express themselves in painting, music, philosophy or (see picture) dynamics. And it costs them only 1,500 dollars a year.

disliked seeing marble and plate glass shop fronts in 18th century houses, and he thought the reigns of Queens Elizabeth I, Anne and Victoria were periods of taste. He ended on a fine, Barry-like note by saying that the present was a period of great and dramatic adventure, when we would have to think anew. . . .

*

President Hillier, in reply, told two funny stories and pointed out that the TPI was already concerned with training planners for overseas territories. He was followed by B. J. Collins who, ASTRAGAL learns, will be the Institute's next President. Mr. Collins, proposing the health of the guests, criticised the proposed Colonial Office building and, speaking with great fervour, referred to someone who had "always insisted on taking forethought," who had "carried the torch of town and country planning," than whom "no one has done more for planning. . . . I speak of Dame Evelyn Sharp." This pæon of praise surprised ASTRAGAL, who has always understood that Dame Evelyn tends to think of planning as a merely administrative matter. It surprised ASTRAGAL'S reporter, too, and further, it appeared, judging from her expression to absolutely amaze Dame Evelyn. Proving, perhaps, how hard it is to see ourselves as others see us. . . .

LOUIS SULLIVAN

An architect who has never lacked good biographers is Louis Sullivan—whose centenary fell last year—the giant of Chicago architects and master of Frank Lloyd Wright. His reputation, however, has been taking quite a knocking lately. Colin Rowe has denounced his connection with the Modern Movement; Philip Johnson has denied that Sullivan ever was a functionalist; various writers have doubted that he had any real influence on Wright, and others have been equally doubtful that the Classical architecture at the Chicago World's Fair was what really did for Sullivan's practice, or whether it was other, less heroic causes. All this being so, it seems possible that John Szarkowski's new book* on Sullivan may well be the last that takes off from the idea that the architect of the *Carson, Pirie, Scott* Building and the *Auditorium* was a towering genius beyond question. The book is not, in any case, an historical assessment of Sullivan, but a portfolio of the author's photographs of his buildings—immensely handsome photographs that tell you a good deal more about Szarkowski than about Sullivan, and descend at times to the downright arty. Nevertheless, it might make a good school-prize presentation, or souvenir of Chicago, but for the price.

* *The Idea of Louis Sullivan*, by John Szarkowski: UOUP (for Minnesota UP) 80s.

ANYTHING BUT BLUE SKIES

Lord Mills, the Minister of Power, when announcing last week the Government's plans for building 19 power stations at a cost of £1,400 m., said that . . ." we cannot put power stations into the countryside in such a way that they cannot be seen, or the

Readers might be forgiven for thinking that this was a still from one of these grittier Hollywood epics of the type of Bad Tuesday at Coonskin Junction, *but it is only the entrance to Louis Sullivan's Owatonna Bank—one of the numerous examples of new ways of glamorizing old buildings that appear in John Szarkowski's book* The Idea of Louis Sullivan, *to which* ASTRAGAL *refers on this page.*

transmission lines cannot be seen . . . we shall have to put up with the fact that . . . we cannot just have blue skies and nothing in them." Now everyone looks forward to the advantages of building plenty of nuclear power stations, but is it necessary to site them in the country? They have to be near a plentiful supply of water—granted—but who is satisfying whom in placing them in the countryside, and not alongside a town? An Atomic Energy Authority spokesman assured ASTRAGAL that it was not on grounds of safety that the stations were given country sites. They are being put in country areas so that the public can become gradually familiar with them and appreciate that they are not dangerous. It depends, of course, of whom the Government is most frightened, but ASTRAGAL hopes that those who wish to see the wild and country areas left that way will create much more of a row than the few hysterical city dwellers who might be afraid of living near a nuclear power station. ASTRAGAL is willing to bet that most towns would boast of having a nuclear power station rather than be afraid of it. At any rate, let's hear the truth: who's said they're afraid?

IDEAL HOMES AGAIN

There's a greeny, fish-tank sort of feeling about the Ideal Home this year, and the usual broad central avenue is stopped by a deplorable fountain halfway down. Nor, I think, are the rather more florid stands an improvement: certainly the individual stand numbers are more carefully concealed than usual, though that does not really matter very much, as the firms one wants to see are generally in the same place year after year.

*

The spec. built houses are much as one would expect, but the timber Canadian house is worth a careful look, though I have my doubts about the heating system being really adequate. The interior (by Heals) has almost the only interesting furniture in the show. The MOHLG's Frostproof house (who designed it, by the way?) is a good idea, but would have been more effective after a really hard winter; nobody can be blamed for this, but visitors will no doubt go away and do nothing until the next ice age.

ASTRAGAL

LETTERS

Elizabeth Denby

A. W. Skempton, D.Sc., A.M.I.C.E.,
Professor of Civil Engineering, Imperial Institute

Stop Flogging The Barlow Horse

SIR,—I have considerable sympathy with your reviewer (February 21) in his misunderstanding (or perhaps failure to read) my article "Oversprawl" in the *Architectural Review* for December last. I was myself disconcerted to find that my dreary lists of figures had been preferred to the maps into which I had translated them. And the absence of cross-headings made mincemeat of the various points raised in a necessarily, over-condensed argument on the chief anomalies of housing and town planning policy.

Far from "writing off decentralisation as a failure or trying to prove that overspill is a myth and low density a fallacy," my figures show how successful has been the decentralization policy pursued since 1919—*i.e.*, for over 35 years. Abundant proof of this exists in the static or declining populations of the old industrial areas, the growth of population in the Home Counties, the extensions of boundaries of urban districts, cities and towns, and the sharp decline of rural area boundaries in spite of their increasing populations.

An acceleration of this policy of decentralizing "surplus" populations in face of these undoubted facts seems to me to need justifying before it is set in motion. I do *not* say that it may *not* be justified, but I *do* suggest that current assumptions should be reviewed in the light of the evidence which is available.

My figures were quite objective. I should be the last to deny that there are pockets of crowding in the old industrial areas. But I do assert that there are also stretches of monstrously-derelict unused land which could and should be brought back into civic use and beauty.

Does your reviewer not feel that cities, towns and regions should be required to justify their "overspill" calculations by reference to actual population and land-use? What does he think will happen to the old industrial areas, based as they are on immovable extractive or heavy industry if their light industries and offices are drained away? Does he remember Jarrow in the 30's?

The present exodus from the central areas of towns is due less to choice, as your reviewer assumes, than to the rezoning of residential areas for offices or light industry; also to the form of high-flat redevelopment which is unacceptable to many English families, but in which architects delight—though I have still to find one who lives in such a block himself!

My second main criticism of current assumptions is the complete confusion which exists on the meaning of "overall," "gross" and "residential" densities. Indeed we no longer seem to know what these terms mean, although they are the basis of all housing and planning policy. This confusion is apparent even in the official handbook on residential density where the terms are used interchangeably, and which are certainly ignored in planning practice.

I tried to show by comparative analyses of the Regents Park Crown Estate and the Oxhey LCC Estate how the same number of people can be housed on the same amount of land, *i.e.*, at the same residential density but in very different estate layouts—implying thereby that experiments in estate-layout can still conform to overall person-per-acre standards. My analysis of four London squares was on the same assumption, *i.e.*, that *family houses* with a reasonably large common garden and good private gardens can be grouped at the same density as *family flats*, costing less and giving greater human satisfaction.

In short, I wholeheartedly advocate, in spite of your reviewer's bland assumption that all is well in our decentralization policy, that planners should return to Sir Patrick Geddes' human approach to our problems and stop flogging Sir Montagu Barlow's dead horse.

ELIZABETH DENBY.

London.

Enthusiasm Is Not Enough

SIR,—Arising from ASTRAGAL'S kindly notice of the paper by Mr. Johnson and myself on William Strutt's cotton mills, Mr. Markus wrote a letter, under the above heading, to the AJ (January 31) which I have only recently seen. Mr. Markus is concerned that less than justice has been done (*a*) to the contribution of Professor Bannister, and (*b*) to Jeremy Bentham as a pioneer in iron-frame construction.

Throughout our research I kept in touch with my friend Turpin Bannister, and full acknowledgment is made in the paper to his notable recognition of the importance of the mills built by Strutt. But, contrary to Bannister's statement, subsequently repeated by several architectural historians, Strutt's mill at Derby (1792-93) actually had timber beams. The earliest multi-storey building with iron beams and iron columns was, so far as we know, the flax mill at Shrewsbury (1796-97) designed by Charles Bage.

The structural sequence leading to the first iron-framed buildings may be summarized as follows:

(*i*) timber columns, timber beams, timber floors (traditional).
(*ii*) iron columns, timber beams, timber floors (1785 or earlier).
(*iii*) iron columns, protected timber beams, brick arch floors (1792, Strutt).
(*iv*) iron columns, iron beams, brick arch floors (1796, Bage).

The circular prison advocated in 1791 by Jeremy Bentham in his book "Pantopticon" seems to have no place in this development, although it is true that a rather extensive use of iron was contemplated in its construction. Moreover, many of the technical ideas almost certainly came from Jeremy's ingenious brother Samuel and, possibly, from Willey Reveley who prepared the drawings. Therefore, in this respect, no great injustice has been done to the memory of Jeremy Bentham.

Incidentally it is somewhat ironical that one of the few buildings constructed explicitly on the Panopticon principle was erected by William Strutt at Belper in 1803 without making any use of iron.

A. W. SKEMPTON.

London.

NEWS

NUCLEAR POWER

Does the Architect Get a Look-in ?

The announcement of a trebled nuclear power programme, providing for the construction of 19 power stations in the next eight years at a cost of £1,460 million, provokes a number of questions to which all the answers are not immediately available. The Central Electricity Authority and the South of Scotland Electricity Board both

have architects' departments, but these will have no part in the design of the new stations. The stations will be designed and constructed by the groups, now numbering five, set up by large electrical engineering, engineering, civil contracting and other firms for this purpose. The Central Electricity Authority has two architectural advisers, Kenneth M. B. Cross, the RIBA's president, for England and Sir Percy Thomas for Wales, and the architectural consultant to the South of Scotland Electricity Board is A. Graham Henderson. Their function is apparently to consider the appearance of the completed designs submitted by the groups that are tendering for contracts. For all practical purposes, therefore, the architects for these stations are selected by the contracting groups, each of which has made different arrangements, and not by the public authority which is ordering them.

So far three contracts have been let: for the Hunterston station to the GEC-Simon-Carves Atomic Engineering Group (consulting architects: Howard V. Lobb and Partners); for the Bradwell station to C. A. Parsons-Sir Robert McAlpine group's Nuclear Power Plant Co. Ltd. (architect: Maurice Bebb); and for the Berkley station by the AEI-John Thompson Nuclear Energy Co. Ltd. (architects: the W. S. Atkins and Partners Architectural Group; chief architect K. F. Molsby, consulting architect Sir Giles Gilbert Scott). The English Electric-Babcock & Wilcox-Taylor Woodrow Group (architect: Frederick Gibberd) is negotiating with the CEA for a station at Inkley Point, in Somerset. A fifth group, the Atomic Power Construction Ltd., in which Richardsons Westgarth Ltd., International Combustion Ltd. and Crompton Parkinson Ltd. are interested, has been formed recently, but is not yet negotiating for any contracts. This group will entrust its architectural design to Nuclear Civil Constructors Ltd., a consortium formed by Trollope & Colls Ltd. and Holland, Hannen & Cubitt Ltd. The three designs that are to be built, together with the English Electric group's unsuccessful design for the Berkley station, were illustrated in the AJ on January 10, 1957. So far as is known the existing arrangements for the architectural design will be continued for future contracts. It remains to be seen whether this system of handing over the entire design to specialist groups will enable the fullest advantages to be derived from architect/engineer/scientist collaboration, and whether the know-how and experience of one group will be freely communicated to the others, and whether the architects will play a sufficiently influential rôle. It is understood that the Atomic Energy Authority, whose Industrial Group (Chief Architect: R. S. Brocklesby) designed Calder Hall (AJ, October 11, 1956), will continue to build power stations for experimental purposes, and that the knowledge it gains will be passed on to the Central Electricity Authority.

There is obviously a very great danger that in a "crash" programme of this magnitude purely engineering considerations may override æsthetic and planning considerations both in the location and in the design of the stations. It is settled policy to locate these stations on the sea coast or river estuaries and at a distance from major centres of population, so that, as Lord Mills said, "the programme will involve the erection of new power stations and of overhead transmission lines in part of the country which have not hitherto felt the impact of the nation's requirements for electricity." To make it possible to carry through the programme in the very brief period of eight years the public enquiry procedure is to be "accelerated," and amendments to existing legislation are to be incorporated in the Electricity Bill which is now before a Standing Committee of the House of Commons. Unfortunately, in the past the public enquiries, and the reference of designs to the Royal Fine Art Commission, have taken place only after virtually irrevocable decisions have in fact been made, and sites have been selected even without informing the local planning officer. No planning consent is required by the Central Electricity Authority. It has promised in future to consult the Royal Fine Art Commission at an earlier stage, but this is the kind of promise that is all too easily lost sight of in the rush to complete an emergency programme at great speed.

A representative of the AEI-John Thompson Nuclear Energy Group, when asked by this JOURNAL where Sir Giles Gilbert Scott came into the picture, explained: "Sir Giles is the last man on the line. He comes into the picture because this scheme has got to go to the Fine Art Commission." This does suggest that the employment of consulting architects may be envisaged by the promoters primarily as a kind of insurance policy to confer a badge of respectability on a scheme, and ensure its safe passage through any storms of opposition. The "accelerated" inquiry could all too easily become a farcical formality. Yet Britain's coastline has already been bombarded to a disastrous extent by bricks, mortar, industrial development, caravans and all manner of unsightly development. Nineteen more nuclear power stations could very easily spoil a substantial part of the remaining unspoilt coastline, if purely technical considerations are allowed completely to over-ride concern for amenity. Lord Mills has given an assurance that the programme will be carried through "with the least possible interference with the amenities of our countryside," but this assurance will be of little value unless æsthetic and planning considerations are given their proper place at the earliest stages in the siting and design of the new stations.

LIGHTING

. . . *In Offices*

The JOURNAL'S Specialist Editor (15) Lighting writes:

The first of three weekly sessions on "Electric Lighting for Welfare and Production" was held on March 7 at the Lighting Service Bureau. W. R. Stevens, of GEC, spoke on office lighting, and concentrated on some of the more important principles involved, which—with the aid of well-staged demonstrations—he carried home convincingly to some 200 architects. He dealt first with the need for suitable levels of illumination, and then showed both in theory and in terms of practical solutions how they could be achieved without causing discomfort glare. In only one or two minor respects could what he had to say be criticized. He seemed, for one thing, slightly too tolerant of bare fluorescent tubes, which can easily be got rid of with efficient and inexpensive devices now on the market, such as clip-on translucent plastic louvres. More controversial was his statement that windows in office buildings were very expensive light sources and that it was much more sensible to include them only for view purposes, and to rely entirely on artificial lighting. One could, he claimed, nowadays have satisfactory artificial installations for as little as 1s. 9d. a sq. ft., a cost which could be more than offset by saving in planning and structure that such an approach could achieve.

As Edward D. Mills said, however, in opening the discussion, almost all clients regard daylight as the best and cheapest source, and therefore quite naturally demanded that architects made full use of it. He asked if sufficient attention was being given to the development of flexibility in installations, compatible with that already achieved with internal partitioning, and why it was that the most elegant fittings always seemed to turn out to be the least efficient. Mr. Stevens replied that demountable fittings were now on the market which could be used in conjunction with suspended ceiling systems. One he had in mind could be fitted to replace a standard-sized ceiling panel in less than a minute. He agreed that in this country there were some industrial designers concerned with fittings who paid insufficient attention to efficiency. But he pointed out that if one went to extremes the most efficient fitting available was the bare bulb, and that some sacrifice must almost always be made to avoid discomfort glare.

New Organization

Following the disbanding of ELMA at the end of last month a new body is to be formed, which will be known as the Electric Lamp Industry Council. Several of the larger firms which did not belong to the old association are on the list of founder members, which includes Aurora Lamps Ltd., A.E.I. Lamp & Lighting Co. Ltd., British Electric Lamps Ltd., Crompton Parkinson Ltd., Cryselco Ltd., Ecko-Ensign Electric Ltd., The General Electric Co. Ltd., Philips Electrical Ltd., Pope's Electric Lamp Co. Ltd., Siemens Bros. & Co. Ltd., Stella Lamp Co. Ltd., and Thorn Electrical Industries Ltd. The objects of the new organization are stated to be to maintain high standards of quality, to encourage fair trading and to promote, develop and safeguard the interests of all who make, buy, sell or use electric lamps in the UK. It is also stated that the new Council will have no jurisdiction in the respect of list prices, which will be determined by individual manufacturers. The Council will begin to function this month, and its address will be Newnham House, 13, Bloomsbury Square, W.C.1 (Chancery 6462).

DIARY

Sense and Sensibility in School Building. Talk by William Tatton Brown. On the BBC Third Programme. 7.30 p.m.

MARCH 17

The Way Ahead for the Fabricator. Paper by E. D. Hinchcliffe. Modular Society meeting at the RSA, John Adam Street, W.C.2. 7.30 p.m. MARCH 18

The Old and New in America. Illustrated talk by P. L. Collymore. At the AA, 34, Bedford Square, W.C.1. 6.15 p.m.

MARCH 20

Are Science and Art Divergent? Talk by Maxwell Fry. Chairman: Sir Alexander Carr-Saunders. At the ICA, 17, Dover Street, W.1. 8.15 p.m. Members 1s. 6d. Guests 3s. MARCH 21

Exhibition of French Architecture. At the RIBA, 66, Portland Place, W.1. Monday to Friday, 10 a.m.-7 p.m. Saturday, 10 a.m.-5 p.m. UNTIL MARCH 23

Office Blocks and the Multivalence of Architecture. Talk by Erno Goldfinger. Chairman: Howard Samuel. At the ICA, 17, Dover Street, W.1. 8.15 p.m. Members 1s. 6d. Guests 3s. APRIL 2

Protection and Repair of Historic Buildings. General Course at York Institute of Architectural Study, York. APRIL 2-11

The Care of Churches. Course at York Institute of Architectural Study, Micklegate, York. APRIL 11-16

CRITICISM

The architect replies

Last week J. M. Richards, in the second of his series of initial articles, discussed the church hall at Tolworth, Surrey, designed by Kenneth Wood. The architect's replies to the points made by Mr. Richards are printed below.

As J. M. Richards suggests in his article, the existing buildings seemed to have very little to commend them. Nevertheless, good manners are desirable, especially in a residential area, and I therefore tried to make a quiet, simple, but emphatic statement; and one that would not overpower the existing church, which for all its lack of quality is the main element of the group and should remain the dominant.

Buildings are, or should be, designed for a purpose and they should come to life fully when occupied, not be designed as precious set-pieces where usage is deplored. It is on this level, too, that they must be assessed, as well as that of pure art, to see how they measure up as *architecture*. The interior of the main hall is therefore similarly restrained, as a background for the activities carried on, and with materials chosen to stand up to constant use, livened by the use of some applied colour and panels of black-and-white "Sgraffito" wallpaper on the proscenium wings to add emphasis to the platform or stage, and chosen specifically to become subdued when the house lights are down for a stage performance.

The structure needs no further explanation from me, being quite simple and having been covered by Mr. Richards in his article, only one or two points calling for comment. Firstly, it may be of interest to readers to know that the patent plywood roofing units were designed as "continuous" units spanning over the intermediate support of the proscenium timber box beam. They were prefabricated in two lengths, a bolted site joint being made 8 ft. in front of the proscenium wings after the erection of the cantilevered stage section. This gave a clear span of 42 ft., the length of the hall, without having to employ deeper and more expensive units. The roofs to the ancillary wing and entrance link similarly span their length with intermediate centre support from softwood beams and posts.

Secondly, the steel flats inserted for stiffening between the coupling members of the cedar framing: these were galvanized after manufacture and having been set behind the outside face of the framing and sealed with mastic pointing, cannot be affected by penetration of moisture.

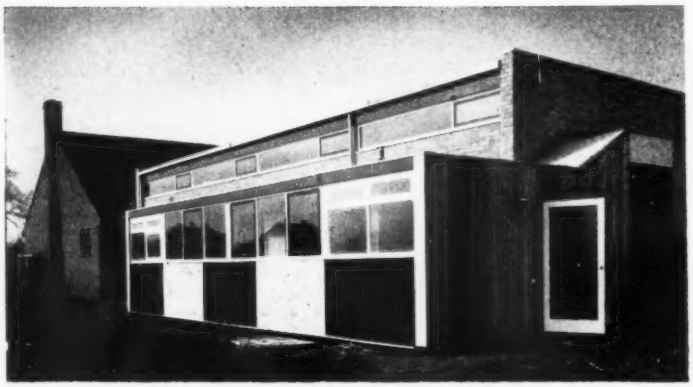
Thirdly, the escape doors: being *escape* doors I intended that they should be fairly prominent although contained by the general treatment of the façade. As to their subdivision I, too, have had second thoughts and agree with Mr. Richards's remarks.

Which now brings me to the main point on which Mr. Richards and myself disagree, the glazed screen which forms a large part of one side of the main hall. It is here, I think, that perhaps Mr. Richards has not given enough consideration to all the conditions.

The main elevation faces a large open private area which is to be developed as garden and lawn very soon, laid out with trees and shrubs to give some seclusion while providing a pleasant area on which to look out. I very naturally decided that this should be the main outlook from the hall and form the major window area. Now the outlook to the rear is private allotments, quite close, and the backs of suburban housing: not an inspiring vista. The decision was therefore made to set the sill line of the committee-room wing relatively high so that the view outwards, when seated, would be mainly sky and such trees as exist in the back gardens of the nearby houses, and with very shallow clerestory lighting to the hall, from this side, to provide reflected light from the ceiling and natural cross-ventilation.

From these points, stemmed the decision to treat the main glazing area as a fully glazed screen and I still feel the decision to have been a logical one, giving as it does a greater sense of space to what is quite a small hall. As Mr. Richards will probably agree, glass reads less transparently from outside when there are no large openings on the far wall, and distance increases this "blankness." The building is in this case set some

Church hall at Tolworth, from the north.



This photograph of the south elevation, which shows the sill line of the committee room wing, is published at the architect's request.

130 ft. back from the pavement so that, coupled with the planting, the interior will not be as much in public view as he fears; transmission of sounds either way is negligible (the site telephone, 50 ft. from the building, could not be heard from inside once we were "glazed in") and the *aggregate* area of glass is not so much in excess of normal as to compromise the high heat insulation standards of the building. By night, the curtains can be drawn for stage performances or private meetings, but for church meetings and such functions as socials and dances, the Vicar is very much alive to the value of a lighted interior to attract outsiders and, as Mr. Richards observes, it will add a little sparkle to the neighbourhood.

These are the reasons that led to my decision and from that decision the architectural character followed quite logically and sincerely.

So to sum up briefly and to answer the specific question, "Can the architect justify this all-glass wall on functional grounds? Or does he, perhaps, think it not necessary to do so?" As Mr. Richards rightly observes in his first article, "the principle of checking every design decision against the demands of logic can, if taken to excess, easily lead to an over-intellectualized architecture, and should not exclude purely intuitive or visual judgments." It is these last which lift the product out of the plane of merely competent building or efficiently organized engineering and make it architecture. Architecture is as seen and apprehended, and the architect is an artist. He must preserve his right to make design decisions that are not based purely on function, but a proper balance of both function and intuitive sensibility.

what readers think

Here are more letters from readers about the first article in J. M. Richards's series. The article, about a primary school at Hornsey, was published on February 14. The architect, H. T. Cadbury Brown, replied on February 21.

SIR,—"Surely [Mr. Lacey and Mr. Meikle] do not seriously expect me to occupy the JOURNAL'S valuable space giving an account of the LCC education programme and explaining what activities go on in an ordinary primary school." What a cheap and easy debating point! Speaking for myself, I should like to say that if Mr. Richards, when criticizing a school, cannot touch on educational requirements to the extent of showing how far they have been met by providing larger areas than the minimum or by providing good quality lighting, adequate sound absorption and quiet floor finishes, then I for one would prefer him not to occupy the JOURNAL'S valuable space at all.

Your JOURNAL so far has catered for serious readers anxious to solve æsthetic problems without detriment to practical requirements, and if criticism is to be anything more than superficial it needs space and a full background of detailed fact. Let us have criticism by all means but the only place for it is in association with your excellent building analyses.

Incidentally, many readers will want to know why Mr. Richards considers the Hornsey School cheap at £166 a cost place when the cost limit is £154. This is a fact which Messrs. Meikle and Lacey would not need to find out; they would know it already.

GUY ODDIE, A.R.I.B.A.

London.

SIR,—If Mr. J. M. Richards's criticism of the Hornsey Primary School was disappointing, even more so was his evasive brush-off of Mr. Meikle and Mr. Lacey, who unerringly put their fingers on what was lacking. I have not the pleasure of Mr. Meikle's acquaintance, but I know Mr. Lacey is very well aware of what goes on in a primary school—which is just why he finds this essentially "from the outside in" criticism (with illustrations in character) such a sad beginning to a promising series of articles. It is their embodiment of evolving educational ideas which is at the root of what has been achieved in British post-war schools, and which puts them in another class from the many Continental schools which can score higher marks on Mr. Richards' main criteria of detailing and elevational treatment.

BERNARD H. COX, L.R.I.B.A.

St. Albans.

SIR,—Will someone kindly explain to "Hornsey Architect" (AJ: February 28) the difference between a "criticism" of a design and a "Schedule of Defects"?

S. N. SHRIMPTON.

Radnor.

SIR,—Forgive me if my complaints about the article on the Hornsey School implied reaction against architecture as a visual art, but my criticism was one of incompleteness rather than of opposition.

To focus critical attention upon a few of the many aspects of that complexity which is a work of architecture, whether visual or functional, the handling of

elements or the foundation construction, the use of colour or the choice of a heating system; is to neglect the development in recent years of architecture as a completely integrated social art. It is almost a truism to say that a building must not only look good but must also comply with all the functions demanded of it, yet to every visual element there is a functional component and mastery of both is necessary to architectural success. To delight with an ordered fenestration having the right daylight factor, to make a curtain wall the essence of transparency but still leakproof, to master an eaves detail and effectively to have drained the roof, to have satisfied the client by truthful interpretation of his needs; to have done all these things and more besides is to have gone far towards good architecture. Since the war many of the finest contributions have been made by Local & Central Government offices whose architecture has above all else been complete and truly social—buildings born of a remarkable humility in the face of child or family, not the conceit of an architect bent on immortality.

It is not only the brilliance of the initial conception, but the continuation and sustaining of effort into all the various parts of the whole, which is the real test.

Here are seven suggestions about criticism:

1. Announce in advance the building which is to be criticized. (Those who can will be able to visit it and provide some reader participation, which by the limits of journalistic presentation can only be superficial.)

2. A short résumé of the client's brief to the architect coupled with a short description by the architect on how he arrived at the "Ethos" or "Spirit" of his building, with such further explanation as will help informed criticism. (I feel that defence should come before the prosecution.)

3. Where it is possible, combine your critical article with the "Building Illustrated." (This should save photographs as well as providing technical information and the cost analysis.)

4. Provide "activity plans" and thumb-nail perspectives explaining the functions of the building. (The plans of the houserooms at Lyng Hall and the sketch of the stage arrangement were fine.)

5. If it is not possible to cover briefly all the major aspects of the building, the critic should deal fully with those he selects and present both sides of the coin, *i.e.*, the visual and the functional. (With minor points perhaps a short description might be given, *e.g.*, Ironmongery: Swedish, nickel-bronze, attractive and comfortable handles but lock springs weak.)

6. Where appropriate, informed lay opinion might be given in combination with the architectural critic. (This would minimize a tendency towards professional arrogance and would help to keep the architect in touch with his public.)

7. Consider the ways in which criticism could be presented in an orderly fashion. (A boxing referee makes a points assessment before giving a final decision. Perhaps some breakdown could be given in the manner familiar to architectural students at criticisms of their works and presumably as in the assessment of some open competitions.)

ALAN MEIKLE, A.R.I.B.A.

Nottingham.

Mr. Richards replies:

I would make two points in answer to Mr. Cox and Mr. Oddie. The first I have made already: all articles can't be about everything, and the critic must choose to discuss whatever aspects of a building seem to him to deserve it. I thought the things worth discussing about the Hornsey school were its structure and use of materials and, to some extent, its planning. I did discuss the layout of cloakrooms in relation to classrooms and some other planning points where I thought a useful contribution had been made. I didn't think there was any special contribution to such questions as the provision of larger areas than the minimum and good quality lighting, and it is hardly worth introducing the question of lighting merely in order to say that in this case it conforms to normal practice. I did not say the school was cheap; I said it was not extravagant.

My second point is more difficult to explain. I suspect that Mr. Cox and Mr. Oddie are school specialists, and they would naturally prefer architectural criticism to concentrate on the programme studies which, as Mr. Cox rightly says, put British post-war schools in a separate class. But one thing I want to get away from is this tendency for criticism to cater only for specialist interests. Post-war school architecture owes its supremacy to an impressive number of fanatics, devoted to the cause of better schools, to whom we cannot be too grateful, but the critic must be more detached than their single-mindedness allows them to be. What is needed now is a disinterested appreciation, criticism and analysis of current buildings as architecture, taking the programme into account of course, but taking a wider view than the specialist's.

In answer to Mr. Meikle's second letter, I agree of course about the interdependence of function and appearance and I tried to bring this out in my first articles and to keep a balance between the two. I will go on trying. May I make the following brief comments on his seven useful suggestions? 1, no practical difficulty about this, though the information could only be acted upon by a minute fraction of the JOURNAL'S many thousands of readers. 2, I think the critic should say enough about the programme the architect was presented with (which, of course, he should understand fully) to make his comments intelligible, but I don't see the need for the architect to justify himself otherwise than through his building. 3, the intention is to do this where possible, but there are difficulties of timing. 4, agreed that supplementary illustrations of this kind are sometimes useful. Space is the difficulty. 5, agreed, but I don't think it is within the scope of these articles to deal with details like door-handles unless there is some special reason, and there might be a danger of obscuring the wood by the trees. 6, the layman's views on architecture are often worth having and I think the JOURNAL might sometimes find room for them. But the object of this particular series is the discussion of buildings by an informed critic—preferably without arrogance. 7, I doubt whether this would help because the same criteria would not apply to all the very different buildings dealt with.

Above: Attingham Park, Salop, where the course reported below was held.
Left: Birmingham students listening to one of the lectures on cost planning.

ARCHITECTURAL ECONOMICS

course held by the Birmingham School of Architecture

We print below the report of a course of lectures given last month to third, fourth and fifth year students of the Birmingham School of Architecture. The twelve lectures were arranged by the ARCHITECTS' JOURNAL at the request of the Birmingham School, and held at Attingham Park Adult College, Salop, a National Trust property, where students " lived in " for the four days of the course. The purpose was twofold: first to discover what cost studies might be introduced into the regular school curriculum, secondly to prepare for the next " live project "—a housing scheme for Birmingham Corporation which students and staff will design and supervise with special attention to costs.

JOHN CARTER

architect, assistant editor AJ

introduction

Mr. Carter gave an account of present-day procedure. He then explained the points where cost control was insecure and cost information was lacking and he said that following speakers would present the knowledge and ideas so far developed to remedy this situation. He suggested that when students or architects spoke of the *organic* or *integrated* quality of a building they betrayed a valid appreciation of economy, but it was an appreciation uninformed (as yet) by precise knowledge—especially of economic factors on the site or in the workshop. Hence the " economic " design might prove more costly to build than the " wasteful " one. We had learned to organize space and material economically—the next problem was to learn to organize events and processes economically.

HENRY SWAIN

architect, Nottinghamshire CC

client's requirements

Henry Swain described the procedure adopted at Nottingham CC since 1955. He said that the previous rather formal, local government structure of both the architect's and the education department was modified to allow for direct consultation at all levels, and arrangements were made by the Director of Education for architects to visit a selected six of the best-organized, existing secondary-modern schools. Two architects were " set aside " for the reconnaissance work on client's requirements and methods of building, to prepare for a £¾ million programme of eleven secondary-modern schools. They had numerous conversations with teachers, sat in on lessons and consulted education inspectors. No questionnaires were used and discussions were about teaching aims, methods and problems, *not* about planning arrangements or constructional detail. All points made were noted, any conclusions being firmly postponed to a later phase. This approach evoked an enthusiastic and very informative response from the teachers and inspectors.

In his conclusions, Henry Swain emphasized that architect-client discussions at the briefing stage should be in terms of *activities* and *purposes*; not of plans.

(Note: we hope in a future article to present a more detailed account of the Nottinghamshire CC architects' work.)

CLIVE WOOSTER

architect, Development Group MOE

programming

Clive Wooster first spoke of the architect's present inability to guarantee time or performance, or to ensure that each aspect of a project received attention appropriate to its importance (leisurely sketch design—rushed working drawings). He then explained that programming was a " tool of management " that could develop architect-client confidence.*

The architect's task was divided into: (*i*) investigation and collection of information, (*ii*) design and (*iii*) working drawings. Work on each phase had to be completed before the next phase was begun and a buffer period—usually a week—was allowed between (*ii*) and (*iii*) for tying up loose ends. (Fig. 1.) His system involved the breaking-down of design work into about 18 aspects—corresponding roughly to elements—and the time required to reach a solution to each, he said, was estimated in man days. In the absence of time records, the cost provided an indication of time needed. Next a priority order was worked out such that aspects on which other aspects depended were considered first. The number of man days for each aspect was then translated into actual calendar time, relative to the number of staff who would work on it, and allowing for holidays, illness and time spent on other jobs. The unit most convenient for recording was the quarter-day, and this was used in recording time actually spent. (Figs. 2 and 3.) Times were collected by a clerk each day and totalled every week or fortnight as a progress check against estimates of time left in the programme. If on the wrong side, the solution was either more time, more staff or lower quality of work. Mr. Wooster emphasized this point and mentioned again the more usual pattern of leisurely detailed-design work at the beginning and a frantic

* See AJ for Oct. 13, 1955

rush—with inadequate consideration of problems—at the end. With programming there was a more even balance, overshooting of dates being foreseen at an early stage.

R. B. HELLARD

architecti n private practice

operational drawings

R. B. Hellard began by saying that contract obligations—of any kind—should above all be clear and unambiguous. Drawings, he said, were part of the building contract, and he showed an example of the typical "crowded" and confusing working drawing, going on to describe the many uses to which the w.d.'s and bill of quantities were put by architect, q.s. and builder, a process involving much repetition.

R. B. Hellard's solution to these problems* was, he said, to show each building operation on a separate drawing, *e.g.*, site clearance and drain trenches; foundations; structural walls. Each drawing showed *all* the information necessary to carry out the operation, or to estimate its cost including specification notes and, where appropriate, quantities (in a right-hand column). All sheets were of standard size, bound together with a sequential index on the front sheet which could form the basis of the builder's site programme. Where appropriate, sheets were drawn with a pricing column, so that the tender would come back in operational breakdown. (See Fig. 4.)

The method really came into its own—and had first been used—on a project with a high proportion of prefabricated components. It also proved worthwhile for alteration works, each "operation" being, in the main, a "geographical" section of the job. To save drawing time, a number of "goldback" negative prints were taken off a basic drawing. By adding and erasing appropriately, each of these became an operational drawing.

Other points mentioned by R. B. Hellard were these: builders found the drawings strange at first, and required education in their use. His firm had used a very long carriage typewriter for lettering—which saved time. If there was doubt as to the operational sequence of a project, a builder should be consulted. This emphasized the value of a negotiated contract. Finally he said that use of the method on some 10 or 12 jobs had induced his firm to think "operationally" at all stages, and to think of costs operationally also. This saved drawing office and supervision time. Replying to a question he said that "elements" and "operations" were not always the same thing, although they could to some extent coincide.

P. F. BOTTLE

quantity surveyor, Development Group M.O.E

cost planning

P. F. Bottle defined an element as that part of a building which always performed the same function, whatever its construction—*e.g.*, roof to keep out the weather; windows to let in light, etc. He then showed how the sq. ft. of floor area provided a better unit of cost comparison than the cu. ft. and illustrated the 32 elements which the MOE had found most useful for schools, mentioning that Herts CC preferred to combine some of these to make 19 elements. Cost analyses were prepared by collecting items from a priced b.q. under these element headings, the list of costs per sq. ft. of floor area being preferably accompanied by (a) brief specification notes (to indicate quality) and ratios, areas or numbers (to indicate the amount of material in each element). One thus had a statement of quantity, quality and cost.* (See Fig. 5.)

* See AJ for August 23, 1956.

* See AJ for Feb. 24, and July 28, 1955, May 10 and 24, 1956.

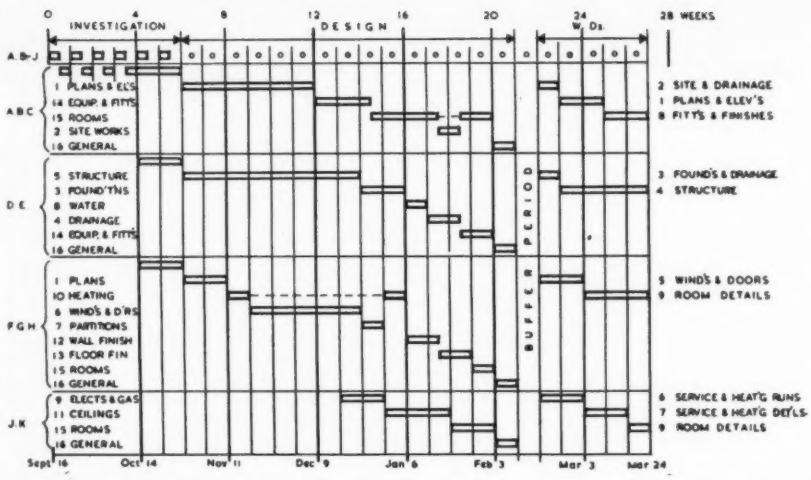
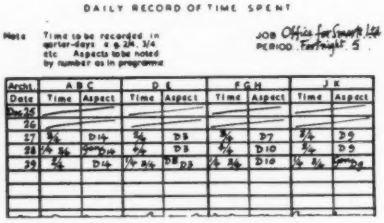


Fig. 1 (above). Example of a programme of work for the design team. Initials down the left hand side represent members of the team, and figures along the top represent weeks. Fig. 2 (below left). Daily record of time spent by a four-member team. Time unit used is the quarter day. Fig. 3 (below right). Weekly abstract of time spent on each design aspect. (See lecture by C. Wooster)



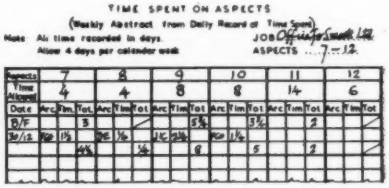
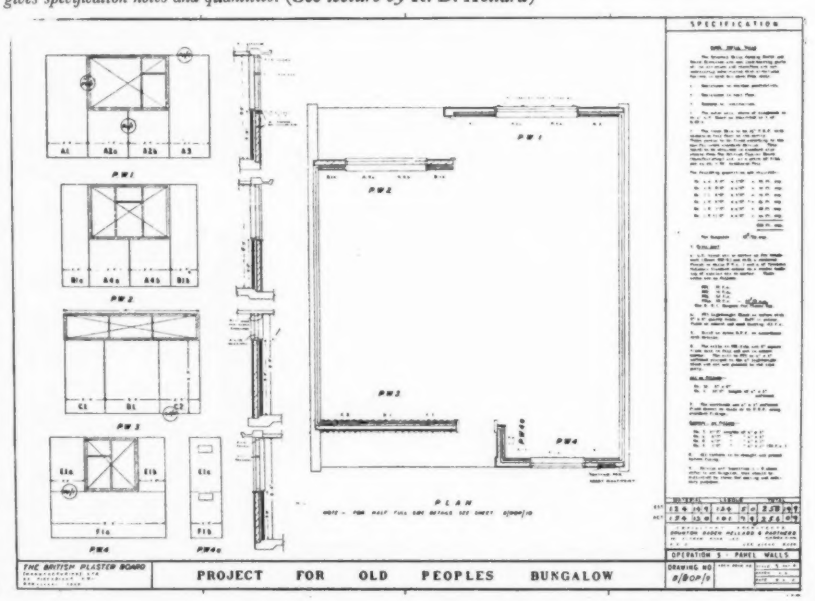


Fig 4. Example of an operational drawing: "non load bearing panel walls". Note the right hand column which gives specification notes and quantities. (See lecture by R. B. Hellard)



ROOF CONSTRUCTION		8 10	6-in. R.C. slabs 12 in. wide 25 ft. 0 in. span. 4 in. × 1 ft. 9 in. R.C. channel gutter, 3 in. foamed slag screed, 2 layers felt roofing. Assembly Hall Roof:—metal decking, ½ in. insulation board, 2 layer of felt roofing.
	Area 12,100 f.s.		
ROOF LIGHTS		1 3	Two skylights 6 ft. 0 in. × 8 ft. 0 in.; Three dome-lights 2 ft. 9 in. diam. Remainder patent glazing on timber curbs and framing.
	Area 300 f.s.		
WINDOWS AND EXTERNAL DOORS		4 7	Blanks galvanized steel windows and doors to Classrooms. Standard galvanized ditto to other rooms. Oak entrance door 7 ft. 0 in. × 8 ft. 0 in.
	Ratio Windows 0·240 / F.		
GLAZIER		0 7	24-oz. C.S. Glass to windows.
INTERNAL PARTITIONS		2 2	11 in. Brick cavity walls between classrooms. 9 in. brick walls to stores. 4½ in. brick walls to Lavatories.
	Room Heights		
W.C. DOORS AND PARTITIONS		0 7·5	Galvanized sheet metal faced plywood and ironmongery.
	No. 21		
INTERNAL DOORS		1 0	Frames: pressed metal. Doors: 1⅜ in. flush, and 1⅞ in. hardwood framed fully glazed double doors.
	Single 46		
	Double 10		
IRONMONGERY		0 9	Anodized aluminium to internal doors. Overhead door closures to double doors.

Fig. 5. A method of showing cost analyses. The areas, ratios or numbers on the left indicate quantity, the specification notes on the right indicate quality and the figures show cost per sq. ft. of floor area. Architect and quantity surveyor should be familiar with the building and market conditions of the contract, to interpret these prices properly.

Cost analyses could be used to compare the distribution of money in one building with that of another, and for judging whether the expenditure was appropriate to the quality and quantity of the various elements. But its real use was to " cost-plan " projects, like this: architect and quantity surveyor should have the analyses of one or two buildings, of which they were thoroughly familiar (their own previous jobs, ideally). At the beginning of the sketch plan stage a likely total cost per sq. ft. was worked out. A percentage of this was deducted as a " buffer " quantity and likely target costs for each element were calculated from the analyses and from other evidence. Analysis prices were not used " cold "; they were adjusted according to differences in quantity and quality between the analysed building and the projected building, use being made of the ratio of area of each element to the total floor area, and the architects' and quantity surveyors' knowledge of differing circumstances of the two jobs.

Completed calculations of element targets might show that the total originally assumed for producing the first sketch plan was too optimistic for the type and quality of building embodied in the client's brief. With a sketch cost plan, the architect knew this early on—where previously he would not have discovered it until the tender stage—and he could go to his client with a reasoned case for more money, lower standards or less accommodation.

With a cost plan agreed, design work could proceed, each element being priced by the quantity surveyor or by sub-contract quotations to check that the choice of material or method did not overshoot the target. In some cases the target would prove to be lower or higher than necessary, a re-distribution of money among the elements then being made so that the total remained the same. Periodic cost checks should take place to ensure continuous control, while architects decisions are determining ultimate cost.

elemental bills

Mr. Bottle said that architects were generally weak on matters of cost and that the q.s. was the right person to provide guidance and information. The main source of this information was the priced bill and the method of expressing it was cost analysis. But this involved abstracting from the trade order bill; hence the idea arose of billing directly in elemental form—a form that was still in an experimental stage.*

It was a more intelligible document than the trade bill. For example, in the latter the items comprising a roof-light might be scattered among concretor, carpenter and joiner, steel and ironworker, asphalter trades—the quantities in many cases being combined with those of other elements. In the elemental bill, roof-lights would appear complete—items being billed in either trade order or operational order within the element. Advantages were that: the estimator got a clearer picture of the building he was pricing, although he might take longer to price it because of recurring items; work could be valued for interim certificates more easily; and the builder found the elemental breakdown of quantities of more use to him in planning site operations and ordering of materials—for he needed to know what quantities went into which operations. And the e.b.q., when priced, provided a ready-made cost analysis.

* See AJ for Sept. 16, 1954, and Nov. 8, 1956.

FREDERICK WEST

Contract Planning Officer, Howard Farrow Ltd.

estimating

The speaker described the events following receipt of a bill of quantities at a builder's office.* The estimator first extracted and totalled the prime cost and provisional sums and listed items from the preliminaries that carried a monetary value (temporary roads, watching, attendance, insurances, etc.). Then the buying department took over the bill, extracting quantities of materials and components for quotations from sub-contractors suppliers and merchants. When the copying of the bill pages for this purpose was complete, it went back to the estimator, who totalled the principal quantities—of concrete, excavation, brickwork and so forth, to see which were the dominant trades.

Next came inspection of drawings at the architect's office—to see what the building was like (the bill gave no clue), how it was placed on the site, what space there was for huts, materials storage and the working of mechanical plant, and to seek answers to queries. Then the site had to be visited—to see what temporary fencing was required, what the ground was like, where the existing services were, where spoil might be dumped, what access there was to the site and similar matters. At the same time local merchants and the labour exchange would be visited. Back now in the office the pricing was completed in the light of methods of tackling the job that seemed most economical. The

* See AJ for Sept. 1, 1955

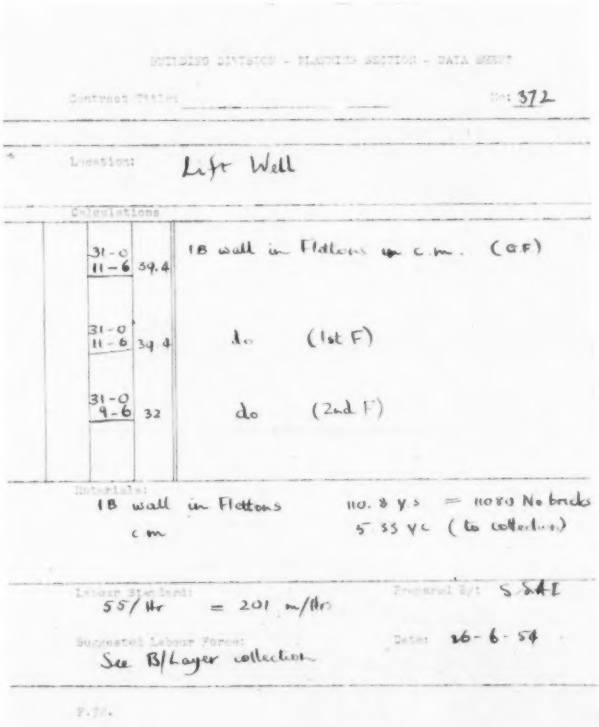


Fig. 7. A typical data sheet of quantities and output per man hour. These sheets are used to calculate the labour and plant requirements. A £100,000 job may require 250 such sheets, although fewer are needed where an elemental bill of quantities is used.

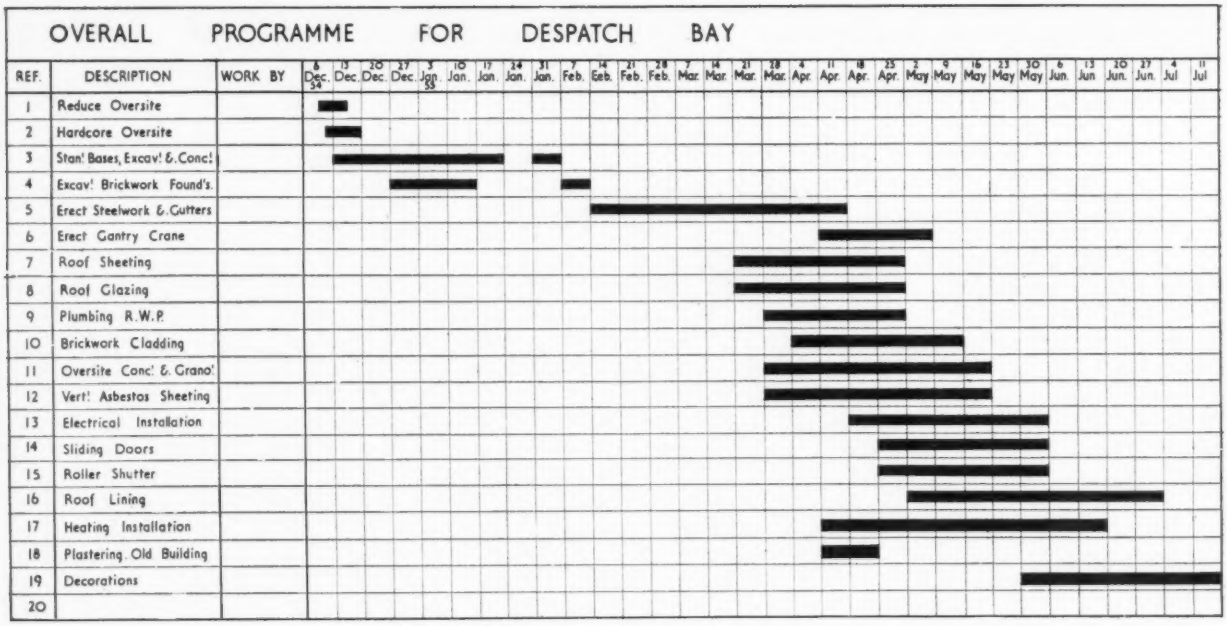
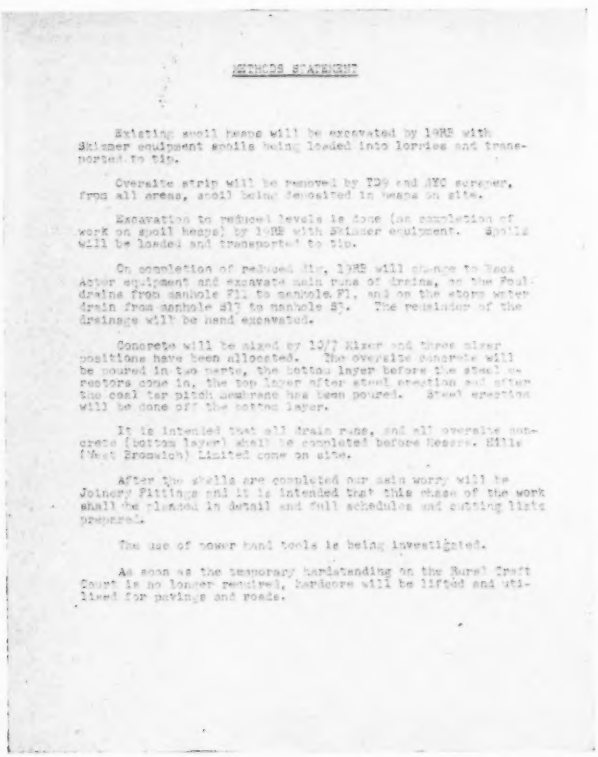


Fig. 7 (above). Typical overall programme. This merely sketches the approximate times and dates of operations. Each operation will be broken down into more detailed four-weekly and perhaps one-weekly programmes on site. Fig. 8 (right). One page of the "planning data" explaining how operations will be tackled.



METHODS STATEMENT

Existing spoil heaps will be excavated by 19RB with Skimmer equipment spoils being loaded into lorries and transported to tip.

Oversite strip will be removed by T29 and AEC scraper, from all areas, spoil being deposited in heaps on site.

Excavation to reduced levels is done (on completion of work on spoil heaps) by 19RB with Skimmer equipment. Spoils will be loaded and transported to tip.

On completion of reduced dig, 19RB will change to Back Actor equipment and excavate main runs of drains, ie the Foul drains from manhole F1 to manhole F1, and on the storm water drain from manhole S17 to manhole S7. The remainder of the drainage will be hand excavated.

Concrete will be mixed by 12/7 Mixer and three mixer positions have been allocated. The oversite concrete will be poured in two parts, the bottom layer before the steel erectors come in, the top layer after steel erection and after the coal tar pitch membrane has been poured. Steel erection will be done off the bottom layer.

It is intended that all drain runs, and all oversite concrete (bottom layer) shall be completed before Messrs. Hills (West Bromwich) Limited come on site.

After the shells are completed our main worry will be Joinery Fittings and it is intended that this phase of the work shall be planned in detail and full schedules and cutting lists prepared.

The use of power hand tools is being investigated.

As soon as the temporary hardstanding on the Rural Craft Centre is no longer required, hardcore will be lifted and utilised for paving and roads.

"rates" (of bricks, cu. yds. of concrete per man hour, etc.) were by no means always based on actual recorded costs; they were taken from price books, or from the estimator's own records or from previous jobs. Where there was no guide, the rates were built up from basic factors: labour, material and overhead charges. It now only remained for a "preliminaries" and site overheads budget ("the front of the bill") to be prepared and for the general manager to decide what tender price he would send in. This would depend on whether he had a full order book, whether the architect was likely to be co-operative and so on.

Mr. West concluded with some comments. There should be more time, he said, for tendering; drawings should be supplied with the bill; some bill pages should be duplicated for the builder to get his quotations; pricing rates should be based on actual recorded costs; there should be more work study—to show the most economical ways of performing operations; the elemental bill, although it took longer to price, was of much more value in the planning and running of site operations than the trade bill. Finally Mr. West said he believed in architect-quantity surveyor-builder collaboration from the sketch plan stage.

contract planning

Mr. West said that the two main aspects of contract planning were: the working out of an overall plan of campaign and assembling data for it; secondly, the more detailed operational work planning during the course of the work.*

The first job in the builder's office was to assemble all the information (from the architect, consultants, estimator). The general foreman who would manage the contract was brought into the planning team—whose next task was to identify the "key" operations in each phase and decide the order in which operations would be done. Quantities were then taken off separately for each phase for the amounts of materials, man- and machine-hours to be determined. (The elemental bill could reduce the amount of this work considerably.) This information was shown on data sheets (see Fig. 6), giving the "work content" of each operation—from which the methods, labour force and plant to be used could be decided. For a £100,000 contract there might be 250 data sheets.

With the labour-time and machine-times known, an overall programme could be drawn up, showing the dates and duration of each operation (see Fig. 7), and from the B. of Q. a materials schedule was prepared, giving quantities, dates required on site and delivery times. A labour schedule was also prepared showing the labour required at each phase, and there was a schedule of huts, plant, tools, barrows, ladders, etc. Finally there was a "methods statement" explaining how the work was to be tackled (see Fig. 8). All these documents were thoroughly reviewed at a "final planning meeting" of all the staff concerned. When this was agreed, the only thing that remained was to prepare a detailed programme for the first four weeks of the contract—so that the general foreman was free to attend to labour recruitment and other problems in getting the work under way. In the third week of the contract he planned out the next four weeks, and from this point the job was in his hands. Within the four-weekly phase, still more detailed programmes were worked out for each week, or in some cases for each day—by the trade foremen concerned. Mr. West emphasized that this approach—as distinct from the detailed *overall* programme approach—gave flexibility, allowing for rapid revision if progress got seriously out of step with programme. He said, in conclusion, that architects should always insist that builders prepared programmes and that they should keep a close check on progress and, if things went wrong, always ask why. Correspondingly, builders should cultivate the questioning attitude essential if planning was to succeed.

* See AJ Sept. 15, 1955.

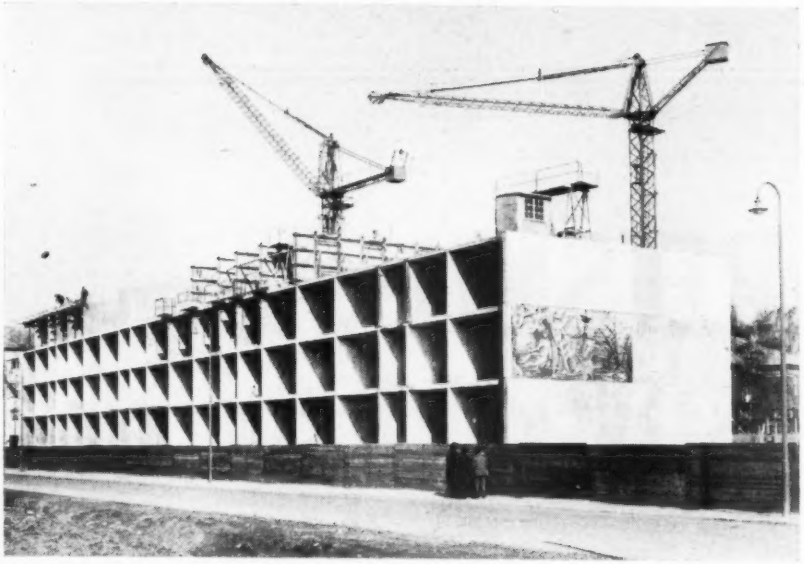


Fig. 9. Four-storey cross-wall flats at Malmo, Sweden, with unreinforced in situ concrete walls 4¾-in. thick. This structure was erected by only 15 men and the two tower cranes.

PETER DUNICAN

structural engineer, Ove Arup and Partners

structure

Peter Dunican (of Ove Arup and Partners) first made a distinction between flats from 3 to 5 storeys; from 6 to 11 storeys and from 12 to 20 storeys. His talk was concerned mainly with the first and third groups.

Structure cost between one-third and one-fifth of the total cost of a building, he said, but the cheapest structure did not lead "a priori" to cheap flats.* The best structure was that which fitted most completely the architectural conception. In high dwellings, overall stability against wind and differential foundation movement were major considerations. With the development of "minimum" structures without external load-bearing walls, they had become a problem even with low flats. If there were no buttressing elements, such as lift and staircase wells, lateral forces must be taken by vertical parts of the structure in bending, and this problem should influence planning from the start. Post-war experience showed that, without external load bearing walls, internal l.b. partitions were a better solution than columns and beams (see Fig. 10). This was partly because fire protection and sound insulation requirements of vertical and horizontal separation could be met by forms which also satisfied structural requirements. The result was a cellular building with 7-in. concrete walls and 5-in. floors. With a beam and column frame, party walls required 9 in. of brickwork or its equivalent, which did not deal so well with wind forces and introduced another trade to complicate site processes.*

Cross walls for high flats should, he said, be of concrete; for low flats they could be of bricks or blocks. Their position and arrangement could depend on the space planning, in which case possibilities were endless. Or they could be determined mainly by structural considerations—in which case they should be at regular intervals and at right angles to the face of the building. This arrangement also allowed for speedy, repetitive site procedures.

The speaker stressed that although cross walls offered many advantages, they were not the only solution. He mentioned a number of proprietary systems, urged the need for a soil survey for foundation design, and finally returned to his first point: that the most economical solution was the one that fitted most completely the architectural conception. Comparison of one system with another should take this into account.

* See *High Flats:* RIBA., 6s. *Economy in Multi-storey Flats: RIBA Journal*, April, 1956.

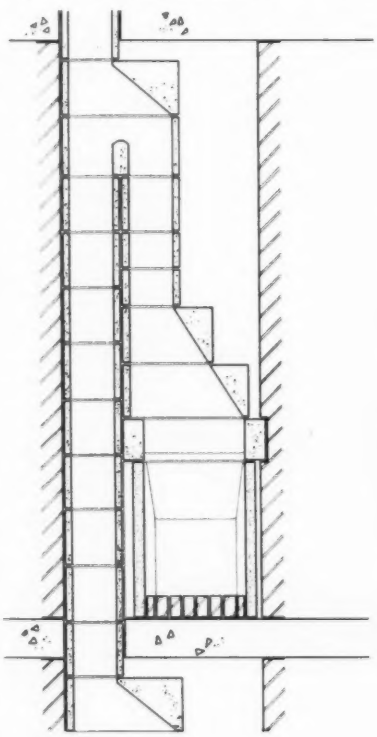
OLIVER COX

senior architect, Development Group LCC

LCC development

After explaining the organization of the LCC architects' department, Mr. Cox described the work of the Development Group within the Housing Division. This group, being relieved of the burden of production, had time to study specific problems in collaboration with experts. Objects of study covered the whole range of design, including user requirements, new materials, services and equipment, new building methods, the application of scientific thought to problems of structure, sound, heat and light, and the analysis of building costs. On scientific problems the group was assisted by the BRS and the LCC's Scientific Adviser, whose chemists also carried out laboratory tests of materials, while for practical problems such as the anticipated length of life of a new window hinge, testing rigs

* See AJ for March 17, 1955, and *RICS Journal* for February, 1957, Cross Wall Construction.



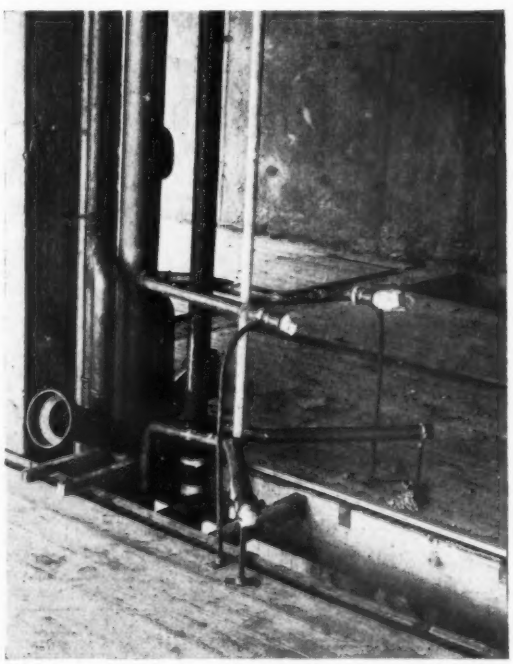


Fig. 10 (extreme left). One-storey of a typical continental arrangement of branched (or shunt) flues with open fires. Fig. 11 (left). Plumbing unit in an LCC eleven-storey block. Connections to fittings are made with a "push fit" socket with neoprene ring. The supporting brackets are temporary.

were set up by the Works Division of the Housing Management Department.

The main work of the group was concerned with the co-ordination of type plans initiated by the production sections, the production of information sheets and standard drawings, the design of components for bulk purchase, the introduction of new techniques and materials experimentally on to running contracts, and the initiation of negotiated contracts with selected firms for the purpose of joint design between architect, builder, engineer and quantity surveyor. A new idea, first tried out as a variation on a job under way and found successful, would, after further trial runs on other jobs, be broadcast to the production sections through an information sheet or standard drawing and thus become standard practice.

Mr. Cox then described some examples of the group's achievements so far. Work on services was illustrated by single stack plumbing which had saved £11 per dwelling, and a soil and waste plumbing unit with a neoprene ring coupling which had saved up to £2 per dwelling. Building components developed with manufacturers included a complete range of door and window furniture, a throat restrictor saving 30s. per dwelling and a drying cabinet which saved £3 per dwelling as well as £10 purchase tax. A new refuse hopper was being designed to overcome noise in use and the escape of smell when closed. Cost analyses had been prepared on a number of 11-storey maisonette and point blocks from which cost targets had been arrived at for each element in the construction. A graph showing the costs of piled and strip foundations of different types against varying bearing pressures and depths illustrated the value of cost research. Examples of buildings experiments were the introduction of precast staircases which speeded the erection of high buildings, and branched flues which showed savings of up to £20 per dwelling.

Mr. Cox concluded with a description of the LCC's Picton Street scheme and said that four further experimental contracts were planned. One of these was to be a study of traditional building methods in which the development group would collaborate from the start with the Direct Labour organization of the LCC's Housing Management Department.

JOHN CARTER

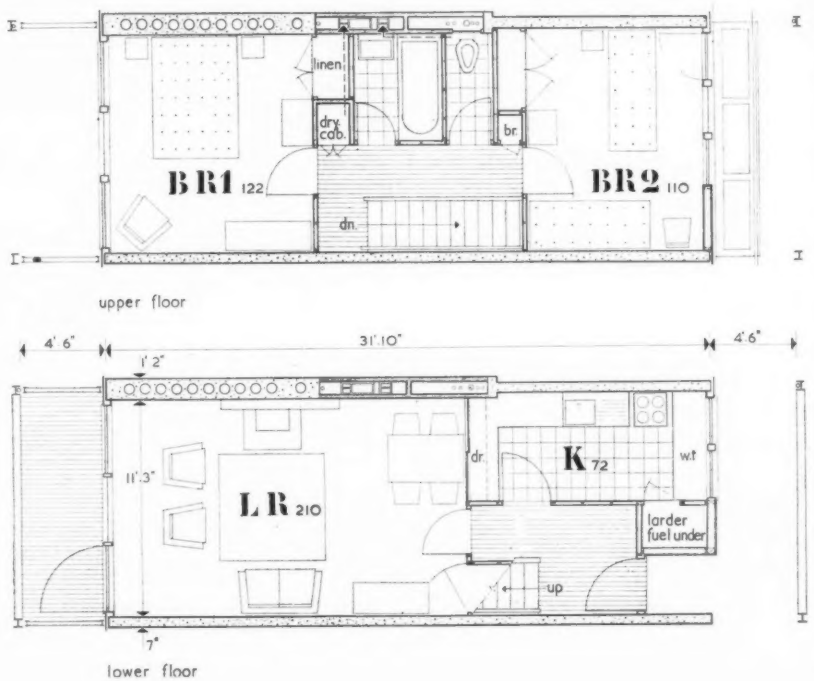
architect, assistant editor AJ

conclusion

John Carter summarized the previous papers and went on to suggest that the recent growth of "cost consciousness" and the research it had engendered, was simply a late—perhaps the last—phase in our working out of the functionalist theory. In the 'thirties "form follows function" simply meant the rational shaping of space and material to use and purpose. But thinking afresh about "function" had revealed the anachronism of a traditional "craft" architecture surviving into a scientific culture. Stylistic changes since the 1930's illustrated not so much changes in æsthetic fashion but a painful 30- or 40-year process of architecture catching up with and making use of other industries, investigating long-neglected problems and using scientific knowledge to find solutions for them. In considering style, Mr. Carter said, we thought too much in terms of the individual architect and the single building—forgetting the narrowness of the limits within which we designed.

Each speaker, he said, had really talked about the effect of one problem on others. The form of our schools should grow from teaching methods; the sequence of site processes should show in the arrangement of our drawings; the elements we manipulated on the drawing board should be mirrored in our cost analyses and bill of quantities. In designing constructional methods we were both determining and trying to anticipate site processes. The solution of each architectural or building or documentary problem, betokened solutions to the other problems and the finished building summarized our skill in recognizing the part each person played.

Fig. 10. Plans of narrow-frontage maisonette in eleven-storey block at Picton Street, London. (Former architect to the LCC, Dr. J. L. Martin; engineers, Ove Arup and Partners.)



Percy Johnson Marshall, a Group Planning Officer in the Town Planning Division of the LCC, has written the following review of a book on the planning of Dutch towns from the 10th to the 17th Centuries.

BOOK REVIEW

Planning Dutch Towns

Since the war there has been a remarkable, and very welcome, increase in the number of books on architectural history. It is now no longer an arduous task for the student to achieve at least a cursory knowledge of almost any stage in the historical development of architecture, in Europe at any rate. Town planning has been less well served, and almost any reasonably accurate book which helps the student to understand how and why towns grow, change, and decay, is welcome.

In his foreword to *The Making of Dutch Towns** Sir William Holford remarks on this lack of scholarship, and makes the point that although we still wait for a comprehensive history of town planning and town building, studies such as this perform a valuable service for the planning student, and indeed for all those who are directly concerned or even mildly interested in town planning.

Mr. Burke has taken for his subject the growth of Dutch Towns from the 10th to the 17th Centuries. Although, as he says, the ground has been well covered by Dutchmen, very little has so far been made available in English. And the subject is a fascinating one, for not only are their basic pattern and subsequent additions still apparent, like many English towns, but, unlike so many English towns, their historic form and character are still very much in evidence.

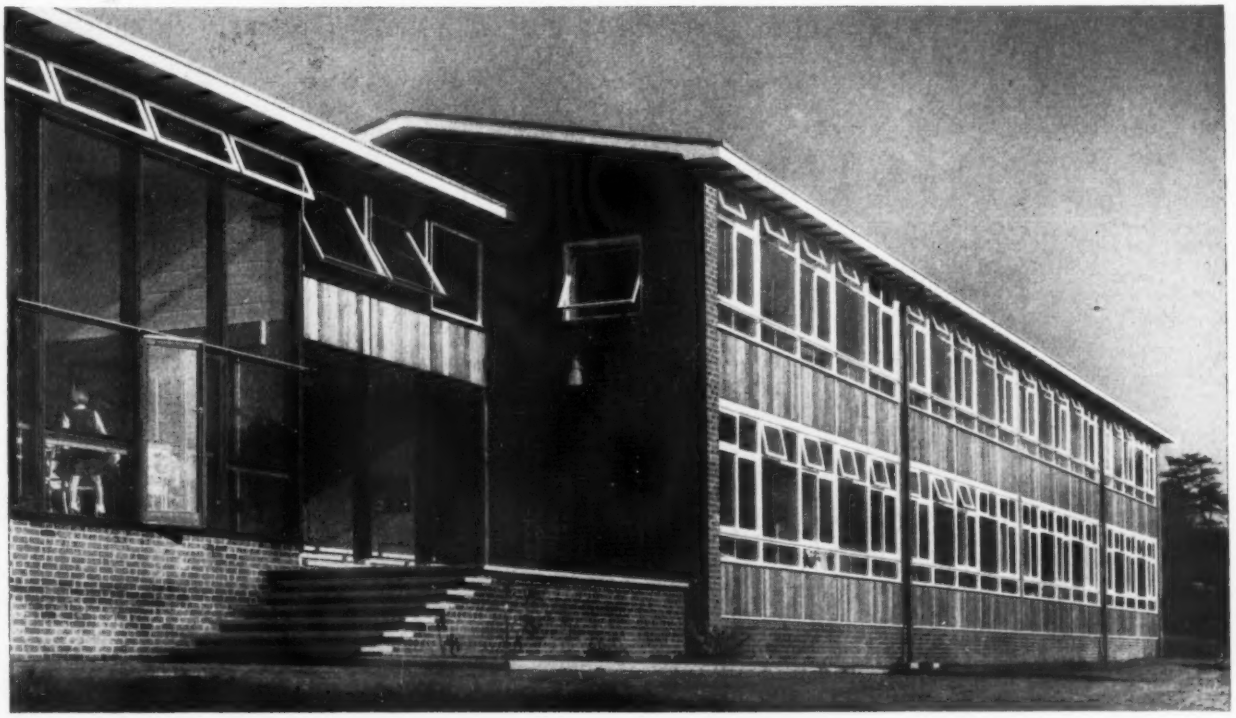
Of particular interest is the fact that Holland has a larger number of planned towns than any other country, and that they were so often part of a process of large-scale regional development. Extensive areas had first to be reclaimed from the sea, protected, drained, and made productive before towns could exist, and even then piling was necessary before building could start.

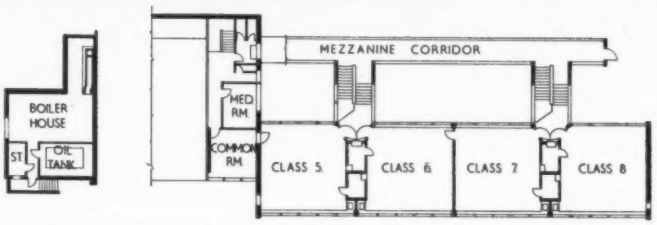
Mr. Burke has had to face certain problems in the presentation of his material. He could have taken a limited number of characteristic examples and given a fairly detailed study of their growth (as Professor Herman Rose did so ably in *Delft Kunststad*, but which unfortunately has not yet been translated into English), or he could have made a more comprehensive but superficial examination of a larger number of towns. That he chose the latter method does not detract from the interest of the book, although I wish he had started his very good intention of making the Dutch town planning and building contribution familiar to us in this country by translating one of the excellent Dutch books on the subject. His book is in a sense, hinged on a set of fine and clearly reproduced 17th Century maps, and the only criticism here is that there is no scale relationship established between them, as Prof. Rasmussen succeeded in doing in his *Towns and Buildings*.

The text, which describes town-making under various type headings (i.e. Dike Towns, Bastide Towns, etc.), within a broader historical framework, is clearly written and contains a large number of useful and interesting facts. The photographs, however, are small and generally undistinguished, and there is a lack of imagination in the format of the book. It is, nevertheless, a good beginning. Other countries please copy.

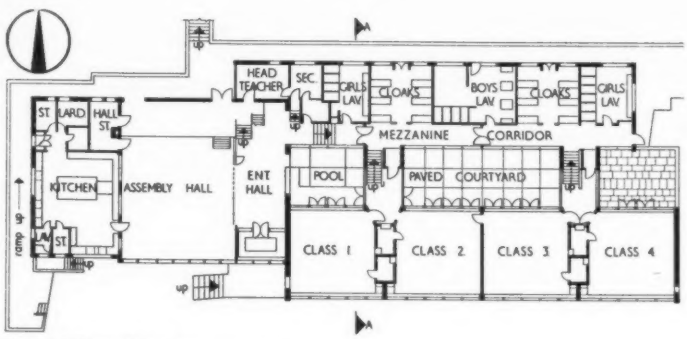
* *The Making of Dutch Towns*. By Gerald L. Burke. Cleaver-Hume Press Ltd. 35s.

CHURCH OF ENGLAND PRIMARY SCHOOL AT BEXHILL, SUSSEX

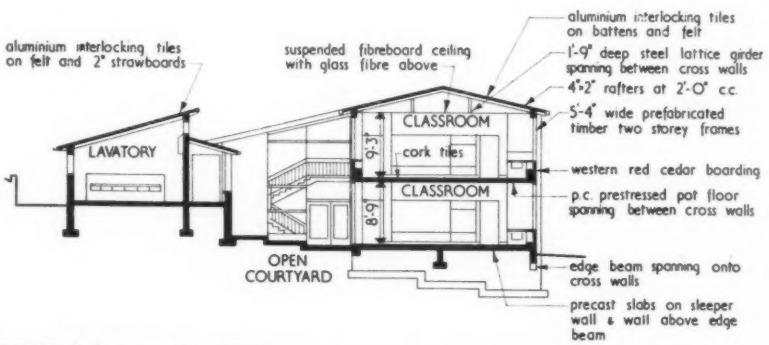




Basement, first floor and mezzanine corridor plans



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



Section A-A [Scale: $\frac{1}{16}$" = 1' 0"]

This is a 2-form entry Church of England junior school, designed by Hilton and J. M. Wright, and built on a narrow steeply sloping site. Above, the south elevation. The two-storey classroom block is served by a mezzanine corridor and staircases (p. 396, below) at the rear. This allows classrooms and lavatories to be lit and ventilated from both sides, an advantage at Bexhill where sea gales may make it impossible to open the south windows, which have sliding openings. Construction is largely traditional, using the minimum of steel and reinforced concrete. The window walls of the assembly hall (above) and classrooms are two-storeyed prefabricated timber panels, with woodwool infilling covered with cedar boarding to spandrels, attached with rag bolts to the edge beam of the concrete first floor. Site assembly was remarkably rapid, and there has been no trouble in waterproofing or alignment. External brick walls are 11-in. cavity, increased to 15-in. in assembly hall and classroom block. The roof, except for the flat kitchen roof, is covered with coloured, anodised finish, aluminium interlocking tiles. The school was completed in October, 1956. The steep slope and the expensive external works, including a lengthy approach road forced on the managers after public inquiry, make the gross cost somewhat high.

CHURCH OF ENGLAND PRIMARY SCHOOL AT BEXHILL continued

SITE AND PLAN ANALYSIS

Site accommodation	*Area in acres*	*Per cent. of total*
Building	·23	4·7
Playing fields	3·07	63·7
Hard playing areas	·99	20·5
School garden	·1	2·1
Planting near building	·17	3·9
Roads	·2	4·2
Paths, paving	·04	·9

Plan accommodation	*Area in sq. ft.*	*Per cent. of tota*	*Area per place*
Hall (s)	1,835	14·0	5·8
Stage	330	2·5	1·0
Gymnasium	—	—	—
Library	—	—	—
Store	675	5·2	2·1
General and practical class rooms	5,082	38·8	15·9
Dining	1,242	9·5	3·9
Pupils, storage	576	4·4	1·8
Sanitary accommodation	1,037	7·9	3·3
Staff rooms	645	4·9	2·0
Service	522	4·0	1·6
Circulation	1,161	8·8	3·6
	13,105	100·0	41·0

RATIOS

Area of enclosing walls / Total floor area	= 0·87 / 1	Area of windows (including external doors) / Total floor area	= 0·418 / 1
Area of solid wall / Total floor area	= 0·452 / 1	Total roof area / Total floor area	= 0·76 / 1

COST ANALYSIS

No. of form entries	2	Nett cost per place	£145
No. of places	320	External works	£8,933
Floor area (sq. ft.)	13,105	Gross cost	£55,292
No. of sq. ft. per place	41	Gross cost per place	£172 10s. 0d.
Nett cost	£46,359	Tender date	January, 1955

	s.	*d.*
Preliminaries and insurance	5	0
Contingencies	1	2
Work below ground floor level	5	8½
External walls and facings	2	3¼
Internal load bearing walls	1	5
Internal partitions		10
Frame		—
Upper floor construction and staircase	5	9½
Roof	8	1
Roof lights		1½
Floor finishes	3	8½
Ceiling finishes	1	5½
Windows and doors (external)	7	0
Doors (internal)		7½
W.C. doors and partitions		7½
Cloakroom fittings		5¼

	s.	*d.*
Wall finishes		11½
Built-in fittings		5½
Fittings		10
Ironmongery	1	3½
Plumbing (external)		5½
Plumbing (internal)	1	4
Sanitary fittings		11
Gas installation		—
Electric installation	2	0
Heating installation	5	8½
Ventilation		1
Drainage	2	2½
Glazing	2	0
Decorations	2	2½
Playgrounds	5	2½
Paved areas		6½
	70	7

COST COMMENTS

From the analysis it can be seen that the overall cost per sq. ft. and the distribution of costs over the elements, or groups of elements, follow the general pattern of costs to be found in most county primary schools.

Notwithstanding the awkward site it has been possible to plan down to a very economical size—40 sq. ft. per place compared with Newton Aycliffe (A.J., Sept. 29, 1955) at 47·73 sq. ft. per place and the Bousfield School (A.J., Sept. 13, 1956) at 48 sq. ft. per place.

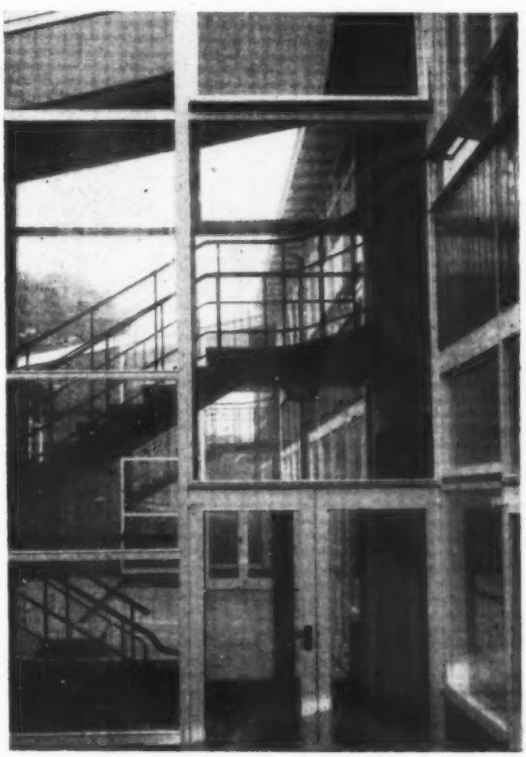
In a recent letter to the editor (AJ, January 31, 1957) a reader queried the usefulness of ratios. In this particular analysis the relatively high external wall to floor area ratio (0·87) reflects the plan shape which has been dictated by the narrowness of the site. The ratio also affords an opportunity to calculate the unit cost of a particular element e.g. the " external windows and doors " which are shown at 7*s.* per sq. ft. of floor area. The ratio of this element to the floor area is 0·418, the unit cost is then $\frac{7s.}{0·418}$ or 16*s.* 9*d.* per sq. ft. of external windows and doors.

Similarly, to arrive at the unit cost of the element " roof," the cost per sq. ft. of floor area is divided by the ratio i.e. $\frac{8s.\ 1d.}{0·76}$ or 10*s.* 7½*d.* per sq. ft. of roof.

The use of ratios may be taken one stage further when building up a cost plan. If the same type of " roof " element used on this school is required on a similar building but with a different roof to floor area ratio (say 0·38), the cost per sq. ft. of floor area would be calculated as follows: $\frac{0·38}{0·76} \times 8s.\ 1d. = 4s.\ 0\frac{1}{2}d.$

CONTRACTORS

Clerk of works: V. D. Barham and later E. G. Cooper. *General contractors:* Llewellyns (Hastings) Ltd. *Sub-contractors—Prestressed and pre-cast concrete slabs:* Costain Concrete Co. Ltd. *Asphalt tanking:* Russell Asphalt Co. Ltd. *Vinyl cork and accotile tiling and linoleum:* Decorative floors Ltd. *Hard strip and block flooring:* Hollis Brothers Ltd. *Rolling shutters:* Tidmarsh Ltd. *Ironmongery:* W. N. Froy & Sons. *Extract vent and roof vents:* Greenwoods & Airvac Ventilating Co. Ltd. *Aluminium roofing and suspended ceilings:* Prefatile (G.B.) Ltd., fixed by Manchester Slate Co. Ltd. *Window gearing:* Teleflex Products Ltd. *Sanitary fittings:* Stitsons Sanitary Fittings Ltd. *Clock:* Gibson Clocks. *Lightning conductor:* J. W. Gray & Co. Ltd. *Electrical installation:* Phoenix (Electrical Contractors) Ltd. *Lighting fittings:* Merchant Adventurers. *External lighting fittings:* Richard Thomas Ltd. and General Electric Co. *Heating and hot water:* Norris Warming Co. Ltd. *Piling:* Cementation Co. Ltd.

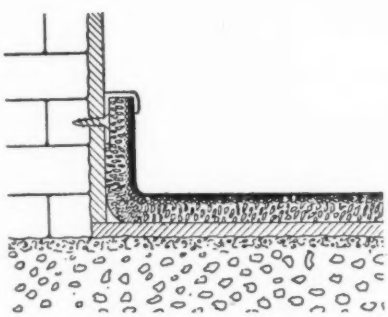


THE INDUSTRY

This week Brian Grant reviews two types of rubber flooring, a new sink heater, perforated p.v.c. sheeting, and a paper on central heating systems.

RUBBER FLOORING

A new type of rubber flooring, known as Bulgomme, has been developed in France and is now on sale in this country. The material has a total thickness of $\frac{3}{16}$-in. and is made up of a thin upper surface of hard rubber to take the wear, and a backing of cellular Latex, the two layers being bonded to a fabric interliner. The flooring is claimed to give a sound reduction of 42 db. when laid on an ordinary concrete slab with adhesive. Standard rolls are 59 in. wide but the material is also made in 9¼ in. square tiles in plain colours or patterns, or in patterned rolls with a plain border in widths of 19½, 26 and 39 in. for staircases and corridors. For rectangular rooms of up to 60 sq. yd. carpets can be made up in one piece, but the standard rolls can be jointed on site with a cold vulcanising glue. A coved skirting can also be arranged by turning the edge of the carpet up the wall and fixing it with a channel section. Price is about 52s. 6d. per sq. yard, in areas of 250 yd. or so. (*Bernard J. Arnull*, 13, *Montpelier Road, London, W.5.*)



Forming a covered skirting with Bulgomme rubber flooring.

ANTI-STATIC FLOORING

Charges of static electricity are not normally much of a nuisance in building but can be dangerous in operating theatres where explosive mixtures of anæsthetics are liable to collect. Anti-static rubber flooring is not a new thing, but so far the only available colour has been black. Silvertown, however, have now produced an anti-static rubber to BS. 2050 which is available in a large range of colours and in thicknesses of $\frac{3}{16}$, ¼ and ⅜ in. Wear resistance is claimed to be the same as standard rubber floors. (*Silvertown Rubber Co. Ltd., Herga House, Vincent Square, London, S.W.*1.)

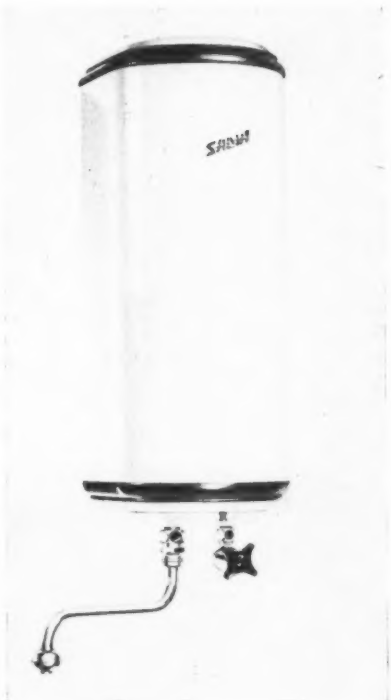
NEW ELECTRIC SINK HEATER

The photograph on the right shows the new Sadia Two-Plus electric sink water heater, which was originally designed for the continental market and has a storage capacity of 10 litres, just under 2¼ gallons. The price is £11 plus £5 3s. purchase tax and this model seems a more appropriate size for the average kitchen than the usual 1½-gallon types, while its price remains comparatively low.

Electrical loading is 1,000 watts, which gives a full recovery rate of just under an hour for a complete change of water. (*Aidas Electric Ltd., Sadia Works, Rowdell Road, Northolt, Greenford, Middlesex.*)

PERFORATED P.V.C.

For more years than most of us can remember, Harveys have been producing various types of perforated metal sheet for use as grilles in front of radiators and for numerous other purposes. The firm is now producing panels of perforated P.V.C. sheet in a number of different patterns and in sizes up to 6 ft. × 3 ft. Both transparent and opaque colours are available with either a polished or a matt finish. Prices range from 4s. 3d. to 14s. 3d. per sq. ft. according to the quantity ordered and also depending on the thickness required; the latter may vary between 6/1,000 in. and ¼ in. (*G. A. Harvey & Co. (London) Ltd., Greenwich Metal Works, Woolwich Road, London, S.E.*7.)

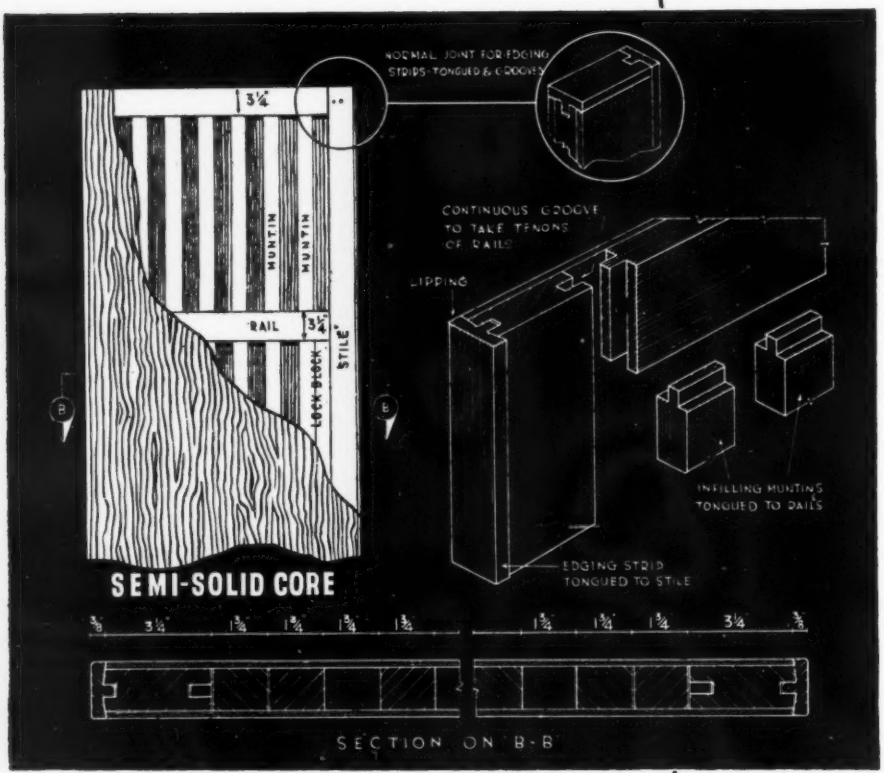


The Sadia two-plus electric sink heater.

CENTRAL HEATING SYSTEMS

The Invisible Panel Warming Association has just issued a reprint (Booklet A.10) of the paper read by its Technical Director, Mr. H. H. Bruce, at the Institute of Fuel Conference held in May last year and summarized in the JOURNAL of June 28, 1956. The paper analyses the results of the experiments carried out by the Building Research Station some years ago at Abbots Langley and the merits of various types of radiator are compared, while the characteristics of floor heating systems, ceiling panels and back boiler systems of hot water supply are also considered. The author believes that small-scale district heating schemes serving a group of about fifty houses or flats should have economic advantages over larger schemes. Copies of the reprint are available free of charge. (*The Invisible Panel Warming Association, Grand Buildings, Trafalgar Square, London, W.C.*2.)

ROYAL FLUSH DOORS



NOTE: "ROYAL FLUSH" Solid Core Doors have the infilling muntins placed edge to edge. The Cores are of Western Red Cedar.

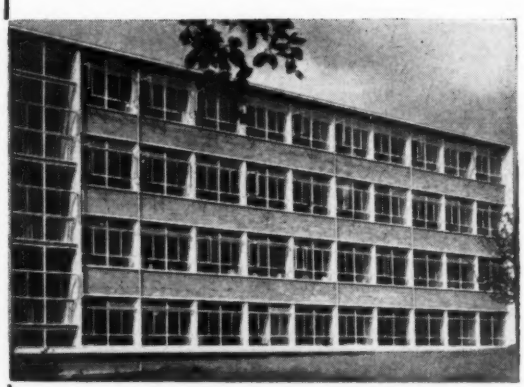
A Semi-Solid Core door was used in this illustration, but if Solid Core doors are required, the spaces in the Semi-Solid door are filled in with muntins.

NORTH GLOUCESTERSHIRE TECHNICAL COLLEGE, CHELTENHAM. NEW BUILDINGS, PHASE II.

S. E. Urwin Esq., F.R.I.B.A. County Architect, Gloucester County Council, Shirehall, Gloucester.

General Contractor: Messrs. A. C. Billings & Sons Ltd. 54 Winchcombe Street, Cheltenham, Gloucester.

Please write for details of the "Royal Flush" Ronuk Decorations Service.



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Φ 49

technical section

28 MISCELLANEOUS
rational aspects of colouring in building interiors, 1

It is now a year since the publication of BS.2660, *Colours for building and decorative paints.** As was pointed out in an article† published in the JOURNAL at the time, one important purpose of this Standard was to provide the architect with a working tool to help him use colour. This week we publish, by permission of the Director of Building Research, the first of two articles explaining how to do this. These have been written by H. L. Gloag, A.R.I.B.A., A.A. DIPL. (HONS.), and M. J. Keyte, A.R.I.B.A., DIP. ARCH. (BIRM.) who together had an important share in the drawing up of the Standard itself. In their first article they discuss their approach to the problem of architectural colour. In their second they apply this approach to three characteristic colour problems. Two points must be made here. The first is that in choosing the title "Rational aspects of colouring in building interiors" they do not wish it to be thought that colour can be dealt with entirely by rational argument. The second is to apologise for the fact that these articles are not illustrated in colour. For this reason our authors must ask readers to refer whenever necessary to the actual colour cards which comprise BS.2660.

The systematic nature of both the approach proposed here and BS 2660 depends first on making a distinction between the qualities of hue, lightness and strength of colours, or Hue, Value and Chroma as they are called in the Munsell Atlas. Without some such positive reference we should continue to flounder in the world of colour with only names to guide us, many of them fanciful and all of them ambiguous. For practical purposes the importance of distinguishing Hue, Value and Chroma is that many functional effects of colour hinge on one or more of these variables. As knowledge of these effects increases so does it become more and more useful to have Munsell references against each colour in the Standard.

* BSI. 7s. 6d. † February 16, 1956.

Character and integration

The word "character" is used to describe the visual impressions in a building. It represents the sum effect of the parts under the control of the architect, including lighting, colour, form, pattern and texture, and this very use of a collective term underlines the necessity to consider all these visual "forces" in relation to each other so that the effect will be one of integration, not of disruption. Bad integration of lighting and colour, for instance, can produce glare and gloom, while form with insufficient articulation or unsatisfactory proportion restricts the scope of the colouring. Though colour, especially when applied in-situ, can be used to some extent to correct or camouflage defects of lighting or form, such negative use is often at the expense of others more positive.

When we come to the examples we shall have an opportunity to consider integration in practical terms. First we must try to assess the contributions which colour itself makes to character.

Three functions of colour

The approach to colouring takes as its basis three broad functions, not because they are the only ones but because between them they control character and serve to "break the back" of colour problems, giving firm lines of guidance which can be refined and adjusted for particular cases.

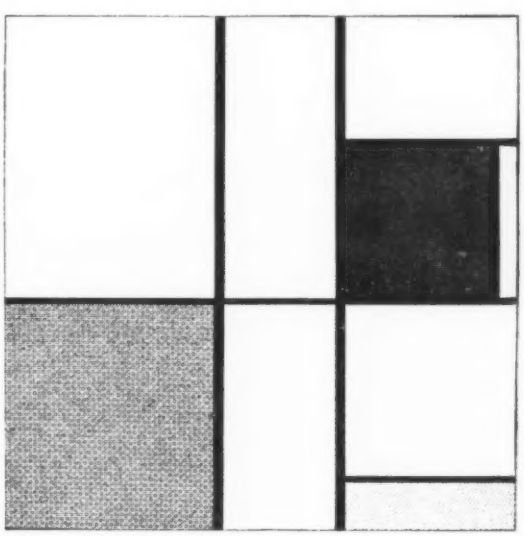
They are:

i. to introduce an appropriate colour stimulus.
ii. to assist good lighting and vision.
iii. to express form or breakdown of surfaces.

Colour stimulus

Most people will have experienced colouring which was "anaemic," and perhaps also colouring which was

Fig. 1. Diagram based on composition with red, blue and yellow by Piet Mondriaan (1935). The "pure" palette of strong primary colours, combined with black bands and white ground, produces sharp clarity and a powerful colour stimulus.



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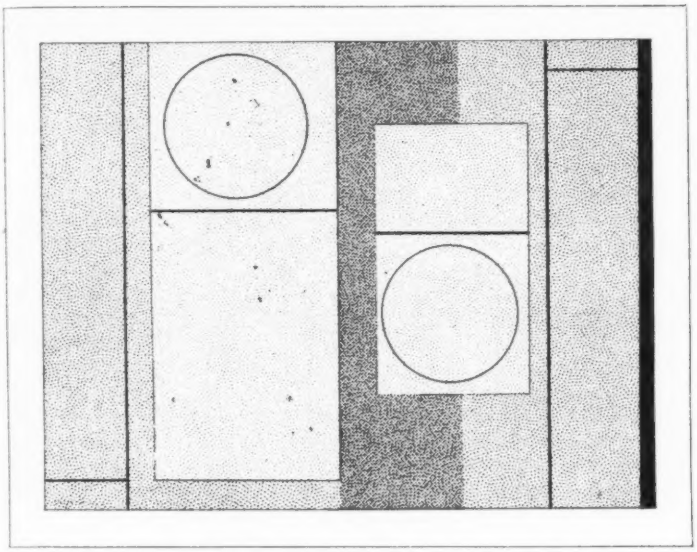


Fig. 2. Diagram based on "Painted Relief" by Ben Nicholson (1943-44). The pattern here is three-dimensional and more complex than Fig. 1, but soft, light colouring adds coherence and a moderate colour stimulus. The palette is pale and medium buff on the background with very pale blue and pale grey on the raised rectangles (with circles). The outer surround is very pale grey. White is omitted and the soft colours blend together without interruptions, the only sharp note being the narrow vertical strip of red on the right.

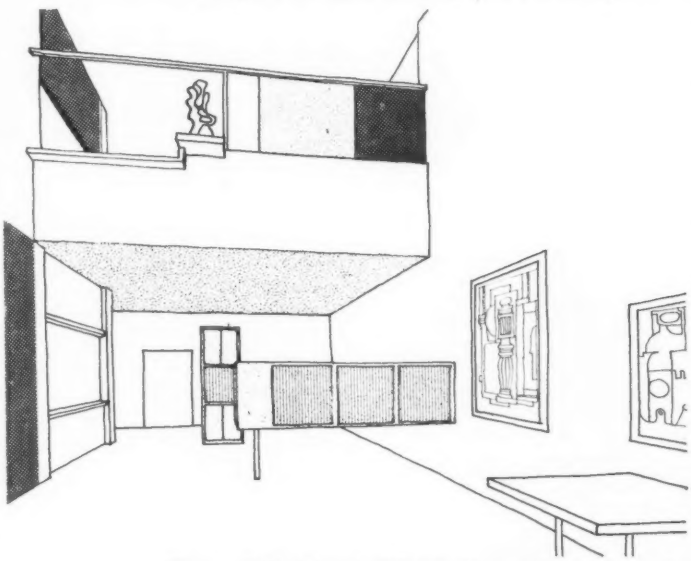


Fig. 3. "Pavilion de l'Esprit Nouveau" 1925, by Le Corbusier. This was one of the first occasions on which Le Corbusier made deliberate use of colour in an interior. White is dominant, with blue on the ceiling, brown panels on left and yellow on the cupboards.

"overpowering." These descriptions indicate extremes and if we consider them objectively as colour stimuli we should say that the stimulus produced by the colouring in the first case was too small and in the second too great. For normal purposes, of course, we would want a degree of stimulus in between these extremes, the scope in each case being limited by the form and arrangement of surfaces, the lighting and the colours used.

The problem in practice is to determine what degree of stimulus is appropriate, and this in turn will be suggested by the purposes for which the environment is being designed. It is here, incidentally, that evidence about emotional reactions to colours* would be useful, but firm data so far available is very scarce compared with the quantity of speculation on this subject. We have to rely on experience and observation, for the time being.

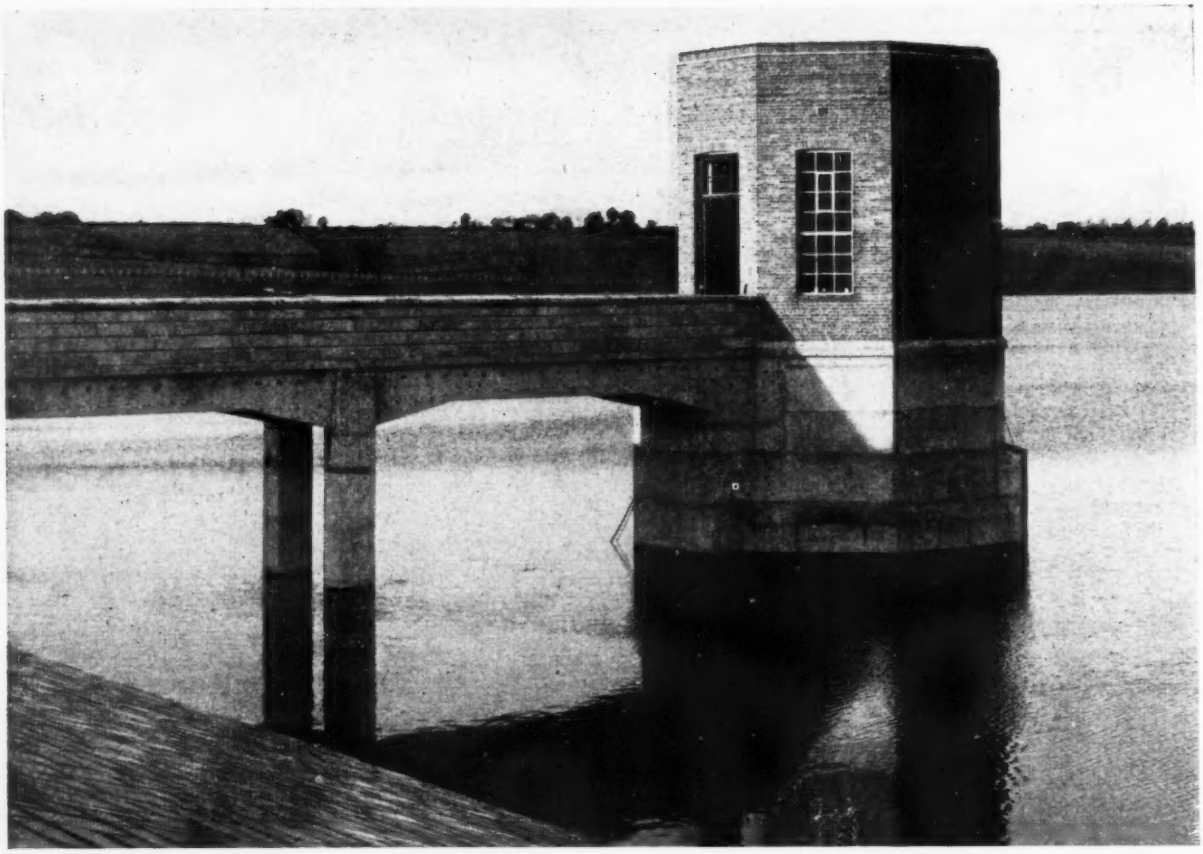
The obvious way of achieving a powerful stimulus is to use strong colours. It has to be remembered, however, that many strong colours are also rather dark, and that if they become dominant in the surroundings, and if they meet each other without any relieving break between them, the potential stimulus is liable to be counteracted by sombreness. The key to successful creation of a powerful stimulus is not merely to use colours of greater strength, but to aim at sharp clarity and freshness in the colouring as a whole.

To point the argument we may be forgiven, perhaps, if we cite a painting by Piet Mondriaan as an example of a powerful colour stimulus especially relevant because it is expressed as an abstract rectilinear pattern reminiscent of architectural settings. In the painting reproduced diagrammatically (Fig. 1), Mondriaan has composed his pattern with primary colours of full strength, together with white and black. Thus his palette consists of very distinct contrasts of colour; and it is to be noted that clarity is consistent in the unambiguous rectangular shapes of the primary colours and their decisive separation by the white of the background and by the black bands. The contrasts so created are vivid, particularly where the black bands themselves are separated by only a narrow strip of white. The white background is of special interest because it is sufficiently dominant to make the picture as a whole seem bright, and because it gives sharp definition to the edges of the black bands and their contained rectangles of colour.

This example serves to identify the factors which seem of prime importance as stimuli, namely strength or purity of colour and clarity of pattern; clarity being influenced by the extent to which the colours are separated from each other by white or neutral, and the degree of contrast between the hues and lightnesses of the colours themselves. Hence at the other end of the scale a gentle stimulus would require colours with low strength, small contrasts of lightness, and closely neighbouring or monochromatic hues (Fig. 2). In buildings it may be necessary to add some white or near-white, if suitable surfaces are available, to act as divisions or breaks in the main colouring, this time to counteract any danger of "lifelessness" or "anaemia."

A technique for the handling of colour which has gained favour in recent years is that of picking out certain surfaces in stronger or darker colour in contrast with soft or neutral colours on the general background. This form of expression no doubt owes much to the examples of Mondriaan, Le Corbusier (Fig. 3) and Ozenfant (Fig. 4) who pioneered and refined it to be in keeping with their philosophies of design.

* Often referred to as "psychological" reactions.



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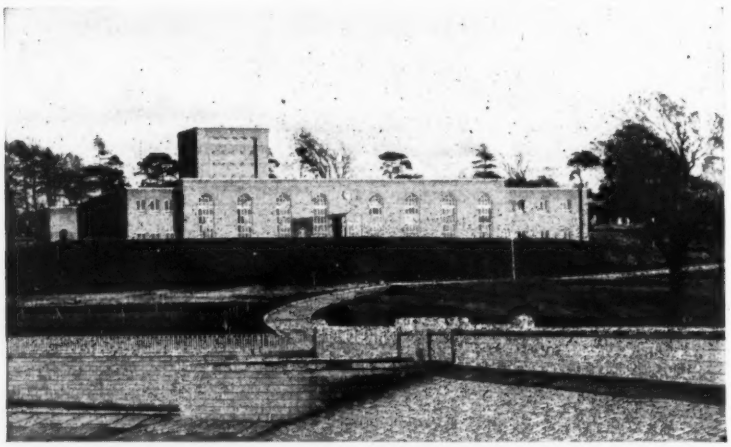

MID-NORTHAMPTONSHIRE WATER BOARD
Constructed to the design of Leonard H. Brown, B.Sc., M.I.C.E., M.I.W.E., Engineer and Manager to the Board.

Architect: Sir Howard Robertson, A.R.A. P/P.R.I.B.A., S.A.D.G., Easton & Robertson, London, W.C.1.

Contractors: Sir Alfred MacAlpine & Son Ltd.

The principal buildings for this fine reservoir, opened recently by H.M. The Queen Mother, are faced with Ibstock Multi-colour Golden-Brown Sandstocks. Approximately 200,000 bricks were supplied, providing, in this district formerly renowned for its local stone, the most attractive, harmonious colour for the elevations.

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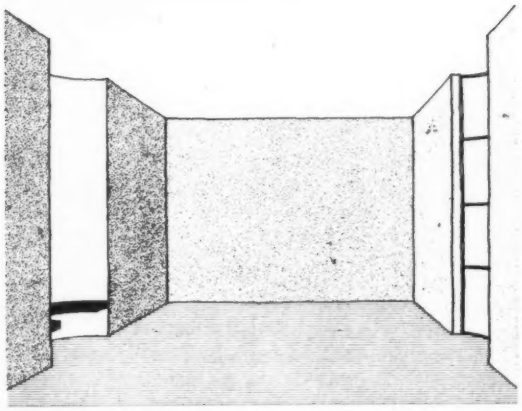


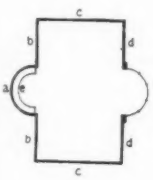


Fig. 4. Example by Ozenfant to demonstrate his ideas on integration of light, colour and form (Architectural Review, *February* 1937). *The colours are white (a), strong yellowish-green (b), pale blue (c), pale orange (d) and strong red (e). The white semi-cylinder on left was deliberately introduced to reflect light on to walls (d).*

This technique of " articulation," * as we will call it, has much in its favour as a means of gaining flexibility in the colour treatment, provided that the surfaces to be coloured lend themselves for their part to changes of colour. By means of it the colour can be more closely related to variations of lighting and to visual requirements, and there is greater opportunity to develop spatial effects. As we have already implied, however, it does not follow that the colour stimulus must be powerful or even that any of the colours must be strong. The method lends itself equally well to subtlety or to schemes based essentially on changes of Value only, as they would be for example, if the colours were restricted (to quote from BS 2660) to the left-hand columns of Cards 3 or 4, or to the greys on Card 9.

One point deserving mention here is the danger and unreality of relying on a very small fixed palette of two or three colours chosen for its own merits rather than for its appropriateness for particular environments. Such small fixed palettes have tended to crop up from time to time, and two of them, creams and greens or creams and browns, certainly have their uses in architectural colouring if well-handled, but do not deserve to be treated as panaceas, if only because as a universal recipe they cramp imagination and lead to monotony.

It will be noted that the discussion has been limited to the application of plain painted colour with little reference to surface-patterning. This omission is deliberate because surface-patterning adds to the designer's vocabulary, but does not alter the main principles.

Lighting

The function of colour in answering requirements of good lighting and vision is controlled chiefly through the Value of the colours and this has been taken into account in the design of BS 2660 by keeping the colours, as far as was possible, to even steps of Value. From this aspect, therefore, with a few exceptions, the range presents alternatives of Hue and Chroma at each of nine steps of

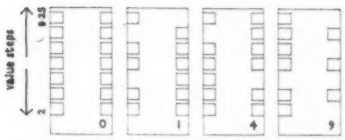


Fig. 5. In general the colours on the BS. cards conform to nine steps of value (lightness) in descending order.

Value, from lightest to darkest (Value 9.25 to 2) see Fig. 5. The process of choosing colours to fit lighting and visual needs thus becomes mainly a matter of thinking in terms of these nine steps.

The function itself can be summarized as:

(*a*) controlling the level and distribution of reflected light, and (*b*) controlling the brightness of surfaces.

For good vision there must be a sufficient amount of light, and specific levels to meet the demands of most categories of work are given in the Code published by the Illuminating Engineering Society. Methods of estimating the levels and distribution of light within buildings, both direct from the sky and by reflection from internal surfaces, have been developed and are fully described elsewhere. † Methods for working out the combined direct and reflected light from artificial sources also exist. ‡

The importance of indirect or reflected daylight is only now beginning to be appreciated in a systematic sense in the design of buildings.

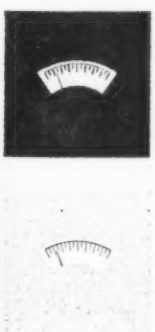
The control of brightnesses is less readily codified and depends in practice on three general rules. The first concerns elimination of glare from sources of light, sky or artificial, and is to avoid strong contrasts of brightness between the sources and their surroundings as seen from normal angles of view. It requires care in the positioning and design of windows and light-fittings together with the use of local colours of high Value to grade the sources into their surrounds.

* Concise Oxford Dictionary defines articulation as "connecting by joints, marking with apparent joints."

† See two articles in the JOURNAL by Dr. R. G. Hopkinson, Ph.D.: "Reflected Daylight," Aug. 5, 1954, and "Calculation of the Indirect Daylight Component for Rooflights," Sept. 16, 1954. Also BRS Digest No. 80, "The Prediction of Levels of Daylighting in Buildings," Aug., 1955.

‡ Illumination Design for Interiors. ELMA Handbook, May, 1951.

Fig. 6a (below left). Concentration is easier if the work is given preferential light, but the contrast between local and general lighting should not be too severe. Fig. 6b (below right). In the upper diagram the pattern of the white dial in a very dark-coloured surround dominates. Attention on the hand and figures is much easier when the white dial-face grades gently into a pale grey surround.



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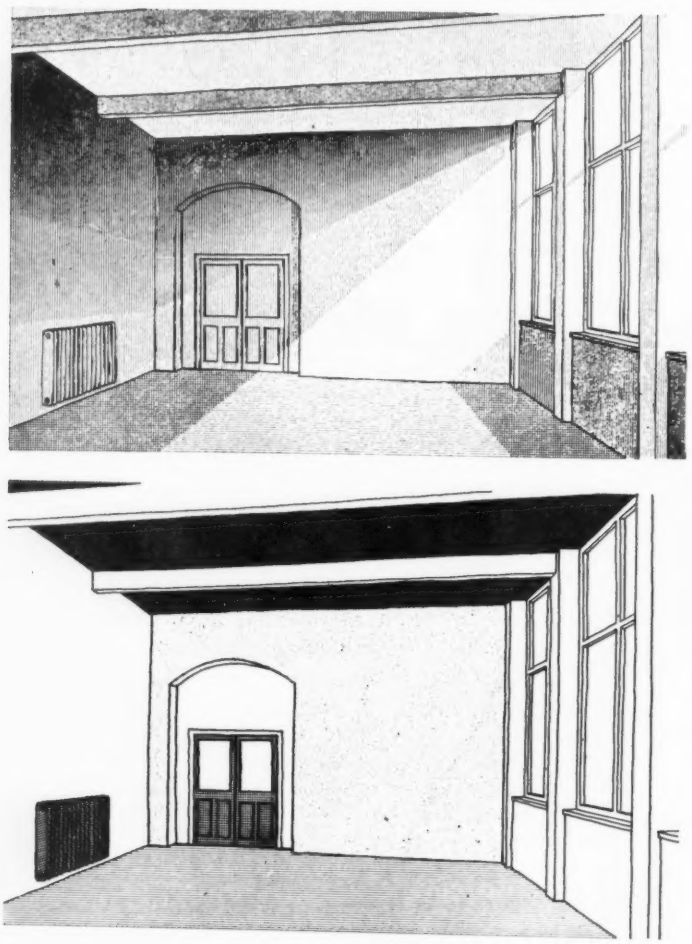

Fig. 7. Edwardian School Dining Room. The natural pattern of light shade created by the windows (7a, top) is balanced and " rounded out " by colouring (7b, above). The shaded surfaces are painted white; the best-lit surface is slightly darkened by light-grey (9-094); doors and radiators are darkened (4-051) to create contrasts which balance the natural shadows on right. Strong red on the ceiling (0-005), divided by white beams, adds a note of strong stimulation, but its lower value (5) lightens the walls.

The second rule is that objects or surfaces demanding attention, especially prolonged attention, such as chalkboards in a school or work-points in a factory, should be treated in the design of the lighting, colouring and, where possible, the form, to make visual attention easy and natural (see Fig. 7). The eye is drawn automatically to the brightest and most contrasty parts of the view and these characteristics should be developed to give preference to the object itself, combined with an attempt to eliminate distractions in the near vicinity. This second rule can be answered chiefly through control of the Values of the colours used, but Hues and Chromas should also be chosen with thought to the contrasts they create with the object of attention.

The third rule concerns control of brightnesses in the general environment, and this is a matter of balancing or adjusting the natural highlights and shadings to avoid harshness or gloom and to achieve a general sense of good lighting (see Fig. 7).

Form or breakdown of surfaces

The function of colour under this head can be discussed briefly here because it will be referred to in the course of dealing with the examples treated in the second article. If the colouring is to be expressed, as it generally should be, as an interplay of differently coloured surfaces, whether powerful or very gentle, and if it is to fulfil its function in relation to good lighting and vision, the design of the form and surfaces themselves must be in sympathy. For example, if strong colours are needed, clearly-defined surfaces are also needed, of the right size and in the right place (see Fig. 8). Similarly, if glare and visual attention are to be controlled, the disposition of the surfaces in relation to the light, and their breakdown or division, must be considered no less carefully than the colouring.

We are emphasising the demands of colour upon form rather than of form upon colour because in our experience the demands of colour are more often neglected on the assumption that they can always be fitted in afterwards.

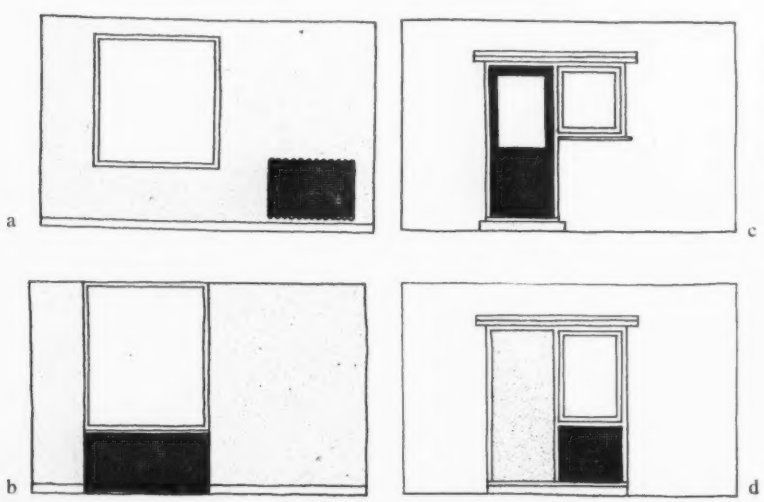

Fig. 8. (a) Choice of colour inhibited by " broken " shapes. (b) Division of wall into 3 separate surfaces " frees " colour and eliminates dark strip above the window. (c) Positive colour cannot be used here without emphasising unhappy form at the same time. (d) Clearly defined and " comfortable " shapes lend themselves to colour.

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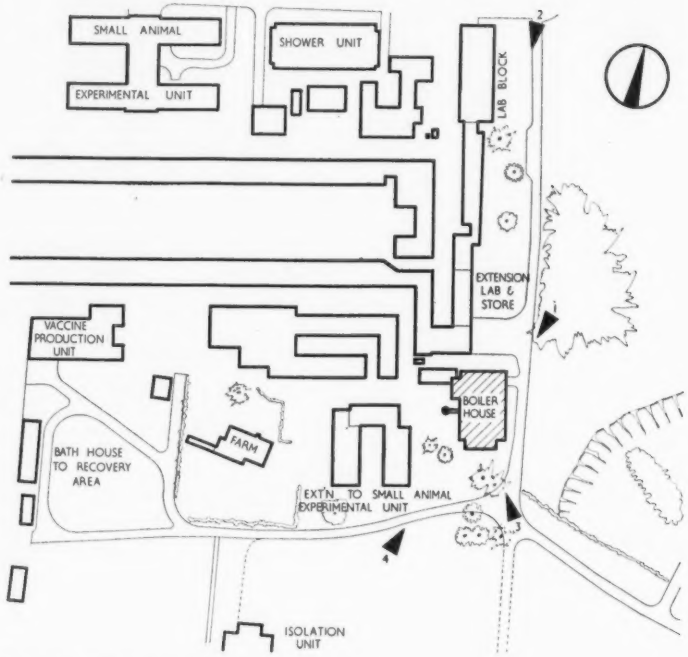
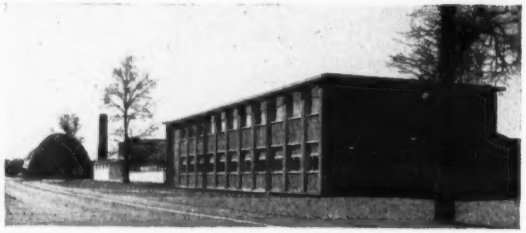
assistant architect IAN SCOTT; consultants (structural) CYRIL V. BLUMFIELD
(services) WINGFIELD, BOWLES and PARTNERS; quantity surveyors LEON and WESTWOOD

This free-standing boiler house serves the Ministry of Agriculture, Fisheries and Food research institute at Pirbright, where virus diseases, particularly foot and mouth disease, are studied. The institute, which has been developed over a number of years, consists of a large number of buildings, widely separated from each other to minimise the risk of infection. The boiler house, which is the first building of its kind to be analysed in the JOURNAL, has an unusual roof construction consisting of a 1½-in. concrete shell, erected without shuttering, and approximately following a catenary curve in shape.

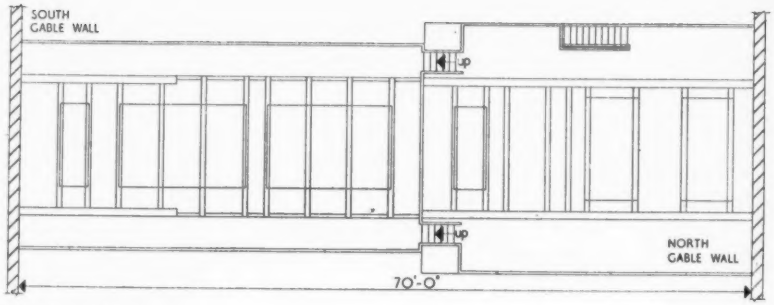
Viewpoint 1, from the north-east.



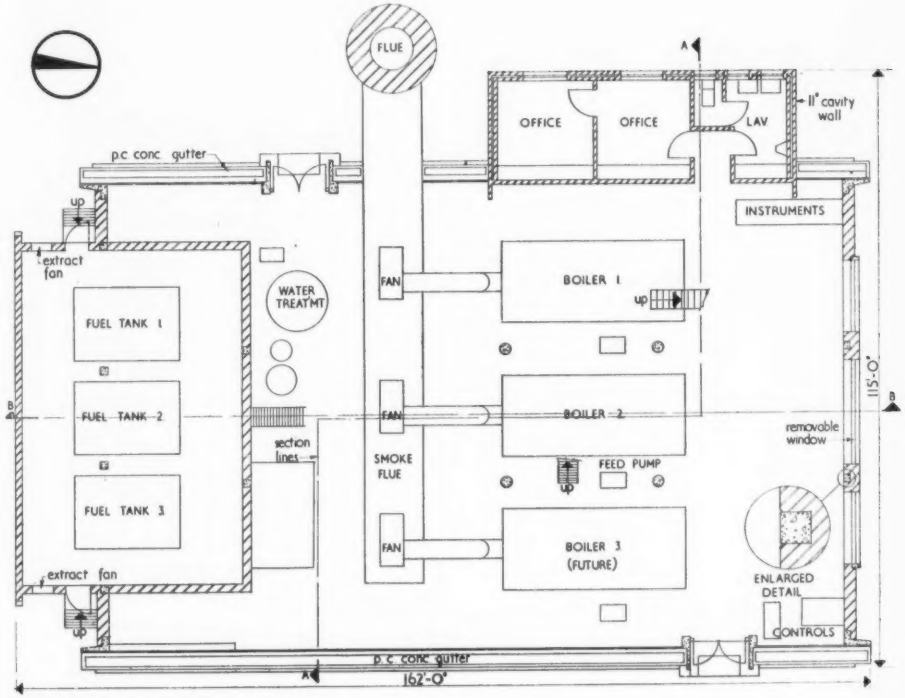
Key plan showing photographic viewpoints



Viewpoint 2, from the main access road running through the site. On the right is the laboratory block, which lies to the north of the boiler house. The site is in an open rural area, suitable to the scattered development, which is necessary to prevent cross-infection between buildings serving different functions. Trees and bushes have been preserved, and a schedule of new planting has been made. The boiler house is part of a long term programme for enlarging the institute.



First floor plan



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

schedule of new planting has been made. The boiler house is part of a long term programme for enlarging the institute.

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

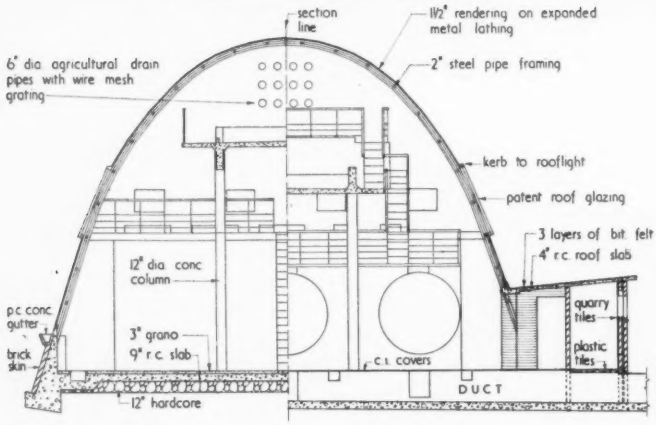
Viewpoint 3, from the south-east. The low-level block in the foreground contains oil fuel storage tanks. Steam was chosen as the means of heat transfer, partly because at the same time it could directly supply certain research equipment such as sterilizers and autoclaves. The mains serving the various buildings are taken by two methods, one running approximately 3 ft. above ground on short concrete supports and the other with mains buried beneath the ground and insulated with cellular concrete. Elaborate design precautions had to be taken at the entry points into the buildings served, to prevent rats or mice entering to become a possible source of cross infection. The boiler house itself was required to house not only the heating plant and fuel store but also calorifiers supplying adjacent buildings, water storage tanks and a water softening plant. The architects decided that what was required to house the equipment was a simple envelope which could be very thin, because thermal insulation was obviously not required. The form chosen by the architects seemed structurally and spatially to fulfil the main requirements in the most economic way. The barrel vault roof has been carried at the sides of the building directly down on to the foundations. The vault is finished externally at the ground with a gutter formed of precast concrete units at about 2 ft. 9 in. above ground line, below which there is a plinth with a 4½-in. skin of facing bricks laid on end. The boiler room is lit by five inset panels of patent aluminium glazing on each side of the roof. There are additional metal windows in the 13½-in. brick end walls, the large central window on the north elevation being demountable, to form a wide enough opening for the removal of the boilers and other large equipment. Natural ventilation is provided at the ridge at each end of the main roof by building in 6-in. agricultural drains, fitted with wire mesh gratings. The fuel oil storage chamber partly projects from the south end of the building, with 9-in. load-bearing walls, reinforced concrete roof and separate external access.

BOILER HOUSE

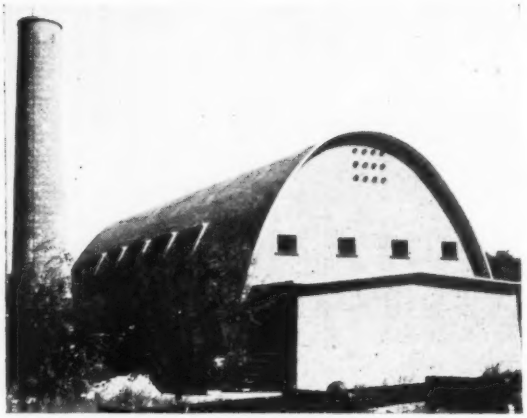
at PIRBRIGHT, SURREY

designed by WESTWOOD, SONS and HARRISON

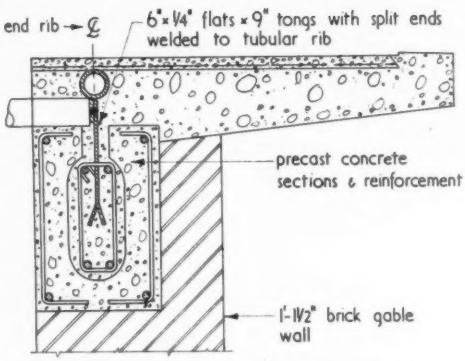
building illustrated



Section A-A [Scale: $\frac{1}{16}$" = 1' 0"]



Viewpoint 4 (above right), from the south-west. The flue gases are carried out horizontally to a free-standing circular brick stack on the west side of the building. To the north of this also projecting from the main structure is a small single-storey block housing an office for the supervising engineer and staff lavatories. The roof has been formed with prefabricated steel tube units welded together to form arches with horizontal ties (see detail below). Tension wires were tied horizontally across these arches, and on them was fixed patent keyed lathing. This was then sprayed both externally and internally with concrete to form a shell approximately 1½ in. thick. By this means the roof was constructed without the need for shuttering, and other building operations including the installation of heavy equipment could proceed without interruption. In addition to the restraint provided by the foundations, the vault is also tied at the ends by arched beams. These are formed of hollow precast concrete units, through which the reinforcement was threaded after positioning and grouted in. The 13½-in. end walls formed permanent centering for this operation. The shape of these arched beams and the vault approximates very closely to a catenary curve, but for simplicity it is formed of two radii and a straight. The roof has been finished with a bituminous waterproof spray on glass fibre. Two self-contained three-pass boilers have been installed, and space has been left for a third, when the research establishment is further enlarged.

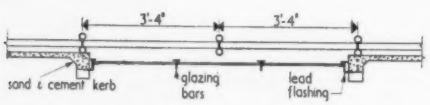


Typical section through end rib [Scale: 1" = 1' 0"]

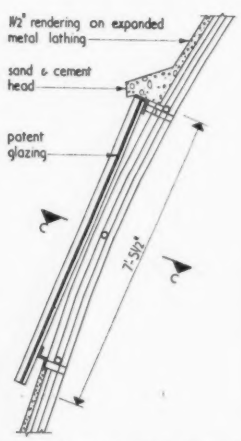
BOILER HOUSE

at PIRBRIGHT, SURREY

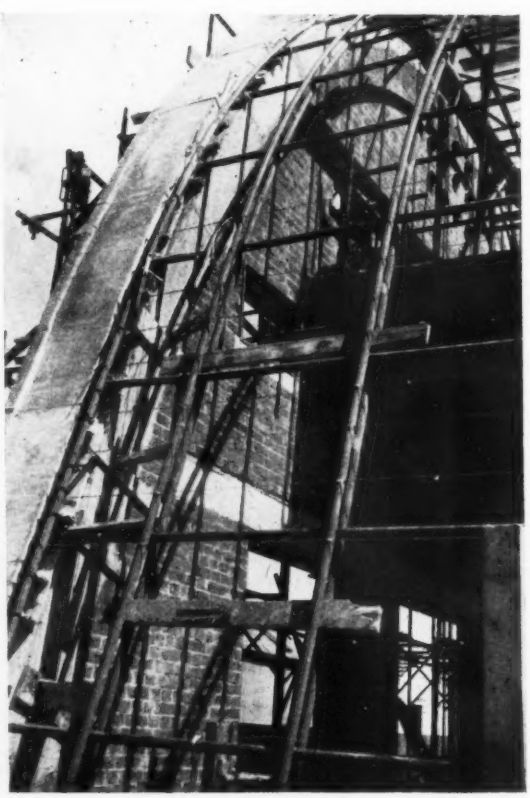
designed by WESTWOOD, SONS and HARRISON



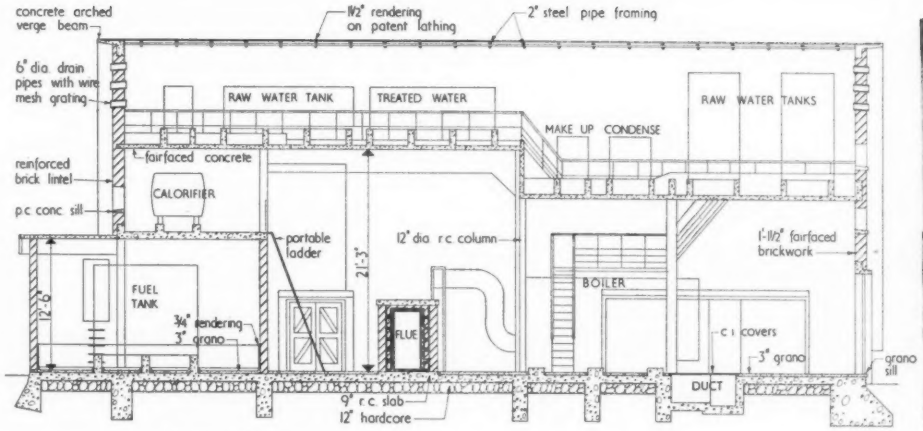
Section C-C [Scale: ¼" = 1' 0"]



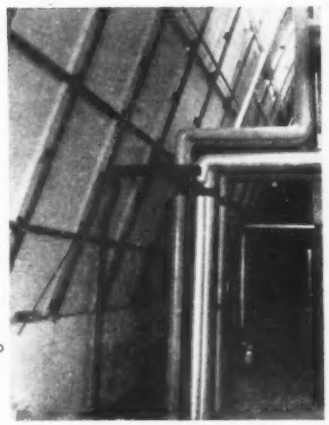
Typical cross-section through rooflight [Scale: ¼" = 1' 0"]



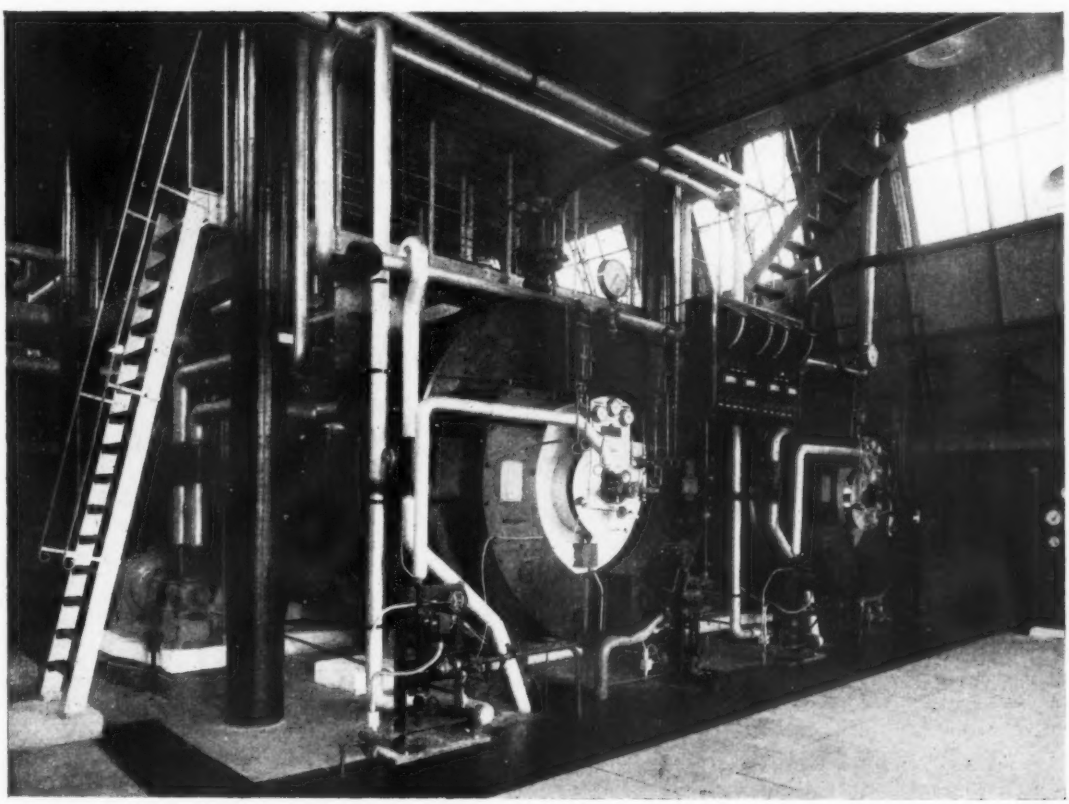
building illustrated



Section B-B [Scale: $\frac{1}{16}$" = 1' 0"]



The boilers have a high efficiency and therefore economizers were not required. They are 14 ft. long over the tube plates, and 17 ft. 6 in. long from front to back. A space of 15 ft. was left in front of each boiler to enable the tubes to be withdrawn for maintenance and cleaning. Each boiler is rated to provide 6000 lb. of steam per hour, and is fitted with medium pressure air-oil firing equipment, with fully automatic modulating flame controls, arranged to burn fuel oil up to a maximum viscosity of 960 seconds. Approximately 9000 gallons of fuel oil is stored in the separate chamber in three 10 ft. by 7 ft. by 7 ft. deep tanks. Induced draught fans, one for each boiler, are situated on the top of a horizontal flue, discharging downwards into it at an angle of 45 deg. Within the main structure, an entirely separate reinforced concrete platform was constructed to carry the water storage tanks, water processing plant and the condense tank. The calorifiers are housed at mezzanine level on a platform formed by the roof of the fuel oil storage chamber. These consist of two heating calorifiers, each having an output of 2,000,000 B.Th.U's per hour, and three 500-gallon calorifiers for hot water supply. The circulation and supply from these is assisted by circulating pumps. The 12-in. asbestos cement pipes which formed permanent shuttering to the columns carrying the reinforced platform have been painted gloss black. The inside of the barrel vault (see detail, above right) has been finished with pale grey emulsion paint. The brick end walls have been left fairface, and the remainder of the structure painted white. Generally the floor has been finished with granolithic, but in front of the boiler normal precast concrete paving slabs have been laid in weak lime mortar, because of the greater risk of cracking or other damage, when they can be easily replaced.



analysis

BOILER HOUSE

at PIRBRIGHT, SURREY

designed by WESTWOOD, SONS and HARRISON

CLIENT'S BRIEF: his stated requirements

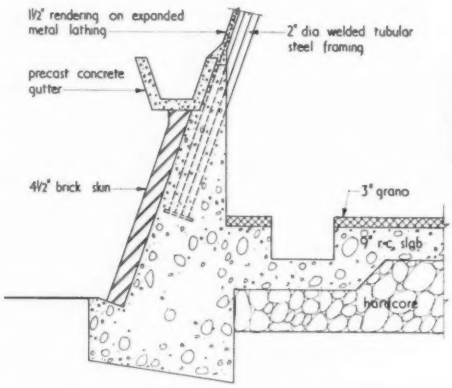
A boiler house to provide space heating and domestic hot water for a number of separate buildings, together with steam for certain research equipment such as autoclaves and sterilizers. Space was also required for calorifiers serving nearby blocks, for a water-softening plant, and for water storage including an adequate reserve for animal feeding in case of interruption of supply. Ancillary accommodation required included an office for the supervising engineer, and lavatories.

SITE: topography, surroundings, access and planting

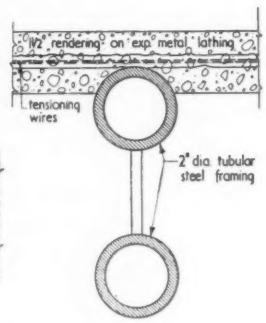
An open and relatively flat rural site has been developed over a number of years for the study of virus diseases in cattle, mainly foot and mouth disease, and for the development and preparation of related vaccines. The buildings have been laid out in an open pattern, wide separation being required to prevent cross-infection. The boiler house has been strategically placed within this layout in a central position adjacent to the main access road running through the site. Existing clumps of trees and bushes have been retained, and in addition there has been extensive planting of young trees, the schedule being based on advice from the Director of Kew Gardens.

PLAN: general appreciation and relation of units

The building has been designed as a simple envelope over the boilers and other equipment. Two boilers have been installed at ground floor level, and space has been left for a third, to increase the supply of steam when the site is further developed. Sufficient space has been left in front of the boilers for their tubes to be withdrawn for maintenance and cleaning. A horizontal flue crosses the block at right angles to the boilers, and carries out to a free standing vertical stack on the west side. Fuel oil is stored in a separate compartment at the south end of the block, projecting partly beyond the main roof structure. Other equipment is housed on a platform at first floor level, including tanks for the storage of both raw and softened water. The calorifiers are housed on a mezzanine between ground and first floor level formed by the roof to the fuel oil store. The office and lavatories project out at ground floor level from the west side of the block.

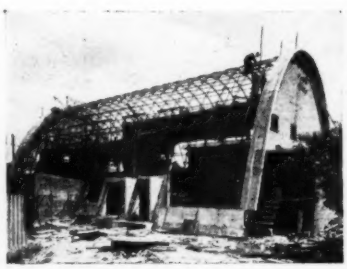


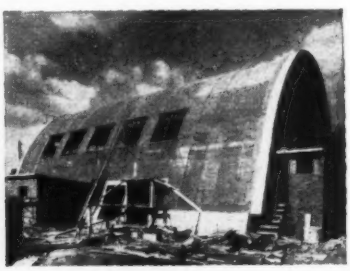
Typical section at foot of roof [Scale: ¼" = 1' 0"]



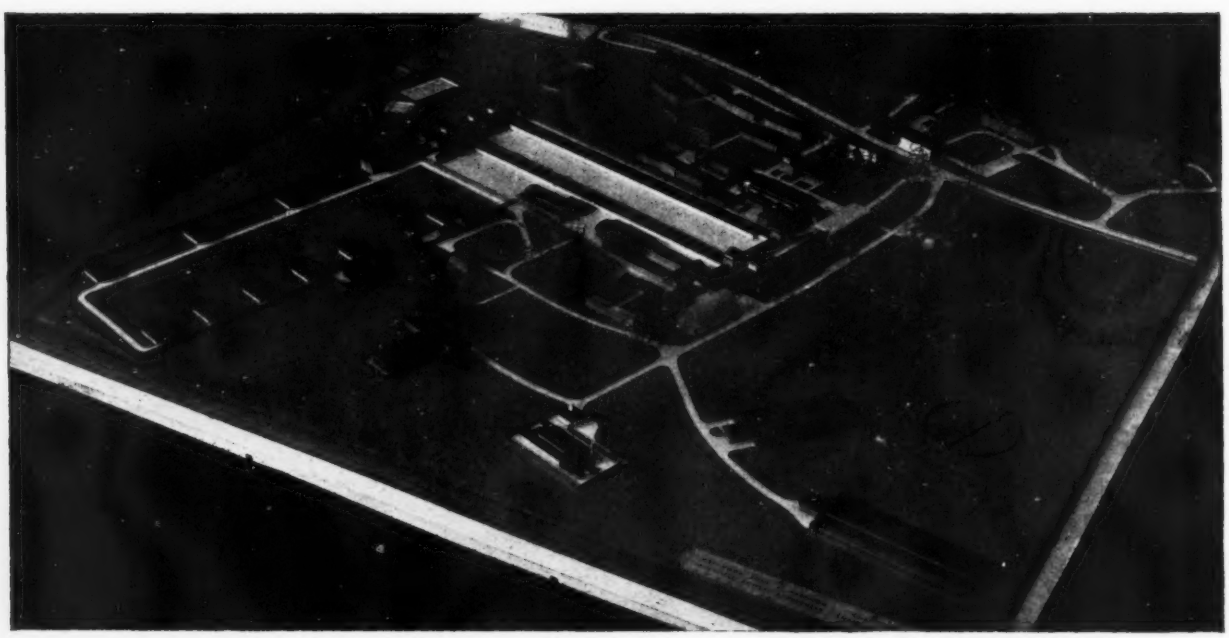
Typical section of rib and roof skin [Scale: 3" = 1' 0"]

Below, left :the tubular steel roof frame in position ready for the expanded metal lathing (below, right) to be fixed.





Model of the Pirbright institute from the south-east. The boiler house is situated at the road-junction near the centre of the layout.



analysis

MAIN CONSTRUCTION:
general appreciation

The main constructional element is the roof, which is a thin concrete barrel vault. This has been formed by building up a light frame from prefabricated tubular steel units, covering these with lathing on tension wires, and then spraying the lathing both internally and externally with a thin layer of concrete. With this method the need for shuttering was avoided. The thin shell barrel vault so formed is laterally restrained by being carried down directly on to concrete foundations. At the ends, reinforced concrete arches have been formed of precast concrete units through which reinforcing rods were threaded and then tensioned before being grouted in. These arches are carried on 13½-in. brick walls which form the enclosing ends to the vault. The platform carrying the water tanks and other equipment is a separate reinforced concrete structure. This breakdown into an enclosing envelope and a supporting frame for equipment as independent elements permitted the installation of boilers, tanks and calorifiers to proceed before the roof was completed. The projecting office and fuel store have reinforced concrete roofs carried on load bearing brickwork walls.

					cost per sq. ft. based on final figures	s	d
					preliminaries and insurances		
					contingencies		

STRUCTURAL ELEMENTS

Work below ground floor level: foundation type	*Location*	*Materials*	*Finish*	*Reasons and comments*			
Mass concrete and concrete strip foundations	Perimeter of building, bases to platform columns, boilers and load-bearing walls, ducting and base of chimney	Reinforced concrete		Cost includes certain making up ground with rammed earth and 12-in. hardcore to the underside of structural floor			
Ground floor structure—continuous structural slab	Throughout	9-in. reinforced concrete		Upstand beams are provided for supports to boilers and fuel oil tanks			
					work below ground floor level	**9**	**9**

External walls and facings	*Location*	*Materials*	*Finish*	*Reasons and comments*			
Load bearing walls	End walls of main structure, external walls to ancillary blocks, and chimney	Rogate hand-made facings		These facings have been used generally on the site			
Plinth to barrel roof	From foundation level up to gutter 2 ft. 6 in. above finished floor level	Rogate hand-made facings in one 4½-in. leaf	Bricks are laid on end				
					external and internal brick walls	**6**	**8½**

Frame or load-bearing element	*Location*	*Materials*	*Finish*	*Reasons and comments*			
Internal platform for equipment	Independent structure enclosed within barrel roof	Reinforced concrete	Spans and column grid vary according to positioning of equipment	12-in. diameter asbestos cement pipes have been used as permanent shuttering for columns			

Upper floor construction	*Location*	*Materials*	*Finish*	*Reasons and comments*			
Platform carrying water tanks and other equipment	Approximately 16 ft. above ground floor level	Reinforced concrete	Brush applied water-proofing	The platform consists of a 6-in. slab with upstand beams which form bearers for the steel water tanks, and leave a smooth soffit			
					concrete boiler and tank plinths, columns, galleries and flat roof slab	**7**	**5**

Staircase, gantries and balustrading	*Location*	*Materials*	*Finish*	*Reasons and comments*			
	Boiler house floor to gantry over boilers and hence to platform. Balustrading to access round tanks	Mild steel	Painted				
					steel gantries, balustrading ladders, scrapers and fireproof doors	**4**	**3**

Roof construction	*Location*	*Materials*	*Finish*	*Reasons and comments*			
Welded steel arches covered with lathing on tension wires and sprayed with concrete	Main roof	2-in. steel tubes built up in prefabricated units, welded together. Patent keyed lathing, sprayed with two coats of cement, ¾-in. thick each side of lathing	Bituminous spray on glass fibre	To minimise bending the section chosen for the roof approximates closely to a catenary curve by the use of two radii only and a straight. The method of construction made shuttering unnecessary, and therefore left the interior free for the installation of equipment to proceed independently. At the same time the form chosen is that which most closely and therefore economically encloses the required space. Restraining arches at each end were formed with precast concrete units through which reinforcement was threaded and grouted in after positioning. The brick end walls formed permanent shuttering to these arches			
					roof construction	**13**	**0**

analysis

					s	d
Roof lights	*Location*	*Materials*	*Finish*	*Reasons and comments*		
Patent glazing	Sloping sides of roof	Aluminium extrusions	Natural	10 No. roof lights of 42 sq. ft. each		
				roof lights		7
Windows	*Location*	*Materials*	*Finish*	*Reasons and comments*		
Fixed and casements	End walls of main structure, office and lavatories	Steel	Painted	The main window at the north end of the building is removable, and is large enough to permit removal of boilers and all other equipment that cannot be demounted		
				windows		4½
External doors	*Location*	*Materials*	*Finish*	*Reasons and comments*		
Side hung, opening out	East and west elevations	Softwood	Painted			
Fireproof	Access to fuel oil store	Steel	Painted			
				external wooden doors		3
Glazing	*Location*	*Materials*	*Finish*	*Reasons and comments*		
	Roof	¼-in. Georgian wired plate				
	Windows	32-oz. and 24-oz. sheet	Clear			
				glazing		1

PARTITIONING

Internal partitions	*Location*	*Materials*	*Finish*	*Reasons and comments*		
	General	4½-in. brickwork	Plastered in office and lavatories, fairface in boiler room			
	Between oil fuel store and boiler room	9-in. brickwork	Fairface	Forms a fire resistant break, and also carries mezzanine platform for calorifiers		
				cost included in external walls and facings		
Internal doors	*Location*	*Materials*	*Finish*	*Reasons and comments*		
Side hung	Office and lavatories	Ply faced hollow core	Painted			
				internal doors		1½
Ironmongery to internal doors	*Location*	*Materials*	*Finish*	*Reasons and comments*		
Door handles	Generally	Plastic	White			
				ironmongery to internal doors		1

FINISHINGS

Floor finishes	*Location*	*Materials*	*Finish*	*Reasons and comments*		
	Office	Wood block	Wax polished	Cost divided between granolithic, 1s. 1½d. and wood block 2d. per sq. ft.		
	In front of boilers	3-ft. by 2-ft. precast paving slabs laid in weak lime mortar		Not liable to cracking, and easily replaced in case of damage		
	Remainder of ground floor	¾-in. granolithic				
				floor finishes	1	3½
Wall finishes	*Location*	*Materials*	*Finish*	*Reasons and comments*		
	Office and lavatories	Rendering	Distemper			
	Boiler room and fuel stores	Fairface brickwork	Left unpainted			
				wall finishes		3½
Ceiling finishes	*Location*	*Materials*	*Finish*	*Reasons and comments*		
	Office and lavatories	⅛-in. plaster	Steel float, painted			
	Boiler room	Cement spray	Painted			
				ceiling finishes		0½

analysis

					s	d
Decorations	*Location*	*Paint types*	*Munsell or other ref.*	*Colour scheme and comments*		
	Office and lavatories	Distemper	White			
	Undersides of boiler house roof and platform	Emulsion	White on underside of platform, pale grey on roof			
	Reinforced concrete columns	Gloss oil paint	Black			
				decorations	1	11

FITTINGS

	Location	*Materials*	*Finish*	*Reasons and comments*		
Seats and cupboards	Office	Softwood	Painted			
				fittings		1

SERVICES

External plumbing	*Location*	*Materials*	*Finish*	*Reasons and comments*		
Gutter	At top of plinth to barrel vault roof	Precast concrete units				
				cost included in sanitary fittings		
Rainwater disposal	*Location*	*Materials*	*Finish*	*Reasons and comments*		
	From gutter to soakaways	Cast-iron pipes loading to salt glazed ware pipes		This method of dispersal permitted by the open layout		
				precast concrete gutters, lintels and steps		9
				rwp's and flashings		3½
Plumbing internal	*Location*	*Materials*	*Finish*	*Reasons and comments*		
Waste disposal	Lavatories	Cast-iron pipes	Painted			
				cost included in sanitary fittings		
Hot water storage	*Location*	*Materials*	*Capacity*	*Reasons and comments*		
Calorifiers fed from steam mains	Mezzanine level	Mild steel	3500 gallons	Steam mains are in operation throughout the year for research equipment, including sterilizers and autoclaves		
Cold water storage	*Location*	*Materials*	*Capacity*	*Reasons and comments*		
Main tank	First floor platform	Cast-iron sectional	8000 gallons			
Soft water tank	First floor platform	Cast-iron sectional	2000 gallons			
Condense tank	First floor platform	Cast-iron sectional	1000 gallons			
Plumbing: sanitary fittings	*Location*	*Materials*	*Finish*	*Reasons and comments*		
W.c. suite, basins and urinals	Lavatories	Stoneware	Glazed			
				plumbing and sanitary fittings		6
Heating installation: heat exchanger type	*Location*	*Criteria temperature*	*Air change rate*	*Reasons and comments*		
Calorifiers	Mezzanine					
Boiler type and capacity	*Location*	*Fuel type*	*Stoking method*	*Reasons and comments*		
Two steam boilers rated at 6000 lb. per hour each	Ground floor level	960 seconds viscosity	Automatic	Considerable saving in weight and space. High efficiency without economisers		
				chimney stack and flue	9	5
Drainage: type of system	*Location*	*Materials*	*Finish*	*Reasons and comments*		
Separate		Soft glazed ware				
				drainage and sump	3	0
Electrical installation: source and fitting type	*Location*	*Illumination level*	*Quality*	*Reasons and comments*		
Tungsten industrial	Ceiling	7 lumens per sq. ft.				
				electric lighting and fittings	1	4
Wiring and switching types	*Location*	*Materials*		*Reasons and comments*		
5 and 15 amp. iron clad	Throughout	VIR and conduit				
				builder's work in connection with engineering services	1	6
				total net cost per sq. ft.	63	0½

analysis

Power supply type	*Location*	*How distributed*	*Reasons and comments*
200 volts, 50 cycle, single-phase 4c	Cubic type switchboard in boiler house	VIR sub-main cables	Provision has been made for later conversion to a 3-phase supply

FIRE

Structural precautions	*Grade of protection apparatus*	*Sprinklers*	*Reasons and comments*
9-in. wall to oil fuel compartments	Grade 1 foam extinguishers		

TIME SCHEDULE

Drawings	*Tender date*	*Contract signed*	*Work commenced*	*Work completed*	*Type of contract*
February, 1953	March, 1953	May, 1953	April, 1953	1954	RIBA with quantities

COSTS SUMMARY

Floor area	*Tender date*	*Cost of superstructure*	*Cost of foundations*	*Boilers plant and equipment including associated electrical work*	*Gross total cost*	*Nett cost per sq. ft.*
5,430 sq. ft.	March, 1953	£14,465	£2,648	£36,793	£53,906	£3 3s. 0½d.

COST COMMENTS

The cost of this rather unusual specialised building has been shown broken down into the normal element headings to give a cost per foot super of overall floor area. This cost should only be considered of academic interest as the scheme is really in three distinct sections which although inter-related are not suitable for this type of analysis when treated as a whole. The sections are *a*, external carcase, *b*, special construction for boiler and ancillary equipment and *c*, office accommodation. Any similar computation of cost upon schemes of this type should therefore be based upon actual quantities of individual forms of construction rather than derived from all-embracing floor area costs. For example, the structural frame element refers only to the concrete columns and platforms for equipment and is quite independent of the main carcase and so the cost per foot super price as shown is quite irrelevant as far as the main structure is concerned.

The main point of interest lies in the catenary curved concrete envelope serving dual function of wall and roof. Normal wall to floor ratios are obviously not practical in this instance and the cost information obtainable for future reference in this type of construction is shown thus: the floor area ratio of 13s. 0d. × 5430 (floor area) divided by 5956 (roof area) produces 11s. 11d. actual cost per foot super of construction. Note, however, the lack of insulation provided which should be included in cost calculations if any other scheme is envisaged apart from a boiler house.

SITE ORGANIZATION

Site labour and equipment: the construction was generally supervised by an agent with a general foreman engaged with 90% of his time during the main stages; after completion of the shell the percentage of his time was able to drop considerably. The heating engineer's foreman was in constant attendance during the installation of boilers and other equipment. Mechanical plant included a 10RB for excavation, a mechanical hoist and a concrete mixer. *Sub-letting:* glazing, painting, plumbing, plastering and granolithic paving were sub-let because of unavailability of labour. All other trades were directly employed on an hourly basis with a bonus scheme in operation. *Job management:* progress charts were prepared by the contractor and approved by the architect. A site agent was permanently resident, and the contracts manager visited the site about twice weekly, and at the same time acted as the liaison with head office. Monthly site meetings, presided over by the architect, were attended by clients' representative, clerk of works, and representatives of sub-contractors. When necessary the contractors' managing director would also attend such meetings.

CONTRACTORS

General Contractors: Sir Lindsay Parkinson & Co. Ltd. *Sub-contractors—Mechanical and engineering services:* Z. D. Berry & Sons Ltd. *Electrical services:* Rashleigh Phipps Ltd. *Flue stack:* Associated Chimney Settings Ltd. *Tubular barrel roof:* Overstructures Ltd. *Lath and rendered roofing:* Aerocem Ltd. *Roof surfacing:* Road & Roof Surfacing Ltd. *Bituminous felt roofing:* William Briggs & Sons Ltd. *Patent glazing:* Hayward Ltd. *Precast gutters:* Girlings Ferro Concrete Co. Ltd. *Metal windows:* Ideal Casements (Reading) Ltd. *Guard rails, chequer plating, fireproof doors and ladder:* S. W. Farmer & Son Ltd. *Wood block flooring:* Hollis Bros. Ltd. *Sanitary fittings:* John Bolding & Sons. *Towel rollers:* Crowden & Keeves Ltd. *Ironmongery:* Stedall & Co. Ltd. *Boot scrapers:* William Smith Ltd.

working detail

OBSERVATION WINDOW: HOSPITAL IN EDINBURGH

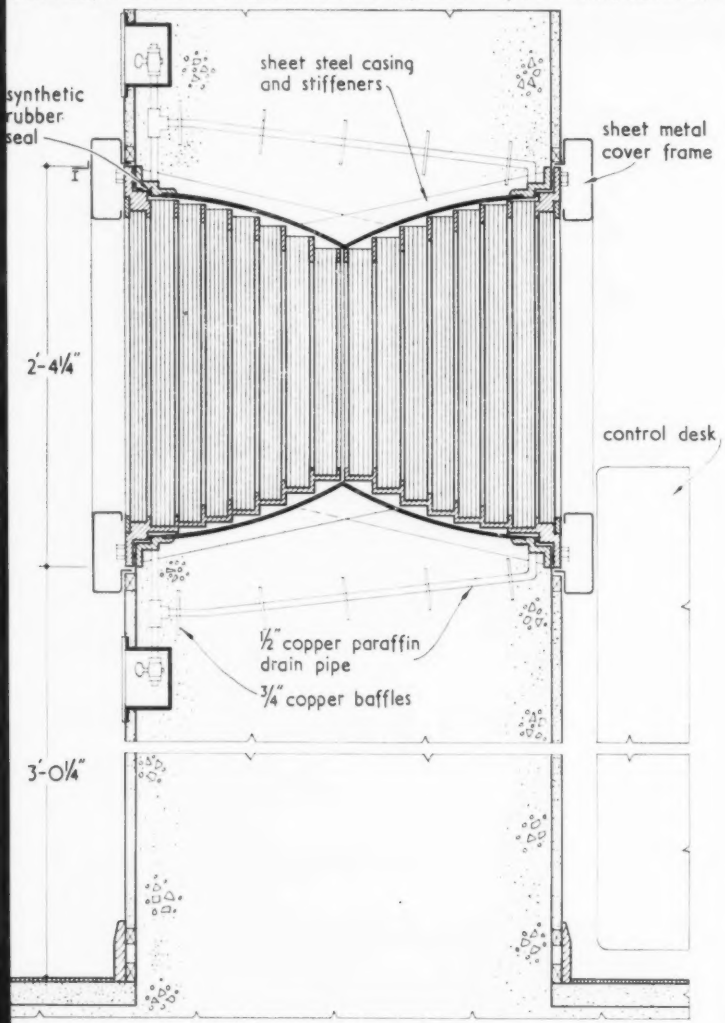
John Holt, Architect to the South-Eastern Regional Hospital Board, Scotland; William Wellwood, architect-in-charge

The sixteen sheets of glass which are required to form a shield against the penetration of X-rays are held in two hinged multiple frames. The eight sheets on the X-ray room side are of a special white stabilised glass to ensure that the X-rays will not cause a change in colour over a period of years. The edges of all sheets are staggered to avoid giving a direct through passage to X-rays, and the space occupied by the frames is sealed off both from the surrounding structure and from the rooms on either side and filled with medium-pure paraffin. This liquid, which is unaffected by X-rays, has the same coefficient of refraction as glass and its object is to eliminate the distortion which would otherwise occur if dry glass were packed solidly. This window is considered a great improvement on the more usual version, which involves the use of a periscope and causes a great strain on the operator.

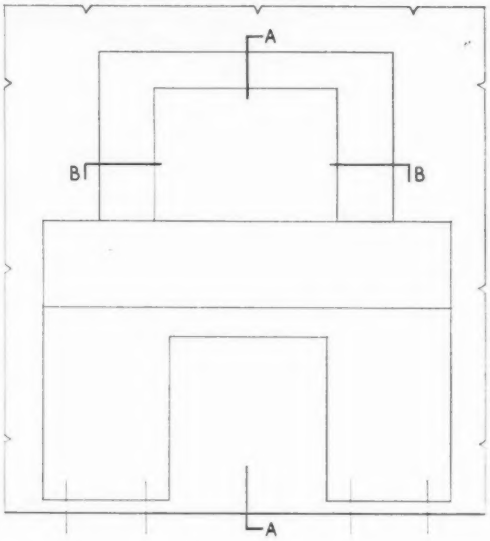
working detail

OBSERVATION WINDOW: HOSPITAL IN EDINBURGH

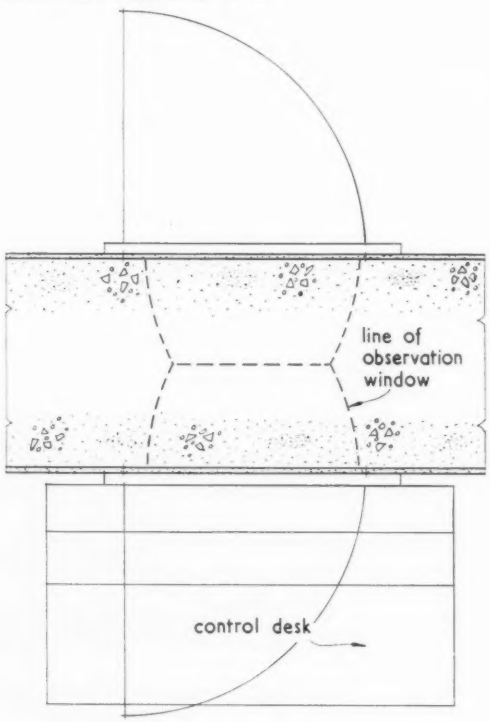
John Holt, Architect to the South-Eastern Regional Hospital Board, Scotland; William Wellwood, architect-in-charge



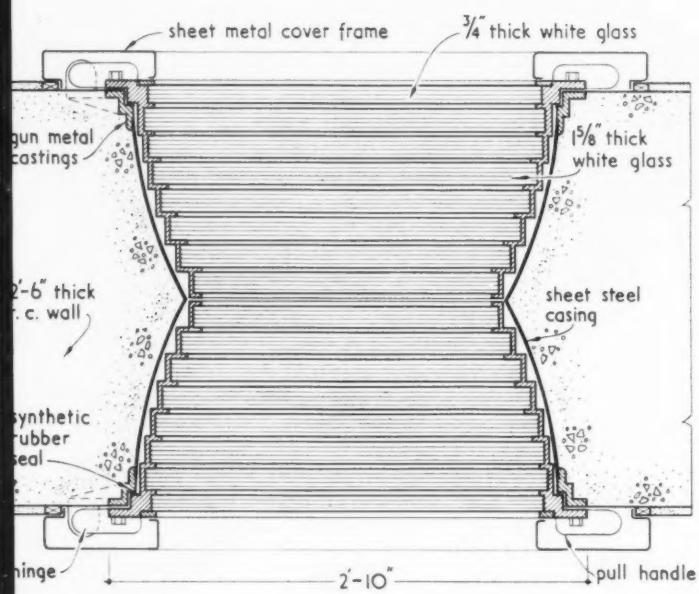
SECTION A–A scale 1"= 1'–0"



ELEVATION. scale ½"= 1'–0"



PLAN. scale ½"= 1'–0"

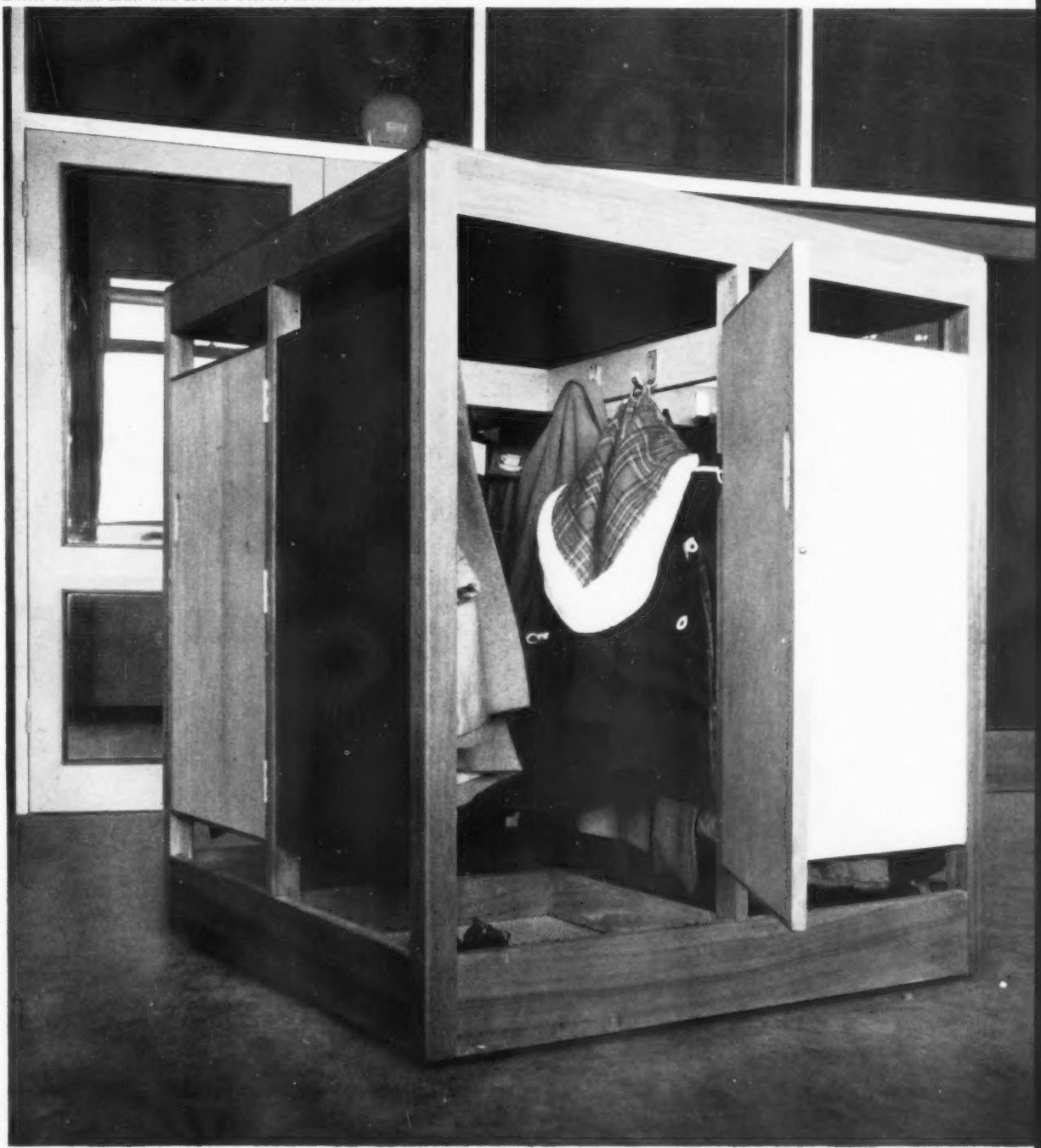


SECTION B–B. scale 1"= 1'–0"

working detail

MOVABLE CLOAKROOM CABINET: SCHOOL AT SCUNTHORPE, LINCOLNSHIRE

Denis Clarke Hall and H. S. Scorer, architects

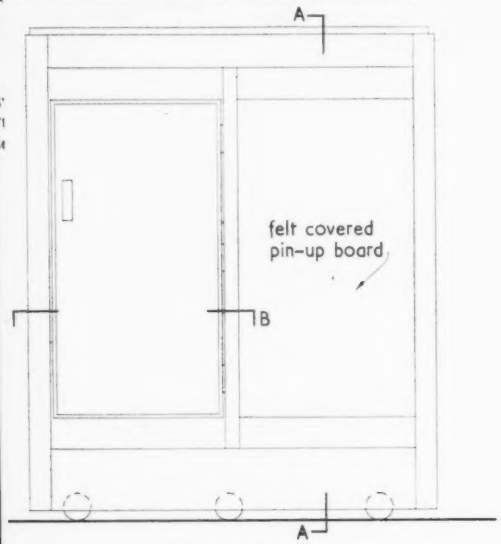


This cabinet has been designed to enable the teacher to keep an eye on children who are putting on their coats while the remainder are still "in class." The enclosing panels are used to provide additional chalkboard and pin-up space, of which there is seldom enough in infants' schools. It is to be noticed that the cabinet is very much smaller than it appears, the total height being only 3 ft. 9 in.; it is therefore possible for children to hang up their coats on the pegs without stepping inside. The plywood doors are mahogany-veneered, polished natural colour. The hardwood is beech, finished natural colour and wax-polished.

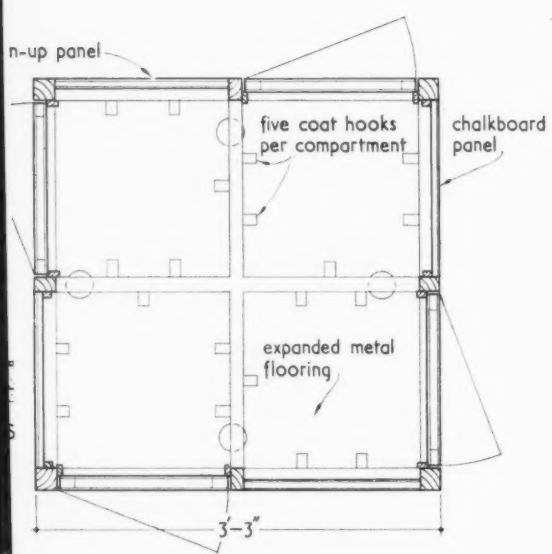
working detail

OVABLE CLOAKROOM CABINET: SCHOOL AT SCUNTHORPE, LINCOLNSHIRE

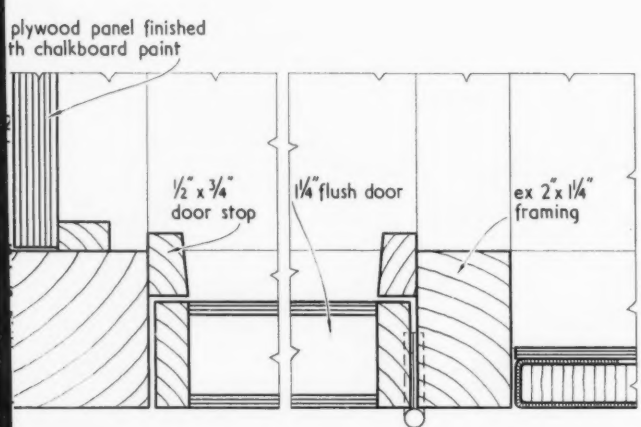
lenis Clarke Hall and H. S. Scorer, architects



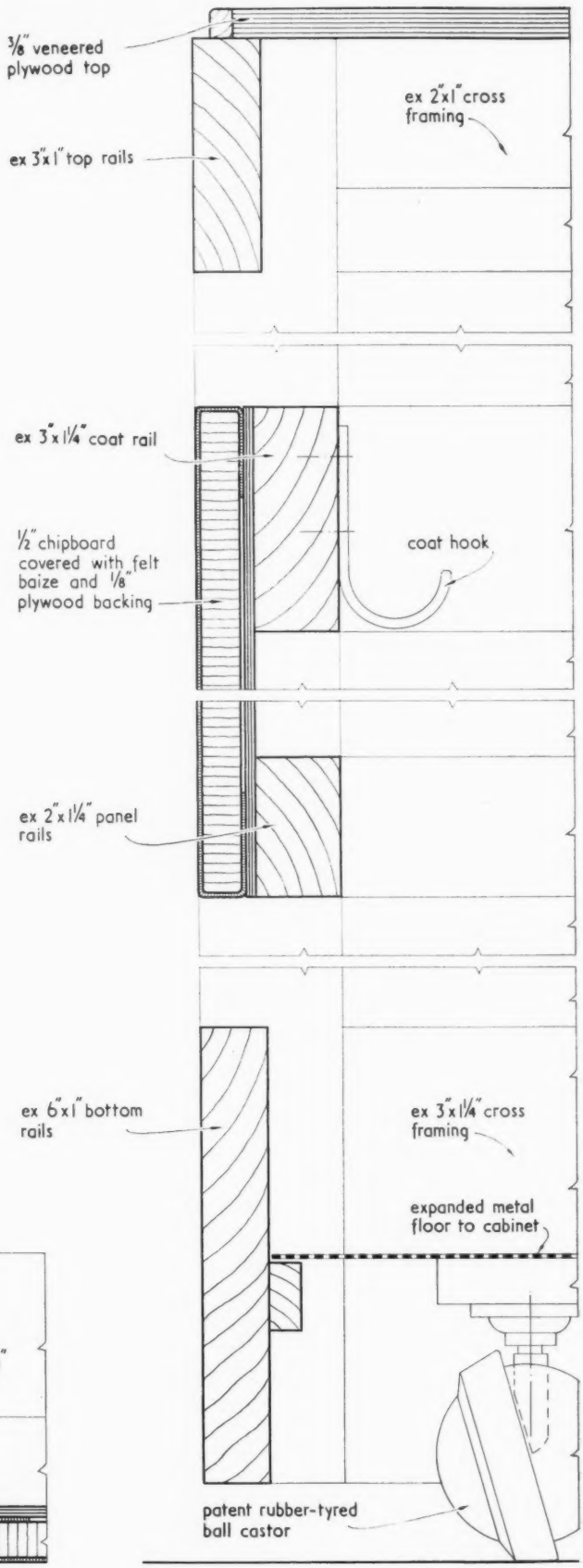
.EVATION. scale 3/4" = 1'-0"



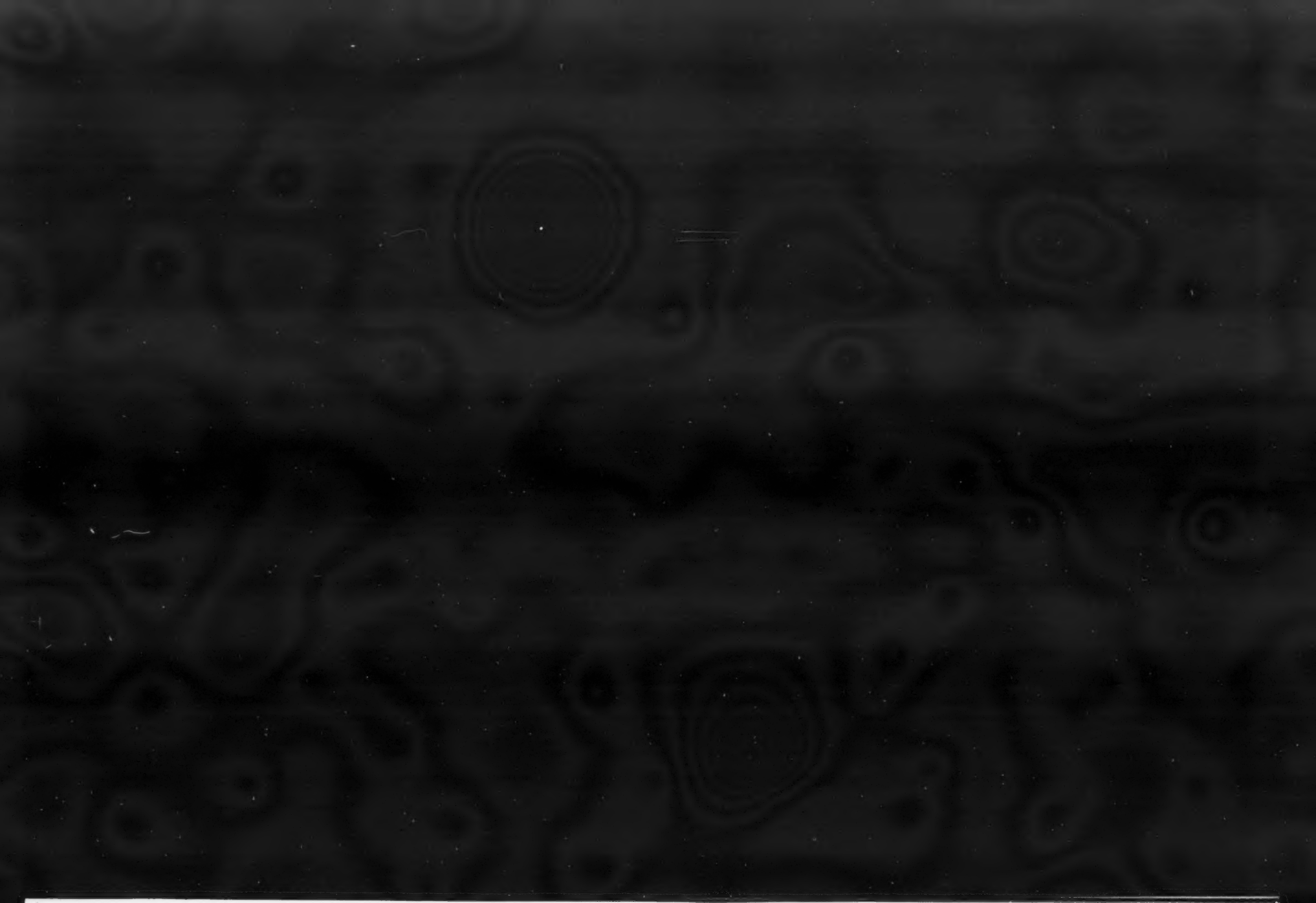
.AN. scale 3/4" = 1'-0"



AN AT B-B. scale 1/2 full size



SECTION A-A. scale 1/2 full size

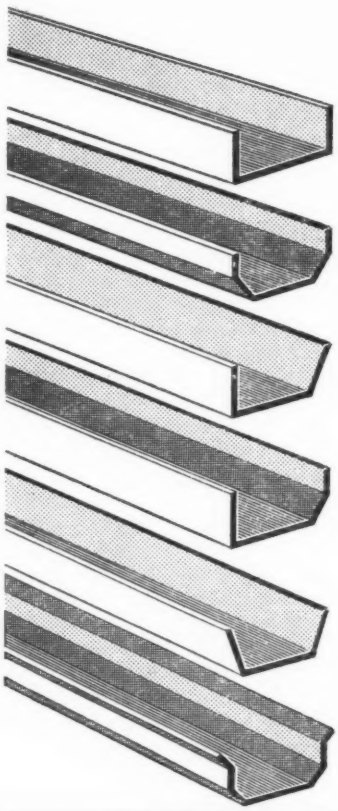


ILLUMINATED SIGN COMPETITION: WINNING DESIGNS

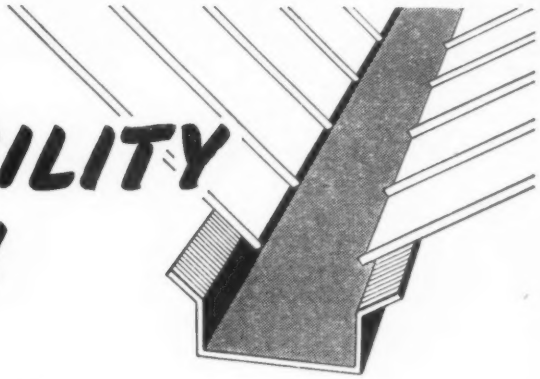
Here and overleaf are winning designs in the illuminated sign design competition sponsored by the Electrical Sign Manufacturers Association. The competition was in two sections: one (illustrated on this page) for garage signs and the other (overleaf) for signs for a music store. Above left: first prize-winning design (£100) by A. W. Windsor, of London. Left: second prize-winning design (£50) by J. K. Hopgood, of Bromley, Kent. Above: the third prize-winning design (£25) by R. W. Pepper, of Kent.

ILLUMINATED SIGN COMPETITION: WINNING DESIGNS continued

Above left: the winning design (£100) in the shop sign competition, by L. R. Lewis, of London. Above right : the second prize-winning design (£50) by R. L. Harding, of London. Left: the third prize-winning design (£25) by R. W. Pepper, of Kent. The assessors were Lord Luke, president of the Advertising Association; Professor Sir Patrick Abercrombie; Sir George Pepler; F. C. Woodward, president of the Radio and Television Retailers Association (music store only), and F. F. Newlands and K. J. Oldham, chairman and vice-chairman respectively of the Electrical Sign Manufacturers Association. The buildings were drawn by R. E. Summer, A.R.I.B.A.



Where DURABILITY is Vital



Out of sight, yet playing an important part in the protection of a building and its contents, roof gutters must be robust and dependable. Produced by specialists in the fabrication of steel, 'Harco' Pressed Steel Gutters conform to B.S. 1091/1946. They are made in standard sizes or to special girths and lengths to meet specific requirements, with pressed socketed joints or butt straps. Supplied self-colour, in painted finish or hot dip galvanized after manufacture by the 'Harco' process.

Send for List No. AJ 793

'HARCO'

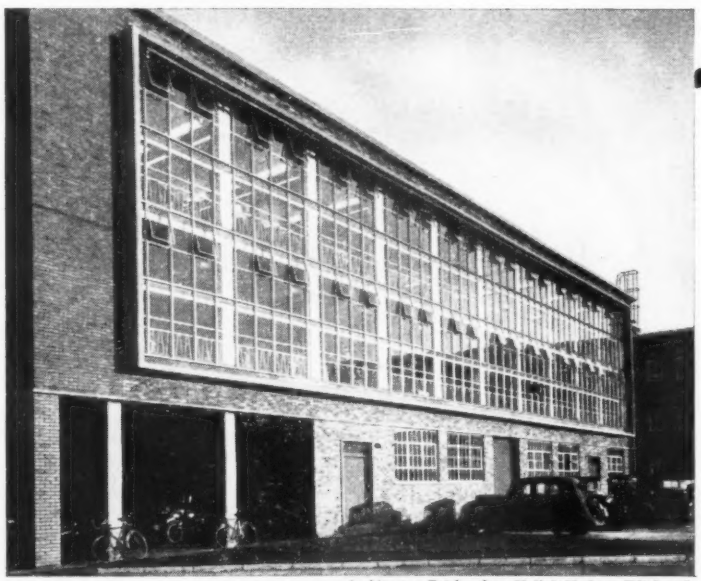
HEAVY GAUGE PRESSED STEEL

GUTTERS

Harvey

G. A. HARVEY & CO. (LONDON) LTD.

Woolwich Road, London, S.E.7 GREenwich 3232 (22 lines)



Architects: Fairbrother, Hall & Hedges, Edinburgh
General Contractors: Wm. Arnott McLeod & Co. Ltd.

FOR THE 'HIGHER REACHES' OF WINDOW CONTROL

Instant accessibility to "out-of-reach" windows is ensured by the positive push-pull action of Teleflex cable. Housed within a neat rigid conduit, it operates accurately and without distortion throughout all directional changes. The flexibility of the Teleflex system also allows simultaneous multi-point operation from a single line transmission.

Please write for illustrated Catalogue.

Pictured above is the Drawing Office Window of the new Ferranti Research Laboratory at Edinburgh, where Teleflex Remote Controls are used throughout.

TELEFLEX

TELEPHONE: BASILDON 22861 TELEGRAMS: TELEFLEX PHONE BASILDON

TELEFLEX PRODUCTS LIMITED : BASILDON : ESSEX

ALSO MANUFACTURERS OF THE WORLD RENOWNED TELEFLEX CONVEYORS

ELLARD

SLIDING DOOR GEAR

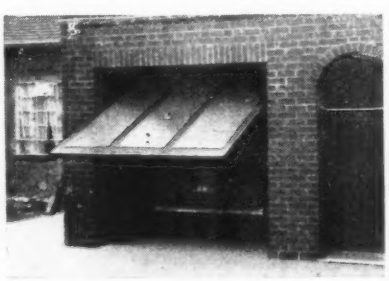
ESTATE FOR THE HOUSE

The illustration on left shows yet another example of ELLARD "Estate" Sliding Door Gear in the modern dwelling-house. See how simple it is to convert a spacious room to one of cosy and intimate atmosphere. Elegant appearance, ease of operation and long service are the main selling features of this attractive ELLARD Door Gear. The obvious choice for both council estates and private houses is ELLARD Door Gear.

FOR THE GARAGE RADIAL

The illustration on right shows ELLARD "Radial" Sliding Door fitted to a private garage. Valuable working space is offered at the entrance to the garage. ELLARD Door Gear provides easy access to and from the garage by a personal entry door. ELLARD "Radial" Sliding Door is low in price and gives long service without maintenance. This gear is also suitable for the larger openings of commercial and industrial garages.

OVERDOR FOR THE GARAGE



ELLARD "Overdor" Gear, illustrated on left, represents the best method of operating an overhead-type door, and it requires the minimum space, fixing time and maintenance. An entirely clear threshold is achieved, and both side walls are available for windows and shelves. ELLARD "Overdor" Gear is designed for doors from 6ft. to 7ft. 3in. high and up to 200 lbs. in weight. The door is safely balanced and can be opened and closed with ease.

ELLARD Sliding Door Gear is readily obtainable from your nearest ironmonger or merchant.

ELLARD SLIDING DOOR GEARS LTD.

(DESK 6) WORKS ROAD, LETCHWORTH, HERTS. Tel. 613/45

BMJ

1 T.V. AERIAL for 100 Receivers or more!

No need to worry about the provision of adequate television services to blocks of flats, hotels, schools, housing estates, etc.

The Antiference system of centralised T.V. reception does away with those ugly arrays of roof-top aerials—one aerial provides perfect reception

Hundreds of such installations throughout the country have been carried out by our engineers and we would be pleased to advise and assist on your particular project.

ANTIFERENCE INSTALLATIONS LTD.

19 DUNRAVEN STREET, PARK LANE, LONDON, W.1

Telephone : GROsvenor 1061/2

DHB/2979

Down with jointing costs!

these 3 FT. PIPES

made by Doulton, cut your jointing costs on 4" and 6" diameter pipes by one-third and do the job quicker into the bargain.

In a mile run I can save 880 joints — see what I mean?

Yes, it's Doulton for me — every time.

For Underground Resistance put down DOULTON Salt-glazed Pipes. There is security in Doulton Drainage Materials—they have proved their corrosion and abrasion resisting properties for over a century.

Comprehensive range of bends, junctions, gulleys, etc., always available; also pipes in 2' 0" and shorter lengths if required.

DOULTON VITRIFIED PIPES LIMITED
Dept. BEP, Doulton House, Albert Embankment, London, S.E.1

Royal
DOULTON
SALT-GLAZED DRAINAGE MATERIALS

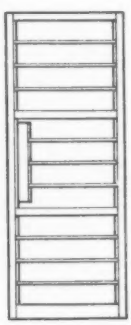
C B5127

ONE OF BRITAIN'S FINEST FLUSH DOORS

THE 'Sherwood'

FOR SCHOOLS
PUBLIC BUILDINGS
AND HOUSING

The construction prevents bowing and twisting, eliminates maintenance costs.



A skeleton-framed, beech plywood faced door with a fine smooth surface ideal for paint, varnish or polish. An inexpensive high quality flush door for internal use in better class housing, offices and schools. The external grade is fully weatherproofed for exterior use in general housing schemes. **A VERY FINE DOOR AT A VERY MODERATE PRICE.**

Other famous Leaderflush Doors are The 'TRENT' half-solid door and The TYPE 'B' fully solid core door.

Leaderflush

LEADERFLUSH LIMITED
TROWELL · NOTTINGHAM

Telephone: **ILKESTON 623 (4 lines)**
Telegrams: **LEADAFLUSH, ILKESTON, NOTTINGHAM**

Cogent

CLASSIFIED ADVERTISEMENTS

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

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

Public and Official Announcements

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

BOROUGH OF BLYTH
BOROUGH ENGINEER'S DEPARTMENT

Applications are invited for the appointment of a JUNIOR ARCHITECTURAL ASSISTANT. The salary for the appointment will be Grade II of the A.P.T. Division £609 17s. 6d. per annum rising to £691 17s. 6d. per annum by annual increments of £20 10s.

Candidates should hold the Intermediate Examination of the R.I.B.A.

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

Applications endorsed "Junior Architectural Assistant" stating age, qualifications, training and experience, must be delivered to the undersigned, with names of two referees not later than 21st March, 1957.

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

The tenancy of a house will be offered to the successful candidate if desired.

EDWIN W. CARTER,
Town Clerk.

"Dinsdale,"
Marine Terrace,
Blyth,
Northumberland. 5509

COUNTY COUNCIL OF ESSEX
COUNTY PLANNING DEPARTMENT

Applications invited for following posts:—

1. PLANNING ASSISTANT A.P.T. Grade I (£543.5.0d.—£625.5.0d.) in Survey and Development Plan section at Romford. Applicants must be experienced draughtsmen.
2. PLANNING ASSISTANT A.P.T. Grade I (£543.5.0d.—£625.5.0d.) at Braintree. Applicants should have had architectural drawing experience and possess some knowledge of housing layouts and design.

Appointments subject to Superannuation.

Applications in own handwriting to County Planning Adviser, Broomfield Place, Broomfield, Chelmsford, by 18th March, 1957. 5515

LONDON COUNTY COUNCIL
ARCHITECT'S DEPARTMENT

Vacancies exist for ARCHITECT/PLANNERS (salaries up to £817). Tasks include 3-dimensional planning within London's eight major Comprehensive Development Areas (including Stepney/Poplar, the South Bank, and Elephant and Castle) and other Redevelopment Areas.

The work includes the preparation of comprehensive layouts covering all the important areas of new public and private development throughout the County, and covers the whole field of planning technique.

Particulars and application form from Architect (AR/EK/ATP/1), County Hall, S.E.1. (907) 4543

UGANDA ELECTRICITY BOARD

Applications are invited for the following appointments on the Board's permanent staff in Uganda:

1. CIVIL ENGINEERING ASSISTANT.

Applicants should preferably have completed their professional institution examinations or be otherwise well advanced towards membership. Practical experience in the design of simple steelwork and reinforced concrete is required.

The salary scale applicable is £1,045 × £30—£1,315 per annum, but persons who have obtained a full qualification will be eligible to rise to a maximum of £1,440.

2. ARCHITECTURAL AND BUILDING DRAUGHTSMAN.

Applicants should be able to prepare sketch plans, finished drawings and details for housing, small offices, sub-station buildings, stores, workshops, etc. and have experience in site surveying, use of level, setting out works and site supervision.

The salary scale applicable is £1,045 × £30—£1,315 per annum.

Commencing salary for both appointments according to age, qualifications and experience.

Uganda has a pleasant climate and income tax is moderate. Free passages, partly furnished accommodation, medical and dental treatment. Six months' vacation leave on full pay after three years' service.

Requests for further information and application forms should be made by postcard to the London Representative, Uganda Electricity Board, 27, Regent Street, London, S.W.1, to whom completed forms should be returned not later than April 15th.

E. H. WILSON,
Secretary.

Head Office,
P.O. Box 559
Kampala, Uganda 5575

CITY OF BIRMINGHAM PUBLIC WORKS DEPARTMENT

Applications are invited for the following posts in the Town Planning Section:—

(*a*) PLANNING ASSISTANTS, Salary Grade A.P.T. IV (£727 15s.—£907 2s. 6d. per annum).
(*b*) PLANNING ASSISTANTS, Salary Grade A.P.T. III (£656—£784 2s. 6d. per annum).
(*c*) PLANNING ASSISTANTS, Salary Grade A.P.T. II (£629 17s. 6d.—£711 17s. 6d. per annum).
(*d*) PLANNING ASSISTANTS, Salary Grade A.P.T. I (£563 5s.—£645 5s. per annum).

Commencing salaries in accordance with qualifications and experience.

Candidates for post (*a*) should have passed the Final Examination of the Town Planning Institute or hold equivalent qualifications. For posts (*b*), (*c*) and (*d*), applicants should have passed the Intermediate Examination or hold equivalent qualifications.

The duties of the successful candidates will include:—Posts (*a*) and (*b*): Surveys and analyses arising from the submitted Development Plan. Posts (*c*) and (*d*) Planning matters in connection with the Development Plan.

The appointments are permanent, superannuable, subject to a medical examination and terminable by one month's notice on either side.

Applications endorsed with the heading of the post applied for stating qualifications, age and experience, together with the names of two persons to whom reference may be made should reach the undersigned not later than 13th April, 1957.

Canvassing disqualifies.

HERBERT J. MANZONI.
City Engineer and Surveyor.

Civic Centre,
Birmingham, 1. 5582

NEWCASTLE REGIONAL HOSPITAL BOARD
ASSISTANT ARCHITECT—Grade £680—£985
(P. H. Knighton, M.B.E., A.R.I.B.A., Regional Architect)

In connection with a large new hospital project, the Board invites applications for the above permanent (superannuable) appointment on the Headquarters' Staff of the Regional Architect in Newcastle.

Applicants must be Registered Architects. The commencing salary within the Grade £680 × £25 (3) × £30 (2) × £35 (1) × £30 (1) × £35 (3)—£985 will be fixed by reference to relevant experience and to age.

The post offers opportunity for gaining all-round general, as well as hospital, experience and for doing good-class work in an expanding department.

Applications stating age, qualifications, past and present appointments, present salary and details of experience and training, together with the names of three referees (of which at least two should be architects) should be forwarded to the Secretary, Newcastle Regional Hospital Board, Benfield Road, Newcastle upon Tyne 6, not later than 28th March, 1957. 5584

NATIONAL COAL BOARD
WEST MIDLANDS DIVISION

Applications are invited for the following posts in the Divisional Architect's Department at Himley Hall, Dudley, Worcs.

ARCHITECTS GRADE II (Salary scale £700 × £30—£1,000).

Applicants must be Associate Members of the Royal Institute of British Architects, and have experience in design, preparation of sketch plans, working drawings, specifications and limited supervision of work in progress.

ARCHITECTURAL ASSISTANTS GRADE I (Salary scale £625 × £25—£750).

Applicants must have passed Intermediate R.I.B.A.

Office is engaged on a large programme of varied and interesting work of industrial and welfare nature, and offers scope for applicants with a professional outlook. Superannuation rights with Local Authority and certain other schemes are transferable.

Applications to Divisional Chief Staff Officer, Himley Hall, Dudley, Worcs., within 14 days of this date. 5580

CLERK OF WORKS required by National Coal Board, No. 1 Area, Newcastle upon Tyne, 1.

The successful candidate will be required to supervise repair work, to prepare schedules of conditions of properties, specifications covering repairs, alterations and improvement to dwelling houses and farm property. Knowledge of estimating will be an advantage also preparation of and working to plan. A thorough knowledge of all branches of the building trade is essential. Salary within scale £690 × £25—£840.

Applications giving date of birth and full details of education, qualifications and experience to Area Staff Manager, National Coal Board, Northern (N. & C.) Division, No. 1 Area, Ellison Buildings, Ellison Place, Newcastle upon Tyne, 1, by 16th March, 1957. 5559

ISLE OF ELY COUNTY COUNCIL
PLANNING DEPARTMENT

Vacancy for SENIOR PLANNING ASSISTANT. Salary £727—£907 (A.P.T. Grade IV). Applicants should hold A.M.T.P.I. or other qualifications. Duties concerned, *inter alia*, with preparation of Town Maps for March and Ely. National Conditions. Application form and Conditions of Appointment from County Planning Officer, returnable by the 29th March, 1957.

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

County Hall,
March, Cambs. 5546

NATIONAL COAL BOARD
WEST MIDLANDS DIVISION
No. 2 (Cannock Chase) Area
Allport Street, Cannock

SUBSIDENCE INSPECTOR required by National Coal Board, No. 2 Cannock Chase Area, West Midlands Division.

Duties will include inspection and repair of subsidence damage to all types of property. Good knowledge of all building trades, ability to control direct labour force, and the preparation of specifications is essential.

Previous experience of repairs to buildings in mining areas will be an advantage.

Applicants should have passed the Intermediate examinations of the Royal Institution of Chartered Surveyors (Building Section).

Salary within the scale £690 × £25—£840.

Applications giving age, experience and quoting reference CC.P.20, to: Area Staff Manager, National Coal Board, Allport Street, Cannock, Staffs, within fourteen days of the date of this advertisement. 5572

BOROUGH OF PORT TALBOT
APPOINTMENT OF ARCHITECTURAL ASSISTANT
BOROUGH ENGINEER'S DEPARTMENT

Applications are invited for the above appointment in the Borough Engineer's Department at a salary in accordance with A.P.T. Grade III (£656—£784 2s. 6d.). Applicants must be of Intermediate R.I.B.A. standard.

The appointment is subject to the provisions of the Local Government Superannuation Acts, and is terminable by one month's notice on either side.

Applications, stating age, qualifications, present and previous appointments held, and details of experience, together with names of three referees, to be received by the undersigned not later than noon, 25th March, 1957.

The Council will give consideration to the provision of housing accommodation.

W. KING DAVIES,
Town Clerk.

Municipal Buildings,
Port Talbot. 5557

BOROUGH OF SOUTHGATE
BOROUGH ENGINEER AND SURVEYOR'S DEPARTMENT
ARCHITECTURAL STAFF

The Southgate Borough Council invite applications for the following vacancies in the Department of the Borough Engineer and Surveyor:—

TWO ARCHITECTURAL ASSISTANTS, Grade A.P.T. V (£814 17s. 6d.—£994 5s.) plus London weighting.

The posts are permanent and superannuated and the starting salary will be fixed in accordance with qualifications and experience.

Candidates must be Associate Members of the Royal Institute of British Architects.

Forms of application may be obtained from the Borough Engineer and Surveyor and should be returned to the undersigned by not later than 9 a.m. on Thursday, 28th March, 1957.

Canvassing, directly or indirectly, will be a disqualification.

GORDON H. TAYLOR,
Town Clerk.

Town Hall,
Palmers Green,
London, N.13.
March, 1957. 5561

BRISTOL EDUCATION COMMITTEE
COLLEGE OF TECHNOLOGY, BRISTOL
Principal: G. H. MOORE, M.Sc., F.P.S., F.R.I.C.

Applications invited for an additional post in the Department of Building.

LECTURER IN QUANTITY SURVEYING and allied subjects up to Final professional level. Appropriate qualifications and teaching experience required.

Duties to commence 1st September, 1957. Burnham Technical Scale. Lecturer (Male) £1,200 × £30—£1,350.

Commencing salary according to previous approved industrial and/or teaching experience.

Further particulars and applications form from Registrar, College of Technology, Bristol, 7.

G. H. SYLVESTER.
Chief Education Officer. 5564

BOROUGH OF TOTTENHAM

A. ASSISTANT ARCHITECT, A.P.T. Grade IV (£727 15s.—£907 2s. 6d. p.a.). Applicants must hold a final professional qualification.

B. ARCHITECTURAL ASSISTANT, A.P.T. Special Grade (£707 5s.—£861 p.a.). Applicants must have passed Parts I and II of the RIBA Final or Special Final Examination, or their equivalent at one of the recognised Schools of Architecture, and to have had at least 5 years' experience including the period spent on theoretical training.

C. ARCHITECTURAL ASSISTANTS, A.P.T. Grade III (£656—£784 2s. 6d. p.a.). Applicants must have at least passed R.I.B.A. Intermediate Examination or equivalent.

D. ARCHITECTURAL ASSISTANTS, A.P.T. Grade II or I (£609 17s. 6d.—£691 17s. 6d. p.a. or £543 5s.—£625 5s. p.a.). Applicants must have passed R.I.B.A. Intermediate examination or equivalent. Grading according to experience.

Commencing salaries within grades according to ability and experience.

London weighting allowance of £20 p.a. or £30 p.a. according to age.

Application form and Conditions of Appointment from Borough Engineer (AJ), Town Hall, Tottenham, N.15. Applications must be delivered by Thursday, 28th March, 1957. 5545

SOUTH EASTERN ELECTRICITY BOARD
ARCHITECTURAL ASSISTANT, Surveyor's Section, South Eastern Electricity Board.

Annual salary £780—£855 under Grade V of the N.J.C. Agreement. Superannuable. Applicants must be competent draughtsmen, capable of preparing specifications and drawings for all types of buildings and carrying out site surveys. Applicants shou.d preferably be members of the R.I.B.A. or the I.A.A.S. and should state age and particulars of present and previous appointments.

Applications, naming two referees, to The Surveyor, 10, Queen's Gardens, Hove 3, by 27th March, 1957.

A. L. BURNELL,
5568

THE UNIVERSITY OF LEEDS
DEPUTY RESIDENT ARCHITECT

Applications are invited for the post of Deputy Resident Architect to assist in the administration of the University expansion programme particularly with reference to major building projects carried out by Consulting Architects and Engineers. Schemes include buildings for the Faculties of Arts, Medicine, Science and Technology, and Halls of Residence. Salary in the range of £1,300 to £1,700 depending upon qualifications and experience. Applicants must be Registered Architects and Associates of the R.I.B.A. and must hold a University degree. Previous executive experience is desirable. Applications (three copies) stating date of birth, qualifications, experience, together with the names of three referees, should reach the Registrar, The University, Leeds, 2 (from whom further particulars may be obtained) not later than 8th April, 1957. 5539

SURREY COUNTY COUNCIL
COUNTY PLANNING DEPARTMENT

Applications are invited for the following appointment:—

At the North-West Area Office, Woking, **ONE PLANNING ASSISTANT, A.P.T. Grade III** (£656—£784 2s. 6d.). The post carries an essential user car allowance and is third in a staff of nine in a varied Area.

Applications stating age, experience and qualifications together with the names of two persons to whom reference may be made, should be lodged with the Clerk of the Council not later than 25th March, 1957.

County Hall,
Kingston-upon-Thames. 5542

SALOP COUNTY COUNCIL

There are vacancies for **ASSISTANT ARCHITECTS** in the County Architect's Department on the following grades:

A.P.T. IV (£727 15s. to £907 2s. 6d. p.a.)
A.P.T. II (£609 17s. 6d. to £691 17s. 6d. p.a.)

Successful applicants will be engaged on major building projects, the experience gained on which will enable them to qualify for the Department's internal promotion scheme.

N.J.C. Conditions of Service will apply.

Monthly rail fare and subsistence allowance not exceeding 30s. a week will be paid for a maximum period of six months to married men temporarily separated from their families.

Conditions of Service and application form obtainable from the County Architect, Column House, London Road, Shrewsbury. Closing date 29th March, 1957. 5578

ARCHITECTURAL AND ENGINEERING STAFF (Male or Female) required by the Prison Commission. Salary (Men) £500 at age 21 rising to £685 at age 28 then to £790; (Women) £500 at age 21, rising to £672 at age 28 and then to £722. Starting pay according to age up to 28. The women's scale is subject to the introduction of equal pay scheme.

Hours 42 per 5-day week. Annual leave 3 weeks 3 days rising to 4 weeks 2 days after 10 years service.

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

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

Appointments in temporary capacity in first instance with prospects of permanency.

Regulations and application forms from Establishment Officer, E.126/2/20, Prison Commission, Horseferry House, Dean Ryle Street, London, S.E.1, to be returned by 30th March, 1957. 5535

NORTHERN IRELAND HOUSING TRUST
ASSISTANT ARCHITECT, Grade I

The Trust invites applications for the post of Assistant Architect, Grade I, on the salary scale £928—£1,018.

Candidates must be Associate Members of the Royal Institute of British Architects and should have considerable experience of housing projects.

Preference will be given to ex-service candidates.

The person appointed will be required to participate in a contributory superannuation scheme which allows for the reciprocal transfer of benefits in Local Government Schemes in suitable cases.

Assistance in obtaining housing accommodation may be given in suitable circumstances to the successful candidate

Please apply not later than 25th March, 1957, giving full details of age, education, qualifications and experience, including present post and salary, to the General Manager, Northern Ireland Housing Trust, 12, Hope Street, Belfast.

Please mark envelope 33/60. 5576

FIFE COUNTY COUNCIL

Required:—

JUNIOR ARCHITECTURAL ASSISTANTS (A.R.I.B.A.), Grade VI-VII, £825—£950 per annum.

Experienced non-qualified **ASSISTANTS**, Grade V-VI, £730—£890 per annum.

SENIOR DRAUGHTSMEN, Grade II-IV, £595—£715 per annum.

JUNIOR DRAUGHTSMEN, Grade I-II, £565—£640 per annum.

Houses may be available. Superannuation scheme. Applications, giving full particulars, to be lodged by 20th March, 1957, with the County Clerk, County Buildings, Cupar, Fife. 5593

BRITISH RAILWAYS
EASTERN REGION
MODERNISATION PLAN. ASSISTANT ARCHITECT required in the Office of the Architect, Eastern Region, King's Cross Station. Applicants should be qualified, skilled and enterprising in design with a sound knowledge of modern building practices and ability in administration. Salary range £872—£910 per annum, 5-day week and concessionary rail travel. Apply in writing giving full particulars as to age, education and experience, previous positions held and any special qualifications possessed to Chief Civil Engineer, British Railways, Eastern Region, King's Cross Station, London, N.1. 5528

LANCASHIRE COUNTY COUNCIL

A vacancy exists for **SECTION LEADER QUANTITY SURVEYOR** within the scale £999 7s. 6d.—£1,230. Applicants must have had a wide experience in all branches of quantity surveying, and the successful candidate will be expected to take full charge of a group of approximately eight assistants and to deal with large contracts from taking off to settlement of final accounts.

Application forms, obtainable from the County Architect, P.O. Box 26, County Hall, Preston, to be returned by Monday, 25th March, 1957, quoting Ref. A/AJ. 5518

BISHOP AUCKLAND URBAN DISTRICT COUNCIL
ARCHITECTURAL ASSISTANT

Applications are invited for the appointment of an Architectural Assistant, to work in the Department of the Council's Architect, Surveyor and Engineer.

The salary for the appointment will be in accordance with the Special Grade, commencing at £707 5s. per annum and rising by annual increments to a maximum of £861 per annum.

Applicants must be Associates of the R.I.B.A. or hold equivalent qualifications, and should have had experience in the work of a local authority.

The appointment will be subject to the provisions of the Local Government Superannuation Acts, 1937-1953, and also to one month's notice on either side. If required, housing accommodation will be provided within a reasonable time after the appointment is made, but this must be vacated if and when the appointment is terminated.

Applications, stating age, qualifications, experience and present appointment, accompanied by the names and addresses of two persons to whom reference can be made must reach the undersigned not later than Monday, 25th March, 1957.

R. W. BLYTHE,
Clerk of the Council.

Town Hall, Bishop Auckland.
7th March, 1957. 5592

NATIONAL COAL BOARD—NORTH-EASTERN DIVISION

Applications are invited for the following appointments in the Department of the Divisional Chief Architect at Conisbrough, near Doncaster:—

ONE ARCHITECT, Grade II.
(Salary scale: £700×£30—£1,000 per annum.)
Qualifications: A.R.I.B.A.

TWO ARCHITECTURAL ASSISTANTS, Grade I.
(Salary scale: £625×£25—£750 and up to £900 per annum in certain circumstances.)
Qualifications: Preferably Intermediate R.I.B.A. or considerable practical experience.

ONE ARCHITECTURAL ASSISTANT, Grade II.
(Salary scale: £520×£20—£615 per annum.)
Qualifications: Preferably Intermediate R.I.B.A. or studying for such examination.

Full details and application forms obtainable from Hugh Smith, F.R.I.B.A., Divisional Chief Architect, National Coal Board, P.O. Box No. 4, Denaby, near Doncaster. 5596

CITY OF LEICESTER
CITY ARCHITECT'S DEPARTMENT

Vacancies exist for Architects and Quantity Surveyors on the following salaries:—

ARCHITECTS:
£609 17s. 6d.—£691 17s. 6d. p.a.
£707 5s.—£861 p.a.
£727 15s.—£907 2s. 6d. p.a.
£902—£1,107 p.a.

QUANTITY SURVEYORS:
£609 17s. 6d.—£907 2s. 6d. p.a.
£902—£1,107 p.a.

Previous experience in Local Government work is not considered essential.

Applications, with copies of two recent testimonials, should be sent to the undersigned not later than Wednesday, 27th March, 1957.

L. H. LLOYD OWEN,
City Architect.

10, Loseby Lane, Leicester. 5589

COUNTY BOROUGH OF WOLVERHAMPTON
APPOINTMENT OF SENIOR PLANNING ASSISTANT

Applications invited for above appointment in the Borough Engineer and Planning Officer's Department. Salary Grade IV (£727 15s.—£907 2s. 6d. per annum) or Special Grade (£707 5s.—£861 p.a.) according to qualifications and planning experience.

N.J.C. conditions of service, one month's notice on either side. Medical examination. Superannuable post.

Applications stating age, training and experience, naming two referees, to Borough Engineer, Town Hall, Wolverhampton, by 20th March, 1957. 5543

THE NATIONAL COAL BOARD, South-Western Division, invite applications for the post of CLERK OF WORKS, Grade I, in the Divisional Architects Branch, Cambrian Buildings, Mount Stuart Square, Cardiff.

Duties will cover supervision of erection of colliery surface buildings generally in South Wales. Candidates must have had considerable experience in the building trade, knowledge of reinforced concrete work, contemporary construction, and specialised engineering services applied to buildings.

The post is superannuable, and in the first instance will be based in Neath.

Salary scale: £590×£25—£840 per annum.

Applications, stating age, training, qualifications and experience, appointments held, with salaries, together with the names of two referees, should be sent to the Divisional Chief Staff Officer, National Coal Board, South-Western Division, Cambrian Buildings, Mount Stuart Square, Cardiff, not later than 22nd March, 1957. 5590

ARCHITECTURAL ASSISTANTS REQUIRED BY MINISTRY OF WORKS

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

Salary range £500 (age 21) to £790 p.a. London (slightly less elsewhere). 5-day week. 3½ weeks' annual leave initially. Starting pay according to age, qualifications and experience. Good prospects of promotion with salaries of £925 p.a. and above. Opportunities for permanent posts leading to pensions (non-contributory). Interviews at Regional Offices where possible. Applicants should be of Intermediate R.I.B.A. standard.

State age, training and experience to Chief Architect, Ministry of Works (H), Abell House, John Islip Street, S.W.1. 5387

GOVERNMENT OF NORTHERN IRELAND
ASSISTANT ARCHITECT

Applications are invited for the unestablished post of Assistant Architect Class II in the Works Directorate, Ministry of Finance.

The consolidated salary scale is £790 × £25—£840 × £30—£990 × £40—£1,190. Minimum of scale is linked to entry at age 26 plus or minus one increment for each year above or below that age. Maximum entry point £1,030.

Candidates must be Registered Architects by examination, and must have had at least two years' experience in an Architect's Office in the preparation of working drawings for new buildings.

Preference will be given to a suitably qualified candidate who served in H.M. Forces during the 1914-1918 or 1939-1945 wars, provided the Ministry is satisfied that such a candidate is, or within a reasonable time will be, able to discharge the duties of the post efficiently.

Application forms may be obtained from the Director of Establishments, Ministry of Finance, Stormont, Belfast, to whom they must be returned, together with copies of two recent testimonials. 5450

CITY ARCHITECT'S OFFICE, MANCHESTER

Applications are invited for the appointment on the permanent staff of an **ARCHITECTURAL ASSISTANT**. Salary A.P.T. Grade I/II, £543 5s. to £691 17s. 6d. per annum.

Form of application from City Architect, P.O. Box 488, Town Hall, Manchester. Closing date 23rd March. 5577

Tenders Invited

6 lines or under, 12s. 6d.: each additional line, 2s.

BOROUGH OF ROYAL TUNBRIDGE WELLS
CREMATORIUM

The Town Council invite tenders for the erection of a Crematorium and contingent works on a site adjoining the Cemetery, Benhall Mill Road.

Firms wishing to tender should apply to the Borough Surveyor, Town Hall, Tunbridge Wells, by the 31st March, 1957, for specification and Bills of Quantities, enclosing a deposit cheque for £5 5s. made payable to the "Tunbridge Wells Corporation."

M. J. H. GIRLING,
Town Clerk.

Town Hall,
Tunbridge Wells. 5527

Architectural Appointments Vacant

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

W. H. WATKINS, GRAY & PARTNERS require qualified ASSISTANTS for interesting hospital work, pension scheme in operation. Write or 'phone, 57, Catherine Place, S.W.1. Victoria 7761. 5496

ASSISTANT ARCHITECTS AND SHOPFITTING DRAUGHTSMEN. Co-operative Wholesale Society, Ltd., invite applications for the following appointments: (1) Assistant Architects capable of preparing working drawings from preliminary details. (2) Shopfitting Draughtsmen with experience in Shop Equipment and modernisation of Interiors.
The posts are pensionable, subject to medical examination. Five-day week in operation. Applications, giving age, details of experience and salary required to W. J. Reed, F.R.I.B.A., Chief Architect, Co-operative Wholesale Society, Ltd., 99, Leman Street, London, E.1. 4977

TAKER-OFF. Applications are invited from experienced and suitably qualified persons. Salary on the scale £850—£1,005, inclusive of L.W., with placing according to age, qualifications and experience. The post is superannuable, subject to medical examination. Five-day week in operation. Applications, stating age, experience, qualifications and salary required to: W. J. Reed, F.R.I.B.A., Chief Architect, Co-operative Wholesale Society, Ltd., 99, Leman Street, London, B.1. 5157

ARCHITECTURAL ASSISTANTS of Intermediate Standard required in West End office for hospital and commercial work. Salary £600, or by arrangement. Luncheon Vouchers. Apply Box 5493.

ARCHITECTURAL DRAUGHTSMAN experienced in complete working drawings from sketch plans for small private practice covering all types of work except ecclesiastical. Salary fully commensurate with ability. A. V. Farrier, A.R.I.B.A., 7 Thornton Hill, S.W.19. 5484

ARCHITECT also STUDIO MASTER at school of Architecture requires ASSISTANT now studying for intermediate. Office in S.W.1 district. Opportunity for good experience and assistance with study. Time provided for attending architectural school. Box 5466.

MANCHESTER architect requires another ASSISTANT in his small office having contemporary outlook to cope with expanding practice. Now has 1 senior assistant and a secretary. Plenty of hard and interesting work for keen person. Box 5463.

CAPABLE SENIOR ASSISTANT required to take control of small but expanding office in the North East. Varied and interesting work. Good prospects for a man with ability and initiative. Staff pension scheme. Salary according to ability. Box 5462.

ASSISTANT ARCHITECTS required. Work includes hospitals, a technical college, flats, a ship interior and university work. Applicants should apply to Pite Son & Fairweather, 6, Queen Anne's Gate, Westminster, S.W.1, giving particulars of qualifications, experience and salary required. 5460

CROYDON. SENIOR and JUNIOR ASSISTANTS required for interesting and varied work. The former able to manage contracts and the latter with general office experience. Write in both cases giving age, experience and salary required, to George Lowe & Partner, F./A.R.I.B.A., 4, High Street, Croydon. 5451

ARCHITECT. Excellent opportunity for recently qualified A.R.I.B.A. for interesting work in busy general practice. Manchester area. Box 5426.

TWO ARCHITECTURAL ASSISTANTS of Intermediate standard required for interesting work in varied practice. Shops, Offices, Flats and Housing schemes, etc. Salary by arrangement. George Watt, A.R.I.B.A., 146, Mostyn Road, Merton Park, S.W.19. LIB 8181. 5431

GOLLINS, MELVIN, WARD & PARTNERS have a vacancy for a school-trained ASSISTANT interested in colour and model making. 5-day week, quarterly bonuses. Telephone WELbeck 9991. 5401

ARCHITECTURAL ASSISTANT required, with about four to five years' office experience. Write or telephone giving full particulars, including age and salary, to Hasker & Hall, Architects, 13, Welbeck Street, W.1 (WELbeck 0061). 5306

VACANCIES for ARCHITECTURAL ASSISTANTS, particularly Junior and Intermediate grades. Applicants with knowledge of commercial work and London experience an advantage. Varied practice, five-day week. Lewis Solomon, Son & Joseph, 21, Bloomsbury Way, London, W.C.1. Holborn 5108. 3152

SENIOR ARCHITECTURAL ASSISTANT urgently required, having good office experience and capable of taking complete charge of contracts. Professional qualifications not essential.—Apply in writing, stating age, qualifications, if any, experience and salary required, to Leach Rhodes & Walker, 90, Deansgate, Manchester, 3. 5591

BUSY progressive office, Sheffield area, wide experience, require immediately JUNIOR and SENIOR ASSISTANTS. Intermediate or Final R.I.B.A. Good salary and bonus, together with permanency, for suitable applicant.—Please apply Box 5595.

ARCHITECTS' Co-partnership require QUALIFIED ASSISTANTS with experience. Write 44, Charlotte Street, W.1, or telephone Langham 5791. 5482

NORTH AFRICA. Required in Tripoli, an experienced CHIEF ASSISTANT to undertake working drawings from sketch plans. Work is of a varied and interesting character. Initial tour 12 months. Salary £1,000 p.a. Local income tax 8%. Preferably single person. Forward full particulars to Box 5483.

TWO ARCHITECT'S ASSISTANTS required in City Architect's Department. Salary range £600—£800 with good prospects of future advancement. Apply stating age, details of experience and salary required. Box 5503.

CITY ARCHITECTS require ASSISTANT, Intermediate standard, with office experience. Five-day week. Phone London Wall 3825. 5502

TAKER-OFF. Applications are invited from experienced and suitably qualified persons in an R.I.C.S. approved office. Salary on the scale £850—£1,005, inclusive of L.W., with placing according to age, qualifications and experience. The post is superannuable, subject to medical examination. Five-day week in operation. Applications, stating age, experience, qualifications and salary required to: W. J. Reed, F.R.I.B.A., Chief Architect, Co-operative Wholesale Society, Ltd., 99, Leman Street, London, E.1. 5512

ARCHITECTURAL ASSISTANT required in West End office Should have some experience of general procedure, including site supervision, etc., in addition to good standard of draughtsmanship and building construction. State age, experience and salary required. Box 5511.

INTERESTING job open in West End office for ASSISTANT with ambition, capable of taking charge of small and medium jobs from sketch to specification. Five-day week. Box 5556.

WEST END Architects require ASSISTANT with about two years' experience since qualifying. Write stating experience and salary required to Box 5558.

JUNIOR ARCHITECTURAL ASSISTANT, Intermediate standard, with practical experience, required for busy office with work of all types. Full particulars of age, experience, salary, etc., to Vallis & Bird, F./A.R.I.B.A., Architects, Frome. 5555

ARCHITECTURAL ASSISTANT required for general practice, chiefly domestic and agricultural work. Intermediate R.I.B.A. standard desirable. Applications from more senior men and women would be considered. Salary by arrangement. Box 5549

ARCHITECTS require ASSISTANTS between Intermediate and Final standard. London office. Interesting projects. Box 5563.

ARCHITECT'S ASSISTANT, Final standard, required in West London office. Must have good practical experience. Box 5562.

FARMER & DARK have vacancies for an experienced ASSISTANT ARCHITECT and JUNIOR ASSISTANT ARCHITECT for industrial projects. Five-day week. Applications marked "Confidential" with full particulars and salary required to: Farmer & Dark, Romney House, Tufton Street, Westminster, S.W.1. 5566

EXPERIENCED and JUNIOR ASSISTANTS required by London Architect for interesting work including hospitals and laboratories, etc. Opportunity to take charge of contracts including site supervision. 5-day week. Salaries £600 to £800 p.a. according to experience. Write, giving details of age and experience, etc., to Box 5550.

J. M. AUSTIN-SMITH & PARTNERS require an ARCHITECTURAL ASSISTANT at or above R.I.B.A. Intermediate standard, with not less than three years' continuous office experience, for interesting and varied work with opportunities for taking responsibility and supervising work in progress. Salary will be according to age and length and type of experience, but starting within the approximate range of £600—£650. Apply by letter to 29, Sackville Street, London, W.1. 5551

LIONEL BRETT, Kenneth Boyd & Peter Bosanquet have vacancies at their London Office for two qualified ASSISTANTS. Previous office experience is essential. Please write stating age, qualification and salary required, to Box 5553.

SENIOR ASSISTANT required to take charge of large interesting jobs from design stage. Salary £800 to £1,150 p.a. according to capabilities. Apply Morris de Metz., F.R.I.B.A. CITy 4086. 5552

ARCHITECTURAL ASSISTANT required in our London office. The appointment offers varied and interesting work over a wide sphere with the possibility of travel. Applications, in writing, stating age, experience, qualifications and salary to Assistant Controller of Works & Buildings, NAAFI, Imperial Court, Kennington, S.E.11. 5569

LARGE BUILDERS in the Home Counties are expanding their Planning Office to include design of Multi-storey Flats, Offices, etc., which will incorporate Curtain Walling of their own manufacture. Applications for this position are invited from suitable candidates. The successful applicant will take sole charge of this work for which he would be responsible to the Directors. Write Box 5571

LONDON firm with interesting work including home and overseas school work requires qualified ASSISTANT. Salary according to experience. Telephone CHAncery 3526. 5541

TWO ARCHITECTURAL ASSISTANTS required in St. Albans office. Intermediate standard—contemporary outlook preferred but not essential—for working on large building projects. Salary by arrangement. Write giving full details of experience, etc., to Box 5540.

CHARTERED ARCHITECTS in Home Counties with large and varied practice require capable ASSISTANT with ability in perspective and colour work. Box 5538.

ARCHITECT'S ASSISTANT required for varied work on housing, office and industrial building. Some travelling involved. Applicant should be in early twenties with at least two years' experience in an Architect's office and capable of undertaking projects with a minimum of supervision. Write giving full particulars of experience and salary required to Personnel Manager, Schweppes Ltd., Connaught Place, London, W.2. 5537

LYONS, ISRAEL & ELLIS, 43, Portland Place, W.1, require two ASSISTANT ARCHITECTS, salary £820 per annum. 5544

GRANADA TV NETWORK LTD. require STAFF ARCHITECT in Manchester for general duties and to help with development of their TV Centre. Excellent opportunity for an experienced and practical man with ideas and a feeling for modern design. Write giving age, experience, present salary, etc., to Sidney L. Bernstein, Chairman, Granada TV Network, Ltd., Manchester 3. 5526

ARCHITECT. Excellent opportunity for recently qualified A.R.I.B.A. for interesting work in busy general practice. Manchester area. Box 5426.

ASSISTANT required for office with town and country work. State experience and present salary. Excellent prospects for the right man. Box 5574.

ARCHITECTURAL ASSISTANT required for small Office undertaking a varied and interesting range of work. Must have at least 6 years' office experience. Reply with details of experience and salary required to Robert C. Carvell, Esq., L.R.I.B.A., 20, Marshall Place, Perth, Scotland. 5573

A PRIVATE OFFICE has several vacancies for ARCHITECTS interested in new building techniques. Previous experience not essential and work will include the research and development of standard structural and building elements. Apply A. M. Gear, F.R.I.B.A., 12, Manchester Square, W.1. 5581

TREHEARNE & NORMAN, PRESTON & PARTNERS have vacancies for SENIOR and JUNIOR ASSISTANTS. Salaries according to experience and qualifications. Apply: 83, Kingsway, W.C.2. (HOL 4071). 5579

HARROW Office requires ASSISTANTS. One Intermediate standard, experienced working drawings, surveys, etc. One Junior with some experience. Please write, full particulars including salary required to Field & Shaw, 40, Station Road, N. Harrow, Middx., Chartered Architects. 5418

ARCHITECTURAL ASSISTANT required immediately for small busy general practice. Salary according to experience. Write giving full details of experience, qualifications, age and salary to Tennant & Smith, F./A.R.I.B.A., Ropengate, Pontefract, Yorkshire. 5585

WANTED. ASSISTANT for small City Office. Direct responsibility. Salary £500—£650. Tel. CEN 5766, or write Box 5583.

ARCHITECTURAL ASSISTANTS all grades required. Pleasant working conditions. Five-day week. Luncheon vouchers. Write: J. Seymour Harris & Partners, 4, Greenfield Crescent, Birmingham 15. 5524

DRAUGHTSMEN (Architectural) required in the Architects' Department of a large North Lincolnshire Steelworks for work on expansion and development projects, embracing a wide variety of office, laboratory and industrial buildings.

Applicants should be competent draughtsmen with a sound knowledge of modern building techniques.

The positions are permanent for suitable applicants and amenities offered include pension scheme, facilities for sports and numerous social activities, etc.

Applications, giving age, experience and salary required, should be made in writing to:—Employment Officer, Appleby-Frodingham Steel Company, Scunthorpe, Lincs. 5525

Architectural Appointments Wanted

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

EXPERIENCED DESIGNER / DRAUGHTSMAN requires position with a firm specialising in prefabricated timber structures. Any area. Please write Box 5586.

ARCHITECTS' SECRETARY, 3 years' experience, requires post abroad after May, preferably Uganda. Box 5560

ASSISTANT, R.I.B.A. Finals, seeks part-time work, evenings, week-ends. Working drawings, surveys, etc. London area. Car owner. Box 5548.

A R.I.B.A., B.Arch. (34), varied experience, requires post in London for up to 6 months; alternatively, permanent responsible position away from London. 5588

Other Appointments Vacant

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

QUANTITY SURVEYOR required, experienced to interim or approaching final standard, or qualified, for Grimsby branch office. Extensive architectural and engineering work. Apply with details, salary, availability, etc., to Wm. Saunders & Partners, 24 Castlegate, Newark-on-Trent. 5494

A MAJOR PETROLEUM COMPANY has a vacancy for a BUILDING SURVEYOR in the 30/45 age bracket. The appointment is for work in the United Kingdom and the successful applicant will work from the London Head Office. Applicants should have a sound knowledge and experience of building construction and contracting, including erection of new office buildings, alterations and general maintenance of office premises, some knowledge of property administration would be an advantage, also ability to undertake building surveys. Good starting salary in line with experience and qualifications. Excellent pension scheme. Apply in writing giving full details of education, qualifications, age and experience to Box 5461. Replies can only be sent to those selected for interview.

CLERK OF WORKS required at National Vegetable Research Station, Wellesbourne, Warwick, to supervise erection of laboratory and administrative block. Duration at least 18 months. Applications giving age, experience, salary required, and three referees, to the Secretary, within 14 days. 5536

Services Offered

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

THE SITE SURVEY COMPANY,
Blackheath, S.E.3. Tel.: LEE Green 7444-5.
Fully equipped to undertake urgent Engineering and Architectural surveys in any part of the country and abroad. Specialists in ¼ in. scale detailed surveys for extensive city development areas. 1890

GOOD LETTERING is essential for Commemorative Wall Tablets, Foundation Stones, etc. Designs prepared and estimates given for the finished work in any suitable material. Renowned as a Centre for Lettering since 1934. Sculptured Memorials, 67, Ebury Street, S.W.1. 9170

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

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

ARCHITECTURAL, Reinforced Concrete and Steel design and detailing work required. Over 30 Assistants available. MUS 8753. 5145

QUALIFIED ENGINEER, with design and contracting experience in drainage, offers his services to the profession. Prepared to vet any scheme—no savings—no fees.—Box 5185.

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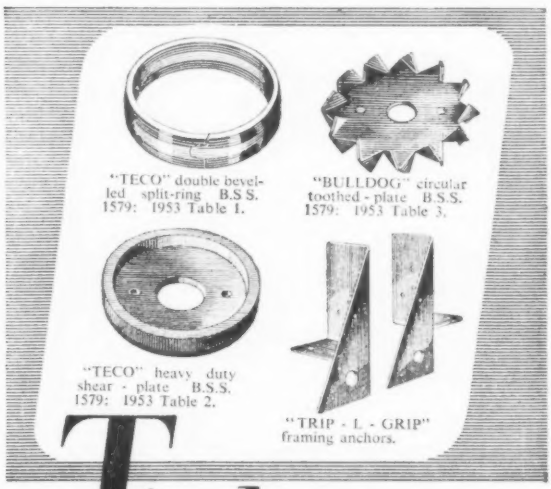

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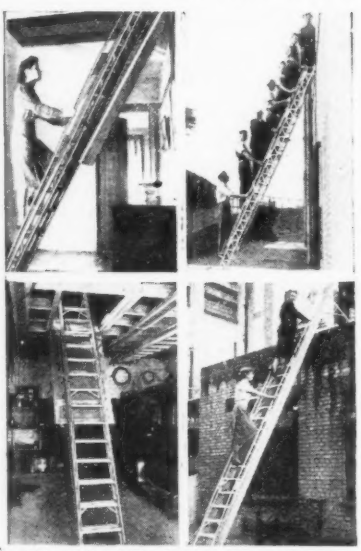

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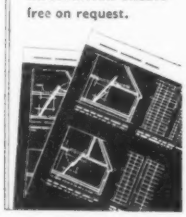

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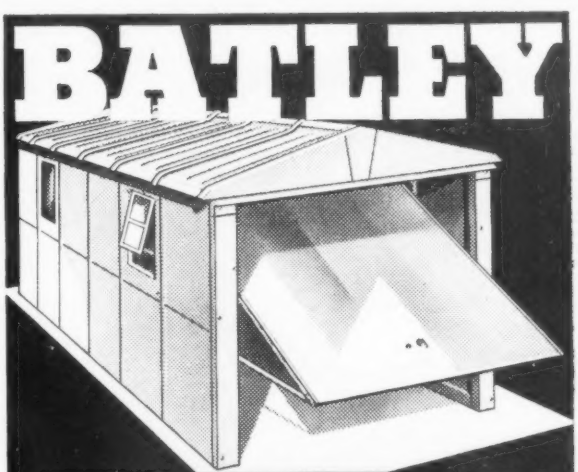

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