THE ARCHITECTS' JOURNAL

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

IHVE	Institution of Heating and Ventilating Engineers. 49, Cadogan Square.	Sloane 1601/3158
IIBDID	Incorporated Institute of British Decorators and Interior Designers. 100, Park Street, Grosvenor Square, W.1.	Mayfair 7086
ILA	Institute of Landscape Architects. 2, Guilford Place, W.C.1.	Holborn 0281
I of Arb	Institute of Arbitrators. Hastings House, 10, Norfolk Street, Strand, W.C.2.	Temple Bar 4071
IOB	Institute of Builders. 48, Bedford Square, W.C.1.	Museum 7179
IQS	Institute of Quantity Surveyors. 98, Gloucester Place, W.1.	Welbeck 1859
IR	Institute of Refrigeration. Dalmeny House, Monument Street, E.C.3.	Avenue 6851
IRA	Institute of Registered Architects. 47, Victoria Street, S.W.1.	Abbey 6172
ISE	Institute of Structural Engineers. 11, Upper Belgrave Street, S.W.1.	Sloane 7128
LDA	Lead Development Association. Eagle House, Jermyn Street, S.W.1.	Whitehall 7264/4175
LMBA	London Master Builders' Association. 47, Bedford Square, W.C.1.	Museum 3891
LSPC	Lead Sheet and Pipe Council. Eagle House, Jermyn Street, S.W.1.	Whitehall 7264/4175
MAFF	Ministry of Agriculture, Fisheries and Food. Whitehall Place, S.W.1.	Trafalgar 7711
MOE	Ministry of Education. Curzon Street House, Curzon Street, W.1.	Mayfair 9400
MOH	Ministry of Health. 23, Savile Row, W.1.	Regent 8411
MOHLG	Ministry of Housing and Local Government. Whitehall, S.W.1.	Whitehall 4300
MOLNS	Ministry of Labour and National Service. 8, St. James' Square, S.W.1.	Whitehall 6200
MOS	Ministry of Supply. Shell Mex House, W.C.2.	Gerrard 6933
MOT	Ministry of Transport. Berkeley Square House, Berkeley Square, W.1.	Mayfair 9494
MOW	Ministry of Works. Lambeth Bridge House, S.E.1.	Reliance 7611
NAMMC	Natural Asphalte Mine Owners and Manufacturers Council. 94/98, Petty France, S.W.1.	Abbey 1010
NAS	National Association of Shopfitters. 9, Victoria Street, S.W.1.	Abbey 4813
NBR	National Buildings Record. 31, Chester Terrace, Regent's Park, N.W.1.	Welbeck 0619
NCBMP	National Council of Building Material Producers. 10, Storey's Gate, S.W.1.	Abbey5111
NEFMAI	National Employers Federation of the Mastic Asphalt Industry. 21, John Adam Street, Adelphi, W.C.2.	Trafalgar 3927
NFBTE	National Federation of Building Trades Employers. 82, New Cavendish Street, W.1.	Langham 4041/4054
NFBTO	National Federation of Building Trades Operatives. Federal House, Cedars Road, Clapham, S.W.4.	Macaulay 4451
NFHS	National Federation of Housing Societies. 12, Suffolk St., S.W.1.	Whitehall 1693
NHBRC	National House Builders Registration Council. 58, Portland Place, W.1.	Langham 0064/5
NPL	National Physical Laboratory. Head Office, Teddington.	Molesey 1380
NRDB	Natural Rubber Development Board. Market Buildings, Mark Lane, E.C.3.	Mansion House 9383
NSAS	National Smoke Abatement Society. Palace Chambers, Bridge Street, S.W.1.	Trafalgar 6838
NT	National Trust for Places of Historic Interest or Natural Beauty. 42, Queen Anne's Gate, S.W.1.	Whitehall 0211
PEP	Political and Economic Planning. 16, Queen Anne's Gate, S.W.1.	Whitehall 7245
RCA	Reinforced Concrete Association. 94, Petty France, S.W.1.	Abbey 4504
RIAS	Royal Incorporation of Architects in Scotland. 15, Rutland Square, Edinburgh.	Fountainbridge 7631
RIBA	Royal Institute of British Architects. 66, Portland Place, W.1.	Langham 5721
RICS	Royal Institution of Chartered Surveyors. 12, Great George Street, S.W.1.	Whitehall 5322/9242
RFAC	Royal Fine Art Commission. 5, Old Palace Yard, S.W	Whitehall 3935
RS	Royal Society. Burlington House, Piccadilly, W.1.	Regent 3335
RSA	Royal Society of Arts. 6, John Adam Street, W.C.2.	Trafalgar 2366
RSH	Royal Society of Health. 90, Buckingham Palace Road, S.W.1.	Sloane 5134
RIB	Rural Industries Bureau. 35, Camp Road, Wimbledon, S.W.19.	Wimbledon 5101
SBPM	Society of British Paint Manufacturers. Grosvenor Gardens House, Grosvenor Gardens, S.W.1.	Victoria 2186
SE	Society of Engineers. 17, Victoria Street, Westminster, S.W.1.	Abbey 7244
SFMA	School Furniture Manufacturers' Association. 30, Cornhill, London, E.C.3.	Mansion House 3921
SIA	Society of Industrial Artists. 7, Woburn Square, London W.C.1.	Langham 1984/5
SIA	Structural Insulation Association. 32, Queen Anne Street, W.1.	Langham 7616
SNHTPC	Scottish National Housing. Town Planning Council. Hon. Sec., Robert Pollock, Town Clerk.	Rutherglen
SPAB	Society for the Protection of Ancient Buildings. 55, Great Ormond Street, W.C.1.	Holborn 2646
TCPA	Town and Country Planning Association. 28, King Street, Covent Garden, W.C.2.	Temple Bar 5006
TDA	Timber Development Association. 21, College Hill, E.C.4.	City 4771
TPI	Town Planning Institute. 18, Ashley Place, S.W.1.	Victoria 8815
TTF	Timber Trades Federation. 75, Cannon Street, E.C.4.	City 5040
WDC	War Damage Commission. 6, Carlton House Terrace, S.W.1.	Whitehall 4341
ZDA	Zinc Development Association. 34, Berkeley Square, W.1.	Grosvenor 6636

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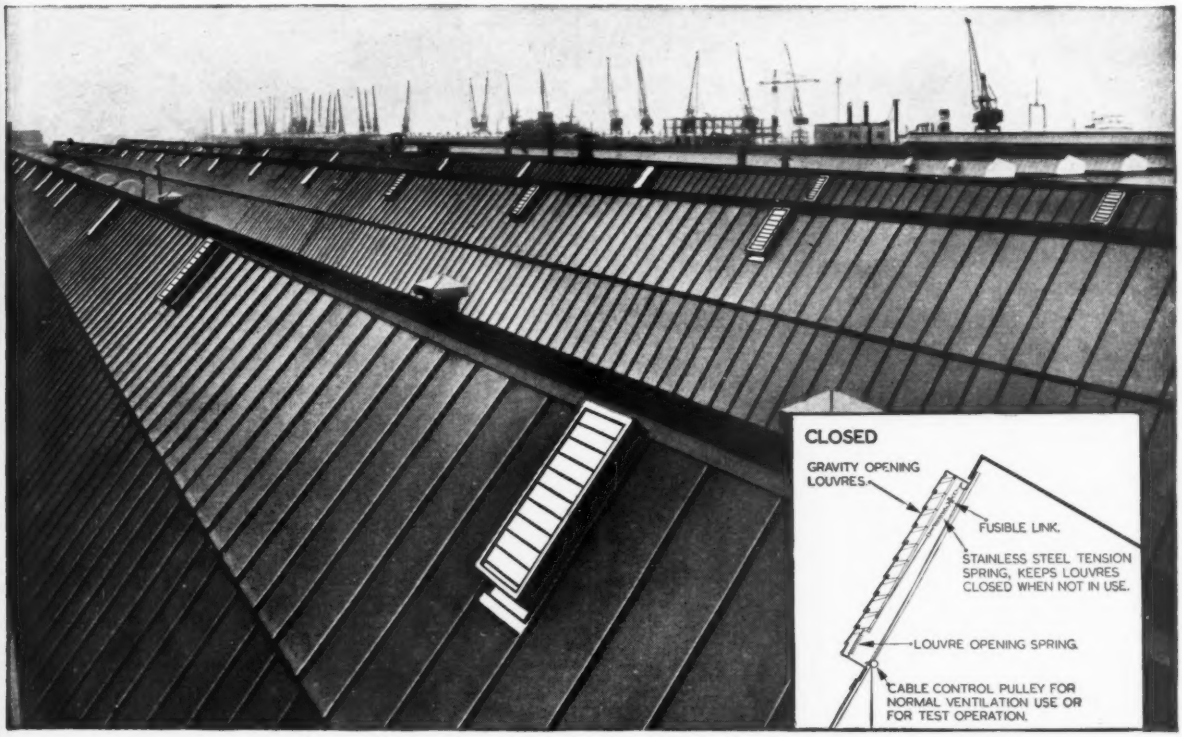


with the COLT DUAL PURPOSE FIRE VENTILATOR

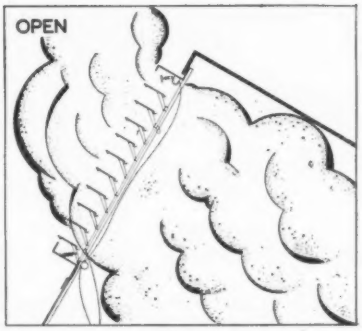
at AC-Delco, Division of General Motors Ltd., Southampton.

A study of industrial fires in Great Britain and in America has shown that the primary cause for the spread of fire is the super-heated air, smoke and explosive gases trapped under the roof. They build up in heat and intensity from the fire below and cause flash fires. Furthermore, the smoke rapidly extends downwards, entirely filling the premises and preventing the work of the fire fighters.

Colt have successfully solved this problem with the design of the Dual Purpose Fire Ventilator which **provides ventilation during normal conditions and—in the event of fire—functions as a heat and smoke exhaust.**

The installation of heat and smoke exhausts is standard practice in America and is rapidly being adopted by leading industrialists in the United Kingdom. Already, 1,290 Colt Dual Purpose Fire Ventilators have been installed in General Motors buildings in this country.

Write to Dept. L.9/6 for paper "Some Aspects of Fire Prevention in Industrial Buildings" by M. J. Reaney, which deals fully with this matter.



The insets illustrate the action of the ventilator as a Heat and Smoke Exhaust. In the event of fire, the fusible link fuses, providing Automatic Escape for Super-Heated Air and Smoke.

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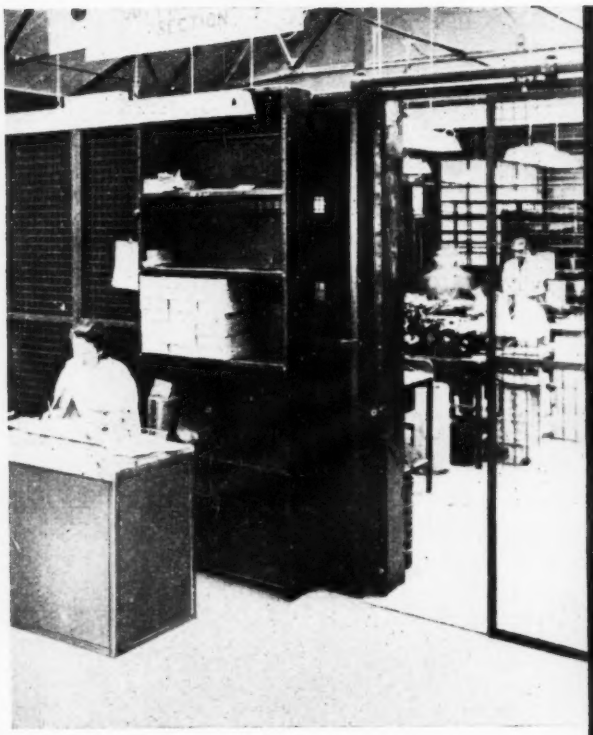

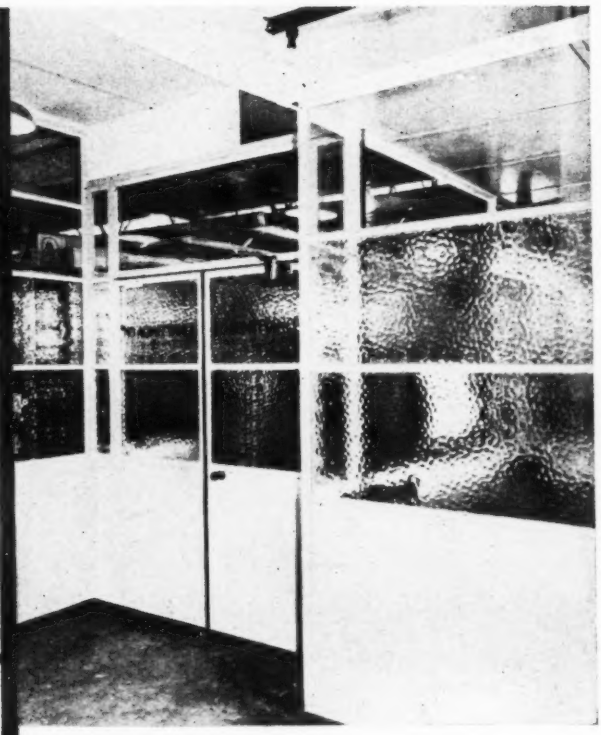

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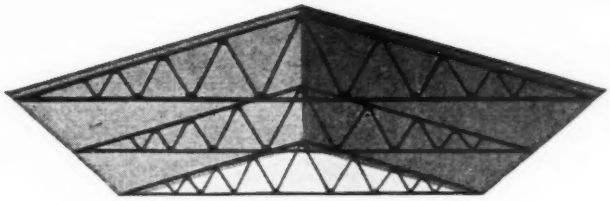
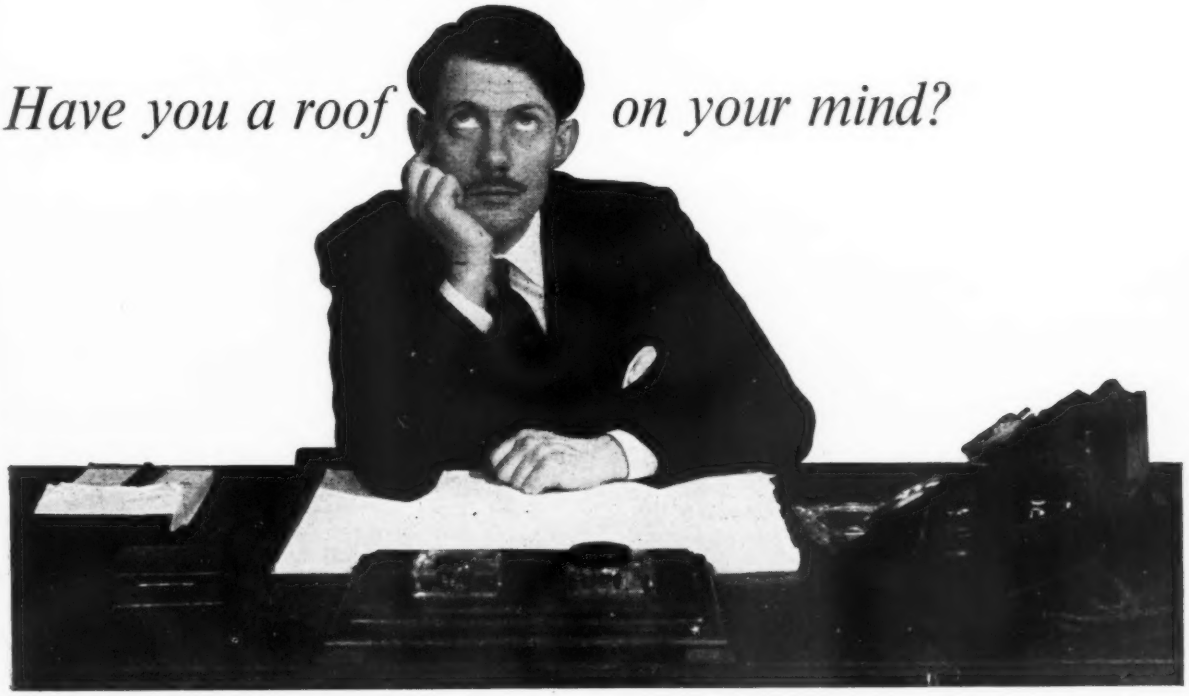


Have you a roof on your mind?



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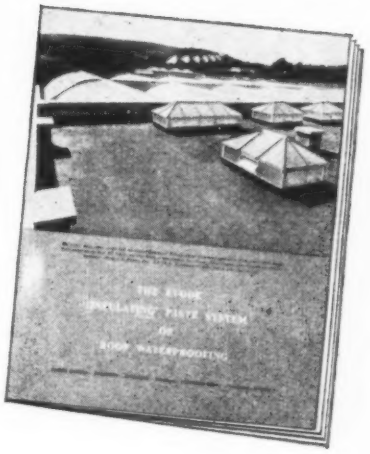

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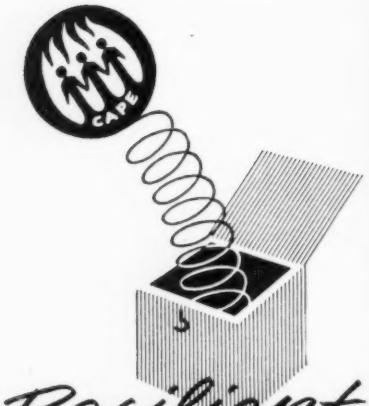

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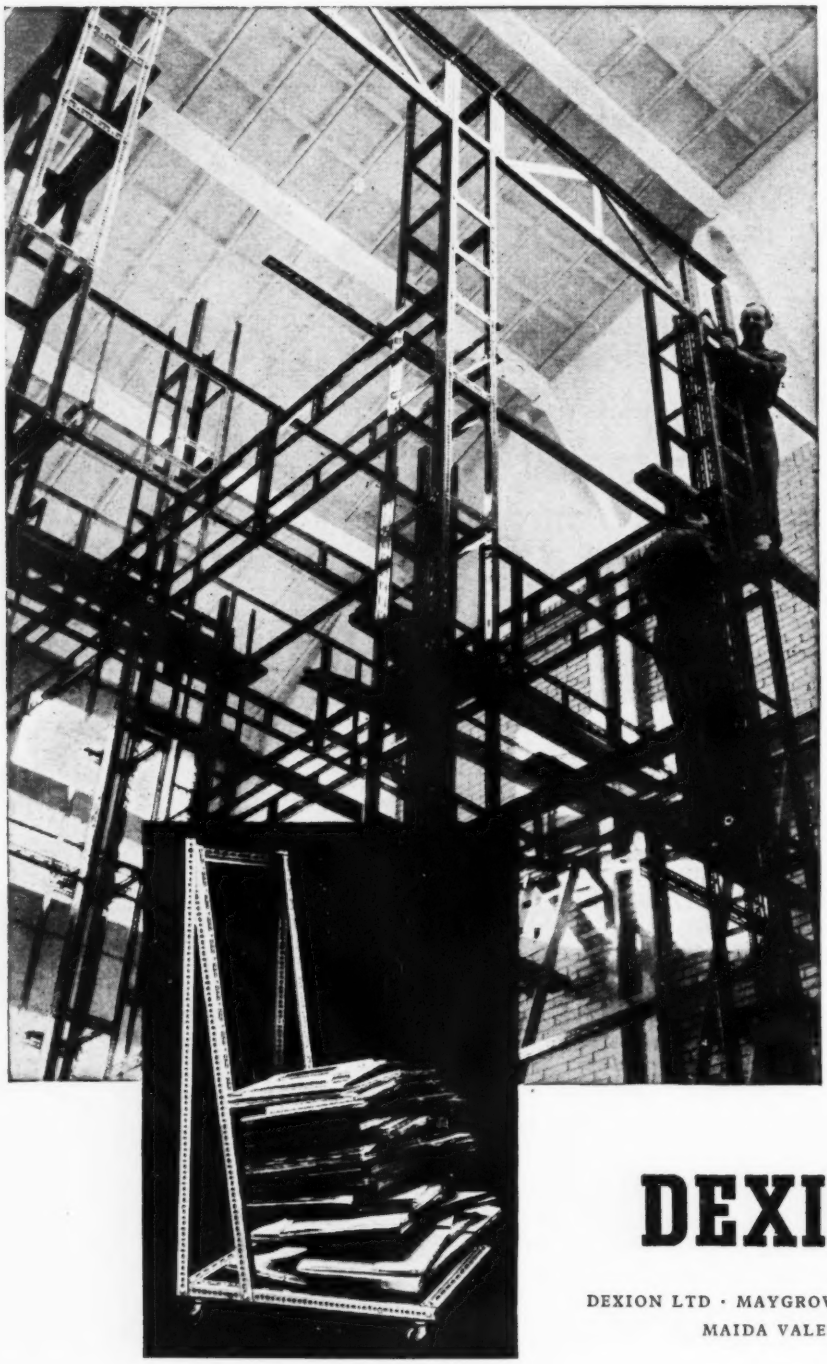

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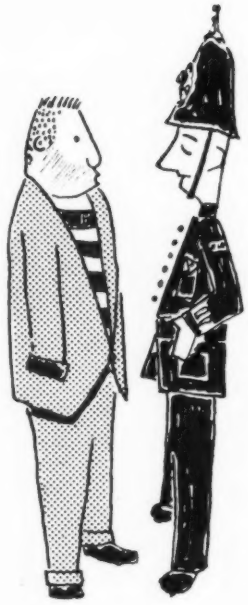

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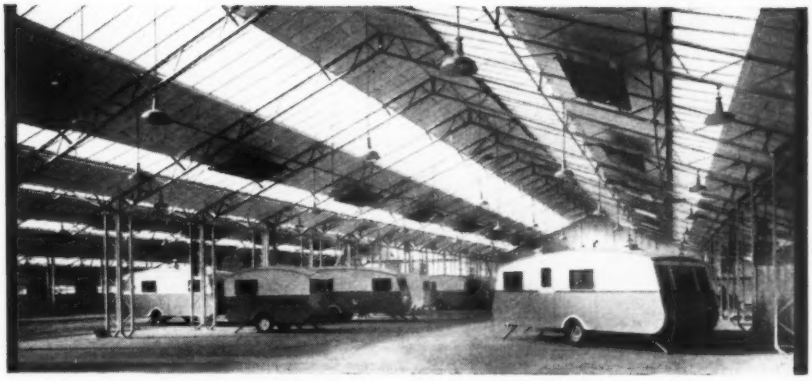
Architects: Philip Skelcher & Partners.



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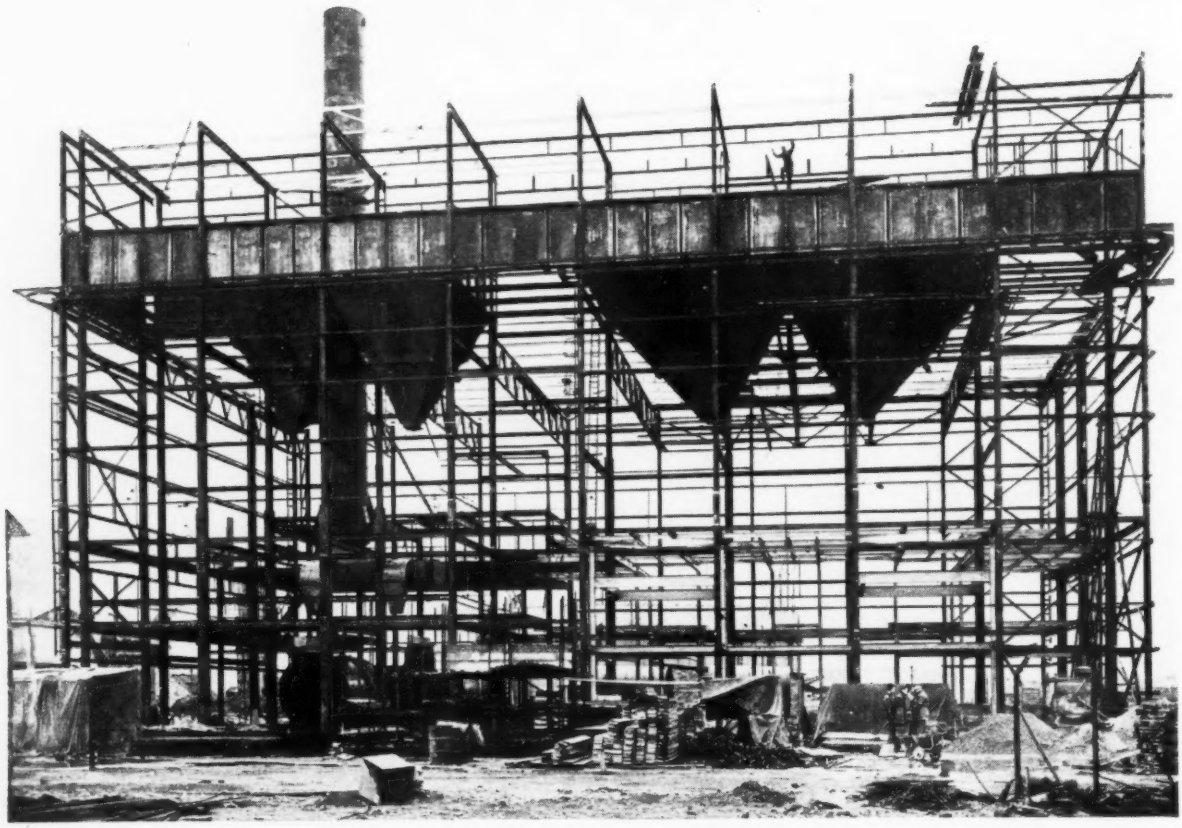

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Architects: T. Alwyn Lloyd & Gordon, P.P.T.P.I., F.A.R.I.B.A.
Contractors: Peter Lind & Co., Ltd.

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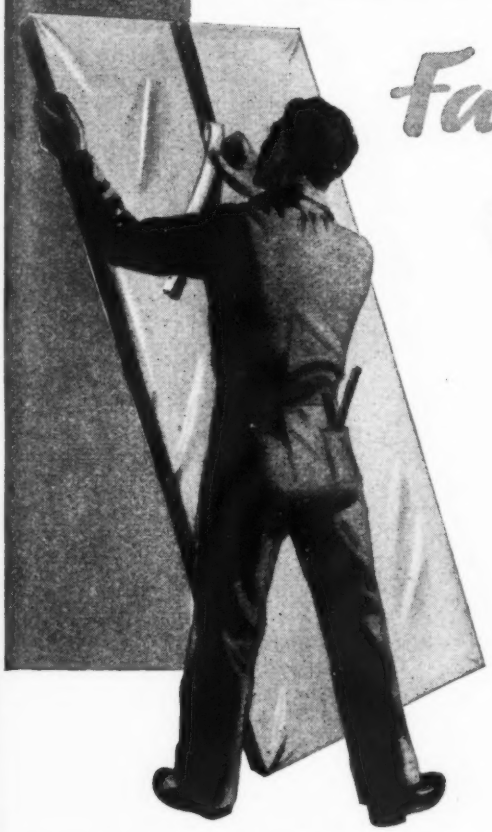

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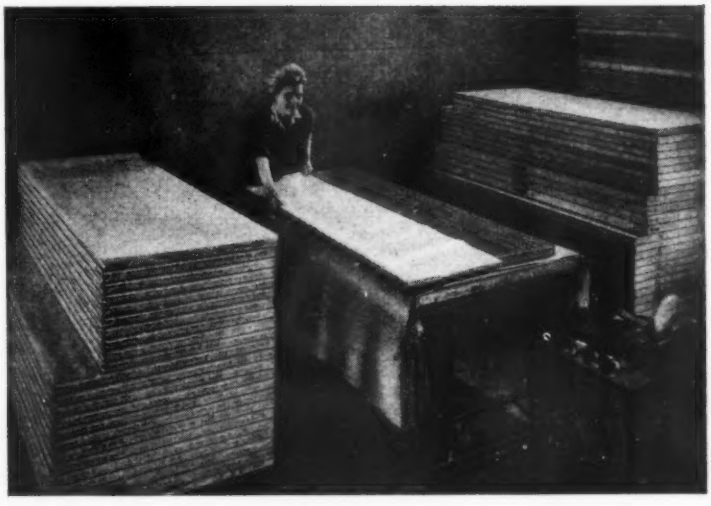

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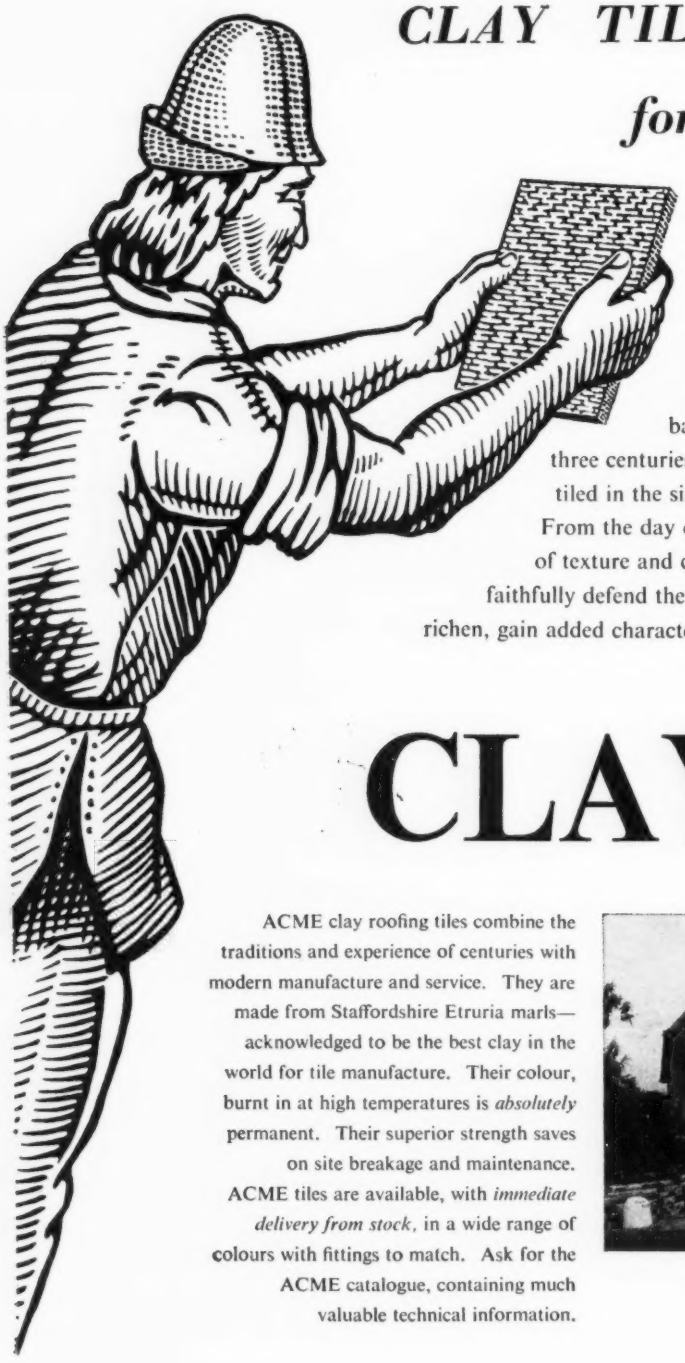

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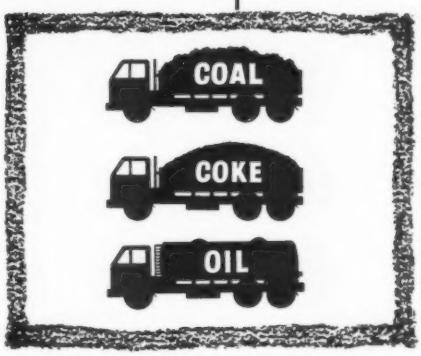

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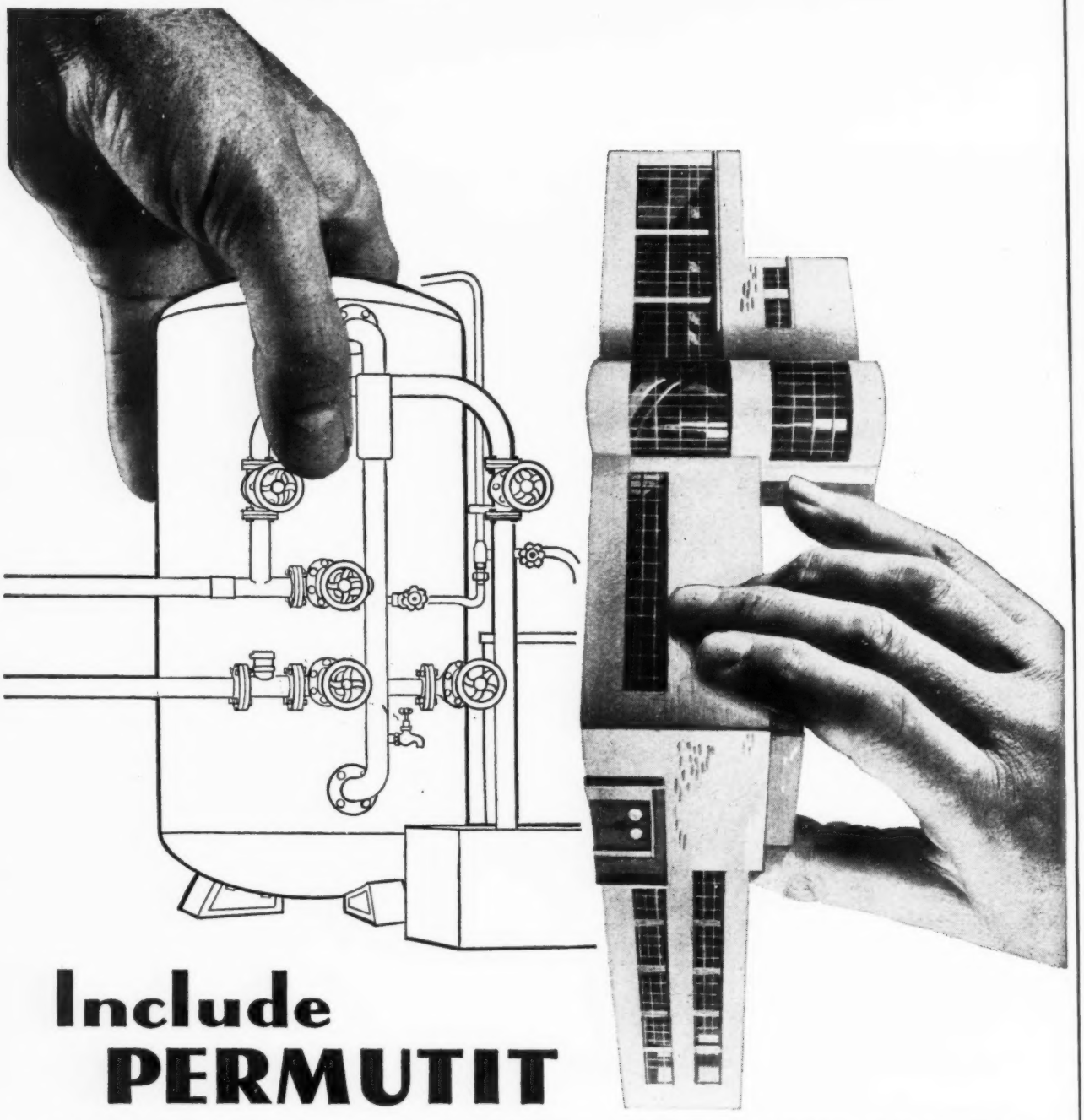

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BICC M.I. CABLES

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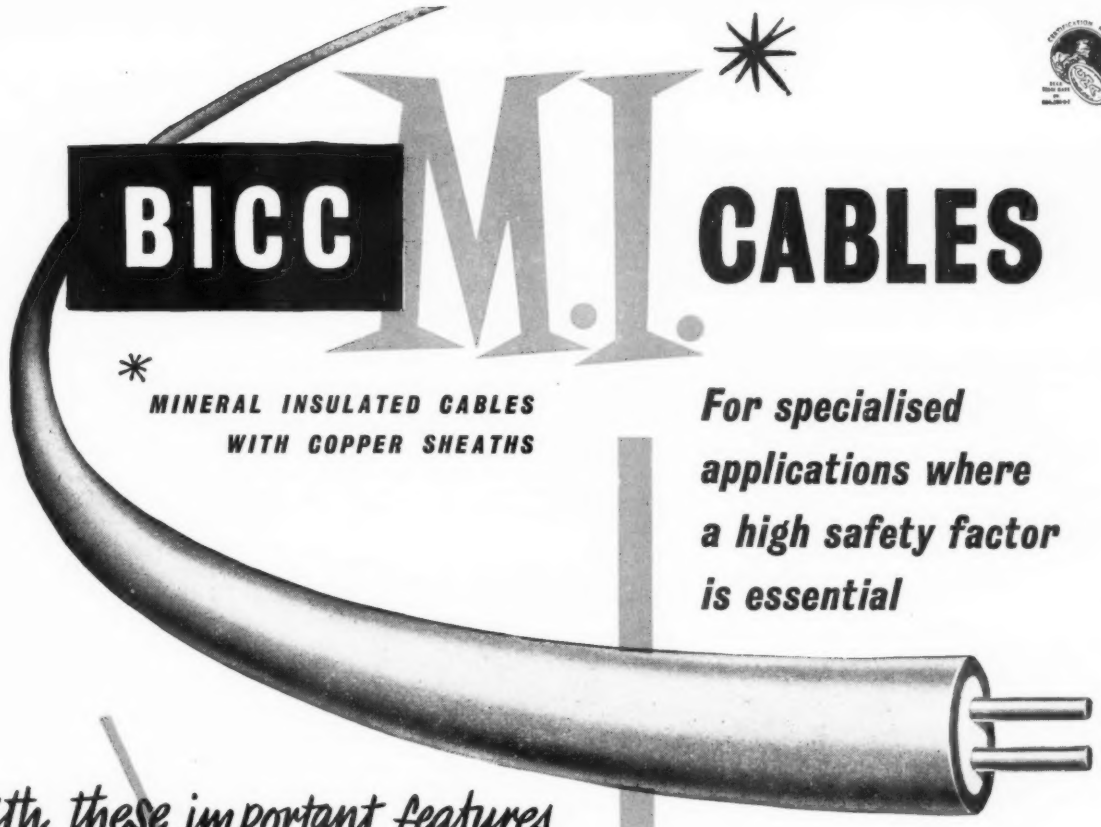

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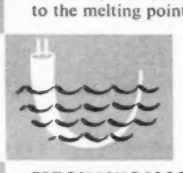
WATERPROOF

Cable and terminations are waterproof and free from internal condensation.



MECHANICALLY TOUGH

Withstand bending, heating, twisting and high external pressures — equivalent to armoured cables, virtually indestructible.

NON-AGEING

Being inorganic they are oil-proof, vermin-proof, corrosion and fatigue resistant — will not deteriorate.

EASILY INSTALLED

Can be bent, straightened and re-set, used and re-used.

BICC M.I. Cables are available for immediate delivery in 250V and 660V grades. The BICC Technical Advisory Service will gladly advise you about usage and methods of installation. Further information is available on request.

BICC M.I. Cables consist of fully annealed copper conductors embedded in compressed mineral insulant, within a solid-drawn copper sheath. These cables for both lighting and power applications have exceptional strength and electrical stability. New manufacturing techniques developed by the Company ensure accurate control of cable size . . . they are specially suitable for hospitals, factories, ships, public buildings etc.

FLAMEPROOF GLANDS

Designed and approved for use in conjunction with certified apparatus for flameproof classifications II and III. These glands are suitable for all sizes of M.I. cables. They may be distinguished from the standard gland by their greater thread length and by the letter 'F' stamped on them. The undoubted merits of the M.I. cable system can now be utilized to the full in the wiring of petrol pumps, tankers and oil refineries.

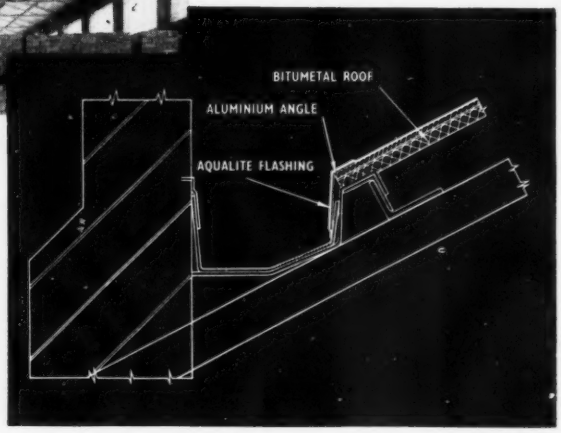
BRITISH INSULATED CALLENDER'S CABLES LIMITED, 21 BLOOMSBURY STREET, LONDON, W.C.1

To Architects about to plan Roofs...

This roof needs no maintenance

New Sugar Warehouse for Tate & Lyle, Ltd., Liverpool where complete weatherproof protection, freedom from maintenance and especially freedom from condensation were essential roofing requirements.

Contractors:
Sir Alfred McAlpine & Son, Ltd.



You can forget about maintenance when you have specified a "BITUMETAL" roof. All "BITUMETAL" Deck Units are composed of an Aluminium Alloy specially designed to combat corrosive conditions without paint or further treatment.

Consider the saving in renewal costs in the course of years; consider, too the continued reliability and appearance of the roof.

Our nearest Area Office will give you full technical details of "BITUMETAL" and explain how economical and adaptable it is for buildings large or small.

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ROOF plus CEILING plus INSULATION

BITUMETAL

Briggs Advisory Service will provide:
Complete Working Drawings.
Experienced Roof Technicians to advise at every stage of the contract.

This service is available in every part of the country.
LONDON—VAUXHALL GROVE, S.W.8
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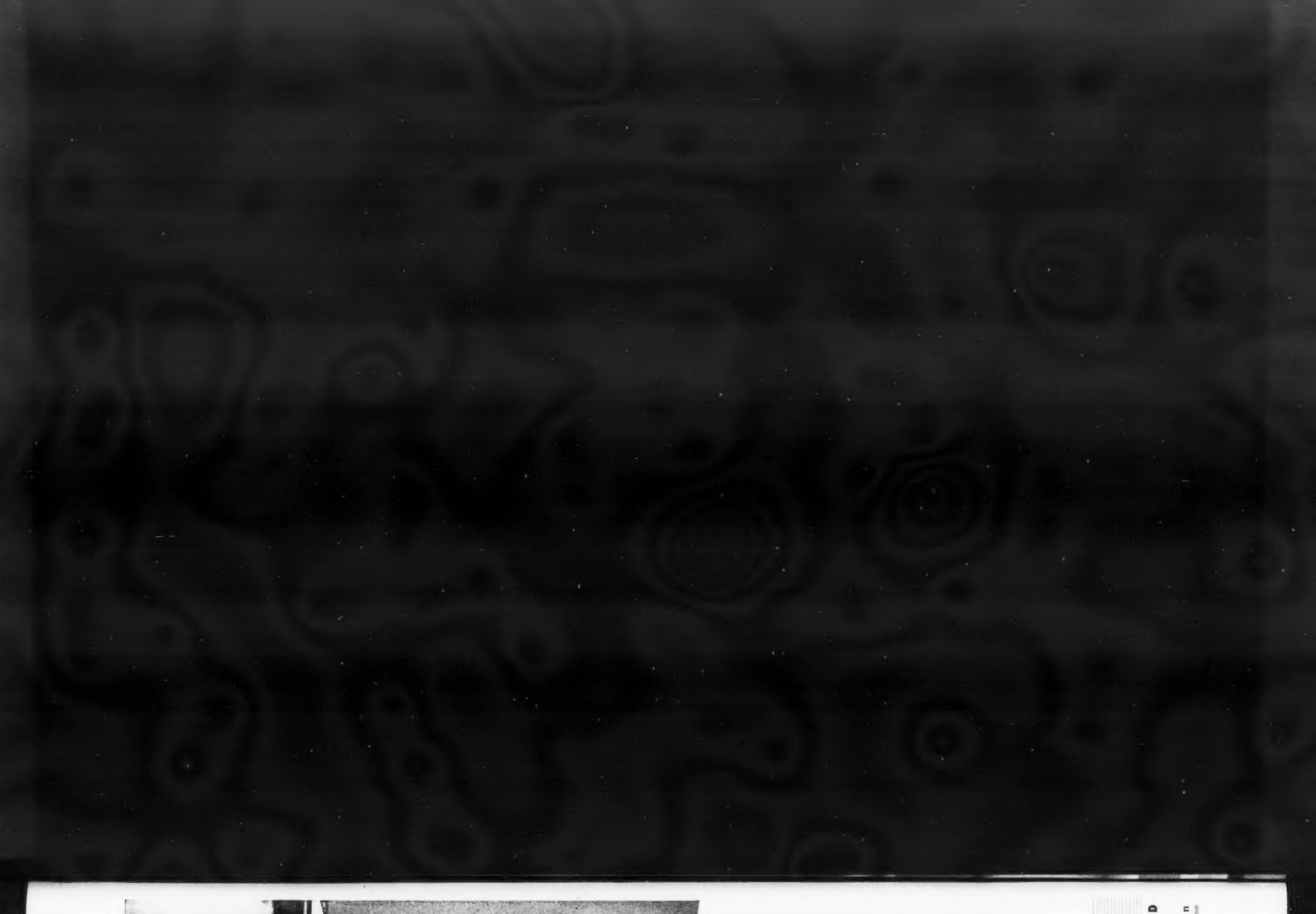
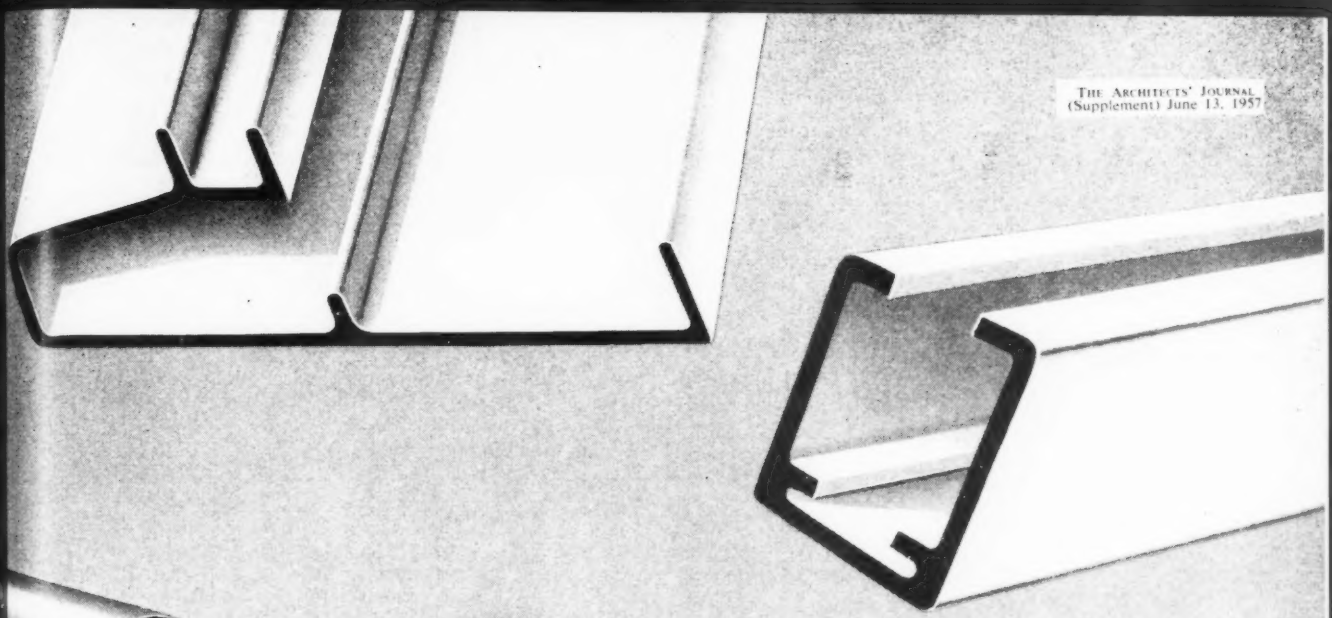
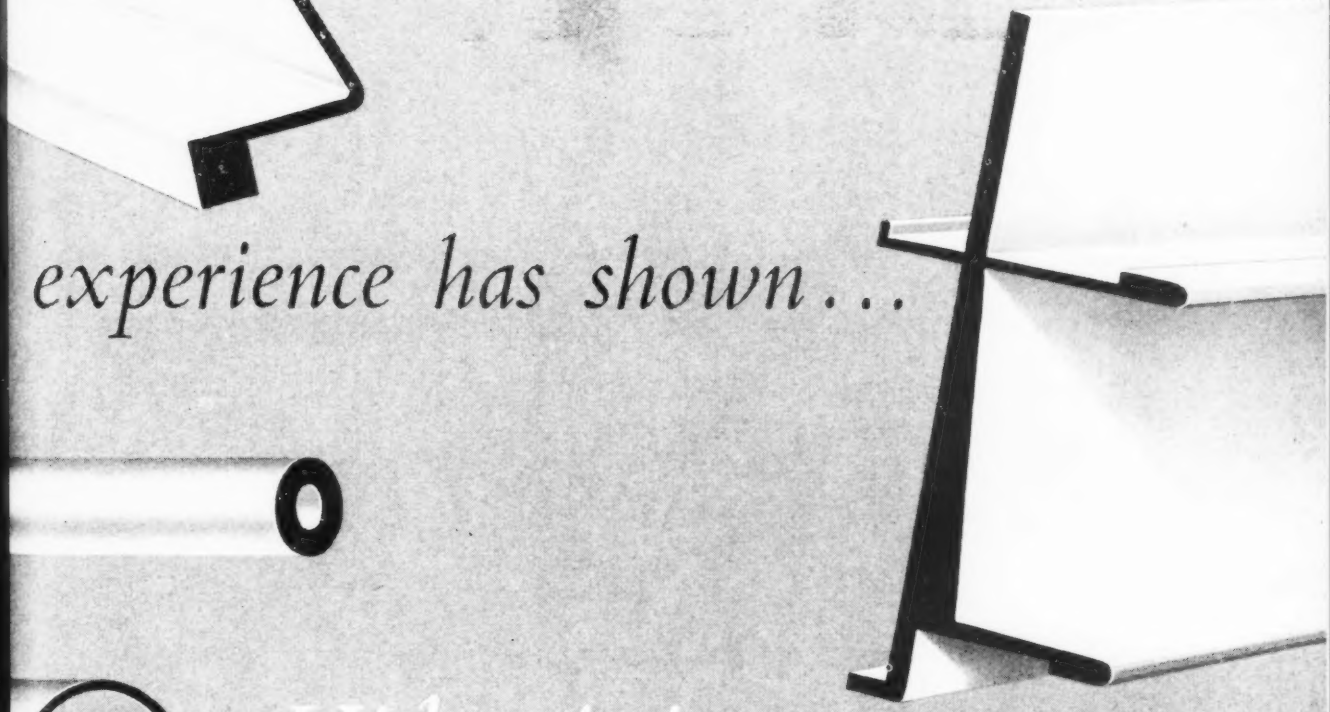
Installations for estimating and carrying out complete contracts also at
Aberdeen, Belfast, Bristol, Dublin, Edinburgh, Glasgow, Leicester, Liverpool and Norwich.





For all extrusions

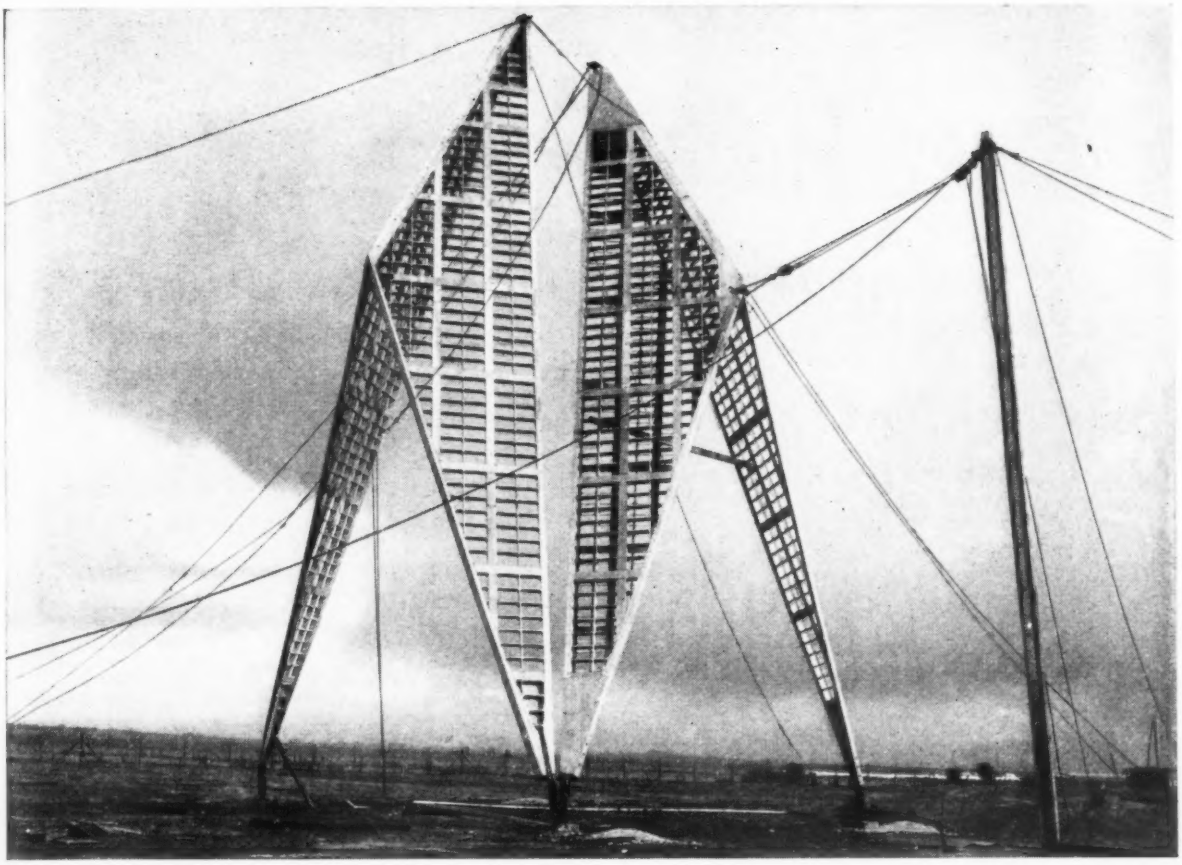
experience has shown...



Hiduminium

makes the most of *Aluminium*

HIGH
DUTY
ALLOYS LIMITED SLOUGH BUCKS



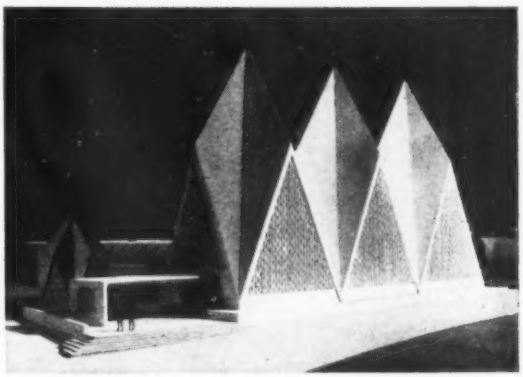
Crystalline Hall • British Government Pavilion • Brussels 1958

One of the most striking features of the Brussels International Exhibition in 1958 will be the Crystalline Hall—entrance to the British Government Pavilion—with its three great crystal-shaped spires 70 feet high. *Architects: Howard V. Lobb & Partners, F/F.R.I.B.A. (Consulting Engineer: Felix J. Samuely, B.Sc.(Eng.), M.I.C.E., M.I.Struct.E.).* These unusual structures are being prefabricated by Rainham Timber Engineering Co. Ltd.

Shown above is a trial assembly of four "egg-crate" panels, eight of which form one spire. The perimeter structural members are of Glued Laminated Timber. The difficult job of precision machining these large pieces (74 feet long) for a perfect fit was accomplished with complete success.

Other R.T.E. contributions to this Pavilion are the outside wall coverings of the Hall of Technology—a series of four-sided flat pyramids made of plywood—and the V.I.P. Hall which is a smaller construction similar to the Crystalline Hall.

R.T.E. are also responsible for the special Timber Curtain Walling incorporated in the British Industries Pavilion at the Exhibition, which will give the Pavilion four glass walls of approximately 60,000 sq. ft.



R/T/E

RAINHAM TIMBER ENGINEERING COMPANY LIMITED

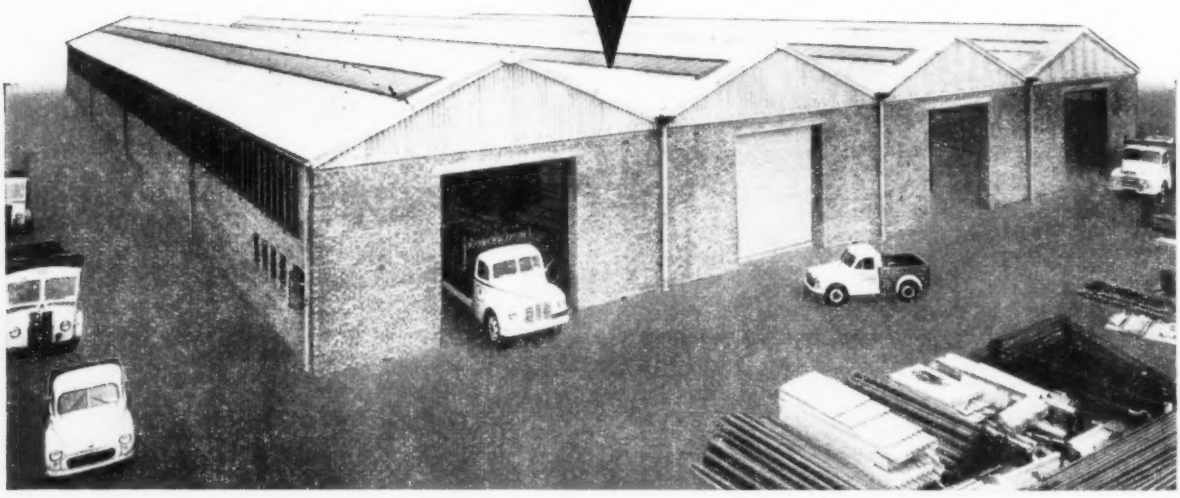
Ferry Lane, Rainham, Essex · Telephone: Rainham 3311

T·D·A Approved Manufacturer

CONSTRUCTION IN GLUED LAMINATED AND BOLTED & CONNECTORED TIMBER

The new Finch factory for constructional work

Higher standards of service. Improved quality. Speedier deliveries. These are what we expect to give you with the addition of this 4-span factory to our manufacturing facilities. We believe modern construction work demands modern service—and this is what we intend to provide.



FACTS AND FIGURES

The main structure of the factory, including the crane columns, is in welded-tubular construction. Length 240', height to eaves 16'. Spans 1 and 2 fitted with 3-ton overhead electric travelling crane. Spans 3 and 4 with 10 cwt. electric monorails. Each span 34' 0". Each end fitted with electrically operated roller shutters 15' 0" × 14' 0". Each roof slope and long side fitted with continuous Patent Glazing.

. . . and these are manufactures produced here.

STANDARD AND SPECIAL TUBULAR STRUCTURES.

TRADITIONAL STEEL STRUCTURES, INCLUDING CONVEYORS, STEEL STAIRCASES AND STEEL DOORS.

BALUSTRADES, RAILINGS, GATES, GRILLES, LIGHT IRONWORK, FUEL AND DUST HOPPERS, DUCTS, STEEL LADDERS. CLOAKROOM EQUIPMENT, CATERING EQUIPMENT, DUCTING, SHEET METAL-WORK.

THE Finch ORGANIZATION

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Head Office & Works: Belvedere Works, Barkingside, Essex. *Valentine 8888 (30 lines)*
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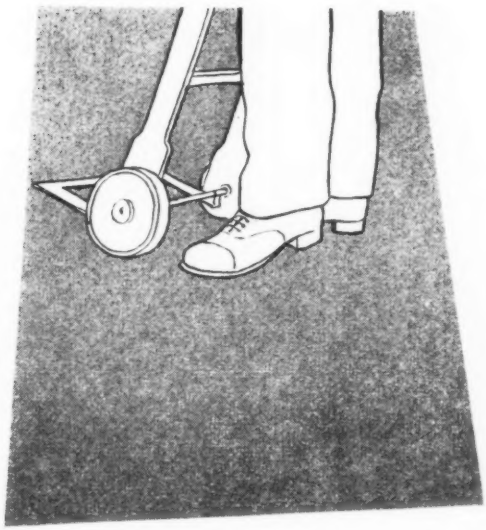
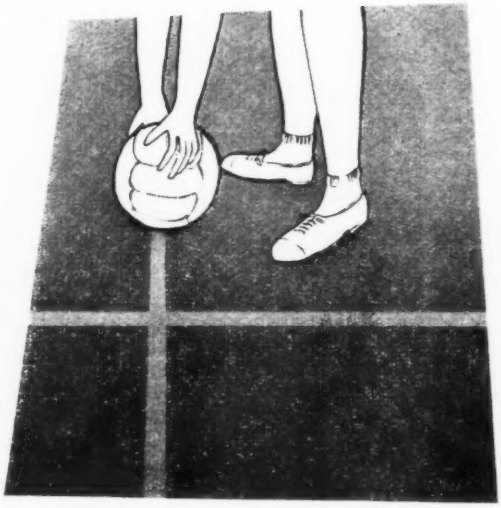
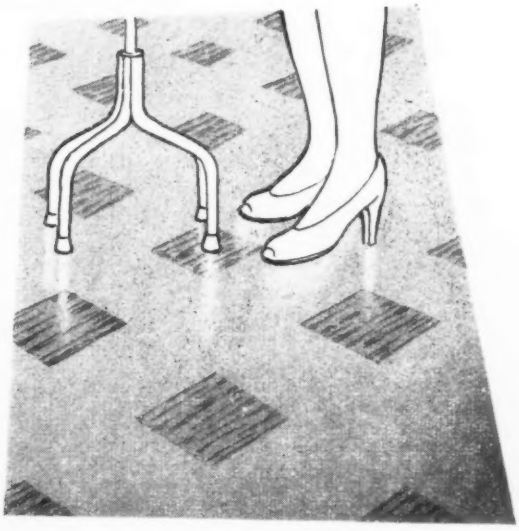


if there's a floor in the contract . . .





Different buildings, different floors—whatever the situation demands the architect can count on Haskel Robertson not only to supply and lay but to advise him, if need be, what material is best for the particular conditions. Only ONE contractor to remember, for the most competent and comprehensive flooring service in the trade.

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Firepak

IN-LINE BURNER FOR 35 SECONDS OIL

The burner is hinge mounted to the boiler — installation and maintenance are simple.

Only two pairs of electrical connections are needed.

The controls are an integral part of the burner.

Photo-electric cell is standard equipment for flame failure protection.

TYPE	FIREPAK I	FIREPAK II
	Pressure Jet	Pressure Jet
Capacity Imp. Galls/Hr.	0.66 to 1.65	1.1 to 3.3
Output B.T.U./Hr.	108,000 to 271,000	181,000 to 543,000
For boilers rated at B.T.U./Hr.	75,000 to 220,000	126,000 to 450,000
Dimensions	L.20" W.9" H.13⅜"	L.20" W.9" H.13⅜"
Weight	60 lbs	62 lbs.

WHITES OF HEBBURN (ENGINEERS) LTD. HEBBURN, CO. DURHAM. PHONE: HEBBURN 32224-6

supported by 40 years experience and research in oil burning

Firejet

BURNER FOR 200 SECONDS OIL

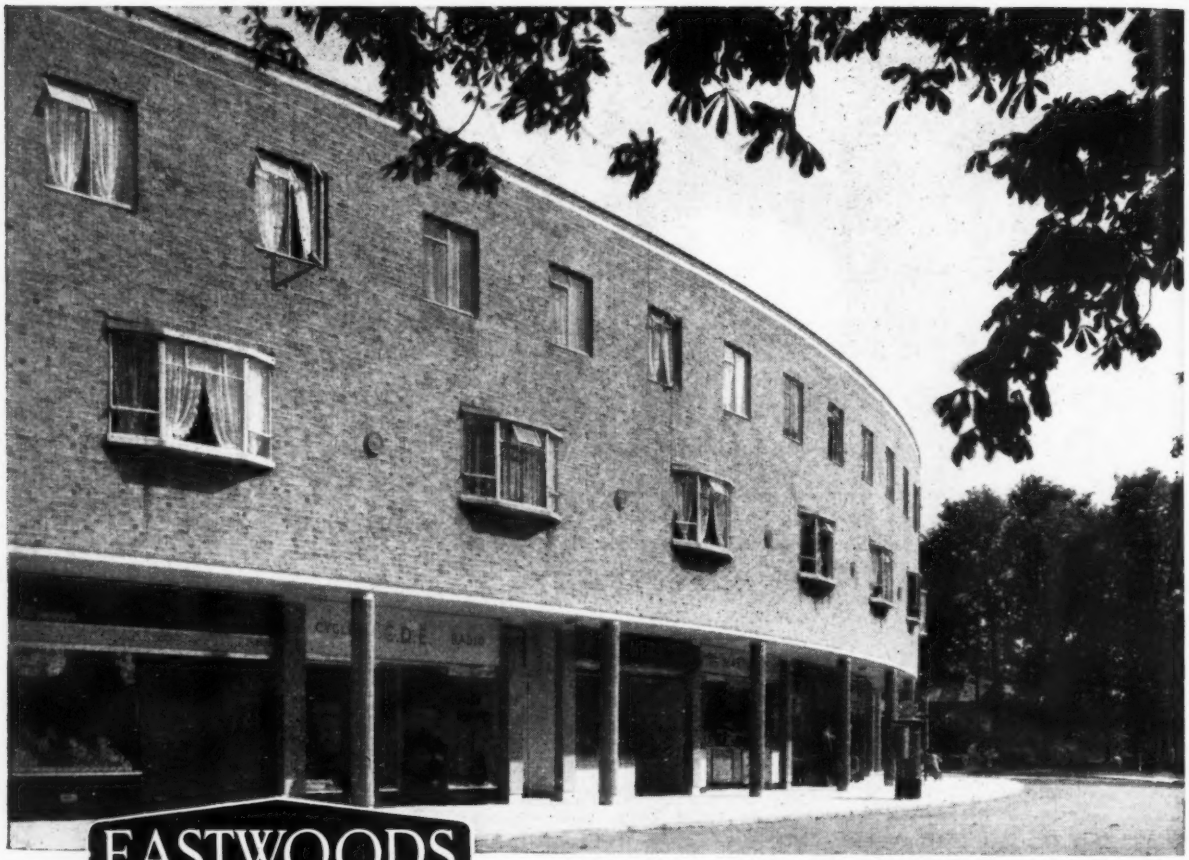
All burners are hinge mounted.

Control unit is compact and mounted on the burner.

Photo-electric cell is standard equipment.

Heaters : Two electric heaters form part of the burner; the main heater with hot oil filter on the right side of the draught-tube, and the final heater in the nozzle assembly.

TYPE	12P	25P	40P	60P
	Pressure Jet	Pressure Jet	Pressure Jet	Pressure Jet
Capacity Imp. Galls/Hr.	2.25 to 3.1	2.63 to 5.65	5.17 to 9.33	8.3 to 21.9
Output B.T.U./Hr.	397,000 to 543,000	460,000 to 988,000	905,000 to 1,630,000	1,450,000 to 3,830,000
For boilers rated at B.T.U./Hr.	300,000 to 450,000	350,000 to 800,000	650,000 to 1,300,000	1,015,000 to 3,000,000
Dimensions	L.21⅜" W.17⅝" H.20¾"	L.22¼" W.18⅜" H.21⅝"	L.23" W.21¼" H.23$\frac{13}{16}$"	L.25" W.22½" H.24$\frac{7}{16}$"
Weight	151 lbs.	156 lbs.	180 lbs.	203 lbs.
Heater Load	650 Watts	950 Watts	1750 Watts	2350 Watts

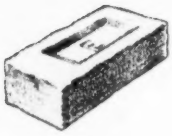


EASTWOODS

Architect: Hubert Bennett, F.R.I.B.A. Architect to London County Council. Contractor: Percy Hilton Limited

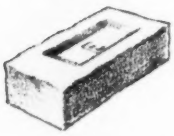
Stock Bricks

Prompt Delivery from Works to Your Site



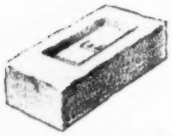
YELLOW FACINGS

A hard high grade stock facing of uniform deep colour and regular shape.
Their mellow warm colour make these bricks very suitable for special architectural features.



SECOND HARD STOCKS

An economical, reliable and well burned brick of varying colour and slight irregularity in shape, the well-known "London" Stock is in great demand for both facing and foundation work.



MILD STOCK FACINGS

Ideally suited for use as facings for schools, factories and housing schemes. Mild Stocks are fairly hard bricks with faces of good medium yellow colour.
They are of regular shape, fast in colour and strengthen with age.

EASTWOODS SALES LIMITED

Technical and Sales enquiries welcomed at:—Eastwood House, 158-160 City Road, London, E.C.1. Tel: CLErkenwell 2040

or at:—29 St. Sepulchre Gate, Doncaster. Tel: Doncaster 49256

Or any of our depots

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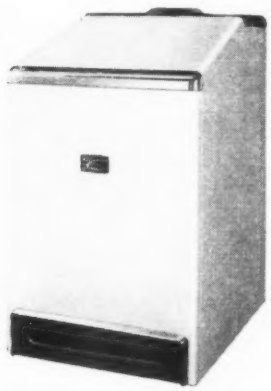
Do-it-itself
is gaining ground

Throughout the country there is a growing impatience with handling fuel and stoking and generally humouring boilers. Many people are prepared to pay a little extra for an absolutely automatic service of hot water or central heating or both.

'Potterton' Gas-Fired Boilers have been shown to be a very good proposition and well within the means of many owners of two or three bedroom houses. In a post-war house, for example, with good insulation—especially when clock controls are fitted—they will supply hot water and service a few radiators for background heating at quite an economical cost.

The 'Diplomat', latest addition to the 'Potterton' range is now available with outputs of 30,000, 44,000, 66,000 and 100,000 B.t.u/hr.

'Potterton' Oil-Fired Boilers are available in a wide range of sizes for hot water supply and/or central heating. Due to their high efficiency the fuel saving which they can achieve—one gallon in five as against the average conversion—is a very real consideration.



Burner and controls are totally enclosed in the 'Potterton' 70; it is designed for use with 35 sec. domestic fuel oil and has an output of 70,000 B.t.u/hr.

The 'Potterton' people naturally want to sell boilers, but their principal concern is to provide the particular boiler—be it gas-fired or oil-fired—which will best suit the customer's needs. To this end they have designed new boilers, competitive in price, that you can recommend with every confidence in the knowledge that you will give satisfaction to your customers by your recommendations.

Have you got the latest information and prices on 'Potterton' Boilers ?

POTTERTON BOILERS DE LA RUE

'Potterton' Boilers make the most of the fuel, *automatically*

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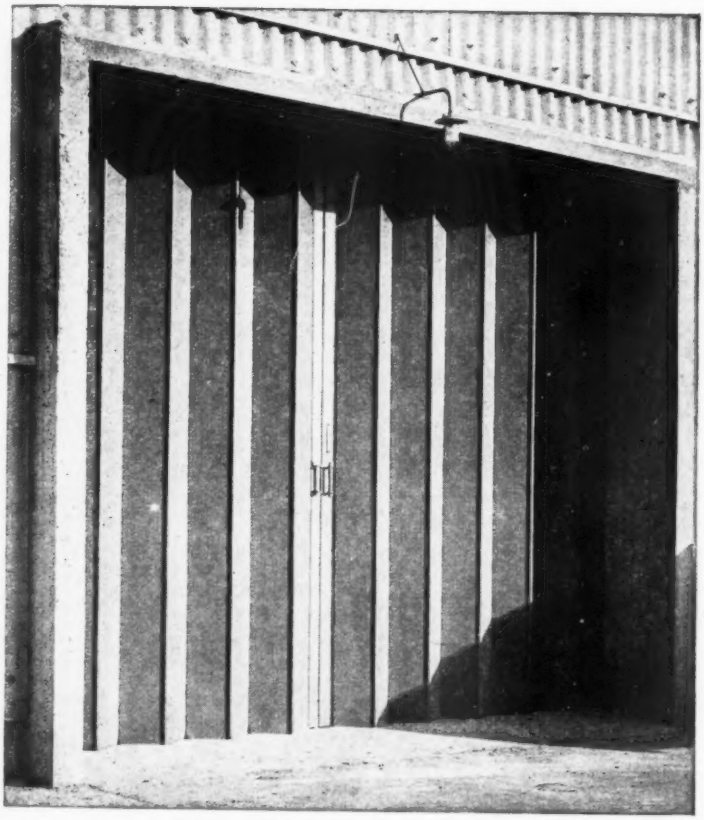
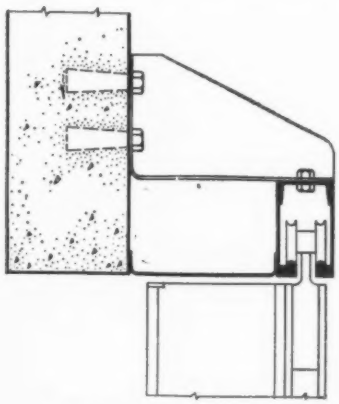
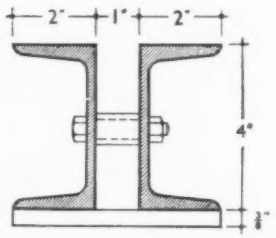




One of the many methods of fixing.

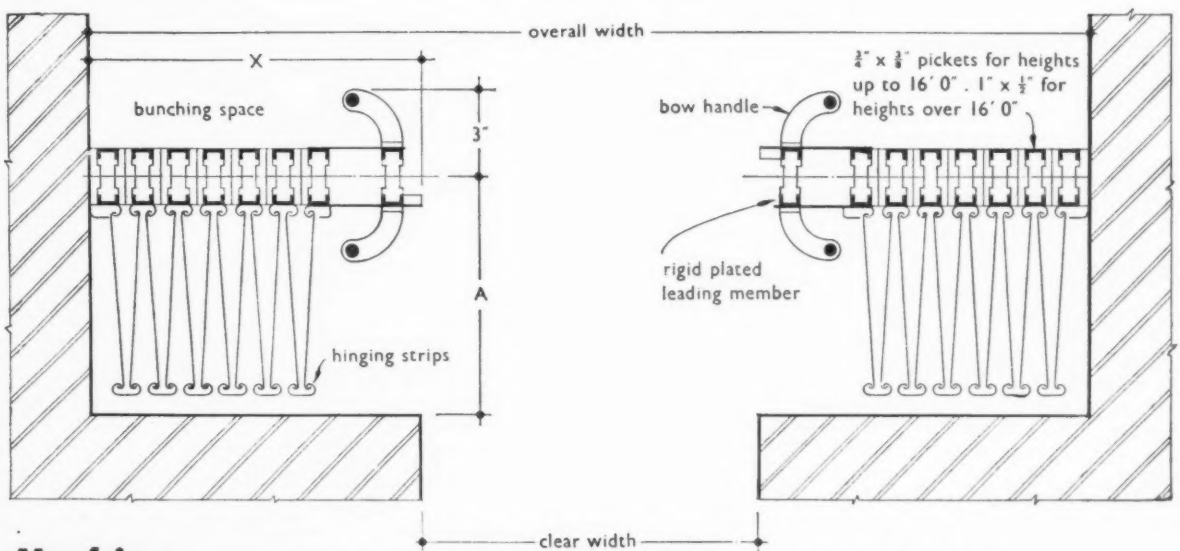


Heavy track to withstand continuous traffic.

Haskins Shutter Doors have been designed to provide economically a collapsible, fire resisting door suitable for industrial entrances.
Strongly constructed and attractive in appearance it is ideally suited to conditions where heavy and continual usage is likely to occur.
There are various types of top and bottom track to suit all openings and they can be operated Manually, Electrically, Pneumatically, etc. For full particulars write for Catalogue No. 273/55.

Haskins

SHUTTER DOORS



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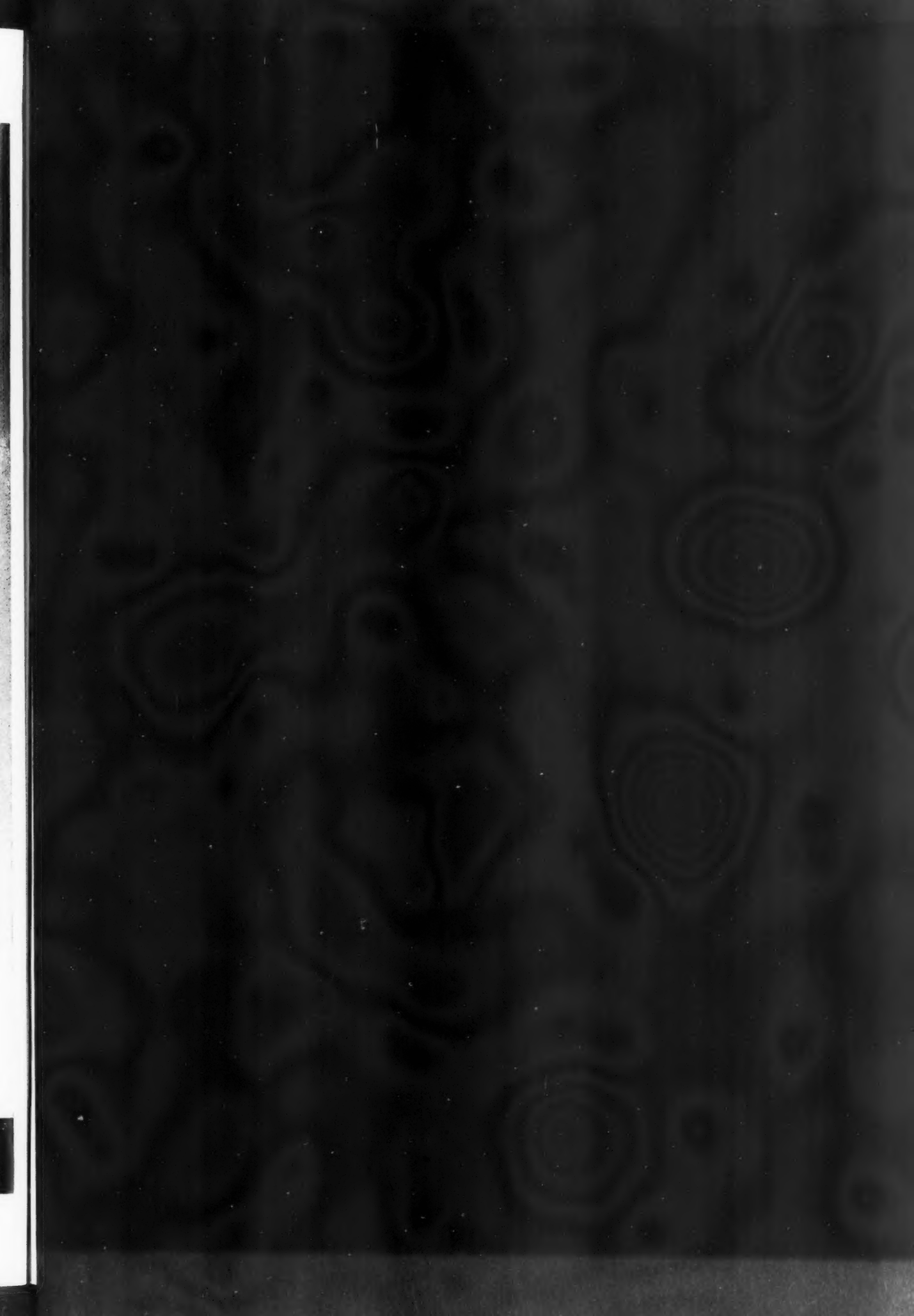
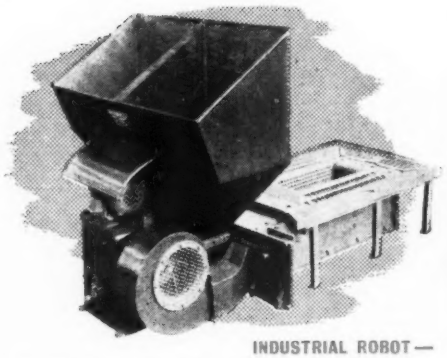
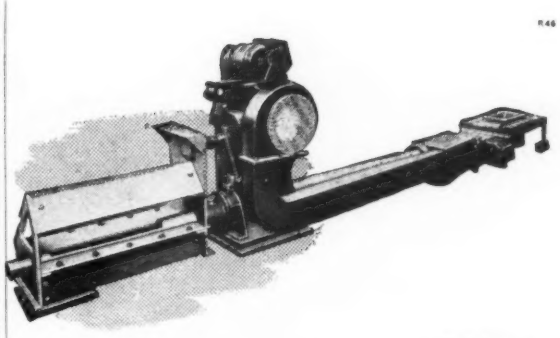




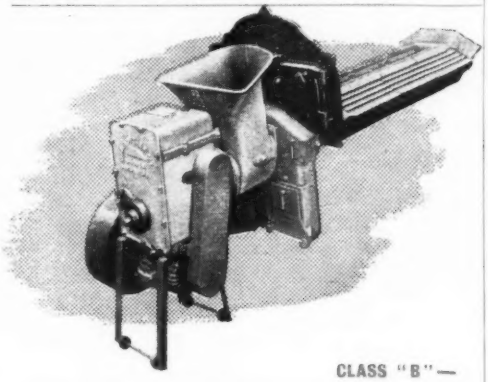
INDUSTRIAL ROBOT—

Hopper feed. For the larger vertical boilers, water tube and locomotive boilers, hot water and steam heating systems and steam processes.



DIREKTO—

Bunker feed. For sectional boilers in domestic hot water and space heating systems. Also for vertical boilers used in steam-raising. Feeds direct from bunker to boiler *below floor level.*

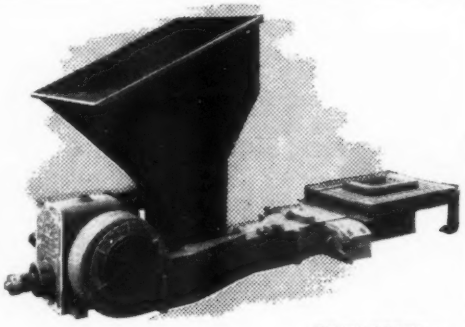


CLASS "B"—

Hopper feed. For Cornish, Lancashire and Economic boilers. Specially designed with grate to fit into circular furnace flues.

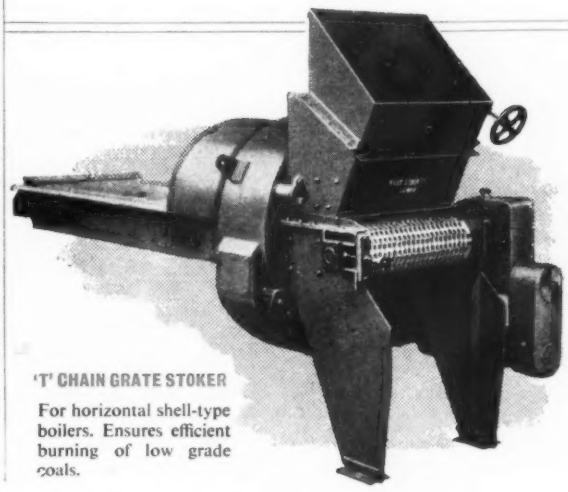
A RILEY STOKER FOR EVERY TASK

To get the best out of a boiler keep it burning contentedly with a Riley Stoker. Over fifty years' experience of mechanical stoking methods is concentrated into every Riley design. Special advantages include efficient smokeless combustion with small bituminous coals, and close control of temperature and pressure to suit the boiler load by automatic adjustments of coal and air.



RILEY ROBOT—

Hopper feed. Suitable for sectional boilers in domestic hot water or space heating systems—and vertical boilers for steam-raising.



'T' CHAIN GRATE STOKER

For horizontal shell-type boilers. Ensures efficient burning of low grade coals.

RILEY (IC) PRODUCTS LIMITED

Mechanical Stokers · Syntron Electric Vibratory Equipment · Member of the International Combustion Organisation

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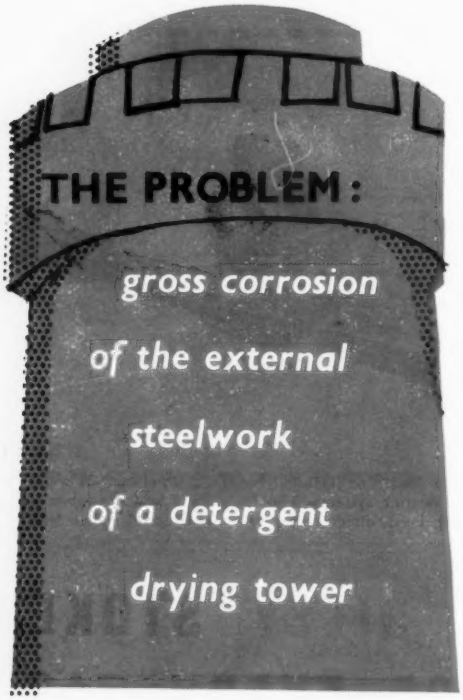


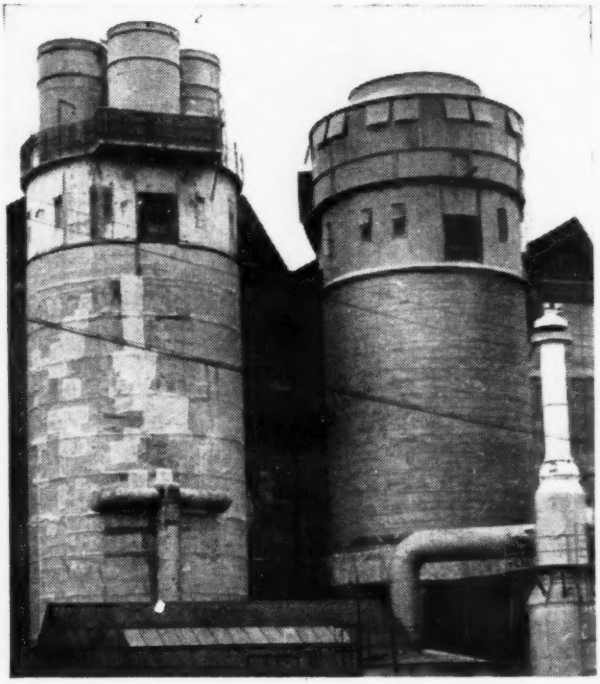
High humidity, high temperature and chemical vapours are part and parcel of the detergent drying process at the works of Joseph Crosfield Ltd., Warrington. The detergent slurry is dried in a tower at 100°C. and when the moisture has been freed from dust, it is exhausted at the top of the tower, via a wet scrubbing system. This process quickly eats into the external steelwork and conventional paints have given only short-lived protection.

THE ANSWER:

a paint that lasts for years

The tower on the right was painted two years ago with an amine-cured paint based on Shell's Epikote Resins. This paint is still in excellent condition and giving complete protection. Contrast this with the left-hand tower, painted with conventional paint at the same time, and used for a far less corrosive process.

For real maintenance savings, ask your paint supplier about paints based on Epikote Resins. The more severe the conditions, the more effective and cost-saving is the protection they offer !



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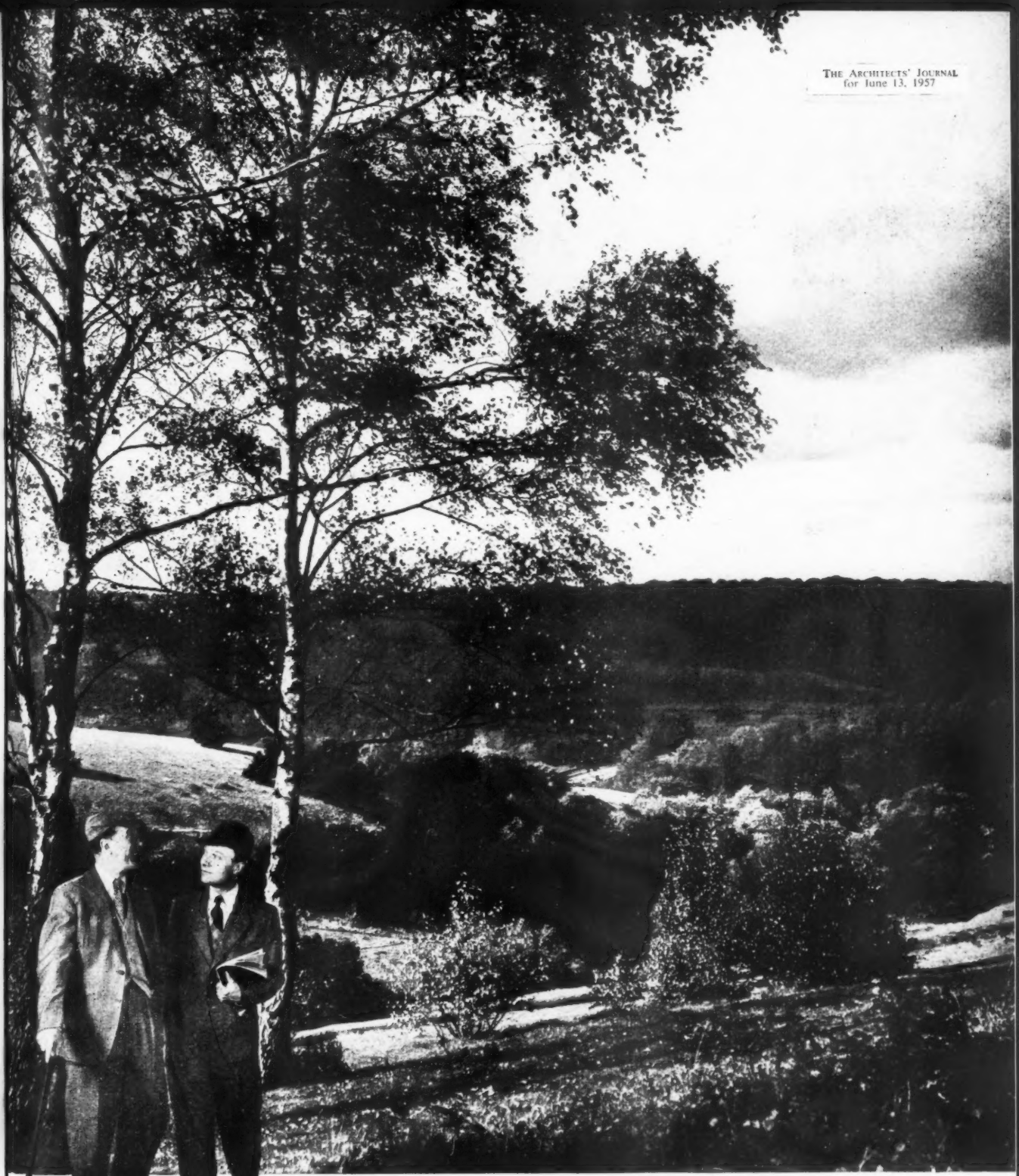

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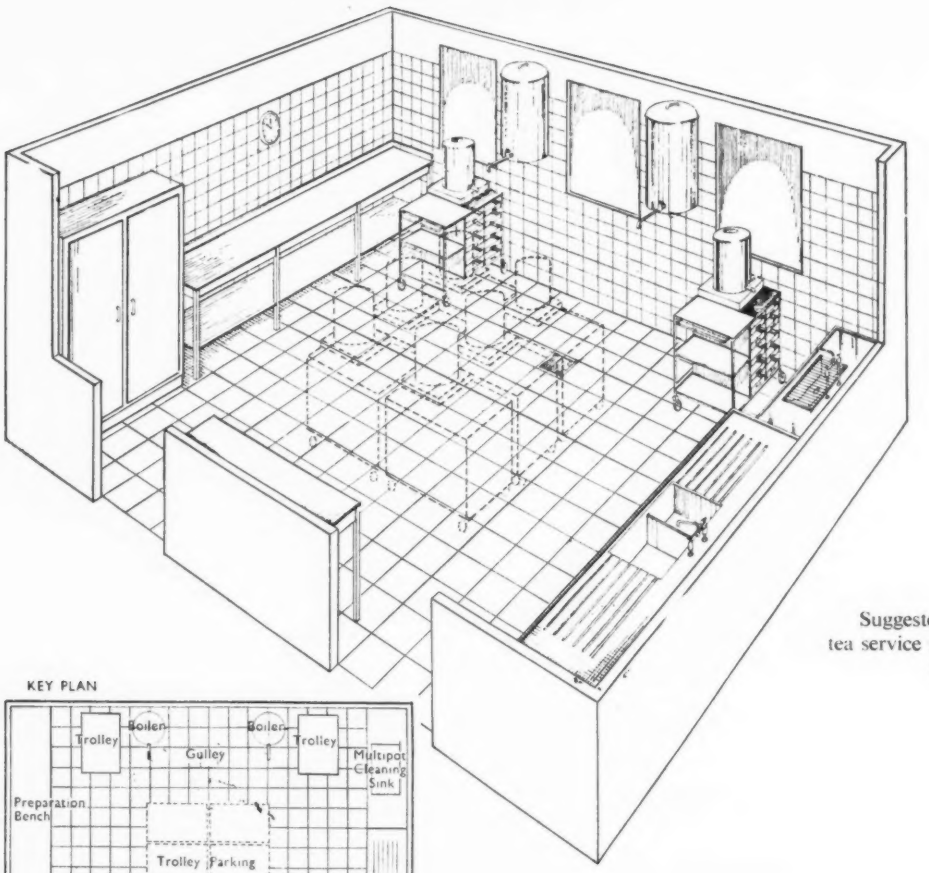
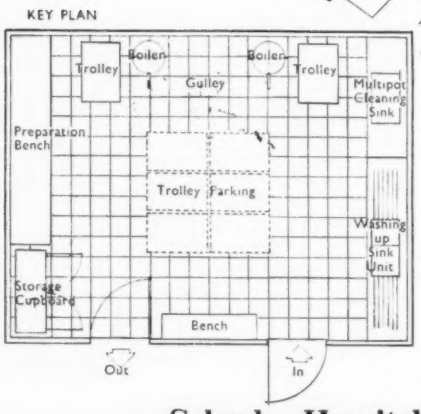


Suggested layout of a tea service trolley station for 8 trolleys.



KITCHEN DESIGN

—Schools, Hospitals, Factories, Hotels, Restaurants and Cafés

Public catering has increased considerably in the post-war years to include most of the larger factories. Meals are likewise provided in schools, hospitals, sanatoria, office canteens, self-service meal counters and so on. The public has also shown an increased interest in the continental habit of 'dining out' at hotels and restaurants as an evening's entertainment. Of course these different establishments provide different menus, different methods of cooking and different services within different price ranges so that kitchens of any one class cannot be compared precisely with those of another. Yet the efficiency of any kitchen depends upon the correct selection, arrangement, operation and care of appliances enabling chefs and kitchen staff to accomplish the maximum effective work in the minimum time. Many establishments have applied time and motion study methods in the preparation of specifications of the kitchen layout and capacity of the equipment.

The Gas Industry through its Area Gas Boards has studied the design and layout of industrial and commercial kitchens throughout the country for a number of years. Although each Area Gas Board supplies kitchen appliances, yet the Gas Industry adopts the modern tendency in commerce of market research and technical sales service as an essential to good business relationships. To this end teams of experts have made continuous surveys over a large cross-section of public service caterers. They have obtained information on (1) The type of equipment used; (2) the capacity of the equipment; (3) the fuel used; (4) specimen menus of the meals; (5) numbers of meals cooked; (6) registered gas consumption; (7) whether gas kitchens were under- or over-equipped.

Kitchen Surveys

In fact, one recent comprehensive survey in the South of England covered hospitals, day schools, boarding schools, works canteens, hostels, and civic restaurants. From this it emerged that both fuel costs and overall costs per similar meal vary considerably. Through study and comparison of these costs with the degree of kitchen planning and with the care taken in maintenance and installation, the Area Gas Boards are able to offer advice for an adequate economic meal service which is based upon practical experience.

A kitchen must be well designed at its inception, for subsequent alterations and modifications are expensive and never

give the same ultimate satisfaction. If any Area Gas Board is approached by the caterer or his architect, he can benefit from the pooled knowledge and advice arising from such surveys. Whatever the particular problem, the Area Gas Board will provide a specification and design layout as a technical guide to both the architect and caterer. This service is free, authoritative and practical.

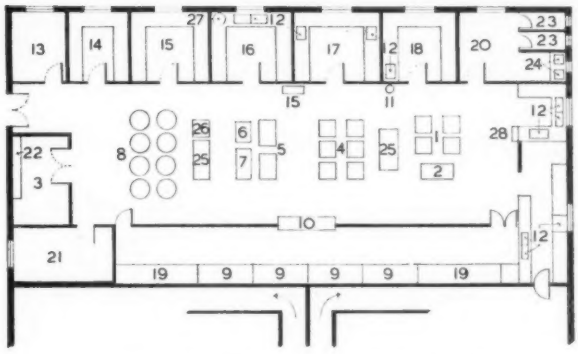
The Ministry of Education, working closely with the Hotel and Catering Institute, is actively promoting the education of young people in both basic and advanced cookery—now more than 8,000 students are receiving such instruction. In the training of cooks the need for accurate and easily manipulated control of a wide range of cooking temperatures make gas almost a universal fuel, both during instruction and in ultimate food preparation. Many training Colleges use completely gas-equipped training kitchens.

Results are the criterion of success

The following well-known restaurants and hotels using gas kitchens are worthy of more than passing thought by the caterer. The Westbury Hotel (London's first 'American' hotel) costing some three million dollars was provided with a gas kitchen including a four-unit solid top range, an under-fired grill, salamander, deep fat fryer, hot closet, bain-marie and carving wells. The Piccadilly Hotel, London, a twelve-oven-size gas range with the latest burners. The ovens are thermostatically controlled and incorporate a heavy duty salamander which can be used from either side of the range. In the centre on each side there is a hot closet section with open bain-marie. One end of the range has three oval frying pans and the whole unit is finished in high grade enamel and stainless steel.

The L'Ecu de France, well known for its variety of dishes prepared by many famous chefs, also uses a modern gas kitchen. There is a battery of seven solid top cookers with an under-fired gas grill—the whole kitchen is designed especially for speedy service. Add to these the Marine Hydro, Rhyl; the Beach Ballroom, Aberdeen—where there is normal service of 300 to 400 meals a day with a similar number of high teas, and which on special occasions will accommodate from 1,000 to 1,200 diners; the Park Lane Hotel, London; Simpson's Restaurant in Piccadilly—using an up-to-date gas-fired roasting spit. The Stratford Memorial Theatre is attended by some 43,000 visitors from all parts of the world each month. Meals are planned and prepared in a modern gas kitchen, most of the cooking being done on a four-oven range. An average of some 1,350 meals is served a week, with up to 12,000 hot drinks in the same period.

A recent report from the Chief Factory Inspector said that in all newly-built factories of any appreciable size a canteen has now come to be regarded "as one of the essential employee services" and that "new canteens are of excellent design and sensibly planned". The Docks and Inland Waterways Executive, Southampton—Reckitt and Colman Ltd. in their Norwich factory—the British Nylon Spinners Ltd. factory at Pontypool—the English Steel Corporation in their Sheffield factory, are just a few excellent industrial canteens using gas kitchens.



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11. Mixing Machine
12. Sinks
13. Office
14. Dry Store
15. Vegetable Store
16. Vegetable Prepar't'n
17. Meat and Fish Preparation
18. Pastry and Sweet Preparation
19. Cold Cupboards
20. Staff Room
21. Staff Dining Room
22. Slated Shelves
23. Water Closets
24. Hand Basins
25. Table
26. Cooling Racks
27. Potato Peeler
28. Pot Rack

Portable tables used as required.

Whatever the size of Hotel, Restaurant or Canteen its reputation hinges upon its catering service. Good meals entail careful kitchen planning, the right choice and placing of the equipment, as well as wise food purchasing. Then dishes are well cooked, service delays are eliminated, no difficulties are experienced in dealing with fluctuating demands, labour is saved and a more contented staff leads to greater factory output.

In view of the widespread preference for gas in all industrial and commercial kitchens, the Gas Industry, through its Area Gas Boards, regularly collates information on the latest developments in kitchen planning and design and the performance of gas appliances.

The Gas Industry through its Area Gas Boards has helped many caterers to run their premises more efficiently, more economically, and more profitably.

REFERENCES

Up-to-date information on the use of gas for large-scale catering is obtainable from:

Scottish Gas Board, Edinburgh
Northern Gas Board, Newcastle-upon-Tyne
North Western Gas Board, Manchester
North Eastern Gas Board, Leeds
East Midlands Gas Board, Leicester
West Midlands Gas Board, Birmingham
Wales Gas Board, Cardiff
Eastern Gas Board, London, S.W.1
North Thames Gas Board, London, W.8
South Eastern Gas Board, Croydon
Southern Gas Board, Southampton
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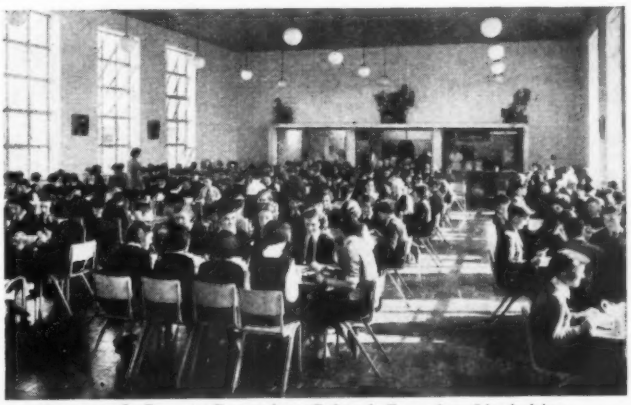
The Gas Council, 1 Grosvenor Place, London, S.W.1



Longcroft County Secondary School, Beverley, Yorkshire—a co-educational day school where some 600 pupils take their mid-day meal.

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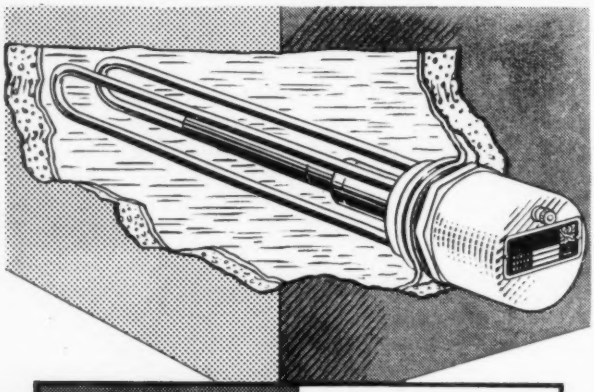

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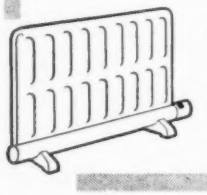

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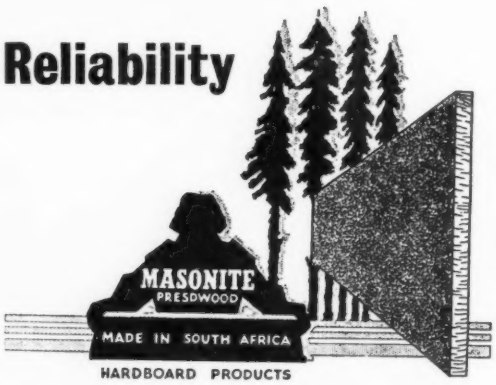

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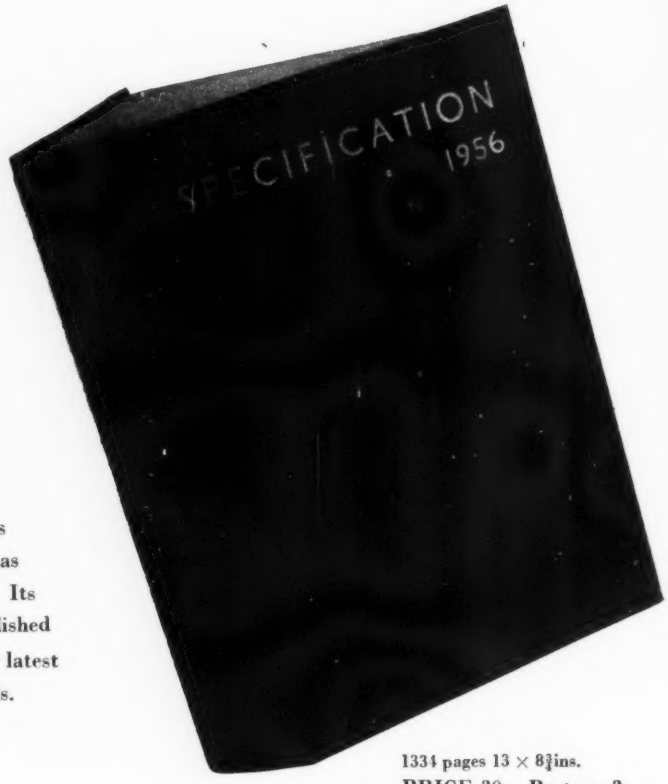

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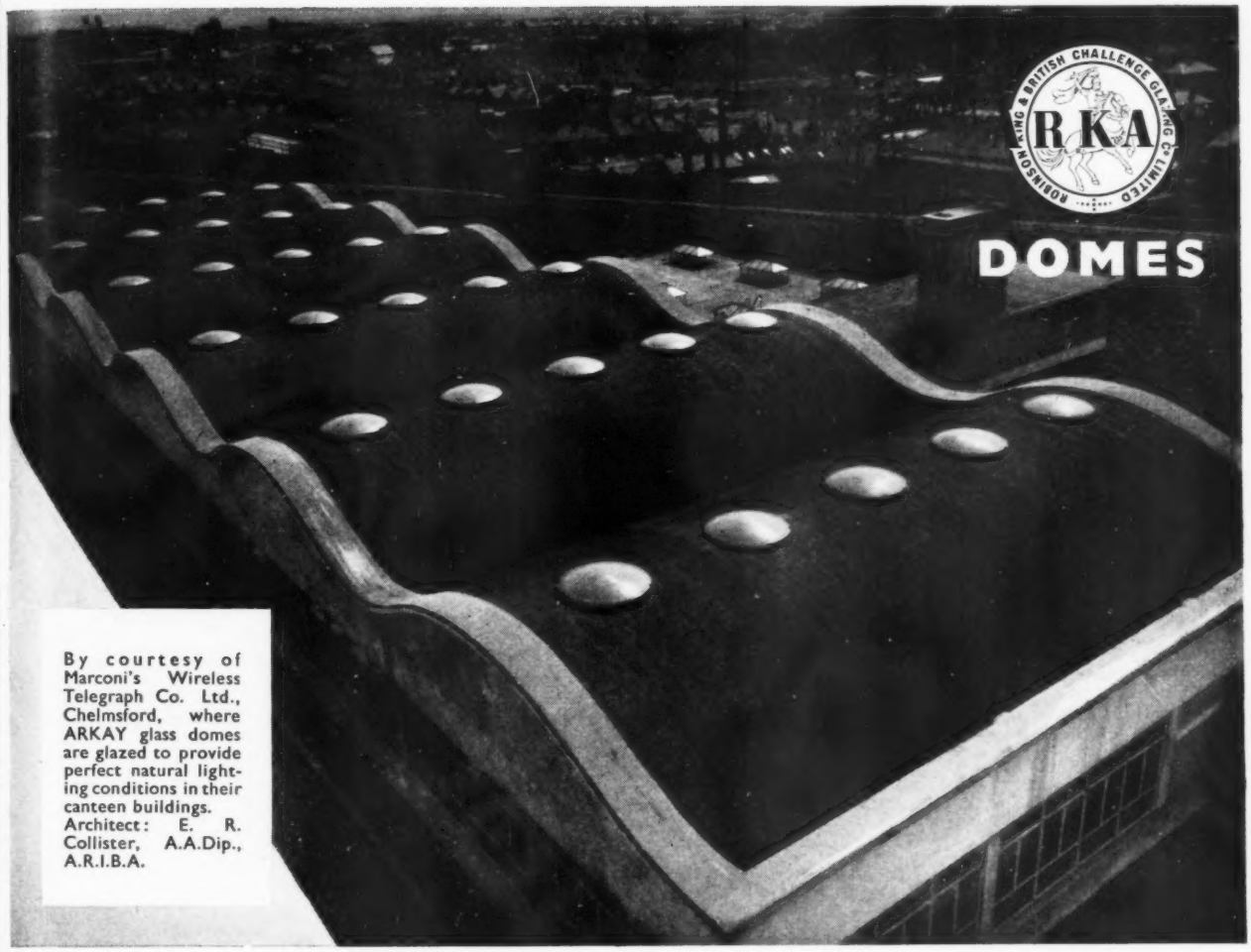

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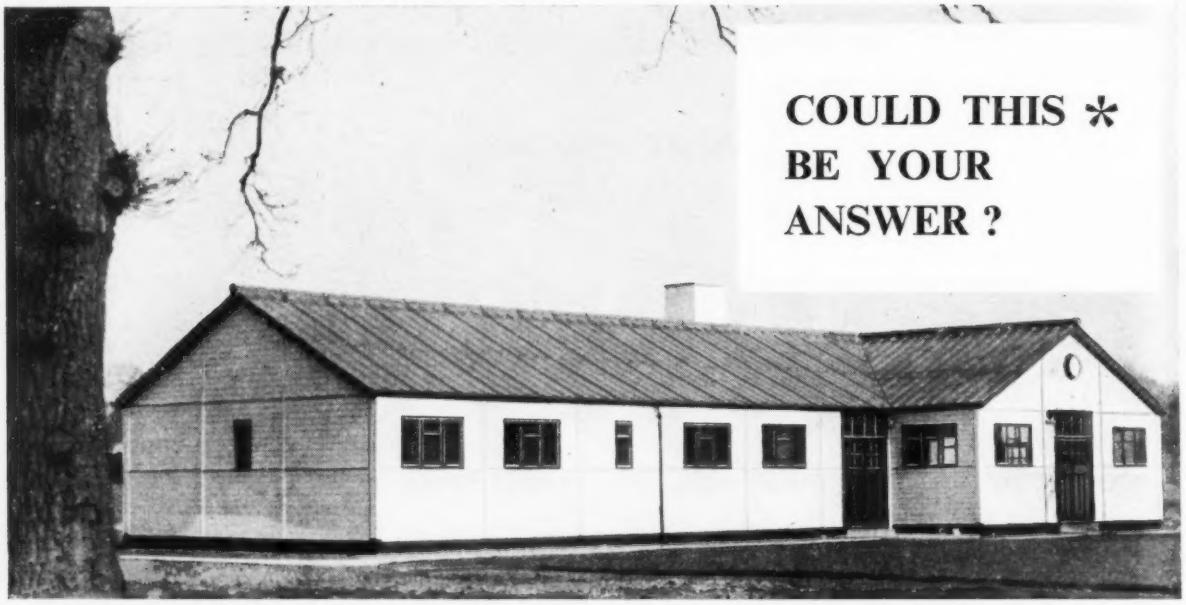

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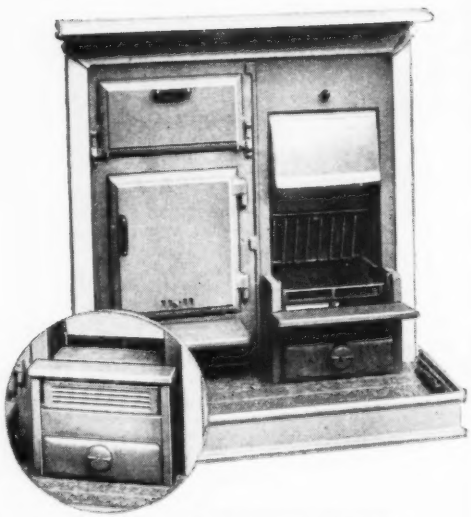

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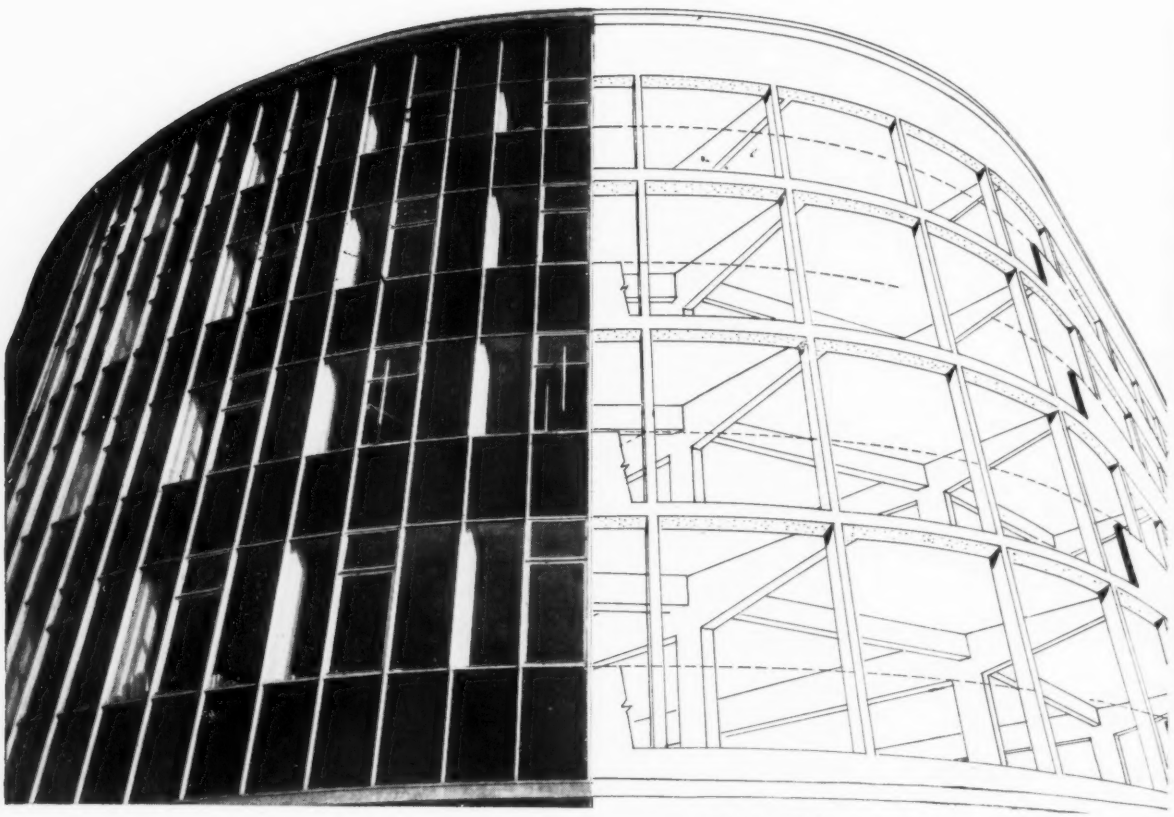
WILLIAMS & WILLIAMS NEWS SHEET

The story behind a 'Wallspan' Wall

Tower House, Hopton Street, S.E.1, was designed specifically to house a printing works. High floor loading had to be provided for but at the same time it was desirable to minimise the total load on the foundations—even so the foundations would carry a 35-story block of



Curtain wall close up and construction detail at Tower House.

flats. This problem has been ingeniously overcome. The structure is supported on reinforced concrete columns which are set back some 15 feet from the face of the building, the floor slabs being cantilevered out. An aluminium and glass curtain wall—Williams & Williams 'Wallspan'—is anchored to the edges of the floor slabs and backed up to sill height by a reinforced concrete stub wall.

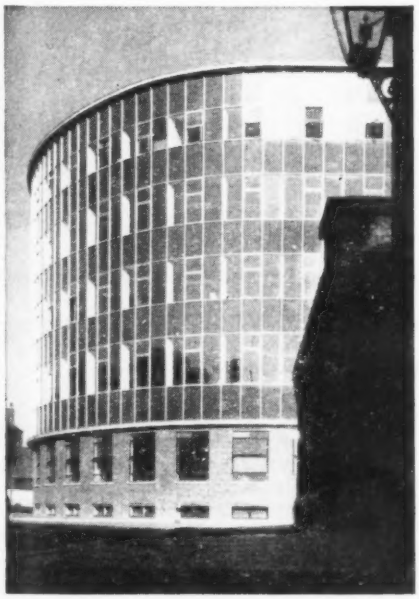
A secondary range of columns is placed immediately behind the curtain wall. These are

not structural but are designed specifically to support the floor loading—in this case printing machinery. Their very slim section was made possible by casing them in a thin layer of special fire-resistant vermiculite plaster.

The sweeping curved facade is the most striking feature of the contract. It is, as far as we can trace, the first time that a curtain wall of this description has been constructed to a curved building line—at least in Great Britain. It is in fact—as close examination of the photograph will show—faceted, each face spanning between a pair of the secondary stanchions referred to above. This arrangement involved a great deal of meticulously accurate draughting and cutting, especially as the curve is 3-centred and not part of a circle. The final result can be judged from its appearance.

Purpose-made aluminium windows by Williams & Williams have been used throughout and the infilling is reeded 'Plyglass'—in dark red on the front of the building and white at the back. The reeded texture allied to the vertical emphasis afforded by the 'Wallspan' mullions gives height and dignity to the facade which otherwise would be dominated by the horizontal pattern of windows and spandrels.

All in all Tower House is a notable contribution to London's architecture south of the river.



Tower House, Hopton Street, S.E.1,
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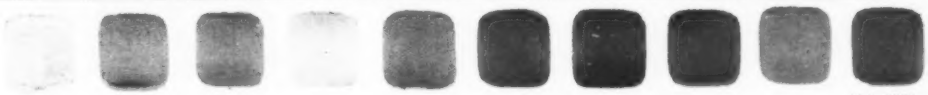

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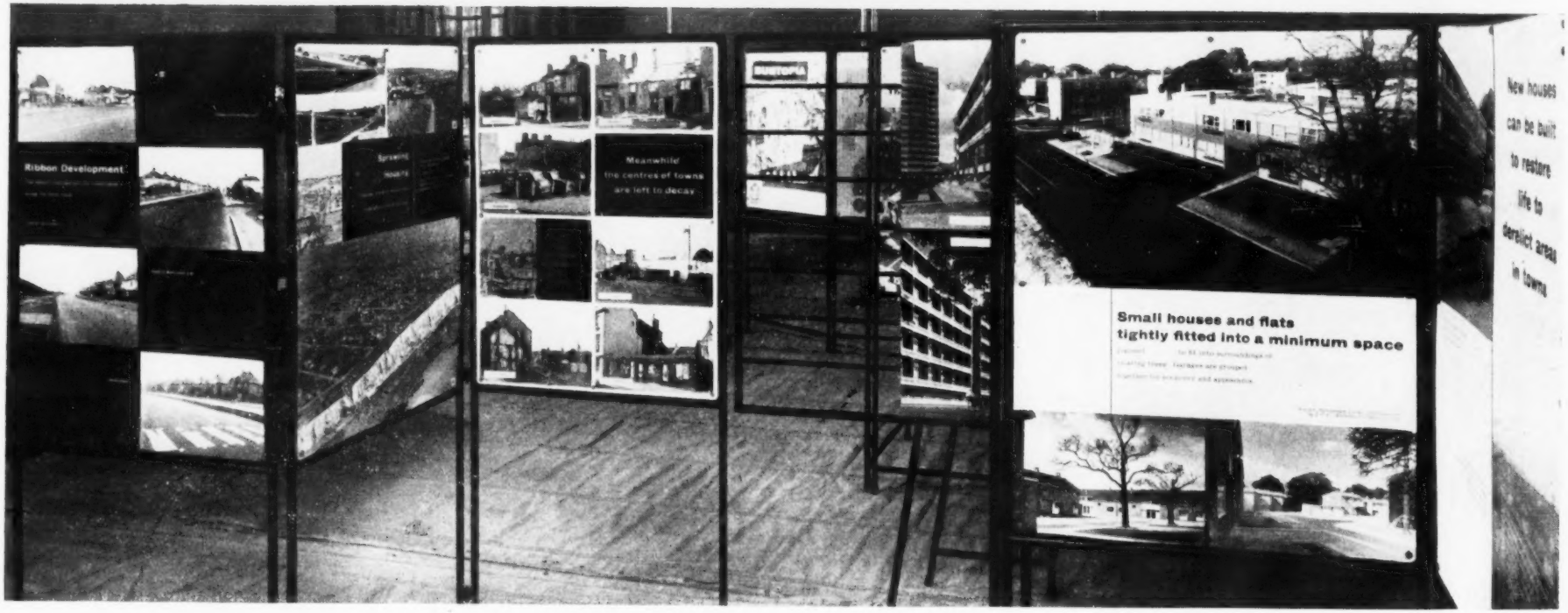
A.I.A. CENTENNIAL CONVENTION

1. The exhibits

Like everything else at the birthday party—except the pronunciations of the Latin-American delegates names—the exhibitions were impeccably produced; but like most exhibitions of architecture they were really exhibitions of architectural photography. There were ten shows in all, including the 1957 Honour Awards and the works of the new medal winners, the 1957 award-winning houses, and the elaborate historical exhibit at the Washington National Gallery of Art. All of them relied on pictures and many of these were good architectural photographs, *i.e.*, they had immense trees in the foreground and the blackest skies you have ever seen. But at the same time a new search for realism was seen to be threatening the worthy old techniques of modern architectural portraiture. The ruby filter and the branch of rubber tree in the foreground were giving way to more colour, greater enlargements, more natural poses, many varied viewpoints, and motion.

*

The main exhibition had ten enormous coloured transparencies. The biggest must have been sixteen by ten feet. They were mounted in evenly-lighted boxes in a blackened room. The effect was dazzling enough, but the expensive pictures did little or nothing that small slides in a projector would not do. They did not give one any illusion of being in the presence, even when they were close enough to fill the field of vision of the shuffling crowd; largely because the technique failed the idea. The enlargement was too much for the originals, and you could have picked off the photographic grain with a teaspoon. The very antithesis in back-lit display was a panel of Charles Eames' work, holding ladders of minute views from different angles: a sort of do-it-yourself movie.



Royal Institute Blitz on Subtopia

An elegant 30-panel travelling exhibition, designed by Charles and Ursula Bowyer, has been arranged by the RIBA as its first contribution in the battle against subtopia. As can be seen from the photographs of the screens above and left (sketches by Henry and Joyce Collins) the exhibition shows not only what is, and what makes, subtopia, but also shows how it can be prevented by good planning and good design. This, the third of the RIBA's travelling exhibitions, will be lent free of charge (save for the cost of forwarding the exhibition to the next centre) to any responsible body which has the initiative and public spiritedness to ask for it. We hope that all allied societies and chapters will immediately stake a claim for this exhibition, and thereby ensure that the eyes of the general public are opened to the insidiousness and omnipresence of this national disease. A special pamphlet has been written by Ian Nairn, the author of the original subtopia articles in the *Architectural Review*, to accompany the exhibition. In it, Ian Nairn makes a strong plea for " together-ness "—his popular term for the careful visual integration of the many items which have to be considered in the modern landscape —and advises the public to support planning officers and to use architects. This exhibition is a powerful and excellent piece of propaganda on the part of RIBA which all will commend.

The photographer selected to take the new pictures for the main exhibition, *One Hundred Years of Architecture in America*, was Mr. W. Eugene Smith, and he was chosen because he is not an architectural photographer and was expected to inject a layman's more lively spirit into the job of finding camera angles. The outcome is a number of spectacular night shots, a tendency for children to be playing in the foreground, and a bus or two drawn up in front of architectural detail. Architecture's best friend, photography, thus tried everything to show her devotion on this special occasion, but after all her efforts the buildings in these exhibitions which looked best were those in the black and white pictures with the dark skies and the branches of rubber tree in the foreground.

*

It is said that the main *Hundred Years* exhibit may travel abroad. If it does, this will surely be the first time that an American publicity export has understated the country's worth. Some U.S. enthusiasts nowadays are inclined to rewrite the history of modern architecture as a native flower of the U.S. prairies which may have been stimulated a little by European watering. Mr. Frederick Gutheim, who arranged and captioned this exhibit, does not go as far as this. In his foreword to the splendid catalogue he writes: "Germany and England saw many of these [technical-functionalist] changes, and brilliant individual architects in other nations grasped their significance, but it was in the U.S. that the creation of the new architecture commenced earliest, grew most rapidly, and found the widest acceptance." He limited the show to about 75 buildings and warned that "the omissions, on any basis, are admittedly staggering . . . Everyone will miss their favourites. I do myself." After this it is probably not baseball to list some of the staggering omissions, but if the show is to travel you should be warned. Not a single Chicago skyscraper of the 1890s is here, nor any from the New York of the 1950s. Sullivan is represented only by his atypical bank in Minnesota. In the climacteric section, *Ten Buildings in America's Future*, a selection of "American architecture at its best," there are no custom-built private homes, no Mies, and no building by anyone under the age of forty-five. There are, however, many moments of sharawaggian enjoyment, some fascinating discoveries in off-beat history, and an example of how austere elements can be made strangely vulgar just by writing "Caribe Hilton" in the wrong place.

ROBIN BOYD

The Editors

DON'T EMASCULATE THE RIBA

"IF you deny us the answers you emasculate the Institute and its power to help you." In such forceful terms Dr. Leslie Martin, the vice-president of the RIBA appealed in a letter to all members for a full and complete return of the questionnaire (titled: Membership Record) which has been sent out. This is the first step in the essential fact-finding mission which the RIBA Council, at the instigation of Richard Sheppard's *ad hoc* committee, has undertaken to carry out. It is absolutely essential that every member fills in this form and returns it as soon as possible, or this census method of fact-finding is rendered invalid. No questions are asked about income, on the assumption that members would prefer to supply this information anonymously. But a random sample of members will be asked to supply this information in due course.

Readers will remember that Professor Ian Bowen and Martyn Webb conducted a rather similar enquiry for the JOURNAL four years ago. They adopted the random sample method, and issued a very much longer questionnaire. A very high proportion of replies were received, all the samples were accounted for, and the result was the first accurate picture of the state of the profession which has ever been made. Again those pertinent questions on income were omitted for fear of offending members. Nevertheless well over a hundred volunteered information on their income. It would seem, therefore, that an *official* survey need not be conducted with quite such scruples as regards personal details.

The great difference between the RIBA's fact-finding exercise and the JOURNAL, and a possible source of confusion, is that the RIBA is only concerned with its own membership, whereas the JOURNAL included *all* registered architects, i.e., the membership of ARCUK. Even taking this action our survey was

not truly complete because it did not include the considerable proportion of " chartered " but not " registered " architects. There are about two thousand five hundred of these. They are assistants and partners and others who, not being in practice under their own name, do not have to register. On the other hand, the RIBA are ignoring about four thousand registered architects who are not members of the Royal Institute. The purpose of this fact-finding is to help the RIBA, in Dr. Martin's words, to promote the " conditions of work, financial and otherwise " of the profession. If such improvements come about, will they be applicable—can they be made applicable—only to members of the Royal Institute? If the RIBA is about to create two classes of registered architect: a rich, protected, set, and a poor minority, it should go into it with its eyes open, and admit that that is a possible outcome, if not its object.

SPEC BUILDERS' WHITEWASH

Most architects would imagine that the National House-Builders Registration Council was a potent factor in the world of speculative house building. Henry Brooke, the Minister of Housing and Local Government, exposed this as a fallacy when he pointed out that only one house in eight carries the NHBRC certificate. That is to say, about 15,000 houses last year (of which 90 per cent. were designed by architects employed by building firms, but were not architect supervized) out of a total of nearly 120,000 privately built houses (an unknown, but certainly a very small proportion of which were architect designed and supervized). Mr. Brooke said that professional advice was worth paying for, but he did not envisage more than a minority of house purchasers having such advice. The pity is that all who wanted architect-designed houses could have had them if Harold Macmillan, when Minister, had not increased subtopia by freeing house building from licensing without insisting on the employment of architects by spec. builders.

Mr. Brooke envisaged housing shortly passing from a seller's to a buyer's market. This he imagined would enable higher standards to be insisted upon by the buyer. This, without the service of an architect, is unlikely. The layman will find it impossible to judge from a finished house whether or not it is soundly built. It is too easy for the builder to bait his sales with housing equipment while concealing—as he has always done—inadequate materials and standards of performance.

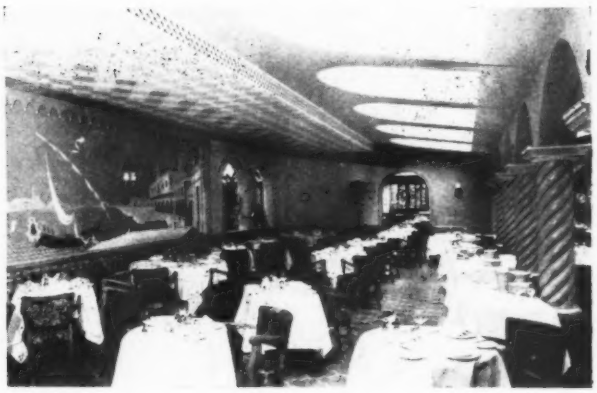
The NHBRC say that they have revised their specification. This will be worth studying when it is published, because the old specification, although better than nothing, was far from satisfactory. But even when revised, the certificate of NHBRC will remain a poor substitute for the complete architects service which all house purchasers should get.

OUTRAGE IN CURZON STREET

" Where in London can you have terrazzo tiles cut and polished by Italian craftsmen beneath your feet—and look out over an English garden banked with colourful flowers? " The answer to this quotation from the Press handout is the new dining room of the Mirabelle restaurant. The garden and the restaurant are shown in the illustrations opposite. You may not be able to see the Italian craftsmen, but then, neither did ASTRAGAL. The restaurant, which, with sliding glass roof-lights (not yet working) replaces the old creeper-clad courtyard, has been designed by René Louvat, and is the most unappetizing room which ASTRAGAL has seen for years. Needless to say, for a restaurant which must exist largely on expense accounts, the cost was £50,000. The garden, blaring puce rhododendrons, metallic pink and blue hydrangeas and crazy paving fitted so crazily one couldn't put a penny in the crazes, is described as English, which is fair, if you remember it is middle-class, stockbroker's, English and not stately-homes English.

*

There are two plane trees in the garden (not discernible in the photograph) which were pruned by Landscape Ltd. On the opening day a spokesman for the firm described it as the principal tree pruning firm in London. There is no denying that its pruning is effective, but the result is appallingly ugly and



Above left, the garden for the Mirabelle restaurant, designed by Landscape Ltd. Above right, the new, top-lit dining room, with sliding glass lights, designed by René Louvat.

bad for the tree. This is one of the firms which should study the RIBA's exhibition on subtopia.

POST GRADUATE RESEARCH

ASTRAGAL was proud to meet what he believes are the profession's first two post-graduate research fellows the other evening. A dinner was given in their honour by Richard Llewelyn Davies, the director of the Division for architectural studies under the Nuffield Foundation. They had just completed the two years of their fellowship, which they celebrated by spending most of the day examining recent modern buildings in London (how nice and relaxing it is to concentrate on other people's mistakes) before going to the Reform Club for an excellent dinner. One of the Fellows, Peter Wixon, is a New Zealander who has had some years gaining practical experience in the architect's department of the New Zealand MOW. The New Zealand Government paid his passage here and made up his salary—a commendable gesture, but an eminently practical one, because Peter Wixon's experience of research work on children's hospitals will be of great value. The other Fellow is Newton Watson, who once worked for Clifford Holliday on Stevenage and was a former assistant of Lionel Brett. He has been helping on a study of the design of research laboratories, at BRS learning about lighting research, and designing a maternity unit—a full programme for a mere two years.

*

The great virtue of this excellent scheme of Llewelyn Davies's is that these Fellows are picked on the understanding that they are not going to spend their lives in research, but are merely going to enjoy the chance of some post-graduate study before going back to architecture. Their first aim is not research but to be architecturally creative. Further fortunate Fellows will shortly be appointed.

EDINBURGH CENTENARY

The Edinburgh Architectural Association is not only the oldest architectural institution in Scotland, but the fourth in seniority in the country. It was founded on December 28, 1858, when a group of seven apprentices, together with a young man who "had a bent for Art" met to form themselves into a Society and draw up rules for its government. It seems that they were angry young men who were dissatisfied with the efforts of the Architectural Institute, which had been founded eight years before and did not admit apprentices to membership. Youth soon triumphed, the Institute passed away, and the Association embarked upon the course of growth and of change that has made it what it is today.

*

The centenary celebrations, held this month in Edinburgh, included a symposium led by Professor Rasmussen, a dinner, a civic reception, a service at St. Giles and the commemorative planting of a tree. The Association has also marked the occasion with the publication of an interesting centenary edition of its handbook and the inauguration of a Centenary Bronze Medal (first awarded, as the JOURNAL has already reported, to Professor Robert Matthew for Turnhouse Airport). ASTRAGAL was a bit puzzled to know why the centenary should be celebrated this year and not next, but he understands the reason to be that this year sees the beginning of the Association's 100th session. ASTRAGAL extends his congratulations to them, not only on their excellent work for the last 100 years, but also on overfulfilling their plan by doing it in 98½.

THIS WEEK'S NEW IDEA

In Texas, according to the *Economist*, loss of water from reservoirs through evaporation is equal to the amount drawn off by consumers, and even allowing for the fact that Texas is notoriously stranger than fiction, this suggests that the proportional loss even in allegedly temperate climes like our own may still be big enough to make disputations about the 150-gallon family look like a drop in the ocean.

*

The Texans have a cure for it, apparently, and one that was invented by an Australian at that (thus proving ASTRAGAL'S long-held suspicion that Australia is the Texas of the Commonwealth). All you have to do is cover the exposed water-surfaces with a monomolecular layer of hexadecanol. It's as simple as that. What isn't so simple is how it works, but roughly it depends on hexadecanol being polar, and having molecules whose appetites are different at either end. One end loves water, the other end can't abide it, and all the molecules therefore stand on end in close-packed ranks and don't leave any room for water to evaporate anywhere. Snags? Nothing to worry about, except that there's a strain of bacteria that just loves to eat hexadecanol. Presumably, however, it shouldn't take too long to identify some other polar molecule with the right characteristics, that will give bacteria indigestion.

ASTRAGAL

LETTERS

R. John Lansdown, A.R.I.B.A.

Jack Whittle, A.R.I.B.A.

"Pre-Suez Immigrant"

Sydney B. Downs, A.R.I.B.A.

Lincoln Page, A.R.I.B.A.

Architecture Is A Decision Process

SIR,—Whilst agreeing with the conclusions of Mr. Llewelyn Davies's admirable article (May 23), the present writer, who is studying how the methods and techniques of operational research can help the architect, has often found himself hampered not, as the article seems to suggest he might, by a surfeit of useful data, but rather by a lack of it. Mr. Llewelyn Davies and his team at the Nuffield Foundation have helped us considerably with their studies on hospitals and laboratories but, in general, there is available very little data of a measurable kind that has any bearing on the planning and similar problems that the architect has to face. Building costs, for example, are only just being investigated on a manageable basis whilst (the above hospital work excepted) little or nothing has yet been done on the question of circulation: a subject especially amenable to operational research.

In his search for new design tools which would help the architect to take into account all pertinent information, the writer has been forced to concentrate mainly on the operational research technique of symbolic logic. Preliminary investigations suggest great possibilities for this method, particularly if logical computers could be used, but, as operational research in its accepted sense must have information which is expressible in numbers or quantities, the other very powerful decision methods (linear programming, games theory, queueing theory, etc.) which operational research workers have developed for use in different fields have, while the lack of suitable numerical data persists, only limited value for architects. Further research organized in the way Mr. Llewelyn Davies has outlined could soon remedy this.

But, despite the complications of present-day designing that the article mentions, we need not feel that the re-emergence of the architect as Uomo Universale is out of the question: architecture as an art of spatial organization is essentially a decision process based on a logical relationship between various limiting factors; that these factors have grown more numerous and complex than hitherto should not deter us, for with the growth in complexity have come new techniques of understanding—Uomo Universale must learn to use them.

R. JOHN LANSDOWN.

London.

High Life

SIR,—The RIBA symposium on "Family Life in High Density Flats," reported in your issue of May 30, seemed to me to bring out two important points.

The first is that the "high" density housing schemes illustrated were mainly schemes around 100-130 persons per acre. It was, perhaps, significant that Professor Holford considered a net density of 100 persons per acre as the point where density becomes "high" and Peter Shepheard considered that anything above that density made satisfactory life very difficult. We have an agreement here between two experts on a point which is vital and which more organized research into, and collection of information on, tenants' reactions to various types of housing development (as urged by Mr. Westergaard) might well illuminate. We must remember, however, that a net density of 100 persons per acre is still low compared with American and Continental standards.

The second point was that the success of high density development depends to an abnormal degree on intelligent planning of space about buildings. It is regrettably true that in general the standard of landscape (or townscape) in our towns is very low. The LCC, in their new schemes, are making attempts to improve on this, and so are certain other local authorities, but the physical results show that the official mind still divides town populations into housing estate tenants and "others," with their respective allocation of "housing amenity land" and "open space." Thus, the maintenance of open land in housing layouts is regarded as a charge on the housing account and open land elsewhere as a charge on the parks account. This attitude apparently seeks to restrict artificially the use of open land provided in housing development to the tenants of the new buildings, while very often the open areas provided in high density schemes (having net densities of 100-150 persons per acre using high blocks) are often the only appreciable open spaces within an extensive built-up area. Planning technique encourages this division in its present definition of public open space and Central Government is often prepared to allow limited expenditure on "housing amenity land" and to restrict expenditure on new open spaces.

In my view it is time that local authorities engaged in residential re-development reviewed the existing administration of open spaces and grouped under one head the maintenance of all open spaces, whether parks, playing fields or the so-called "housing amenity land." There is also a need for a review of ideas on open space planning and standards based on the integration of space about buildings with the open areas elsewhere provided.

Behind all this is the question of money. As a nation of urban dwellers we have to face up to the fact that to create an attractive environment out of bombed and slum cleared sites is very expensive. Local authorities with clearance problems are more often than not those committed to immense expenditure on housing. Building costs for these authorities, because of site conditions, are extremely high and in an effort to obtain tenders which are acceptable to the Ministry of Housing and Local Government, site works are frequently cut to the bone. Unless there is increased recognition by Central Government of the exceptional costs involved in creating an environment for dwellings quite apart from building the dwelling itself, and some additional financial assistance towards this vast expense, there is little hope that we shall ever see in England anything like those views which Mr. Blom showed of Stockholm.

JACK WHITTLE.

Essex.

Warning to Immigrants

SIR,—The aquaintance of a number of immigrant architects currently looking for jobs prompts me to write this. The best advice to anyone thinking of coming to Canada is this: before you pack your bags find out from a personal aquaintance over here just how the land lies in your intended destination.

I have no idea what goes on in the East, but in Vancouver it is tough for architects at the moment for these reasons: the government has imposed a squeeze on mortgages as a slump preventative. Vancouver is a pleasant place and architects seem to gravitate here. The local university has a good school and turns out about ten new assistants per annum. Although Vancouver is expanding it compares, as a centre of population with, say, Bristol and can obviously absorb only a limited number of new assistants each year. You can't very well move on to the next town because, apart from a government job in Victoria that's about it. There are openings in the interior of the province, but if you figure on going after them you had better be self-sufficient, culturally and socially.

You can try writing to the local offices before embarking, but almost certainly those that reply will simply say "come and see us when you get here."

If this sounds all rather depressing I hope it may at least prevent some grief.

PRE-SUEZ IMMIGRANT.

Canada.

Life is More Beautiful Than Architecture

SIR,—I should like to refer to your report of the RIBA 119th annual general meeting and particularly to Thurston Williams' statement that he believes that "the average doctor is no more important or efficient or beneficial to the community than the average architect."

If our case for greater usefulness and wider recognition is to merit just consideration it must be presented with reality and not distortion, with reason and not emotion. Otherwise our judgment will be regarded as fallible.

I think that it can be widely argued that there is no case for the statement quoted above. Though our profession and art are entitled to infinitely greater support, reward and interest than they receive, it can only be idle to pretend that they are exactly as valuable to humanity as the continuation of the beauty of life itself.

SYDNEY B. DOWNS.

Coventry.

Photographs Are More Beautiful Than Architecture

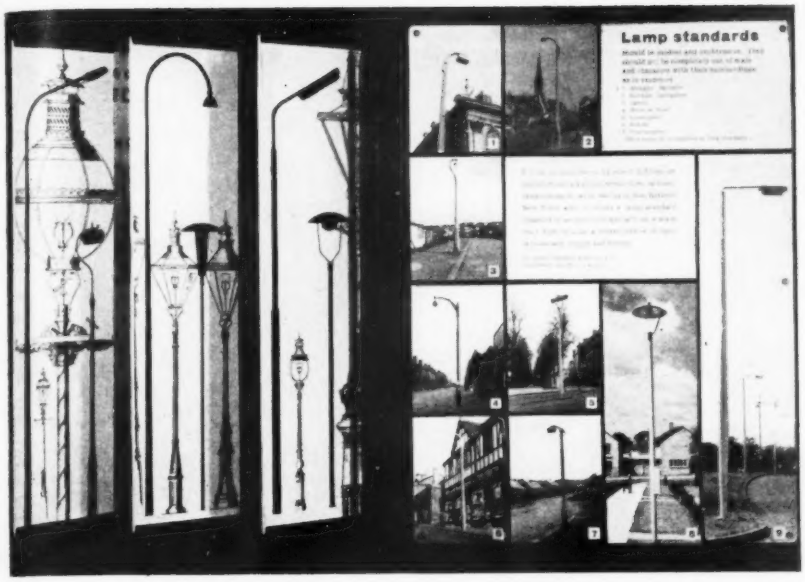
SIR,—Must we be confronted by so many illustrations of new schools? Remorselessly, they appear week after week in the architectural journals, beautifully photographed with red filters. They all possess the same irritating clichés, ingenious window systems with hit-and-miss transomes, odd walls papered in geometrical patterns, naked girders showing below the ceilings, townscape pools and paving and all the rest of it. They all display the same monotony and each aspires to be more precious than the last.

On inspection these schools are found not to live up to the photographs (a characteristic of most contemporary, *i.e.*, "modern" architecture). They are depressing indeed; there are no nice sharp shadows, the ponds have a dusty film over them and the glazing and paint are murky.

Some of us are getting a bit tired of seeing them. Of course Frank Lloyd Wright is right in saying that architecture has reached a dead end by going up a one-way street. Almost all our contemporary work suffers from the same tiresome mannerisms, betraying a poverty of spirit and yet (judging by the articles we read) we are quite pleased with ourselves. These mannerisms are as ephemeral as dress fashions and tomorrow will appear as ludicrous as outmoded fashions.

Could less space in the JOURNAL be devoted to these examples of "glossy" architecture and more to buildings of fundamental architectural value?

Singapore. LINCOLN PAGE.



Recently architect planner Lionel Brett read the following letter on the BBC's light programme. It is addressed to what is perhaps the most discriptive of the vertical features which are strewn through town and landscape: the lamp-post. The appropriate illustration, above, shows two screens from the RIBA's travelling exhibition on subtopia (see page 868).

AN OPEN LETTER TO A LAMP-POST

Lionel Brett

DEAR LAMP-POST: Forgive my addressing you in this familiar way. I know you like to be called a Lighting Column, just as some butchers like to be called Meat Purveyors (though you would think they could avoid the crude word "meat") and some shoemakers like to be called Footwear Specialists. But just as we go on calling them butchers and shoemakers, I hope we shall go on calling you and your friends lamp-posts.

You are twenty-five feet high, concrete with knobs on; you have a curving neck, and from your beak hangs a glass casserole which at night gives out a painful stab of deathly green light. You are the first in the village, but soon your friends will be joining you. At the moment you look lonely and absurdly gawky beside one of our little old iron ones.

You are here, I take it, because our local Council can't resist getting you on the cheap. If they carried on with something simpler and smaller they would have to pay for the whole of it themselves. But you are part of a national lighting standard, identical for Birmingham and Broadway, Liverpool and Looe, and so you are heavily subsidized.

For the village this green light, like a tooth on edge, will take some getting used to. Our old lamplight was pale gold. It lay in pools at odd intervals, and there were dark shadows and mysterious corners where the imagination of councillors could exercise itself about what went on. Soon there will be nothing to imagine. And yet curiously enough there will be less to see. Our old lamps stood near the walls of houses and cottages and lit them up. You could tell where you were. When you and your friends are all present, with your equally spaced lights miles up in the air, this place will look exactly like the next one. They will both be standard bits of subtopia.

I am sure that if you answer this letter you will tell me about road safety and slap me down with casualty figures. But look, this is a village—or at most you could call it a small and ancient market town. Because it has a wide main street and because its main road, though a main one, isn't a very busy one, there is no need to by-pass it. But for that same reason, it isn't a danger spot. Nobody remembers an accident in the High Street. There are a couple of minor bottlenecks on the fringe of the place, but our old lamp-posts were sensibly sited to pick them out.

At the moment what little night-time traffic there is cruises through with dipped headlights, and is no trouble to anybody.

I know that a lot of small towns and villages are much more twisty and congested than this, and obviously they will have to be by-passed. But if places like this were just left alone, quite a bit of taxpayers' money could be saved, and quite a bit of England, Scotland, and Wales would still be worth looking at. Instead of which, the first thing the foreign tourist notices when he lands in England are lamp-posts like you, sticking up in the middle of everything he wants to photograph. You are practically unique in Europe.

We shall not get a more sensible approach until the people who employ you and deploy you realize one big but simple thing—that places, like people, have to be handled on their merits. If you give each and all of them the same treatment, you fail with them all. And in a country as small as this, we really can't afford to go on much longer failing with places.

Yours truly,

LIONEL BRETT

AA

Council for 1957-1958 Session

The result of the ballot for the Election of the Officers and Council of the Architectural Association for the 1957-1958 Session is as follows:

President: John Brandon-Jones. Vice-Presidents: D. Clarke Hall. H. T. Cadbury-Brown. Hon. Secretary: J. M. Austin-Smith. Hon. Treasurer: Edward Playne. Hon. Editor: Neville Conder. Hon Librarian: J. Eastwick-Field. Ordinary Members of Council: B. L. Adams, D. A. C. A. Boyne, Anthony Cox, L. De Syllas, G. Epstein, Gontran Goulden, W. G. Howell, John Lacey, Edward Mills, Peter Newnham, Hilton Wright.

HENRY BROOKE

"Eradicate Jerry-Building"

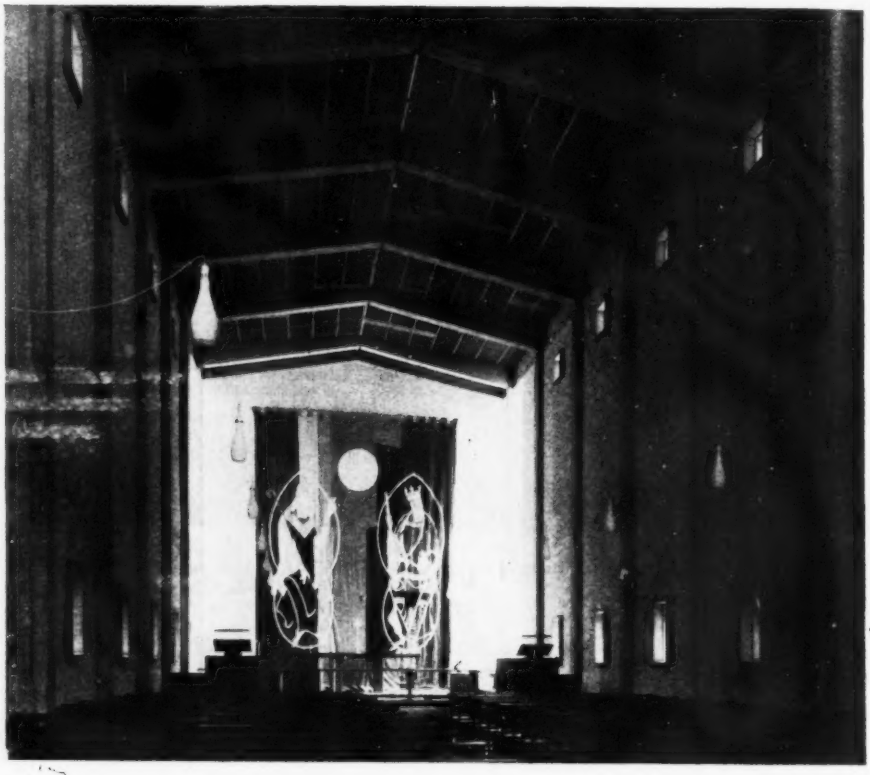
An appeal to house-builders to join the National House-Builders' Registration Council, and to house-purchasers to demand the Council's certificate, was made by Henry Brooke, the Minister of Housing and Local Government at the Council's 21st anniversary luncheon last week. Mr. Brooke disclosed the fact that only 12 per cent. of privately built houses receive the Council's certificate, and he suggested that this figure should be raised to 50 per cent. or more. The luncheon was presided over by the retiring chairman G. Langley-Taylor, who had earlier told the annual general meeting of the Council that the Council had now certified over 60,000 houses, and that 90 per cent. of those inspected by the council were now "architect designed." Many houses built by private enterprise, he said, had no architect supervision whatever, and the independent inspection service of the Council at all stages of construction was the purchaser's safeguard. Mr. Langley-Taylor appealed for the Minister's help in removing from the national character the blot of sub-standard building and bad siting or design.

Mr. Brooke said that he regarded the Council as a major weapon in the attack against jerry-building, which had nothing to commend it and ought to be eradicated. A purchaser of a house from a builder who was one of their members got a certificate that it had been built to the Council's specification, and a two year guarantee against any defect arising from a breach of the specification. What greater safeguard than that could any purchaser want? The Council had a great deal to its credit, but there was still a long way to go. In 1956,

Continued on page 875

CHURCH BUILT FOR £15,000 IN 'NO-FINES' CONCRETE

The Hill parish church, Coventry (below) is one of three designed by Basil Spence and constructed by George Wimpey and Co. Ltd. at a cost of between £15,000 and £16,000 each. Each church has three almost identical components, a detached bell tower, a simple aisled church seating 250 and a small parish hall seating 100. They are arranged differently in relation to each other on each site, and were built by the contractor in a single operation. The construction is concrete frame and "no fines" walls, with roughcast rendering externally and whitewash internally. The interior view of the church (right) shows the richly coloured hanging cloth over the altar designed and made by Gerald Holtom.



News *continued from page* 873

he believed, the number of houses receiving the certificate amounted to close on one in 8 of all the privately built houses in this country. But they could not be satisfied until the percentage had gone up from something like 12 per cent. at present to 50 per cent. or more. It would not be possible to achieve the full 100 per cent., because obviously a certain number of houses were built for their would-be owners by architects, for which the sort of test the Council applied was not necessary.

A fresh new opportunity offered to the council as we were getting back to a balance between supply and demand, and might be passing before long from a sellers' to a buyers' market. The conditions were going to be more and more favourable for the Council to insist upon the high standards which it set.

He understood the Council had prepared a new edition of its specification and he was very glad to know that the Council was concerned not only with the quality of construction but also with the quality of design as well. He felt that the frills and ornamentation on some of the houses he saw were purely designed to detract attention from the poor quality of the construction that lay below. Surely it was time that everyone in this country awoke to the fact that good design need not be more expensive than bad design either in money or in space. What was required was a proper appreciation of the value, including the economic value, of good design.

Mr. Brooke was delighted to know that many members of the Council were interested in the big effort that had been made by the building industry, in co-operation with the RIBA and the Council for the Preservation of Rural England, to produce a new booklet on house design which he understood was to be circulated to local authorities. He certainly hoped that its practical lessons would be studied widely, not only by the local authorities, but by builders and the public generally.

The Council, he understood, was an independent body between the public and the builder, trying to get the confidence of both. He had heard it said that it was just another builders' racket, but he did not share that view. He greatly hoped that all house builders who were efficient would come into the organization. The Government were anxious to see people, wherever practicable, owning their own homes, but too often, in his experience, people embarked upon house purchase without the requisite professional advice. Not everyone could pay for professional advice, though he believed it was always worth buying. But everyone buying a house could enquire whether it had been built by a member of the Council and carried its certificate, and would be foolish not to do so.

At its annual general meeting the Council elected C. Douglas Calverley, the director of a Leicester building firm, as chairman, and approved a revised Specification of Constructional Standards which will be published shortly.

COSTS

Fourth AJ Lecture

Grenfell Baines was the speaker at the meeting on May 28. In describing the experience of his own practice with cost planning, he emphasized, with vivid illustration, the sense of an "economics stress pattern" that comes with the use of this method. He told the audience that working to cost targets for each element, far from fettering the designer actually freed him by providing a much better informed choice of material and method. It had also considerably strengthened relations with the clients who were impressed by the businesslike approach that it symbolized and who, if they asked for some change at sketch plan stage, could be told just what it would mean in redistribution of the total outlay.

Grenfell Baines related how he had started to use cost planning. He took the analyses of six different kinds of building (from those published in the AJ)—converted them into percentages, to show the *proportions* of cost among the different elements and to cancel price discrepancies caused by differences in time and location. Copies of these were then used by his staff as a first rough guide to break down overall target prices and so provide a first approximate cost plan. As a design progressed on the board, more precise cost figures for each element were obtained and the distribution of costs adjusted accordingly. Since that time, six of the firm's jobs had been cost planned, he said, none of which had required a reduction bill at tender stage. The office had also compiled a "cost bible" of detailed cost information with each sheet dated and, said Grenfell Baines, "never taken as gospel." He suggested that the most urgent problems were first, to define the scope of each element on a national basis, so that an architect (and his quantity surveyor) using someone else's analysis would know just what items each element price included. Second, that as many people as possible should experiment with cost planning so that information could be exchanged and the technique sufficiently developed for it to be introduced into the schools of architecture.

The numerous questions from the floor which followed his paper unfolded further aspects of the technique, and gave the impression that, potentially, there is a fair number of architects ready to try cost planning.

LCC

Why Burn to Death?

Last week the LCC started a campaign to bring old buildings into line with the Fire Regulations (i.e. with those sections of the London Building Act which are concerned with fire prevention and escape). It is estimated that there may be as many as 34,000 properties in the county which contravene these regulations. The reason is that authorities have only reviewed the fire-worthiness of properties when a formal submission has been made for alterations under the Byelaws or for change of user under the Town Planning Acts. Needless to say, not everyone makes a formal submission when he should; the result is that there must be a vast number of properties the authorities know nothing about which have been carved up internally with partitions in a manner to increase the fire load or to obstruct access to escape. To set this right the LCC have issued a leaflet called *Why burn to death?* and a booklet called *Escape from fire*, which are meant primarily to alarm and instruct householders. They have also embarked on two pilot house-to-house surveys (one in Soho and the other in Shoreditch) to find out the actual state of affairs and, doubtless, to enforce compliance with the regulations. Ultimately these surveys may cover the whole county.

In these circumstances it is well for architects to recall that under Sections 35 and 37 the LCC has powers to require building owners to provide "reasonable means of escape" from certain categories of old building. Under Section 35, firm buildings (except single-family dwelling houses) of the following kinds: those which have any storey at a height greater than 42 feet; those where more than 20 people sleep or are employed; those where more than ten people normally work above the first storey or in any storey higher than 20 feet; those which are more than two-storeys high, contain any storey more than 20 feet high and are let in flats or tenements, used for such purposes as a hostel, boarding house, nursing home, boarding school, etc., or have sleeping accommodation above a restaurant, shop, store or warehouse; or contain a place of assembly having a superficial area of not less than 500 square feet. Section 37 provides that every old building (except a building to which Section 35 refers, or a dwelling house used for dwelling purposes by not more than ten persons) having a storey at a height of more than 20 feet shall, unless the Council otherwise consent, be provided by the owner with means of access to the roof such as a window or trap-door with ladder, to the satisfaction of the district surveyor.

Escape from fire (obtainable free from County Hall) is interesting as evidence of what are considered to be "reasonable means of escape."

St. PAULS

Inquiry into Revised Plan

The public inquiry into the revised plan by Sir William Holford for the development of the area around St. Paul's is to open at the Guildhall on July 15. The plan is put forward jointly by the City Corporation and the London County Council. The inquiry will be conducted by an inspector of the Ministry of Housing and Local Government; it will be into objections or representations into the plan, but it is open to any person to represent that an alternative scheme would be preferable.

RENT ACT

Effective from July 6

The Rent Act received the Royal assent on June 6, and comes into effect on July 6. A booklet, *The Rent Act and You*, published by HMSO (6d.) explains the provisions of the Act.

BLENHEIM DANCE

For Architects

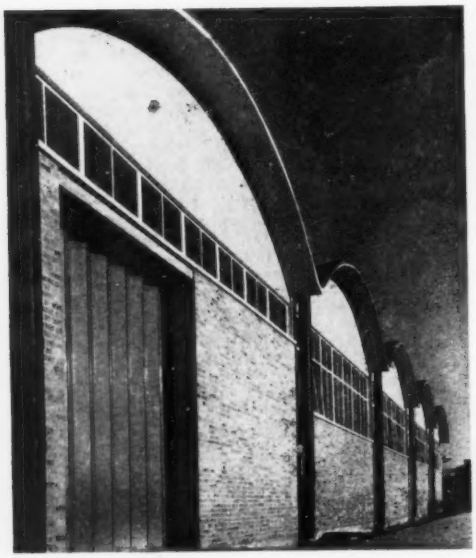
The dance which is to be held at Blenheim Palace to mark the end of the British Architects Conference in Oxford (July 10 to 13) is to be held on *Friday*, July 13, not *Saturday*, as announced in last week's issue. Tickets—which cost £2 2s. each, can be obtained by people not attending the Conference—from the Secretary, RIBA, 66, Portland Place, W.1, or from Mrs. M. J. Holmes, 9, Blackhall Road, Oxford.

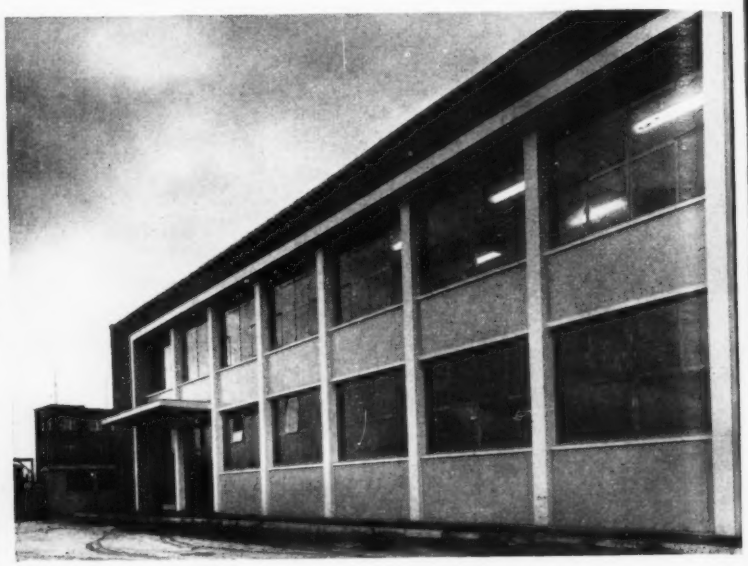
CORRECTION

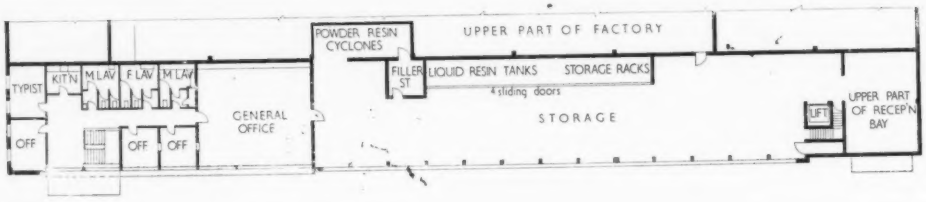
RIBA Symposium

An illustration to the report of the RIBA symposium on family life in high density housing (AJ, May 30, page 812) showed cars and motor cycles littering the roadside on an unidentified housing estate because, the caption said, the local authority had failed to provide garages or parking spaces. This estate was in fact the St. Pancras estate by Davies and Arnold which was illustrated on the same page as an example of good playground design. The architects point out, however, that garages and parking spaces were provided in their scheme, although they are not all let. The illustration, it seems, shows up the unwillingness of tenants to use garages when they are provided, or even the bad habits of residents from other parts of London who leave their cars lying about.

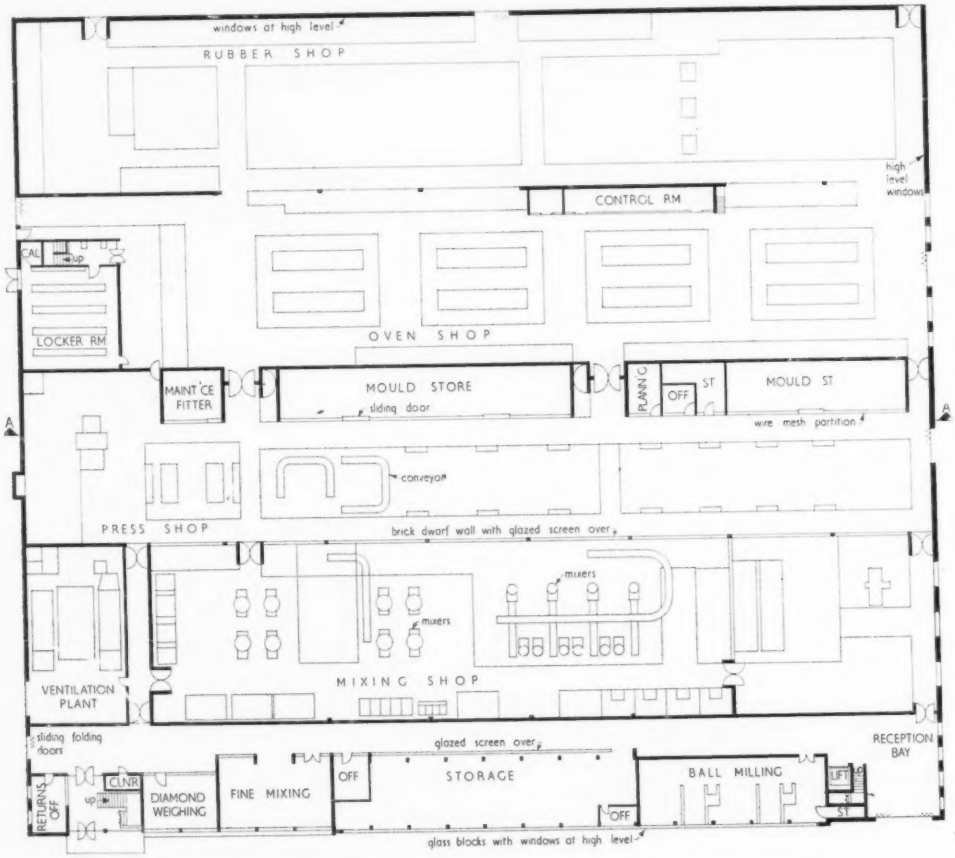
FACTORY AND OFFICES IN SEIGHFORD RO







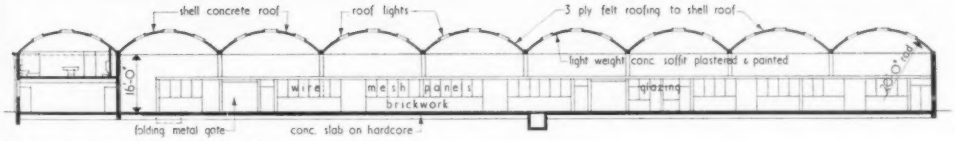
First floor plan



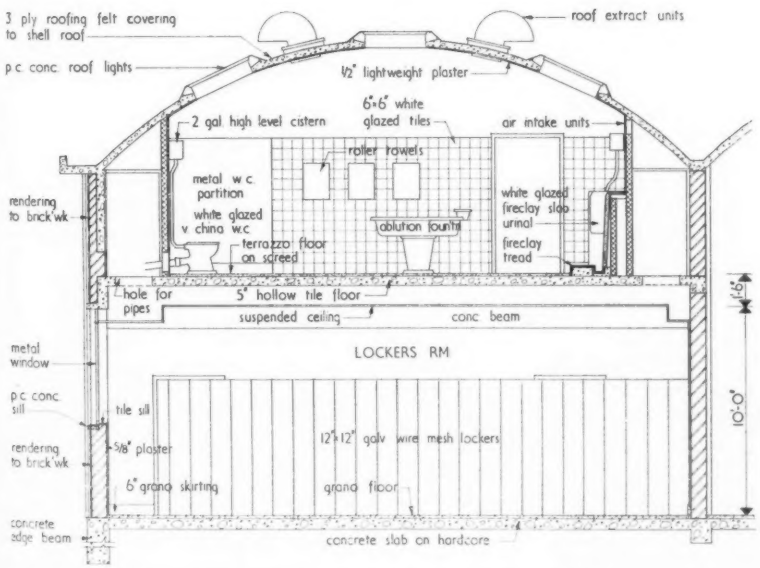
Ground floor plan [Scale: $\frac{1}{16}$" = 1' 0"]

This factory in Seighford Road, about a mile to the north-west of the city was designed for the Universal Grinding Wheel Co. Ltd. by Edward D. Mills and Partners. The quantity surveyor was Leslie W. Clark. Along the north side of the site, facing the main road, is the two-storey administration block (above left) containing offices on the first floor, small process units and storage on the ground floor and a large loading bay at the west end. The production area (seen above right from the south and opposite from the west) is single storey and is divided into bays, each containing plant dealing with a specific process. The site has a sub-soil of poor load bearing capacity, necessitating the use of 370 reinforced concrete

ROAD, STAFFORD, STAFFS.

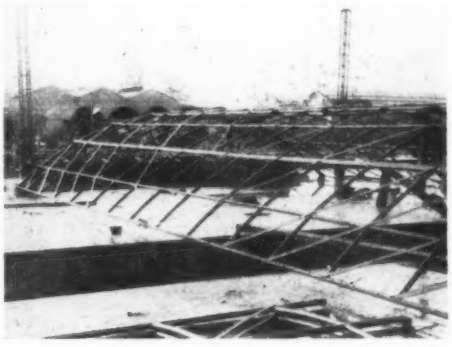


Section A-A [Scale: $\frac{3}{16}$" = 1' 0"]

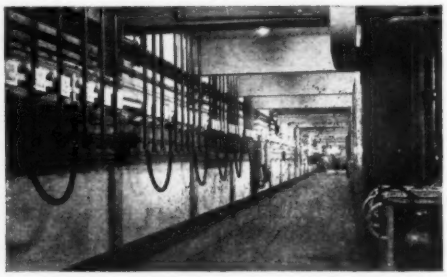


Detail section through works lavatory and locker room. [Scale: $\frac{1}{4}$" = 1' 0"]

piles for the foundations. The piles support heavy plant as well as the structure, which includes a reinforced concrete raft over the whole area in which ducts and tunnels have been incorporated to carry services and provide access to some of the machinery. The barrel vault roof construction used for the production area consists of light framework of tubular steel (below) around which vermiculite concrete is laid, with expanded metal lathing used as shuttering under



FACTORY AND OFFICES IN SEIGHFORD ROAD, STAFFORD continued



the framework. This concrete is plastered internally and screeded and finished with mineral-surfaced felt externally. The barrel vaults are supported on boxed tubular steel columns cased in concrete, and rectangular precast concrete glazed units are inserted to give an even distribution of light. The office block, which is separated structurally from the production area, has a reinforced concrete frame with clear spans at first floor level of about 30 ft. (Above left is the main staircase in the office block and above right is the ground floor service corridor between the production area and the office block.) External walling is mainly of semi-engineering brickwork. The clients required a floor in the production area capable of withstanding heavy traffic and be hard wearing, and at the same time have a clean and even surface. The main production floor areas generally are finished with a carefully graded, crushed gravel concrete, moisture controlled, compacted and power floated. Compacted concrete is also used for the floors in the main storage areas and the offices have a floor finish of hardwood blocks. Certain areas of the workshops are air conditioned, with high level inlet ducts and outlet ducts in the floor structure (below). In non-air conditioned workshops ventilation is by continuous units in the crown of the roof barrels. The assistant-in-charge was G. Partridge and the consulting engineer for the shell-concrete roof was C. V. Blumfield.

COST ANALYSIS

Total ground floor area:	factory	51,833 sq. ft.
	office block	7,746 sq. ft.
		59,579 sq. ft.
Total floor area (excluding tunnels etc.):	factory	53,490 sq. ft.
	office block	14,875 sq. ft.
		68,365 sq. ft.

Tender cost of piling, foundations, ground floor slab, service tunnels, plant bases, etc. (September, 1952) £56,856
Tender cost of barrel roof over factory, including columns and beams, roof covering, etc. (July, 1953) £42,400
Tender cost of superstructure generally, including finishes, plumbing, heating and drainage (October, 1953) £72,623
Gross tender cost £171,879
Tender cost per ft. cube (excluding tunnels, etc.) 2s. 4½d.

Element	*Cost per sq. ft.* s.	d.
Preliminaries	2	8
Piling, foundations, ground floor slab, service tunnels, etc.	16	2½
Concrete frame, floor and flat roof slabs, barrel roof construction, staircases	12	2½
External walls, facings, precast concrete facing units, window sills, external wall tiling	2	3¾
Internal walls and block partitions	1	0¾
Metal partitions		9¾
Roof coverings, rainwater goods and flashings	1	8½
Roof lights		10¼
Ceiling and wall finishes	1	4
Floor finishes including screeds, skirtings, etc.	4	0¾
Metal windows		7¾
Doors and ironmongery		7
Hand and electrically-operated shutter gates		9¾
Staircase balustrades, railings and fittings		4½
Internal plumbing, and heating	1	4½
Sanitary fittings		2¾
Lift installation		6½
Glazing and glass blocks		3
Decorations	1	2¼
Drainage		7½
Builders' work in connection with clients' services and plant		5¼
	50	3½
Increase in final cost over tender cost:		
Sundry additional works and further work in connection with clients' plant	1	6¼
Increased cost of wages and materials over basic rates, and overtime	1	6¾
Final cost per sq. ft. of floor area	53	4½

Note: The foregoing costs are exclusive of electrical installation and fittings, also ventilation and extract system, carried out by the clients under separate contracts.

CONTRACTORS

General Contractors: Wilson Lovatt Ltd. *Sub-contractors—Vermiculite barrel roof and reinforced concrete columns:* Overstructures Ltd. *Foundation and piling:* West Piling Construction Co. *Design of reinforced concrete frame 2-storey section:* BRC Engineering Co. *Three-ply roofing felt:* Highways Construction Co. *Asphalt roofing:* Val de Travers Asphalte Ltd. *Metal windows:* James Couper & Co. *Precast concrete roof lights and sills:* J. A. King & Co. *Glazed partitions:* Sankey Sheldon Ltd. *Thermoplastic flooring:* Armstrong Cork Co. *Folding metal gates:* Bolton Gate Co. *Hardwood flooring:* Horsley Smith & Co. *Radiators:* Ideal Boilers & Radiators Ltd. *Lift:* Gimsen & Co. (Leicester).

To assist in eliminating misunderstandings about the effect of the judgment of the Queen's Bench Divisional Court in the case of Hughes v. *The Architects' Registration Council of the United Kingdom, the Specialist Editor* (17), *Legal, has contributed the following article:*

LEGAL COMMENT

What the Hughes v. ARCKUK Decision Means

The recent decision of the Divisional Court in the case of Hughes *v.* The Architects' Registration Council of the United Kingdom is an important accretion to the sparse crop of judicial statements on the powers of professional bodies to control the activities of their members. In emphasizing, however, that the judgment of the Court has imposed a fetter on the disciplinary powers of a professional body it is easy to overlook the limited nature of the decision.

Mr. Hughes, the appellant, in December, 1956, had his name removed from the register of architects kept under the Architects (Registration) Acts, 1931 to 1938, he was disqualified from registration for two years and was not to be entitled to admission to the register thereafter unless he had meanwhile passed one of the recognized examinations. The Discipline Committee of the Council had made this order because, it was held, he "was deliberately and knowingly flouting, because of his own private interests, the standard which the profession as a whole has set itself and which has been set out in the Code of Conduct." By Section 7 of the Architects (Registration) Act, 1931, the Council has power to remove from the register the name of a person convicted of a criminal offence or found guilty of conduct disgraceful to him in his capacity as an architect. The Council, in 1950, had issued a Code of Conduct which provided that no architect would be allowed to practise as an estate agent after January 1, 1956. Now, the Court agreed that such a restriction was reasonable and that the Code expresses the best opinion in the profession today but Mr. Hughes, who has practised in England both as an architect and an estate agent for about 35 years, rejected this provision of the 1950 Code and, when he insisted on continuing his estate agency after 1st January, 1956, the Discipline Committee found him guilty of conduct disgraceful to him in his capacity as an architect and imposed its sanctions.

Before 1931, any person could call himself an architect and the profession was quite uncontrolled by statute. The Architects (Registration) Act, 1931 set up a Registration Council and a Register of Architects. By the usual "Parliamentary bargain" the unqualified *bona fide* practitioner was allowed to have his name entered on the register. He could then call himself a "Registered Architect." This Act did not forbid a person calling himself an architect or practising as an architect although not registered. Tighter organization came with the Architects (Registration) Act, 1938, which prohibits under heavy penalties any unregistered person calling himself an architect. This Act made unnecessary the old title "Registered Architect."

These are, then, the only statutes controlling the profession. But, from time to time, the Council has issued its Codes of Conduct. Of themselves *they have no legal force*. They cannot, *e.g.*, be compared to Byelaws, which are legally binding because made under the authority of a parent statute. In 1931, any person who was a *bona fide* architect was legally entitled to be registered as an architect. It did not matter that, *e.g.*, he was also an estate agent. In 1938, by the mere fact of being then a "Registered Architect" he became entitled to call himself thenceforth an architect. The codes issued from time to time might express the best opinion in the profession but they could not—as they lacked legal force—restrict the rights which were given without qualification by the two Acts of Parliament.

Though Mr. Hughes succeeded in his appeal, the power of the Council to remove a person convicted of a criminal offence, or guilty of conduct disgraceful to him in his capacity as an architect, is in no way in question. It has simply been decided now that concurrent practice as an estate agent when undertaken *before* a code prohibits it is not disgraceful conduct. The facts that influenced the Court must not be lost sight of.

First, earlier assurances had been given. The President of the Council in January, 1937, had informed the Institute of Chartered Surveyors that there was nothing in the coming Act to "interfere in any way with the activities of any person save that he may not call himself 'architect' unless he is so qualified by registration." It was felt that the Appellant, who is also a surveyor, was asserting simply a right to do what the President had once said he and others like him could do. Second, it would be difficult to say that concurrent practice as an estate agent was *inherently* disgraceful in view of the fact that, as Mr. Justice Devlin said, "Mr. Hughes has been flouting the opinion of the profession for the last 20 years and for the last seven of them—the period of grace—with the express approval of the Council. His offence is not that he is flouting it but that he is flouting it for longer than the Council consider it reasonable it should be flouted. . . . If, in December, 1955, anyone had suggested that Mr. Hughes was behaving disgracefully he could have recovered heavy damages for defamation. But, it is said, when the clock struck midnight he began to sin. . . . Disgrace is not something that gets brought in with the New Year."

But the Court made it clear that disgraceful conduct is a reality. The learned judge emphasized the Council's power to disqualify and said that "disgraceful" is to be given its natural and popular meaning. "I do not say," he declared, "that the pursuit of an undesirable practice can never be disgraceful. Every profession has practices which it bars. Among the commonest of these are advertising, poaching, and undercutting. These activities, which are considered in the business world to be laudable examples of enterprise—so much so that their restraint is *prima facie* contrary to public policy—have always been considered offensive professionally. If a man joins a profession in which the use of trade weapons is barred, and then proceeds to employ them, he is taking an unfair advantage over his fellows. They restrain themselves, believing rightly or wrongly that such restraint is essential to the good health of the profession as a whole: he gets the benefit of their restraint and fills his purse at their expense. He is defaulting on the obligation, by which explicitly or implicitly he undertook to be bound, when they made him of their company. Such conduct could be thought disgraceful, not merely by those of the profession, but by outsiders who were not themselves bound by the same standards."

The Lord Chief Justice took the same view. "I do not wish it to be thought that I am saying that architects admitted to the register, as was Mr. Hughes, are not bound by any rules of professional conduct, nor has he so contended. There are rules of conduct which all professional men must observe. Refraining from advertising would, I think, clearly be one." It would be very rash, therefore, to read into this judgment any general licence to architects or other professional people to depart from the accepted standards of professional practice.

Furthermore, the decision does not affect the binding force of a particular Code of Conduct on persons joining the profession *after* the code has been declared. Mr. Justice Devlin stated "It is only if a man has bound himself in honour to accept a majority view and to act according to the code, that a deliberate breach of the code for his own profit can be called disgraceful. Mr. Hughes has never bound himself in that way . . . His case differs, not merely in degree but *toto coelo* from that of the new entrant who is admitted upon terms, written or unwritten." The Council, the learned judge indicated, might bind a member by statute or by contract, and Mr. Hughes, as regards his estate agency, happened to be bound by neither. He was "in at the start" and was not contractually bound by the code. His estate agency practice was held as a fact, not to be inherently disgraceful. On these limited grounds his particular appeal succeeded.

It was argued that, as the Council's decision that estate agency practice was disgraceful was a finding of fact, and not of law, the Divisional Court had no power to upset it. Support for this argument was sought from cases where the Court refused to interfere with factual findings by the General Council of Medical Education but the Lord Chief Justice pointed out that, by statute, the Court is limited to deciding if the latter body has jurisdiction to make a particular order and whether they have evidence on which they could act. Provided evidence existed that reasonableness of a particular finding could not be questioned. But in the case of the Architects (Registration) Act 1931 and also in the case of appeals from the findings of several other professional bodies, the Divisional Court can go further and decide if the Tribunal's decision was a proper one. From the decision of the Divisional Court there is in such cases no appeal.

It seems clear now that when an architect joins the profession he agrees, so far as concerns activities not inherently unprofessional, to bind himself only to the Codes of Conduct prevailing at the time. A young architect joining the profession today may also practice journalism. If, to take an extreme example, a majority of his colleagues one day resolve that such activities are unprofessional, could he dissent? This judgment seems to have established that he could. "There is the right of every man," run the final words, "to earn his living in whatever way he chooses unless by the law or by his own voluntary submission his way is taken from him."

DIARY

Sculpture 1850 *and* 1950. Exhibition at Holland Park, W.8. 10 a.m. to dusk (including Sundays). Admission 1s. 6d.

City Planning—from St. Paul's Precinct to Pubs. TCPA tour of the City of London under the guidance of Anthony Mealand (City Planning Officer). From the City Corporation Offices, 55, Moorgate, E.C.2. 6.15 p.m. JUNE 17

Design for Leisure. Exhibition at the Design Centre, Haymarket, S.W.1. Monday to Saturday 9.30 a.m.—5.30 p.m. JUNE 17 TO JULY 10

Cost control in building

Six lecture-discussions

This week we publish the first two of the lecture discussions which we have organised in association with the Regent Street Polytechnic School of Architecture. The remaining meetings will appear in following issues of the JOURNAL. *The course was for those architects, quantity surveyors and builders who wished to learn more about the techniques of cost planning. Attendance far exceeded our expectations—some* 350 *" students " enrolled, about half of them architects, the majority of the remainder quantity surveyors, some builders and even a " client." We regret that many applications had to be turned away for lack of space in the Portland Hall. In later issues of the* JOURNAL *we shall print a bibliography of articles and other publications on the subject of cost analysis and a list of the analyses published in the* AJ *so far. The first analysis appeared on February* 24, 1955.

1. April 30. *The Need for Cost Control.* J. M. Austin-Smith, A.R.I.B.A. (architect in private practice). Chairman: Sir Thomas Bennett, F.R.I.B.A.
2. May 7. *Cost Analysis.* James Nisbet A.R.I.C.S. (principal quantity surveyor, MOE). Chairman: Hubert Bennett, F.R.I.B.A.
3. May 14. *The Elemental Bill of Quantities.* Clifford Nott, A.R.I.C.S. (chief quantity survey, Herts. C.C.) and Ivan Tomlin, A.I.B.E. (contract manager, Howard Farrow Ltd.). Chairman: P. E. Trench, B.SC.
4. May 28. *Cost Planning.* I. G. Grenfell Baines, A.R.I.B.A., A.M.T.P.I. (architect in private practice). Chairman: M. H. Thackray, F.R.I.C.S.
5. June 4. *Cost Planning* II. John Wilkinson, A.R.I.B.A. (architect in private practice) and Arnold Towler, A.R.I.C.S. (quantity surveyor in private practice). Chairman: Cyril Sweett, F.R.I.C.S.
6. June 18. Symposium. Chairman: D. E. Woodbine Parish, F.I.O.B.

1 The need for cost control

chairman SIR THOMAS BENNETT

speaker MICHAEL AUSTIN-SMITH

THE CHAIRMAN: the building industry is engaged increasingly upon putting up buildings for a wider and wider circle of people for a greater number of objectives, in a time of rising costs, at a period when the capital investment in any individual building must be a minimum. Now that, in many ways, is different from the approach of 50 years ago, when the great aim of most architects was to produce fine buildings. The architects still have to produce fine buildings, but in so doing, they have to be cost-conscious at each stage of the proceedings, and at the preliminary discussion we had about this series of lectures we thought it desirable to outline some of the points of approach at which cost must be an element in design.

The architect has to find the best architectural interpretation which can be achieved at the least possible cost, at the least amount of labour content and with the smallest use of scarce, difficult or expensive materials. Frequently that will require analysis at that stage from the cost angle as well as from the design angle.

The second point of importance is reached when an effort is made to find out whether the client wants this or that type of finish, whether he wishes to balance a marble hall against a lift or paint against distemper, or a facing material of the traditional order against escalators. Therefore, in order that we may have a clear conception of the cost picture at that stage, we must discover what is in their minds and technically to present them with the alternatives. We then have to apply our constructional knowledge to find out the best type of construction.

There was a period at which you merely thought in terms of brick or masonry, and then another period when you thought in terms of steel frame and possibly of reinforced concrete. But each of them had, broadly speaking, only one type of interpretation. Today, each of those may have a number, which vary with the plan, the type of building, the loads to be carried, the current price of materials, and a number of other items which produce a third stage of cost examination.

Now in this picture—and I do not want to supplant the lecturer tonight, I merely want to point the road which all of you, I hope, will travel to the end—that picture clearly has as its background the need for a large amount of study. I incline to the view that the teachers, professors of architecture, the heads of the higher and more advanced schools have, aside from their purely teaching requirements today, to be the men who, by training, skill and equipment are best able to carry out this background analysis to settle principles upon which the rest of us could work.

And so meeting as we do here today, in the Hall of the Regent Street Polytechnic, under an extremely capable head, and with the assistance of THE ARCHITECTS' JOURNAL, we are going to set out on a journey to try to see how we can control costs.

MICHAEL AUSTIN-SMITH: One would have thought that the need for cost control was so thunderingly obvious as to make the holding of a course of lectures such as this completely unnecessary. Some pretty far-reaching and drastic changes have overtaken the building industry and its associated professions. Changes so drastic that they are tending to overthrow many of the long established methods of cost, or price as it really should be called, control. In the history of architecture and building it is only comparatively recently that the materials available did not exceed say brick, stone, timber, glass, plaster and lead. Services as we know them today were non-existent and the whole building industry was based on a craft system which had accumulated its knowledge through centuries of experience. Under

such a system it was possible for the architect to really know the cost of all the possible combinations and permutations of all materials and methods of construction. The assumption that this is still so underlies the principles of existing methods of cost control. The architect is expected to be fully aware of the financial implications of all his design decisions. Once the architect has produced his sketch scheme and obtained an approximate estimate from the quantity surveyor, then it is expected that the architect will be able to so balance all the conflicting factors that in the end the final cost will be the same as the approximate estimate. This was perfectly feasible when the methods of building and sequence of operations was on a well defined and recurring basis. When such a system reached a very high level of efficiency and produced, as a result, most lovely architecture, the industrial revolution almost overnight commenced to attack the very basis upon which such a system and method was founded. So complex have the new techniques of construction become; so varied the conditions that have to be met; so enormously increased the types of buildings now required; so great the demand and so limited the resources, that the industry as a whole and architects in particular have been failing to discharge adequately one of their prime functions of giving value for money. So great has been the failure that we have become mistrusted and our standing debased. In the eyes of the public we have in many cases been reduced from responsible members of business life to "airy fairy" people with our heads in the clouds, whose ideas of costs and value for money are spoken of as music hall jokes.

If we look at other industries we see the same set of circumstances and changing techniques, with new requirements and demands being made on industry which but a decade ago had never even been contemplated. Yet on the whole, industry has not sunk to the level of costing by trusting to luck. New products are formulated, new machines and processes designed, costed and put into production, all demanding an outlay of capital, resources and labour on a simply gigantic scale. So exact and precise must the management of such enterprises be that they cannot be regulated by empirical means, but by every aid that scientific management can provide.

The meaning of management

What are the principles of this type of management which industry has used so effectively and can they be applied to architecture and the building industry? The term Management refers to the group or individual that directs at any level the use of men and materials to a definite end. Top management creates policy, determines procedure and provides the co-ordination where many activities are carried out.

The major aspects of management fall into two broad divisions. Firstly the philosophy of management and secondly the functions of management and the techniques which have been developed so that these functions may be properly exercised. Among the functions of management the most prominent are the following: General Management, which is responsible, amongst other things, for the formulation and interpretation of policy, direction, control, and economic forecasting. Financial management, covering control of capital and revenue resources, accounting and costing. Marketing Management and Production Management, as well as Management of personnel, purchasing, offices and development. Appropriate to each of these *functions* of management there are *tools* of management which have been developed for general use, for example:—General Management has the following tools and techniques: Organization charts and manuals, standard practices, communication methods, management ratios and control figures. Financial management has the technique of budgetary control, cost analysis and cost control, and management accountancy.

It is possible for us to see within this general background and framework ot management some of our own techniques which are emerging. The technique of obtaining the clients' brief, and acquainting the client with the problems involved, the calculation of work loads, the programming of the production of drawings, cost planning and analysis, operations programming and site organization, to mention only a few. We are thus able to see the subject of this course as just one of the many techniques of management with which the management may better discharge their proper functions. It is therefore in such a light, that this study of cost control should be viewed. Being only a technique or tool of management it will vary greatly according to need and size of projects. Do not expect to come away from this course with a neat brochure which you can throw on to your secretary's desk, smoothly murmuring in a rather superior voice, "Oh, by the way, Miss Jones, as from the 25th of next month we shall be working on Cost Control method 'C'." None of the lecturers in this course will claim that what they will tell you is final, complete and absolutely the last word on the subject.

Present cost control

Very broadly speaking the present procedure follows the following pattern. An approximate estimate is obtained from the quantity surveyor based on a sketch scheme. During the design and working drawing stage any major additions or omissions are obviously assessed, and the quantity surveyor may probably be asked to work out some comparisons between certain methods of construction or differing finishes. Certain types of equipment and finishes are decided upon and quotations obtained; the cheapest normally being accepted. Every now and then some pretty glaring excess of zeal on the part of an assistant, such as marble in local authority housing, is unearthed and thrown out. This zealous assistant, reacting in a fairly normal manner to such brusque treatment of his ambitions, sets to work to rectify the position. He knocks off a few pounds from, say some piece of sanitary equipment and gets away with the trump card of "Well we've saved on that, can't we now spend a bit on my marble." Eventually the bill goes out to tender and the resultant price is too high. Out goes the marble for a start. "Why not take out all the tiling in the cloaks and lavatories" suggests someone in a neutral voice, carefully modulated to the depressing and macabre scene of the building being dismembered. "No," replies someone, "That would mean altering all our details of windows, doors, skirtings, etc." Gloomy silence descends on the

office, no one daring to voice their darkest thoughts for fear of being thought too murderous. " Well something has to be done, what about calling in the contractor," suggests someone. " Perhaps he may have some bright ideas." So Mr. So and So from the contractor arrives with some very bright ideas, the least horrible of which are accepted by the architect with the doubtful consolation of knowing that anyway he himself did not actually strike the blow. What is cut out, however, is anyone's guess, and is quite haphazard with the result that the building which eventually is erected has a very unbalanced allocation of expenditure.

Such an unbalanced result is obviously bad, and with this method it is liable to happen whether the tender figure is in excess of the estimate or not. In the example I have just given, how can the architect tell whether the cost of the sanitary equipment was not already too high in relation to the other costs of the building, even after it had been reduced. In other words he has not correctly apportioned in advance his proposed expenditure. He has in fact made no plan for so doing.

The questions which need answering are firstly, ought an architect to do this, secondly how will it help if he does make a cost plan. To answer the first question in the negative is tantamount to saying, " As an architect, I am an artist and above such mundane and restrictive matters as money." Such an attitude might be possible for the genii of this world, but the rest of us have a moral obligation to design buildings that are in sympathy with the existing economic and social structure. The answer then to the first question must surely be in the affirmative.The difficulty of the task brings us to the second question: how does making a plan help? It must be clearly understood that the mere making of a cost plan will not miraculously solve all the problems, but once a plan has been made there exists a target against which to assess one's results. If, you may ask, it is not going to save a whole lot of work what is the use of doing it. Is it not similar, you will say, to the ludicrous situation where a commercial firm which is losing money, calls in a management consultant to investigate, and at the end they say they are still losing money but all they now know is how they are losing it. Surely the only ludicrous thing about this situation is the people in the firm who do nothing about rectifying a fault which they know exists. A cost plan will bring forth the problems for us to tackle and not leave them hidden and buried, greatly helping the architect and eventually saving him an enormous amount of wasted time.

The planning of cost

If we look closer at this technique we will see that it is a complete cycle of events, each portion bearing its proper relationship towards the other portions. To take one portion out of context can therefore lead to an incomplete understanding of it. It is for this reason that I propose to deal, in outline, first with the making of the cost plan, rather than making the cost analysis which some of you might think would be the first essential. Early in one's experience it will be necessary to start with a target figure of cost to work to, such as a fixed cost limit in the case of schools, or an approximate extimate prepared by oneself or one's quantity surveyor. Later on in one's experience it may well be that it will be possible to build up the cost of a building by adding together the cost of each little portion. This presupposes the existence of a vast accumulation of information which, except in certain specific cases, is at the moment lacking.

We start with our target cost, and, dividing the building up into portions most convenient to us, such as walls, windows, floors, etc., we allocate a proportion of the total cost to each of these items. In deciding on the cost of any particular item we naturally make use of our skill as an architect. We draw on what information we possess as regards quality and cost, and if we find any example which we think is really comparable we feel reassured about that item and go on with the building up of our cost plan.

The making of the cost plan is done quite early in the architects' work, towards the end of the investigation stage and at the beginning of the design stage. It is now necessary to implement the cost plan. This is done during the rest of the design stage and before the working drawings are attempted. Each item or portion of the building is studied carefully and the sum of money allotted to it is broken down into cost per sq. yd. or other unit of measurement which is readily appreciated by the architect, manufacturer and contractor alike. With this information the architect has a cost and quality basis against which he can measure any alternative plan form, construction or finish and can make the choice of materials and components, fully aware of their effects on the cost of a job. There is therefore considerable too-ing and fro-ing between architect and quantity surveyor until the best balance of cost and quality has been obtained. Then and only then are the working drawings commenced, which, being based on the considerable amount of detailed study during the design stage, are much more a question of merely drawing out.

Cost information

This being the first time we have been through this procedure we feel a bit confused and all sorts of horrors and doubts appeared as we progressed. We have, however, broken down our building into units and set a target price against each one, all this is down in writing together with our reasons and specification notes as regards quality, and we naturally will be interested to see how it all turns out. Off goes everything to the quantity surveyor, and we tell him what we have done and say that we are looking forward very much to seeing the results. What the quantity surveyor then says has been censored. Anyway, the job goes out to tender, is built and the final account rendered. During this period we have been exercising our normal control over the job, such as regular site meetings, written instructions, running financial statements, and so on, to ensure the cost is properly controlled. It should not be thought for one minute that because you now wear a badge in your lapel which says " Cost Planners Club " that you can throw overboard all the other managerial techniques which are not strictly within the scope of this course but by now should be considered standard practice. By the time the final account is prepared you will have come to certain conclusions about the way in which you divided

up the building into different units, and the quantity surveyor will have various ideas on what should or should not be included under these headings. Eventually you will decide on an agreed method of dividing the building into certain elements and what should be contained within these elements. Having agreed this, it is not really very difficult to get the final account broken down to show the cost of these elements, and so that you may easily be reminded what standard of quality each cost represents you add a very rough specification to each element. You will be able to compare the cost plan target with the actual result, and you will be able to understand the reasons for some of the discrepancies and thereby add to your fund of knowledge. Other problems will remain unsolved to be tackled next time. The information you have acquired is obviously of great use to you and you use it whenever you can. When you are cost-planning another building you will break the building down into exactly the same list of elements, and, making the necessary adjustments for sizes, quality and economic changes, you can apply the costs which were previously found by your analysis of the final account of the last building. It may well be that the next job you get is one of those " add a bit here, chop a bit there " horrors, which all the analyses in Christendom would never parallel, in which case you have to make your cost plan without the benefit of any analysis to guide you. On the other hand, your next building may in some but not all respects have certain similarities with the building whose costs you analysed. In this case you obviously apply what is applicable and judge as best you can the remainder. As you can appreciate, it might be quite some time before you were able to design and analyse all the various types of buildings which you might be called upon to execute.

The building which you have analysed may be exactly the type which another architect is working on but lacks the necessary information and vice versa. If your analysis could be presented in a standardized fashion, so that another architect was able to tell what quality the costs represent, what sizes and quantities are involved and how the building is planned and what it looked like, then he could, after first preferably visiting the building together with his quantity surveyor, begin to use with confidence certain portions of your analysis.

Thus the cycle is complete and the next time you have a building to design you will be able to make use of several cost analyses of the same type of building, together with your own already acquired knowledge of planning the cost of the various portions of a building. This time your plan can be more exact and will be worked out according to the generally accepted procedures, which have been devised for this purpose. Exactly *how* you plan and what information you require to enable you to use and adapt other people's analyses are the details which you will be given in the remaining lectures of this course.

Implications of the elemental breakdown

Though you will be hearing, in detail, about the impact of cost planning and cost analysis on the running of a job, it might be useful for us at this stage to consider in principle what the long-term effects might be The general trend towards mechanization on the site and the greater use of factory-made units and assemblies is tending to make the architect think more and more in terms of larger units than he has done in the past. He is inclined to think of complete wall panels instead of numbers of little bricks, of complete structural systems instead of joists, bearers and supports.

We have seen that it is in the design stage that the real control of costs must be done by cost planning and its attendant continuous cost checks. It is therefore not surprising to find that the method of cost analysis and cost planning is conceived on the larger unit basis or elemental basis as it has come to be known. On the site there is a trend towards more of an assembly process than a craft process, and this in turn means that the drawings required will be increasingly produced in a form which makes such a process easier. This trend is clearly apparent and drawings are already being produced solely for their respective elements. If drawings are produced this way then we will find that technical information and special items in a cost library will be filed under the same headings of elements. In the builder's office the build-up of the tender has to be done by reference to the various functions that the materials involved have to fulfil, *i.e.* in what elements are they distributed. On the site the overall planning and preparation of the overall and stage programme is more and more being done by elements. Most of the research which is being carried out by builders through method study is being done on an elemental basis. From the information they obtain through these studies they are able to arrive at the true values of certain operations. The piecing together of these work values will give the builder his costs of an element. The real costs, not the price. The adding together of the cost of a series of small operations will result in the cost of a larger operation, not in the cost of a list of materials.

There is, therefore, a discernible trend right the way through the method of thinking and producing the building and analysing the results towards maintaining an elemental basis. It is therefore not surprising that the idea of producing the bill of quantities on an elemental basis has particular attractions. A bill produced on this basis would, in the circumstances I have just mentioned, be of inestimable value throughout all the stages of a job and especially for producing the analysis for future jobs to come. What exactly an elemental bill consists of and what it entails will be the subject of one of the lectures later in the course. This lecture will also cover the use of the elemental bill in the builder's office and on the site, and will deal with the pros and cons of this rather controversial subject.

Development of the method

It would, I think, be appropriate to consider the quantity surveyor's attitude on this matter. Firstly I think it is entirely wrong for any of us to expect that so major a change could come about by edict. We cannot expect the quantity surveyors to issue as it were, a royal command that " With effect from next Monday—all change—elemental Bills from now on chaps." Cost planning and analysis requires a very great deal of hard patient work. One of the leading authorities on this subject, the Ministry of Education Development Group, first published a

preliminary bulletin on Cost Study in March, 1951. They are just about to or just have published a second edition will full details of the procedure. Six years can be taken as an indication that this is definitely not the sort of thing which one can knock off over the weekend.

There is an awful lot more thought and work that is required to be done: the question of how many elements there should be, and what they should contain, and the problem of making and disseminating the analysis in such a form that it can be used with accuracy by other architects. The present methods are capable of variation and adaptation, and it is not beyond the bounds of possibility that new methods might be evolved after further study and experience. This study can only be done by people like yourselves who take the trouble to find out what it is all about.

If you should feel tempted to criticize the quantity surveyor for being too conservative, first ask yourselves how much you are doing to help solve some of the problems. Are you actively engaged in putting these ideas into practice or are you on the touchline lustily yelling, " Down with the reactionary quantity surveyor."

However, make no mistake about it, if the trends which I have described continue then some form of annotated elemental bill will be badly needed. The demand for such a bill can only come from a body of architects with real live knowledge of the problem. I am absolutely convinced that as soon as such a demand is made on the quantity surveyors they will meet it, and many of the problems will be overcome. Already, in a most significant report on " Standardized quantities and mechanized billing" in THE ARCHITECTS' JOURNAL of April 18, 1957, appears the following sentence: " Having prepared a set of punched cards representing a job, they may be sorted and re-assembled in any given order to aid cost analysis or for any other purpose simply by passing them through a machine. This fact should be of great interest in view of the present discussion on elemental bills."

I am not qualified to go into the details and difficulties of billing by automation, but I strongly advise you to read that article. The possibilities attendant upon such developments are vast, and it is now possible to foresee in the not too distant future regional centres where architects and quantity surveyors would use one central machine to print and analyse their bills; there too might be established the regional centre for the storage and exchange of cost information.

The client, the most important person in this setting, whether he be an individual or a corporate body or the public at large, just will not commission an architect unless he thinks he will obtain an efficient service and value for money. As architects we are useless members of society unless we are commissioned to build.

By developing these techniques of management we must look forward with confidence to the time when the architect will, from the very first moment when the client gives him his instructions, follow a well mapped out procedure that enables him to gain a reputation of being reliable and efficient.

If at the end of this course you feel you want to start on the long and hard path of putting what you have learnt into practice, then the course will have succeeded, since it is only in your offices that the results will be born.

Discussion

A. G. ALLEN (architectural assistant): May I first of all say that I think it was a most exhilarating talk tonight. My question is, is this collection and summation of data of costing going to require new specialists in architecture, and is it going to be possible for the architect as known today to be able to carry out this task and still to carry out what he also has to do, design his own buildings?

K. HEWITT (a builder): Is there a future envisaged where the architect will be the supreme cost controller, to the detriment of artistic work?

MICHAEL AUSTIN-SMITH: I rather feel that both those questions are the same thing. There are those management responsibilities which an architect has got to undertake, and I feel unless we do it ourselves, then we are going to find a form of bureaucracy on top of us. We will have a non-architect manager-planner character knocking around the office, who won't half get in the way.

J. A. SPON (architect): I think Mr. Austin-Smith made it quite clear that we have all got something to get out of this. As we know, some information on these lines is already available through THE ARCHITECTS' JOURNAL giving some data, and I am sure there are offices where the information has been built up, but it is not always forthcoming, and one feels there may be some opposition to passing this information into general circuit. You yourself, Mr. Chairman, have done a great number of buildings in London and I do not think we have seen any costs in relation to those.

MICHAEL AUSTIN-SMITH: With 350 of you thinking about the problem, something may well be evolved, and it is obvious that the answer is in our own hands and no one else's. One of the first things obviously, is to standardize the way of presenting it. I presume most of you read THE ARCHITECTS' JOURNAL. You notice how there is a change in the way they are presenting their things, and I do know

that some of the people who have been working on this do not like to be too dogmatic and say "This is the way to do it." It may well be that we have to start amongst ourselves. A certain town or a certain group where information could be slowly passed around, and that will gradually grow. One looks forward to a sort of regional centre. The Building Centre have been thinking of this. There are, of course, professional bodies, our own professional bodies, our own local societies. Since there is nothing in existence at the moment I am certain the only people who can start it is yourselves.

MR. KNIGHT (architect): I wonder whether Mr. Austin-Smith would say to what extent he believes this subject could be introduced into architectural education, so that future generations of architects will come into practice with a clearer understanding of this problem.

MICHAEL AUSTIN-SMITH: I am not an educationist, and I feel some fear in answering a question like that in such a venerable institution as the Polytechnic. I am certain if you read this book I have here, on management training in the building industry, you will see that it can be brought down to principles, and you can teach a lot of these principles to students.

J. S. FOSTER (architect): We are leaving out the quantity surveyor in this matter. Will cost planning take up too much of the architect's time, to the detriment of his design work? We should work very closely with our quantity surveyor. He already has a store of cost data which we call upon, which he gathers from all the various jobs, which we can make use of without the data being published. In other words it is a matter of confidence.

H. E. EDWARDS (quantity surveyor): I would like to say first of all that I am very much in agreement with the proposition of cost analysis and so forth. The making of the cost plan, and then the designing to it is more a problem of the quantity surveyor than of the architect. The cost plan allows so many shillings a square foot of the building, say, for the roof. The quantity surveyor perhaps proposes that amount, and the architect says "what sort of roof can I have for that amount of money?"

The other point I would like to mention, if I may, is that I thought the lecturer rather overstated his case when he dealt with the forecasting of costs. Those of us who examine priced bills can all say that the serious tenders are quite wide apart, 10 and even perhaps 20 per cent. apart; and secondly, that the prices of brickwork, joinery, and so forth, from bill to bill, are very different.

THE CHAIRMAN: Perhaps while we are on that subject there might be a builder here who would like to comment on some of the reasons why costs in tendering in that way vary.

W. E. J. BUDGEN: I am not a builder. I used to think I was an engineer, but now I am a steel peddler. I gather all this analysis and so on is based on rates put in bills of quantities. Now only the man who is successful in getting the job and who carries out the job knows the cost of that. Rates in bills of quantities may have very little to do with costs.

MICHAEL AUSTIN-SMITH: I could not agree more. As architects, we never see the costs, but that is all we have got to work on. The more one does regularize these things, the harder work you put into it, the closer co-operation there will be with builders, and you will eventually come to know something about costs as opposed to prices.

A. M. EDWARDS (architect): One aspect of this problem has been worrying me. The price of an item in 1956 may be quite different from the price in 1957. Costs in one part of the country may be different from costs in another part of the country. I wonder if the speaker could discuss how this variation in place and in time can be dealt with.

MICHAEL AUSTIN-SMITH: That is part of the very hard work that I mentioned, and you will hear from Jim Nisbet next week, one of the things you have got to put into your cost analysis is the time, the place where it was, the nature of the contract, the site and so forth. That is why the architect must do this work, because he can look at the building as a whole. Undoubtedly that is one of the things which worries the quantity surveyor. They say "All right, you architects, you are mad keen on things but you have not the faintest idea how to look at analyses." Of course they are absolutely right, but this thing is designed as a joint effort between architect, quantity surveyor and builder.

E. G. FISH (cost accountant): I have been in the building industry for the last 25 years. Cost control of any real worth will never come about unless you bring the builder into your closest deliberations at a very early stage. The builder has all the costs, he knows the cheapest way of doing anything, and he also can build to a price, because that is his job.

MICHAEL AUSTIN-SMITH: I think I agree entirely with you. One does need to have some sort of competition, you cannot throw overboard all tendering procedures. In management technique, that is where the builder and the architect will meet, then the costs will be made available to the architect.

H. F. KERLEY (quantity surveyor): I believe in the United States there are consultants whose work is in the collection and recording of just this kind of information on cost of building elements. I am not suggesting it could be done in that way in this country, but I think a reference to their methods might be helpful to us.

A. T. BRETT-JONES (quantity surveyor): I think the quantity surveyor could be a great help to the architect if he were brought in at the sketch plan stage. If the sketch plans could be shown him and if you would permit the quantity surveyor to criticize those plans, I think that is perhaps one of the biggest services we can give you. Before we get down to any sort of figures. Just advice, if you like, on things which we know by experience.

MICHAEL AUSTIN-SMITH: I do agree entirely, and I feel one of the great dangers at the present moment is that tempers are pretty frayed between architect and quantity surveyor, and there is great danger at the moment that the architect will take himself away and say "I am not going to see the quantity surveyor, he will pour cold water all over it."

THE CHAIRMAN: I think perhaps we have had a very full discussion. We have heard a number of architects, quantity surveyors; one or two builders asked questions on this very thorny subject.

Over the last few years the relative costs of almost everything in building have changed in relation to each other as well as the actual cost itself. In my own business we have on many occasions produced as many as twenty different panels to face a building, different types of cladding, in the sketch plan stage, and said to our quantity surveyor, "How much per panel will all of these cost?" I have at times produced as many as twenty schemes and had them priced on a mixture of cube and some type of quantity surveying in order to see which type of building is most economical.

In so far as costs, as distinct from pricing, is concerned, there are very serious difficulties inside the building industry itself. You must remember that building is almost the only industry where something has yet to be paid for before it is built. If you are dealing with motor-cars, your production people make a motor-car, cost it, add a profit if they think there is one, and the public then buy it if they think it is worth the money when it is finished and in front of their eyes. There are, of course, a few other things like ships and certain bigger kinds of production machinery and so on, but in general, building from first to last makes its product and the client agrees to pay for it before it is started. The only exception on a large scale is house-building.

We have also reached a stage at which specialization has attained a very high level and we are subletting more and more. The builders generally accuse the architects of producing all these sub-contracts but the architects know perfectly well that the moment you leave the bill with the builder he sublets it to somebody else. No process of that kind goes on unless it produces a fundamentally good answer to the public in the long run.

We have got into the habit of putting in bills of quantities 2½% discount on prime costs. The builder has got into the habit of regarding that as profit, as long as we have a high amount of building work to do. But actually it ought to be a management charge, not a profit at all, and once it is described as a management charge the builder has then the task of co-ordinating all of these sub-contractors, something which he very frequently fails to do today.

So one of the things which our cost analysis will lead us to is that we are trying to evolve a new system of giving the public buildings at less than the relative increase in price of the component parts. That is very far-reaching.

Now it is a great tribute to the industry as a whole, that its interest in this matter, its aliveness to its responsibilities in this sense, is able to bring something like three hundred and fifty people here tonight to learn the first bit about it.

Cost control in building

2 Cost analysis

chairman HUBERT BENNETT

speaker JAMES NISBET

JAMES NISBET : Last week Austin-Smith reminded us that since the Industrial Revolution the building industry had been subjected to quite stupendous changes, and he also reminded us that we are now living in a highly developed scientific age and we are now on the threshold of the Nuclear Age. The only thing we can be sure of now is that there will be new building types, new building methods, new procedures, new materials and new productions—all of these making building much more complicated and undermining many of our established customs and procedures and, most important of all, affecting the way we go about things.

Analytical approach

Now building is predominantly a craft industry, and as a result of that we have tended to learn our jobs, whether professional or in the building industry, almost by copying. But learning by imitation may not be applicable any longer and we may in fact have reached the stage when we can no longer expect to do the job, the same kind of job as our fathers did. To do any job properly we must first examine and analyse the problem and then later define and synthesize the solution. This analytical approach underlies many of the developments which are now taking place in the building industry; as an example we have management, contract planning and programming of architects' drawings. The same approach underlies the techniques of cost control. By cost control we mean all the methods and techniques from the time the architect first get his instructions from the client till the builder receives his last penny from the final certificate; but we are going to concern ourselves much more with the techniques of cost control in the pre-contract period.

The two techniques we are going to discuss are cost planning and cost analysis. Both of these techniques were introduced in a tentative form in 1951 with the publication of the Ministry of Education Bulletin No. 4. They have been under test for the last six years and while there have been variations the principles upon which they have been founded remain intact.

Just to make sure we have got our terms fairly clear I shall give a short definition of these two techniques. The first one is cost planning, which can be described as a method of controlling the cost of a building during the design stage (and the methods of cost planning will, of course, be discussed later in two lectures). To cost plan you must have data, and that data is supplied by cost analysis. Cost analysis, therefore, is a method of examining and comparing the cost of buildings. If we are going to make the best use of what we have, we must know how we normally spend it, find out where we spend it improperly and where we spend it to best advantage. One thing I should like to emphasize in cost analysis and that is it is not a method of approximate estimating, although it has been used for approximate estimating very successfully by the Hertfordshire County Council, and I shall refer to that later on in the lecture.

The sequence of events

Before we go on to the details of cost analysis I would like to show where it fits into the pattern of events. The first operation is that of getting information from the client.

Subsequent to that there is a period when the architect makes some preliminary studies to arrive at a solution to the client's requirements, to the type of structure and services which will satisfy the client. Then he moves on to the design phase, to make very detailed studies of the way he is going to construct his building, of the materials, the services, the methods of construction and so on. So that the next phase of making drawings is merely a process of putting all that information on the drawings for the builder, and after that the drawings go to the quantity surveyor, and then there is the anxious period when the bill is out to tender and then the receipt of the tender. Accepting that description it will be quite obvious that the important part in relation to cost is the design stage, because it is there that final decisions on construction, finishing and so on are made. Now what really happens? At the end of the investigation stage a sketch plan is ready, and on that sketch plan a quantity surveyor is usually asked to prepare an approximate estimate; and he cannot prepare an estimate unless he has got a specification. Clearly the architect is not in a position to give the quantity surveyor a detailed specification, so the quantity surveyor is in the position of literally having to guess or to persuade the architect to make some sort of specification. The estimate is often prepared as a cubic foot estimate, which is of very little use because the architect is thinking of satisfying functions of a building, he is trying to meet acoustic requirements or the fireproofing requirements, he is trying to enclose space, to satisfy the load-bearing functions of the building, and he requires cost information, in terms of functions. Clients are now a bit more exacting: they want to know how the architect is going to spend the money he is being asked to provide, and so he wants more detailed information than the normal procedure. That is rather the background to the need for cost analysis.

The range of school costs

Now, in defining cost analysis I said it was rather important we should know how our money was spent. Figure I shows the tender cost per square foot for 64 secondary schools, tenders for which were received between the 1st May 1955 and the 31st January 1956. That was a period when there was relative stability; there was no labour increase, and material increases were roughly $3\frac{3}{4}$ per cent. Now, the chart shows on the horizontal lines the area in square feet per place and the vertical lines the cost per square foot, and one multiplied by the other gives the cost per place, which is represented by one of the dots on the chart. The top black line represents the cost limit at the time, and the dotted line the previous cost limit. Although the cost limit is £264 per place, there are a large number of schools, almost 50 per cent. of them, which were built below the cost per place; secondly, there is no grouping or massing round a particular cost per square foot, or round a particular area per place. There will be a number of reasons for this variety, but I think it emphasizes that even with a building type where there is a strict cost limit there is a great variety in costs and therefore in quality. If the architect is going to design his school to give the best value for money he must know a fair amount about the distribution of costs within these various buildings. I think this chart will also dispel any idea that there is such a thing as a standard school.

The variety does not stop there, because even getting the same cost per square foot there is still a variety in the distribution of that cost. Figure II shows five schools of roughly the same cost per square foot, and you can see that the structure varies in cost from 29s. 5d. a square foot to 37s. 3d.; so that there is a choice in the kind of construction. In services there is quite a range from 10s. 9d. up to 17s. 0d.; in fittings from 7s. 1d. up to 11s. 6d. If an architect is really going to produce value for money he needs a fair amount of data on the variety of costs, why buildings are costing what they do. I think the procedure I have described here shows that the architect has an extremely difficult task and that he does need information to help him produce value for money; hunches and intuition are no longer entirely sufficient and we must have this systematic method of examining a large selection of costs, and this is what we have cost analysis for. Now, in describing cost analysis I want to emphasize what was said last week, that the method has not been worked out to the last detail and the last button; it is not the final answer.

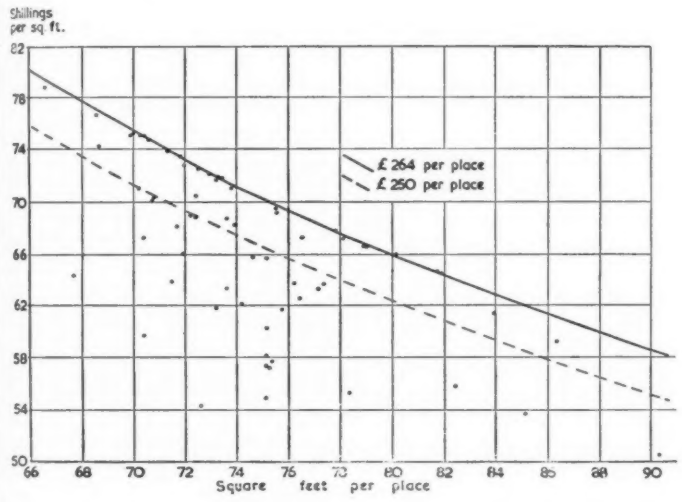


Fig. 1 (left): Scatter chart in which each dot represents the cost per sq. ft. and the area per place of a secondary school. The curve marks the allowable cost limit. Fig. 2 (below): Cost distribution of 5 primary schools showing the elements grouped into 6 headings

SCHOOL	NETT COST PER SQ. FT.	STRUCTURE (5/- 10/- 15/- 20/- 25/- 30/- 35/-)	PARTITIONS (5/-)	SERVICES (5/- 10/- 15/-)	FITTINGS (5/- 10/- 15/-)	PLAYGROUND & DRAINAGE (5/- 10/-)	CONTINGENCIES (5/-)
A	65/3	33/1	1/11	10/9	9/8	8/10	1/-
B	65/11	31/2	4/7	17/-	7/4	3/8	2/2
C	65/4	29/5	3/11	11/9	11/6	7/8	1/1
D	64/8	29/7	3/-	13/-	10/-	7/9	1/4
E	65/5	37/3	3/0	12/3	7/1	4/2	0/10
ELEMENTS INCLUDED		Work below ground floor level; external walls; frame; upper floor construction; staircases; roof construction; rooflights; windows; doors (external); glazing; wall finishes; ceiling finishes; proportion of preliminaries and insurances	Internal partitions; doors (internal); proportion of preliminaries and insurances.	Plumbing (external), (internal), (sanitary fitting); gas, electric and heating installations; proportion of preliminaries and insurances	Floor finishes; W.C. doors and partitions; cloakroom fittings; fittings; furniture(built-in); decorations; proportion of preliminaries and insurances.	Drainage (nett cost); playgrounds and paved areas; proportion of preliminaries and insurances.	Contingencies

Definition of the element

To describe cost analysis I would like you to turn to Table I, which shows a simple cost analysis which has three constituents: firstly, the elements; secondly, a yardstick by which we measure the cost, and, thirdly, the cost itself. The elements are shown in the centre column. They relate to parts of a building and they can be grouped according to the main sections of the building, such as structure, partitioning, finishing and services. The yardstick by which cost is measured is the square foot of floor area and the cost is expressed in shillings and pence.

The element can be defined as part of the building which always more or less performs the same function or functions; for example, a building must always have horizontal protection to keep out the rain and weather, and an architect will look to a roof to satisfy that particular function. It does not matter whether it is a roof with timbers and tiles or concrete or asphalt, it is performing the same function. Similarly, if we want something to let the daylight in and keep the rain out we look to windows. Now, all buildings will not include all elements. A single-storey building will not include upper floors, lifts, or staircases, and the load-bearing construction will not include a frame; so that we may have a list of elements but we may not use them all for each particular building.

Now, the choice of elements depends on a number of factors. The most important is the type of construction which we use as a datum for comparison. Each particular office or organization will probably consider that it knows one construction fairly thoroughly and knows its cost, and therefore it would choose that particular construction as the datum for comparison. The next factor is the sub-division of a building, by which the architect designs, and the choice of elements must also be related to the way a builder would carry out his contract planning. If he considered decorations as an important and separate operation in his planning of operations, then it should be a separate element; whereas the designer may say decoration should be part and parcel of other elements; so that there can be a conflict between the various factors.

It is important to define the limits of an element. At previous meetings on this subject it has often been stated, " Well, what is a door? Should the cost of a door include the door less the cost of the wall that would be there if the door were not there?" It seems to me this is making things rather difficult, and that the obvious answer is the right one.

Now, the list of elements which are presently in use are shown in Table II. The first list is suggested by the Ministry of Education; the second list is that used by at least two local authorities; the third list is that used by THE ARCHITECTS' JOURNAL; and the fourth by a large firm of quantity surveyors. I should like first of all to draw attention to the similarity between the first, third and fourth columns; there is also a fair similarity between the second and the last. The two main lists of elements currently in use are the first and the second; THE ARCHITECTS' JOURNAL list, of course, deals with a large number of different building types and it has been found applicable to a large range of buildings; and the last list of elements was chosen in a bill of quantities produced by elements and it was designed to reduce the work of the estimator.

You will note that the second list is much shorter because some of the elements in the Ministry's list have been amalgamated. For example, you will see that in the

TABLE I: SPECIMEN OF A SIMPLE COST ANALYSIS

Serial No.	Element	Cost per sq. ft. s. d.	s. d.
1	Preliminaries and insurances	6 10	
2	Contingencies	1 11	
			8 9
3	Work below ground floor level	5 10	
4	Frame	2 6	
5	External walls	5 0	
6	Windows	4 4	
7	Doors (external)		
8	Roof construction	5 2	
9	Roof lights	2	
10	Upper floor construction	1 8	
11	Staircases		
12	Glazier	7	
			25 3
13	Internal partitions	2 3	
14	Doors (internal)	1 1	
15	Ironmongery	9	
16	W.C. doors and partitions	2	
			4 3
17	Wall finishes	1 2	
18	Floor finishes	3 1	
19	Ceiling finishes	1 6	
20	Decorations	1 4	
			7 1
21	Cloakroom fittings	8	
22	Fittings	1 4	
			2 0
23	Plumbing (external)	5	
24	Plumbing (internal)	1 8	
25	Plumbing (sanitary fittings)	1 1	
26	Gas installation	2	
27	Electric installation	4 10	
28	Heating installation	6 8	
29	Kitchen ventilation	5	
30	Drainage (net cost)	1 8	
			16 11
31	Playgrounds and paved areas	1 8	
			1 8
	NET COST		65 11

TABLE II: LIST OF ELEMENTS NOW IN USE

Ministry of Education	A Local Authority	Architects' Journal	A Large Firm of Chartered Quantity Surveyors
Preliminaries and insurances contingencies	Preliminaries	Preliminaries and insurances contingencies	Preliminaries
Work below ground floor level	Foundations	Work below ground floor level	Substructure
Frame	Structural frame	Frame or load bearing element	Frame
External walls	External walling	External walls	External walls, windows and doors
Windows	—	Windows	
Doors (external)	—	External doors	
Roof construction	Roofing	Roof construction	Roof construction and roof lights
Roof lights	—	Roof lights	
Upper floor construction	Upper floor construction	Upper floor construction	Upper floor construction and staircases
Staircases	Stairs and steps	Staircases	
Glazing	—	Glazing	Glazing
Internal partitions	Internal walling	Internal partitions, screens	Internal walls, screens and doors
Doors (internal)	—	Internal doors	
W.C. doors and partitions	—	W.C. doors and partitions	
—	—	Ironmongery to internal doors	Ironmongery
—	—	—	Balustrades and handrails
Wall finishes	—	Wall finishes	Wall finishes
Floor finishes	Floor finishes	Floor finishes	Floor finishes
Ceiling finishes	Ceilings	Ceiling finishes	Ceilings
Decorations	—	Decorations	Decorations
Cloakroom fittings	Furniture and equipment	Cloak fittings	
Fittings	—	Fittings	Fittings and equipment
Furniture (built in)	—	—	
Plumbing (external)	Plumbing installation	External plumbing	Plumbing
Plumbing (internal)	—	Internal plumbing	
Plumbing (sanitary fittings)	—	—	
Gas installation	Gas installation	Gas installation	
Electric installation	Electrical installation	Electrical installation	Electrical installation
Heating installation	Heating and ventilation	Heating, hot water and ventilation	Heating, hot water and ventilation
Kitchen ventilation	—	—	
Drainage (net cost)	Drainage	Drainage	Drainage
—	—	Lifts	Lift and dust chute
Playgrounds and paved areas	Paved playgrounds	Paved areas	

Ministry's list " External walls, windows and doors (external) " have been incorporated into one element: " External walling," in the local authority's list. You will also see that " Wall finishes " and " Decorations " have been distributed among the other elements in the local authority's list. Those two lists, I think, are a good example of how the various factors which I mentioned earlier have influenced the choice of elements.

The Ministry of Education's list was determined on the basis of windows, walls and wall finishes as separate and distinct items of construction. We could not adopt the same procedure as the local authority because it meant that the value of the glazing and decorations would have to be split between a large number of elements, which would have involved a great deal of work. The third thing which determined the rather long MOE list was that we felt the greater the breakdown the more useful it would be. Now, the local authority's list gives much more emphasis to the designer's requirements. They argued: " If you are talking about the partition we must know the full cost of that partition, including the blocks and plaster and decoration on it, and therefore we want the cost as related to those functions." They were also very much influenced by the use of a prefabricated system, and of course that is very closely linked up to the designer's requirements. The third thing was that the bill of quantities used was different from the normal trade bill and the information was readily available in this form from their bill. They were also influenced by the use of analysis for approximate estimating.

The yardstick of comparison

That deals with the elements and I now turn to description of the yardstick. The yardstick, we felt, must be applicable, certainly as far as schools were concerned, to all sizes of schools irrespective of planning and construction ; and should be of value to the user of the building. Horizontal space was the most valuable thing as far as school-children were concerned, and I have no doubt the same thing applies to anybody who lives on a horizontal plane; so we decided that the square foot was the yardstick which gave us a common denominator for all buildings. The cubic foot was an established method of costing over a very, very long period of time but we rejected it for a number of reasons, the first one being that vertical space was relatively unimportant as long as we had enough for comfort, light and ventilation. The same floor area designed to the same functional standards could have quite different volumes, depending on the planning and construction adopted. If you look at the bottom drawings in Fig. 3 the left-hand one is meant to indicate two classrooms back to back. It is necessary to get a certain amount of daylight at the back of the room; to get that daylight at the back of the room it is necessary to have a window which is high enough, which means you have got to raise the ceiling. That is one case. In the right-hand one an architect can obtain the same functional standards, get the same amount of light by reducing the height of the ceiling and putting roof lights at the back of the room, so that straight away he reduces the cube of the building. You have the same area of accommodation, the same standards, but two quite different cubic contents, depending on the architect's skill.

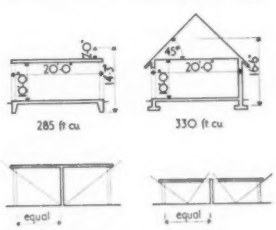


Fig. 3. Diagrams showing how identical floor areas may give differing cube figures.

The second disadvantage was in the choice of constructions, and this is demonstrated in the top drawings in Fig. 3. Here we have two buildings which are the same width and they have the same height from floor to ceiling but two different cubic contents. For these two reasons we had to leave cubic foot alone. As a further example of the uselessness of cubic foot costs for comparison purposes here is another example. The figures are taken from a very detailed report of the cost analysis of the Darton Kexborough Secondary Modern School, prepared under the direction of Mr. Hubert Bennett. That report shows that for two blocks we get identical cubic foot costs of 4s. 6d. each, but the cost per square foot for one was 54s. 8d. and for the other was 90s. 3d. In the case of another two blocks, we got almost the same cost per square foot, 54s. 11d. and 55s. 0d., yet the cubic foot costs were 3s. 10d. and 4s. 11d. These things led us to disregard cubic foot as a yardstick. The third constituent is the cost itself.

Cost

It is often suggested that the cost analysis of the final account is much more useful than that of the tender, and the answer is of course it would be much more useful if we could get it; but the final accounts take so long to prepare that when they are prepared they are only usually of historical interest to the chap who got paid. So generally speaking we analyse the cost on tender. Now, this cost will be affected by two main considerations. The first is market conditions which will affect the level of the tender; it will be affected by such things as the importation of labour, the quantity of particular craftsmen which might affect the wage rates and it must be affected by the volume of work in that particular area. These things affect whatever kind of costing system we have. They have to be taken into consideration in the same way as the date of the tender, the number, and whether they are negotiated. There should be some section in a cost analysis headed " Market conditions " with the various items listed so that you can give these various conditions due regard.

Now, the distribution of costs within the elements will be affected by the builder's method of pricing. In some cases imported labour may go in in a lump sum at the beginning or end of a bill, or distributed amongst the labour costs of individual items. This is no more difficult than one normally encounters in any other form of costing. There is always the hope that if we do use this cost analysis we ought to know what we should be paying for each of these elements, and if we get sufficient information we may be

able to influence the builders to price their buildings in a different manner. It may be a distant hope, but still, perhaps, one worth pursuing. That is the simple cost analysis with its three main constituents: the element, the yardstick of comparison and the cost itself.

Quantity and quality

To explain why we are spending a lot of money or too little we need information as to quantity and to quality, an example of which is shown at Table IV. Here the "quantity factors," shown on the left-hand side of the sheet may be single numbers, with internal doors (not shown), or an area such as at 8 and 9, Roof construction and Roof lights, or it may be a ratio as you see at 5 in External walls. One may ask why do you use a ratio for external walls when you use an area for everything else, but using a ratio for external walls is a very good index to the economy of the planning.

Quality of each element is shown on the right-hand side where you have a brief specification. So very briefly one can say a full cost analysis can be considered as a précis of a bill of quantities because it gives the quantity, the cost and the quality, and the market conditions of the contract. If you look at Table V you will see another type of full cost analysis. I did mention variations on the method earlier and this is one of them, and here instead of ratios for each element you have the element broken down into various components; you have a much fuller specification and you have the cost per square foot or per square yard of each component with the element. This is a very thorough cost analysis and it has been influenced very much by the fact that it is primarily used for approximate estimating. I will leave full cost analysis at that point.

Now, I mentioned briefly preparation and I do not think I need spend much time on that. The analysis is, of course, normally prepared from the bill of quantities, and since the bill is written by trades it is necessary to re-abstract the items within the bill of quantities to the elements; The time spent in doing that depends on the type of bill and, of course, on the construction which is used; some constructions will be easier to analyse than others. If you have one item of brickwork which may apply to external walls and internal walls and playground walls, that, put into various elements would make a good deal of work; but it has been found that it generally takes two days for a primary school, and some people say it takes less. Of course, some people say it takes a good deal more, but they don't know how to prepare an analysis.

The comparison of costs

The first use is to relate the cost of the element to its importance in the building. The importance depends on each individual's judgment; but in Table VI if you look at serial 27 in School A you will see the cost of electrical installation is 4s. 10d. Now, if this were the first analysis you have had it may not show whether 4s. 10d. is too much or too little; but if you look at C, which is only 1s. 6d. you might say "By gum, it does look high; why is it?" and you may decide that nearly 5s. 0d. out of 65s. 11d. is rather too much to spend on electrics. If you look at School B you will see the heating is 8s. 5d., and once again you may come to the conclusion that is rather too high a proportion of 65s. for heating the building.

The second main use is to compare the cost of the same element in different buildings. If you look at serial 18, which is floor finishings, you see in School A they spent 3s. 1d. in School B they spent 4s. 1d., and in School C they spent 1s. 11d.; so that there is quite a big variety of

TABLE IV: SPECIMEN PAGE OF A FULL COST ANALYSIS

Element	Cost per sq. ft. s. d.	Specification
1. *Preliminaries and Insurance*	2 3·1	
2. *Contingencies*	1 3·9	
3. *Work Below Ground Floor Leve*	4 10·5	Strip surface 6 in. deep Excavate to reduce levels—397 yds. cube Excavate surface trenches generally 1 ft. 3 in. wide × 1 ft. 6 in. deep Hardcore (minimum 3 in. thick) average 9 in. thick Concrete foundations to brick walls 1 ft. 3 in. wide × 7 in. thick 3-in. and 2-in. concrete sandwich slab with No. 126 fabric reinforcement and ⅛-in. coal tar pitch membrane Concrete edge beam 3 in. wide × maximum 2 ft. 1 in. deep retaining hardcore under floor level cills
Floor area in single storey: 15,127 sq. ft. Bearing pressure: 1½ tons sq. ft. Nature of soil: sandy clay Site levels: slightly sloping Water table: non encountered Depth of bearing strata: 1 ft. 9 in.		
4. *Frame*	Nil	—
5. *External Walls*	2 10·6	Cavity walls generally comprising half-brick outer skin in mild stocks, 4½-in. clinker concrete block inner skin with 2½-in. cavity between Approx. 8 squares of softwood stud walling in four isolated panels, covered one side with ⅜-in. softwood vertical plain edge boarding in 8-in. widths A further 8 squares of similar stud walling all round upper part of assembly hall supporting edges of monopitch roof
Ratio: solid wall / floor area = 0·518		
6. *Windows and Doors (external)* and 7.	9·0	1st quality joinery softwood frames and fixed lights, B.C. pine opening lights and external doors. Louvred ventilators. Insulated cavity ply panels below sill. Plywood fascia over window head
Ratio: openings / floor area = 0·425		
8. *Roof Construction*	7 2·8	Rolled steel channels and beams Timber joists, aluminium foil insulation ¾-in ." chipboard." Two layer bitumen felt roofing and granite chips
Area: 16,488 sq. ft.		
9. *Roof Lights*	0 8·7	No. 8 fixed 8 ft. × 2 ft. 19 opening 4 ft. × 2 ft. 5 opening 2 ft. × 2 ft. Softwood framing with iroko cills Zinc drips. ⅛-in. hardboard linings trimmed at junction with ceiling with aluminium angles Aluminium condensation channels
Area: 355 sq. ft.		
10. *Upper Floor Construction*	Nil	—
11. *Staircases*	Nil	—

TABLE V: SPECIMEN PAGE OF A FULL COST ANALYSIS

	Actual cost £ s. d.	*Cost per sq. ft. floor area* £ s. d.
External walling		
Metal windows and metal doors including glazing, painting, sills, "Jicwood" panels and fibrous plaster casings. 21,150 f.s. at 16s. 2½d. per f.s.	17,144 17 6	7 6¾
Precast concrete block walling including breeze and brick inner skins, plaster, decoration, acoustic panels and fibrous plaster casings. 7,915 f.s. at 12s. 7½d. per f.s.	4,992 15 7	2 2¼
External doors in softwood and hardwood including frames, sidelights, glazing, decoration and ironmongery. 1,227 f.s. at £1 10s. 10d. per f.s.	1,892 14 7	10
Softwood boarded panels including framing and decorations 535 f.s. at 12s. per f.s.	321 3 6	1¼
Skirtings in hardwood, quarry tile and aluminium	673 1 7	3¼
Entrance porches	443 14 11	2¼
	£25,468 7 8	11 2¾
Internal walling		
Partitions including brick and clinker block, plaster, decorations, fibrous plaster casings over all doors. 26,175 f.s. at 4s. 11½ per f.s.	6,469 6 10	2 9¾
Timber screens including frames, decorations and ironmongery. 1485 f.s. at 8s. 4½d. per f.s.	621 15 7	2¼
Internal doors including frames, decoration and ironmongery. No. 123 doors, £31 15s. 10d. each	3,910 6 4	1 8¼
W.C. compartments No. 21 compartments, £17 15s. 9½d. each	373 11 6	1¼
Skirtings in hardwood, quarry tile and aluminium	705 5 9	3¼
	£12,080 6 0	5 1¾

cost on that particular element. Now why should that be? Is it true to say that School C was shoddy? Is it the fact that School B is far too expensive? or School A just about right? With this method of comparison and with specification we can examine these things and come to a decision as to what is reasonable for us depending on our own judgment. The significance of these figures will be realized when it is seen that 1s. 0d. represents something like £600 for an ordinary primary school and £2,200 for a secondary school.

One of the difficulties many people find in using this form of cost analysis is the problem of comparing one analysis of, say, a load-bearing construction with a frame construction. They say " Well, look, how can you compare the frame in School C with the frame in School B because there isn't one?" Well, of course you can't. To compare like with like, what has to be done is to add up the elements until you get the elements in one totalling the functions in another. As an example of that we can say that the total of the structural elements from serial 3 to serial 12 totalling 33s. 10d. is directly comparable with 27s. 0d. You are now comparing like with like, and within that job you can then examine the distribution of costs within the elements. It is often very useful, even though you can't compare two elements which are doing precisely the same, to get information. For example, if we look at serial 5 the external walls in School B, which we will assume is a load-bearing construction, are doing two functions—keeping out the rain and keeping the building up, and it is costing only 6d. more than the external walls of School C which are only keeping the weather out. That to me is fairly useful information and suggests that perhaps we are spending too much on our external walls at School C. If we want to get a better quality of school these analyses will tell us how we can do it. For example, if we look at School B we can see that serial 28, Heating installation; 8s. 5d. is rather too much to spend and we can reduce that and pass some of the money back into, let us say, decorations and get a better standard of decoration. Then the question often asked is how many cost analyses do we require before we start cost planning? The answer is one or two or three—providing they are fully detailed. Quite obviously the analyses of one's own jobs are much more valuable.

TABLE VI: COMPARISON OF THREE SIMPLE COST ANALYSES

Serial No.	*Element*	*A* s. d.	s. d.	*B* s. d.	s. d.	*C* s. d.	s. d.
1	Preliminaries and insurances	6 10		1 11		1 10	
2	Contingencies	1 11		1 1		10	
			8 9		3 0		2 8
3	Work below ground floor level	5 10		6 5		3 10	
4	Frame	2 6		—		12 6	
5	External walls	5 0		6 0		5 6	
6	Windows	} 4 4		3 9		5 11	
7	Doors (external)						
8	Roof construction	5 2		9 7		3 2	
9	Roof lights	2		1		7	
10	Upper floor construction	} 1 8		—		1 8	
11	Staircases						
12	Glazier	7		1 2		8	
			25 3		27 0		33 10
13	Internal partitions	2 3		6		1 9	
14	Doors (internal)	1 1		1 6		1 0	
15	Ironmongery	9		10		10	
16	W.C. doors and partitions	2		5		7	
			4 3		3 3		4 2
17	Wall finishes	1 2		1 3		1 0	
18	Floor finishes	3 1		4 1		1 11	
19	Ceiling finishes	1 6		1 0		1 5	
20	Decorations	1 4		1 6		2 2	
			7 1		7 10		6 6
21	Cloakroom fittings	8		5		6	
22	Fittings	1 4		2 6		1 8	
			2 0		2 11		2 2
23	Plumbing (external)	5		8		11	
24	Plumbing (internal)	1 8		1 0		1 0	
25	Plumbing (sanitary fittings)	1 1		1 2		10	
26	Gas installation	2		1		2	
27	Electric installation	4 10		3 6		1 6	
28	Heating installation	6 8		8 5		7 5	
29	Kitchen ventilation	5		—		—	
30	Drainage (net cost)	1 8		2 4		2 2	
			16 11		17 2		14 0
31	Playgrounds and paved areas	1 8		3 11		2 0	
			1 8		3 11		2 0
	NET COST		65 11		65 1		65 4

In the discussions last week, it was suggested that if the architect really wants to get economic buildings he should send the drawings along to the quantity surveyor and he could tell the architect. That seems to be completely and utterly wrong; The quantity surveyor does not have any knowledge of the client's brief, nor has he any training in interpreting a client's requirements into a building, or trying to satisfy the functions. His judgment of extravagances may be entirely wrong and may be no better than a lay judgment. But what I think is important is that he should develop a method of costing and presenting costs to the architect and to the client so that they can make their judgments; because after all it is they who really know what they require and it is they who must make the decision.

Discussion

A. J. STRONG (architect): There is one question I would like to clarify right away, and that is the yardstick. Does Mr. Nisbet mean net floor area or does he include the outside walls? There is one other thing: Mr. Nisbet said that If one looks at the walls, in the case of school C, which has a structural frame, the cost is comparatively high as compared with school B, and therefore there was a possibility of saving there. Then he went on to say if you refer to another section, " Heating " in school C seems to be rather high. Might not one conclude that one thing cancels out the other?

JAMES NISBET: Floor area: as far as school buildings are concerned it is measured to the inside of the external walls.

The second part of the question is not simple to answer. I made the point that if you are going to compare a load-bearing construction with a frame construction then you have to add up the elements in both constructions until the functions are identical; but it is often very useful to compare elements even if they are not providing the same functions. For example, if you look at serial 5, external walls, the 6s. 0d. is doing, as we say, two functions, it is serving the load-bearing function and it is keeping the weather out. In school C the 5s. 6d. is only keeping the weather out. Does that clear your point? You still seem very worried.

E.R. WATSON (cost clerk): I feel like Daniel in the lions' den being present among so much nobility. I have been here for two lectures, but I have not heard mention of the cost accountant. It does seem to me that at some stage during the proceedings between the planning and the construction that the cost accountant might be called in to consult with the architect. He is very often consulted by the surveyor and the drawing office and various other people, and usually has at his finger tips a large quantity of what you might call historical information on labour costs, bonuses, overheads, contingences, plant and so on. I would like to know whether you have made any provision at any point for calling in the cost accountant?

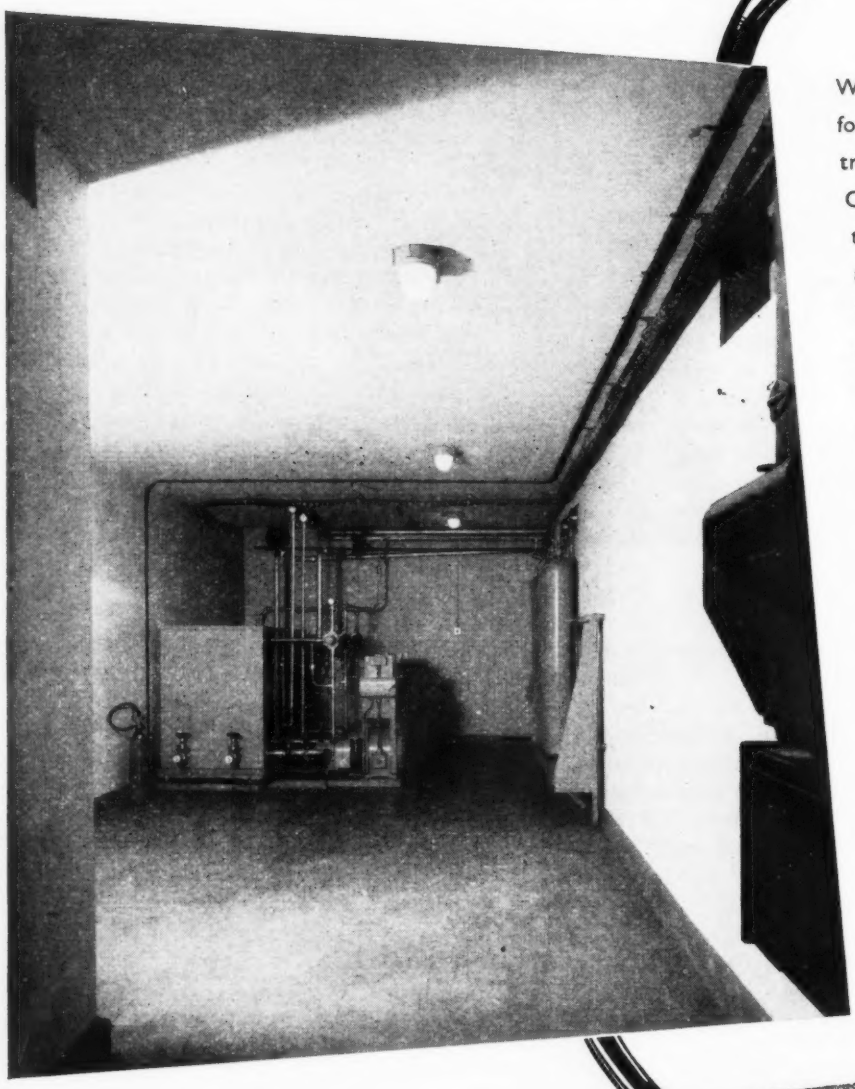
JAMES NISBET: I assume, Mr. Watson, you are a cost accountant in a building firm?

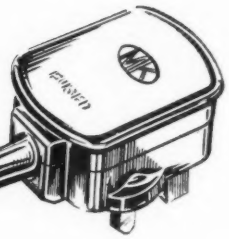
E.R. WATSON: Yes.

JAMES NISBET: Well, we would very much like to have all your information and all your data when we are designing a building, but, you see, we can't get near you if we are in competition, we can't deal with the builder till the job is designed and let. But if we have negotiated the contract then it seems to me you are one of the chaps we want to talk to and who can con-

WATERPROOFED BASEMENTS

at the new works of MK Electric Ltd. Park Road, Edmonton





When constructing the new Works for manufacturing modern electrical fittings "PUDLO" Brand Cement Waterproofer was chosen to waterproof the concrete floors and walls of the basements.

This photograph, taken two years after the completion of the work, shows part of one basement in which is installed a specialised Power Unit driving a large battery of Thermo-Setting Plastic Moulding Presses.

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tribute a great deal to the designing and planning of the job.

H. F. KERLEY (quantity surveyor): These lectures are arousing quite a considerable interest from the numbers here. I notice on one of these Tables there are shown four lists of elements now in use. Now, if most of these people go away and discuss this amongst themselves, will there not be 144 lists of elements produced in a few years time, and is there not a most crying need for a national standardization of this development?

JAMES NISBET: It is this problem which is bound up with dissemination. Sooner or later, no doubt, if we consider this is something useful, the building industry will come round to a standard number of elements. Whether the time is ripe at the moment I would not like to say. We should get various ideas before deciding on what the right form is, if there *is* a right form; there might be a number. One of the troubles with standardization is that once you have a standard form, or whatever it is, it is difficult to move from it and it tends to stop people thinking.

B. W. KNIGHT (architect): The lecturer suggested that it is only necessary to do one or two cost analyses to provide a useful basis for cost planning. I know nothing about cost at all with regard to schools, but a little about the cost of flats; and one of the striking features when you look at the cost of flats up and down the country is not only the difference in the cost but the wide spread of overall cost. If the architect is taking his examples from one end of the scale or the other he will be getting himself very misleading information. Does it not argue that a single architect by himself cannot do his own analysis and get reliable information? True, I agree, that the detailed information he would get would be useful background, but he must draw from a very much wider field if the information is to be useful. Perhaps I misunderstood you.

JAMES NISBET: Well, I know something about schools but nothing about flats. I did say if you have got one or two cost analyses which you know thoroughly and if you have got the details and you know the conditions that is most valuable. If you as an architect want to start designing a block of flats it is much better to go to a block you think is the standard of quality you want to achieve and get to know the building very thoroughly; that seems to me much more useful than looking at a chart which has a whole range of costs, such as this on Fig. 1, and merely selecting something. But once you have a cost analysis of your own you can begin to relate it to other people's.

B. L. LIPPMAN (quantity surveyor): I was very glad to hear Mr. Nisbet say he felt a cost analysis is most useful of one of your own jobs. I do think Mr. Austin-Smith last week put forward the idea we should all look at everybody's cost analyses and get some marvellous answer from them, but I think one might get the wrong answer. It is not easy to understand a cost analysis for a job with which you are not familiar, and also I think we are reluctant to hand out inaccurate—well, not inaccurate, but information which might be misunderstood.

JAMES NISBET: I do not think that Mr. Austin-Smith and I are at cross purposes here. Obviously, your own job which you know thoroughly is much more useful to you; but if you are only looking at your own jobs you are going to get yourself into a little circle and you are not going to see anything beyond that, and therefore you must, it seems to me, have information about other jobs.

The other point is, I think we as quantity surveyors will have to be a little more forthcoming and get over this over-careful attitude about giving information which might be misunderstood. Everything will be misunderstood by somebody, and everything can be used for good or ill. Atomic energy can be used for good or ill. We must give architects credit for having some intelligence. One hears so often that an architect can't read a bill of quantities and he doesn't know what it is about. I think we might try and make it easier for him.

A. G. ALLEN (architect): One detailed point on the cost analysis. Is there any variation in the cost of various elements on buildings which increase in size, and if there is, is it a constant or an inconstant variation?

JAMES NISBET: That is the sort of question that architects ask and which we find it very difficult to answer; but I am fairly convinced that if we can develop this method of cost analysis we will be able to give you that answer; because after all a small building or a big building is made up of the same elements and has a roof and walls and upper floors, and so on, and if you analyse these and take into account the quantity factors you will begin to see whether size by itself makes the job cheaper or more expensive.

G. T. WEST (architect): Mr. Nisbet seems to have spent some time in explaining the question of the yardstick. He has put a diagram on the board, the top two show similar cost per cubic foot and the bottom two a similar cost per square foot, and he proceeded to suggest that the one which shows the square footage rather than the cubic footage was the best. To me, that diagram seems to prove that both are equally useless. I am not quite sure why he wants to choose square footage as opposed to cubic footage. Why not, for instance, produce your analysis in terms of the total cost, and your elements in percentages of that?

JAMES NISBET: There is nothing to stop you producing a cost analysis by total cost. The trouble with that of course is it makes it difficult to compare with another building. Percentages are misleading, because you can have the same element in two jobs each costing 5s. 0d., but your total cost per square foot may in one case be 60s. 0d. and another case 90s. 0d., and your percentages in both cases might be quite different, whereas the actual cost of your element is the same. So by using percentages you can draw misleading conclusions. Square foot was a unit of real value to a building user, in that a building user works or plays, whatever he does, in a horizontal way. If we were to bring down the ceiling in this hall and we still had sufficient for light and comfort and ventilation we could get more people in above. If we were birds living in an aviary, cubic foot would probably be the right answer.

N. E. HIGGITT (quantity surveyor): I would like to support Mr. West. Surely you can't apply the square foot in the case of a factory where the owner is interested in function and the function may be a machine which has height?

Secondly, we have to be careful that in our cost analysing we are comparing like with like. Mr. Nisbet mentioned the heating installation and the sums of 8s. 5d. and 7s. 5d. Now, the 8s. 5d. was for a single-storey school and the 7s. 5d. was for a multi-storey school; surely that is the difference? We must be careful we are comparing like with like.

JAMES NISBET: I would like to take the second one first. I do not think there is anything in there which allows you to draw that conclusion, and I think the conclusion one can eventually draw must be based upon a study of these two buildings and their construction and insulation properties, and, for instance, the level of temperature which was desired in the various rooms.

The first point about the cubic foot: I think we have already recognized the fact that there may be cases where the cubic foot would be more valuable than the square foot; but I hope I have given the basic reason why the square foot was chosen, and that is because we live on two dimensions.

J. S. CLARKE (quantity surveyor): Emphasis has been placed on the elemental bill of quantities as a necessary part of cost planning and cost analysis. I feel that we are tending to overlook the fact that the primary purpose of a bill is for tendering. Contractors generally do not favour elemental bills, at least at the tendering stage. We must therefore take care that the tail does not wag the dog. Any competent quantity surveyor could prepare a cost analysis of the type shown in Table VI from a normal bill of quantities within a very short time. It does not seem, therefore, that an elemental bill of quantities is essential to cost planning nor does it appear to be advisable.

JAMES NISBET: I would like to make one point on that: I hope I did not say that elemental bills were essential for cost analysis; I thought I was taking a great deal of care to avoid saying just that.

D. SPELLER (architect): Referring to Table VI; the net cost at the bottom shows that they are all very similar. Is it a fact that these three buildings are very similar in floor area, or are there considerable differences in the sense that one may be a lot bigger, working out at 65s. 11d., and the other a lot smaller, working out at 65s. 1d. Is there any sort of comparison enabling one to tell?

JAMES NISBET: One of the things which I think is behind your question is if you have a big building it is going to be cheaper than a small building. Is that one of the things at the back of your mind?

D. SPELLER: Partly; but what is the standard?

JAMES NISBET: I can't give you the answer to your specific question, but you can find very large schools being built at the same cost per square foot as small schools. But replying to your specific inquiry: these are three primary schools, if I remember rightly, of something between 12,000 and 14,000 sq. ft.

In closing the meeting the chairman, Hubert Bennett, said " the biggest contribution of quantity surveyors today would be the provision of early cost information."

technical section

THE INDUSTRY

From the industry this week Brian Grant reviews a powder which prevents corrosion in boilers in the summer months, movable partitioning and metal-lined damp courses.

BOILER MAINTENANCE

During the summer months when central heating boilers are not in use there is some danger of internal corrosion by sulphur compounds which tend to form weak acids when the boiler is cold and so liable to a certain amount of internal condensation. As a preventative it is quite a good practice to leave the fire doors open to promote air circulation and to spray the interior with a weak solution of lime or to paint it with aluminium paint, but very few boilers are completely accessible internally and areas are inevitably left where corrosion can start.

P. H. Thermal Products have introduced a material known as Corrotex which consists of a white powder which slowly volatilises, the vapours having a corrosion inhibiting effect. Tests at the National Physical Laboratory have shown that corrosion of partially rusted steel is reduced by as much as 95 per cent. and the manufacturers claim that these results have been confirmed by field tests carried out during the summer of last year. The material is quite simple to use, as it is supplied in tins which are stood on the fire bars or the bottom of the boiler and the lid removed. All boiler dampers and doors are shut tight to prevent the escape of the vapour which completely fills the internal air space and reaches inaccessible cavities. In large boilers further tins can be distributed at strategic points. A single tin suitable for a boiler with an output of 100,000 B.U.T's per hour costs only 7/6 so that even with large boilers the cost is almost negligible. (*P. H. Thermal Products, Westgate, Baildon, Yorks*)

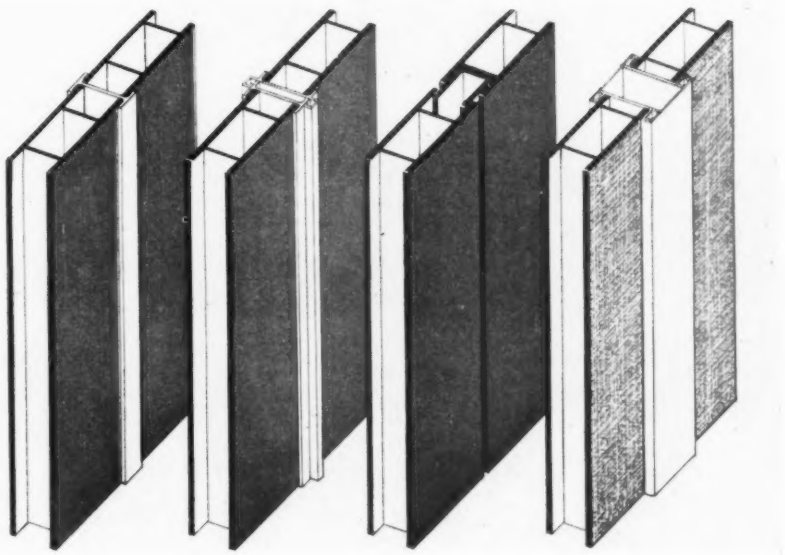
MOVABLE PARTITIONING

A recently issued 48-page publication deals with Holoplast movable walls which can be made either with the original type 90 panel or with the newer, lighter, type 75 panel. Both types of panel are available with a stove enamel, Decorplast, or an applied veneer finish. The various partitioning units are normally joined by standardized light alloy extrusions, spanning from floor to ceiling to a maximum height of 12 ft., but where it is required to dismantle and re-erect partitions at frequent intervals a modified system is used with two interlocking extrusions at the joints, providing a tolerance to take up minor irregularities in distances between fixed walls. The publication contains numerous full size details of jointing, both horizontal and vertical, details at doors, corners and other junctions as well as information about glazing and the provision of stiffening posts. There are also some notes on sound insulation which show that while the standard type 90 panel has a sound reduction factor of 22 decibels, the same panel filled with dry silver sand and having a weight per sq. ft. of 10·8 as against 2·1 lb. for the standard panel, provides a reduction figure of 38 decibels. It is generally assumed that a sound reduction of about 30 decibels is adequate even when there is a considerable difference between the noise level in adjacent offices, and this amount of sound reduction can be achieved by filling the panels with wood wool. (*Holoplast Ltd.*, 116, *Victoria Street, S.W.*1.)

METAL LINED DAMPCOURSES

A recent leaflet from Permanite describes this firm's metal lined damp courses which are sufficiently flexible to resist settlement or vibration and which, besides their normal use at foundation level, are also suitable for use as a moisture barrier at lintels, sills and parapet walls. Both aluminium and lead lined damp courses are produced with a hessian base and in addition the lead lined types are also available with a fibre or an asbestos base. Standard rolls are 8 yd. long × 1 yd. wide, but rolls can also be supplied cut to any width from 2½ in. upwards at no extra cost. (*Permanite Limited*, 455, *Old Ford Road, E.*3.)

Below, four methods of jointing Holoplast movable partitions. From left to right: standard, assembly, tongue and groove and interchangeable.



technical section

INFORMATION CENTRE

A digest of current information prepared by independent specialists ; printed so that readers may cut out items for filing and paste them up in classified order.

8.56 surveying: specification
COST ANALYSIS

Cost Study. Building Bulletin 4 (second edition). HMSO for the MOE. 5s. 6d.

This—the most voluminous MOE Bulletin yet to appear, is a revised version of the first edition, published six years ago, which, as we now see, is destined to be a document of historic significance for British architecture.

The second edition begins with an account of the purposes of cost analysis and cost planning, with examples to demonstrate the fixing of cost targets for each element of a design. This takes only twenty pages, the remainder of the book consisting of twelve appendices. Among other matters, these deal with the effect of plan shape on cost, the allocations of items to element headings, a description of "quantity factors"—what the AJ calls ratios—used to adjust element prices when using them for a cost plan. Appendix 6 shows the cost analyses of three primary and four secondary schools with floor plans and brief specification notes. Appendices 7 and 8 show scatter charts of 64 secondary school costs ranging from 67 sq. ft. per place at 79s. per sq. ft. to 86 sq. ft. at 59s.—all the schools costing £264 per place, and to reinforce this astonishing variation it shows five primary schools of the same total cost but diverging sharply in the distribution of that total among the elements—an awkward fact for those who assert that cost analysis only works for buildings that are exactly alike (*i.e.* schools). Appendix 9 is a revealing examination of the effect of number of storeys on cost and the last three appendices are: elemental bills; sequence of architects' work and an example of cost planning.

Opening the AJ on Thursday mornings, and seeing yet *another* school illustrated and described in detail, we are inclined to forget the cultural significance of the intensive work on this building type over the past ten years. Between 1949 and 1956 the teaching areas of primary schools increased, but the cost per place went down from £195 to £148. In this period building costs generally rose by about 50 per cent. These astounding figures express not only a national economic gain but a better educational beginning for the coming generation and a change in our notions of architectural quality which shows that stylistic changes in other building types are so far no more than skin deep. What we need is an MOE-Herts team to carry out development work on the laggards—office blocks, factories, and, not least, on dwellings. Their work on cost control, at least, is now beginning to pass into general currency, as this book modestly admits. We probably have not so very long to wait before visual evidence of more precise cost control appears in the buildings we put up, for the most far-sighted contention of this Bulletin and its predecessor, is the insistence that cost only has meaning when related to value; that it is the cost of *quality* and *performance* not merely of items of building construction, that we should be concerned with. This, of course, is why the MOE relates cost to floor area—as a measure of what the building owner, and user, is getting, and why they break down a total cost to show the price of each *function*—how much it is costing to keep out the weather, to provide vertical circulation, to enable the occupants to wash their hands, to work in the building after dark, and so forth. The majority of quantity surveyors have found the MOE approach rather a puzzle, not only because of the resistance to change (inherent in all social groups), but because they do not understand the architect's conception of *function*. This is the strongest argument of all for joint training. To the quantity surveyors, cheapness, or expense is relative, only recognized by comparison with some alternative, not by comparison with the functional achievement that the money buys. This point is of supreme importance, for there is a danger that "cost consciousness" may spread among architects as a factor outside their notions of architectural quality.

This throws up one regret. The pedagogic intention of the Bulletin is not so persuasive as it might have been. Over the past 5 years, valuable experience of cost planning and elemental bills of quantities has accumulated in the hands of a few key professional men and builders, yet the accounts of "these powerful instruments" of cost control wear a cloistered air. Following through the steps of preparing and readjusting a cost plan, so clearly described in the Bulletin, one is eager to learn just what happened to the costs during the course of the work, how the builder actually used the elemental bill, what difference the new methods made to that agonizing last phase, the final account. But we are not told. Similarly the "Effect of plan shape on cost" opens a promising and unexplored field of study, but we are not told whether the effect of plan shape is discernable in actual schools costs or whether it is swamped inextricably by other factors.

These criticisms are not major ones, and they are only of importance because cost control, as an idea, is now entering its political phase.

Of the numerous and formidable appendices, no. 9 is the more interesting. It shows the analyses of one, two, three and four-storey classroom blocks, all of the same plan size, the same construction. Internal planning is the same for all four blocks except for staircases and the re-arrangements that they entail, above one storey. Costs are all based on the estimates of a builder with wide experience of the type of construction. The study shows us the effect of cost on height and the results are that the one, three and four storey are all about the same—64s. per sq. ft., but the two storey is 61s. That the two storey is cheaper, is what one would expect. Half the difference between one and two storey occurs because reductions in work below ground, roof and drainage together outweigh the *extra* cost of upper floor and staircase. The other half of the cost difference is due to several things: (*a*) omission in the two storey of some partitioning, internal doors, fittings and ceiling finishes—all to make room for the staircase; (*b*) to the external door cost being spread over twice the floor area; (*c*) to more economical pipe and cable runs permitted by the two-storey design. A study of the

(Continued on page 896)

INFLUENCE ON COST PATTERN OF INCREASING NUMBER OF STOREYS IN CLASSROOM BLOCKS

with increase in no. of storeys the—				
cost per sq. ft.:—	*goes down steeply*	*goes down*	*remains the same*	*goes up*
actual cost	*remains the same*	*rises less than floor area rise*	*rises same as floor area rise*	*rises more than floor area rise*
	roof site slab	col. bases ext. doors windows heating inst. drainage	prelims. and insurance contingencies frame glazing int. ptns. int. doors floor fins. ceiling fins. decoration b.i. fittings ext. plumbing san. fittings electrics	ext. walls upper floors staircase wall fins. int. plumbing

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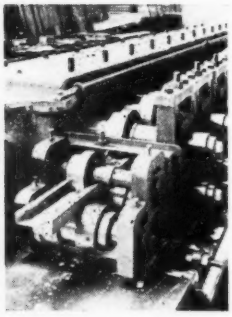

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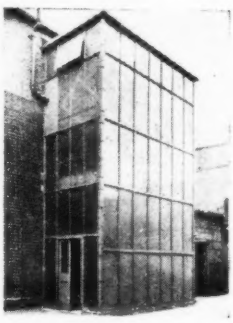
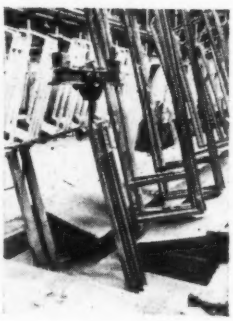


Our calcium plumbate primer (of controlled viscosity to ensure adequate and even coating thickness) is applied by dipping and is then stoved on at 250° F. to provide a hard, durable surface.



Further details on List Nos. 254 and 337 from

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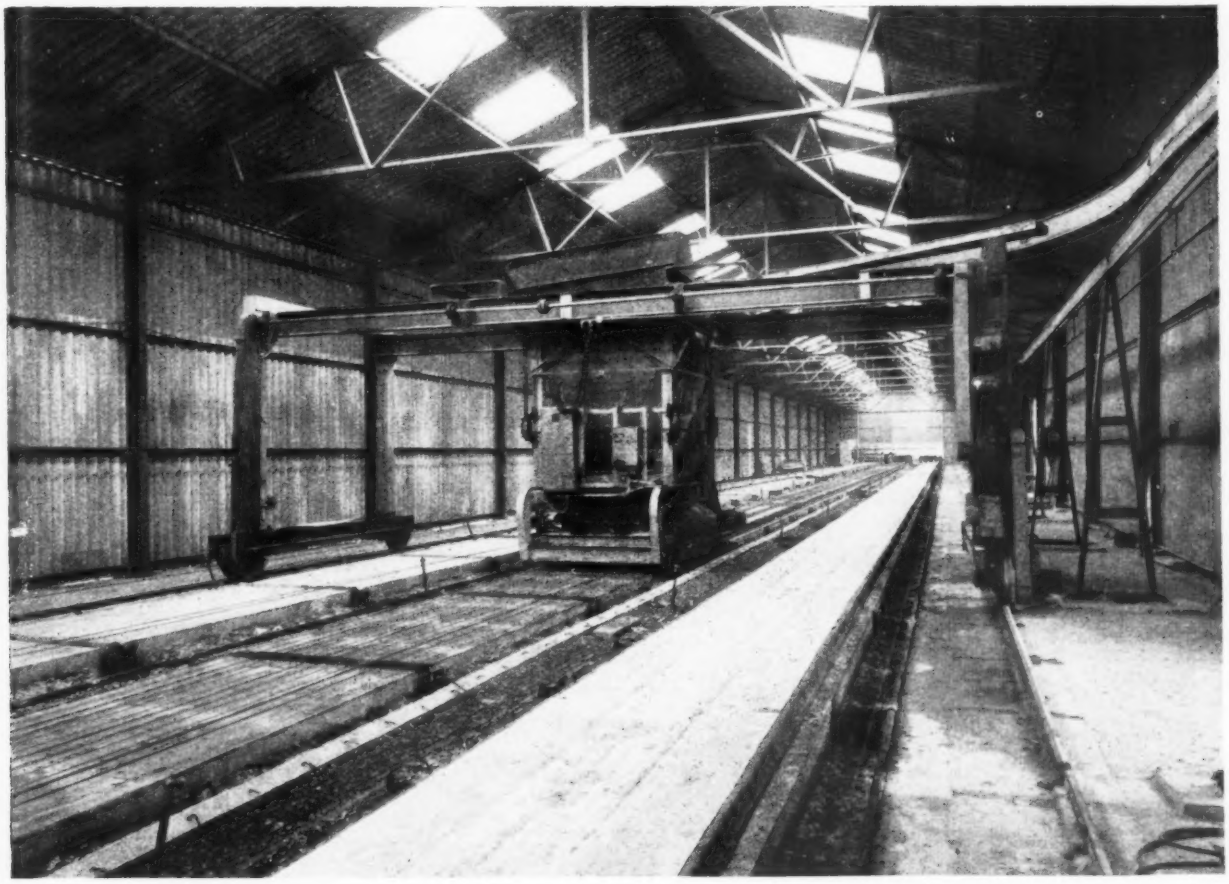
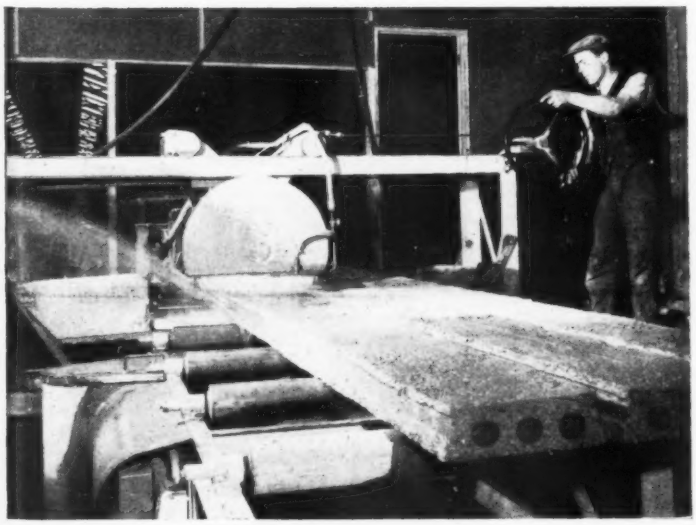
technical section

PRESTRESSED CONCRETE BEAMS IN 300-ft. LENGTHS



At Mugginton, Derbyshire, a new process is being used by Richard Lees Ltd. (a subsidiary of the Butterley Company) to make prestressed concrete beams in continuous 300-ft. lengths. No moulds are used, the concrete being extruded from a travelling machine, and when cured the beam is mechanically-fed to a saw table which cuts off the required lengths. The beams are formed on flat concrete beds, and the extruding machine, which is pneumatically driven, is suspended from an overhead gantry (above). It moves forward in short steps, metering the correct quantity of concrete mix from a hopper which is supplied from an overhead mono-rail tipper, and then vibrating it between the side plates which, with the concrete bed, act as a form. The top of the beam is automatically levelled to any desired thickness between 4 in. and 8 in. by a moving screed. Hollows are formed by steel tubes which cannot be seen when the machine is in operation: rubber extensions to these tubes trail for some way behind the machine to prevent the hollows from filling in. While the machine is travelling over one bed, a completed length of beam is curing on another, while on a third bed a cured beam is being rolled forward to the cutting table (left). For this purpose, rollers at 8-ft. intervals along the bed are hydraulically raised, and the 300 ft. length of prestressed concrete is pulled forward by powered rolls, as in a steel bar mill. The reinforcing wires are cut only on the saw table, so



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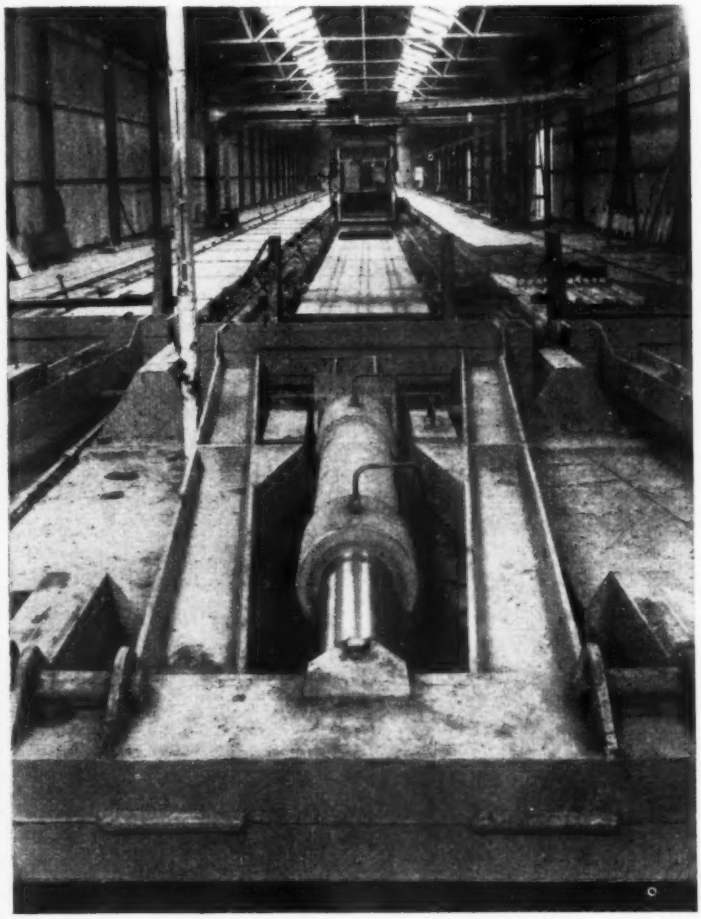
PIONEERS OF SMOKE REDUCTION

technical section

PRESTRESSED CONCRETE BEAMS IN 300-FT. LENGTHS: continued



that as the beam moves along, wires for the next length to be extruded are automatically drawn from reels at the far end of the bed. Prestressing is by normal hydraulic stressing jacks (left), and normal anchors are used. The beams are cured at a temperature of about 180° F. The heating method is very economical, high-pressure hot water pipes embedded in the concrete beds which are insulated from the ground by vermiculite, so that heat loss other than into the beam to be cured is negligible. The beams have insulated covers placed over them while curing. Thermocouples relay information to an automatic control in the boiler-house, and any desired temperature cycle can be pre-set and controlled with precision. Beams are normally cast with a cross-section 13 in.× 4 in. to 8 in. Present cutting facilities allow lengths up to 30 ft. Maximum output of the plant for an eight-hour day is one-third of a mile (1,700 linear feet). The whole process, which was invented by Mr. Richard Oakden, a Director of Richard Lees Ltd., was developed by his company and the Butterley Company. Experimental production began in the early part of this year, and the plant is now in normal production. The process has been successfully applied, both to the manufacture of prestressed beams in dense concretes and lightweight concretes made with Aglite aggregate.

Information Centre continued from page 894

figures shown raises the problem of the meaning of *actual* costs and costs per sq. ft. of floor area. The table on page 894 clarifies the trends of these two measures. As the number of storeys increases, elements in the two left hand columns will take a smaller and those in the right hand column will take a larger proportion of the total cost. Clearly this tendency will not follow through indefinitely, and graphs of individual elements shown in the Bulletin suggest a flattening out at and above four storeys. With all the cautions and qualifications (that different kinds of buildings and different kinds of construction might give different figures) the study does give us an idea of which elements we should keep an eye on, when deciding how many storeys. There are a number of surprises: we might expect the frame cost to increase at a sharper rate than the increase in floor area as storeys are added, but in fact it remains much the same. Heating installation cost, one might guess to follow the floor changes, but it actually goes down with increasing number of storeys, and so do windows. And it is puzzling to know why decorations cost increases at the same rate as floor area increase, while wall finishes increase more steeply.

Perhaps the greatest value of this study is that it opens the door on to many such general cost problems—so far untouched. What happens to detailed cost trends above four storeys? What happens if the building were twice the plan area? What is the point at which wind forces induce a major transformation in the economic pattern? (if they do at all). We cannot expect the MOE to look at these questions, they have done far more than their share in cost study—BRS and the RICS are perhaps the proper places.

But the most pressing need of the professions and the industry, is not for answers to specialized questions, but to develop the methods and habit of cost control in day to day work. For this reason, Appendix 12 —An Example of Cost Planning, is the most important in the book. It takes the reader through the motions of deciding cost targets for each element of a projected building, taking each price from example analyses and adjusting for differing quantity, quality and market conditions. With this before them, architect and quantity surveyor setting out to prepare their first cost plan could have no better guide. One's only regret is that the Appendix does take us through the subsequent phases of cost plan adjustments, when the design is developing, and actual prices being calculated or obtained by quotation, for it is this phase that reveals how well the MOE method fits the architect's mode of working. The adjustment of a cost target with the adjustment to other targets that it entails, is exactly analogous to the provisional choice of a planning idea or method of construction for an element entailing examination of its consequences among other elements. Integration—to use a now unfashionable word—is the aim, for both design and costs.

technical section

10.158 design: building types
SMALL HOUSES

New Houses for Moderate Means. H. Dalton Clifford. (Country Life Ltd. 21s.)

This book, as it tells you on the dust cover, consists of two parts. The first is an explanation, written for the layman, of the process of designing and building a house. The second is a collection of photographs of 66 houses built in recent years.

Most of the photographs are excellent, and there are clear plans of the houses. A full description of each includes such facts as floor area, total cost, and cost per square foot. In many instances the cost of heating and/or hot water installations, etc., is abstracted from the total. This is just what the prospective client wants to know, and what the architect should be able to tell him, but often cannot, on the spot. All good stuff—if only the buildings themselves were not so disappointing.

The first half of the book is masterly—House Building without Tears, almost. All the pitfalls, financial or otherwise, are set out in an easy style that is at once lucid and unpretentious and has an attractive air of optimism. Mr. Clifford sounds a sanguine man. He must have a great deal of experience of houses and clients; yet he remains a realist, not a cynic. It is no doubt his realism that made him select most of his examples, which range from a house by Sir Albert Richardson to one by James Cubitt & Partners.

Except for the section on windows, in which he adopts a forceful and partisan attitude against large areas of glass, he remains remarkably impartial throughout, *e.g.*, "It is perfectly possible to build a comfortable, open-planned modern house with a symmetrical façade of Georgian character, at about the same price as an equivalent "contemporary" house, and if that is what the client wants, he should be able to get it." This is one of the "hottest" sentences I have read for a long time; it is typical of Mr. Clifford's disarming attitude.

The book is frankly written for the layman, and includes, in Chapter 3, some powerfully-reasoned arguments for the employment of architects. The author draws a brilliant analogy between going direct to a builder and asking for an orchestra to perform a symphony without providing them with either music or a conductor.

The layman will find the whole book stimulating and useful. The architect may prefer the clear, readable and easily digested facts and statistics of house building.

Mr. Clifford has one rather odd thing to say about the form of contract. "A completion date," he says, "is agreed and included as part of the contract, which also specifies the mode of payment, retention period, etc., and is signed by the builder, the client *and the architect*" (my italics). I have never heard of an architect signing the contract. The contract is between the builder and the client only. The architect has quite enough on his plate without having to sign the contract as well—anyway, there is no space for his signature.

1 SOCIOLOGY

what do old people want ?

1 Sociology. What do old people want?

Recently Margaret Willis, the LCC's sociologist, at the request of the LCC's housing committee, made a survey of 200 households comprising people over 65 living in one-roomed flats and bungalows on the Council's estates. This is a small sample and 88½% of those interviewed happened to be women, which must be a much larger proportion than the national average. Nevertheless, in view of the scarcity of sociological evidence on this subject, her report is of special interest for architects and we are therefore printing it in full. Among the points which emerge are that the old people's reactions to siting are mostly conditioned by their fear of unwanted noise, that they don't like eating where they sleep, that the desirable room size depends on how large a space they can afford to heat and on how much furniture they have, and that they like windows low enough to see out of when sitting down and low baths with handrails.

Although there was considerable variation in the needs and preferences of elderly people there was some evidence that flats or bungalows in a separate block or group were preferred to those that were mixed among family dwellings. The survey showed that one-half (51%) of the elderly people (65 years and over) at present living in blocks of flats where families are also accommodated, or in bungalows attached to family houses, would prefer to live in a separate block or group on their own; one-third (32%) liked being with the younger people and the remainder (17%) did not mind either way.

The elderly people who were already experiencing living in a separate block or group had almost the same preferences, rather more than half (58%) liked this arrangement, a quarter (27%) would prefer to be with families and the remainder (15%) had no preference.

The main reason given by those who preferred to live in a separate group of dwellings was to be away from the noise and disturbance of children. Only on three estates, where most of the neighbours were middle-aged

technical section

and there were very few young children in the block, did more than half choose "mixed" flats. The other reasons given for wanting to live in a group on their own were the greater quiet with only one person in the flats rather than families and the more congenial atmosphere when they were with people of their own age and interests.

On the other hand, the main reason for liking mixed accommodation was that the neighbours were better able to help in case of illness or an emergency, and a number of people who preferred this type of accommodation said they had "nice neighbours." Also mentioned was a genuine liking for families, particularly children, saying that they felt younger when in their company, whereas a few people said that all old people together was depressing, that they quarrelled and were bad tempered.

Floor preferences

Although many elderly people were occupying the ground floor, only 62% would choose it again, mainly for health reasons, while the others would prefer to be on the first floor or above. However, the popularity of the ground floor varied according to the type of accommodation. When the people interviewed were living on the ground floor of large blocks of flats with "mixed" accommodation, one-half wanted to go higher, mostly to the first floor, whereas those living in two- or three-storey blocks consisting of one-room flats only, less than a third did not like the ground floor. This is because the main reason for wishing to live above the ground floor is to be quieter and away from the noise of children and the nuisance of their play, e.g., balls against the windows, etc. Also mentioned was the fear of burglars and being unable to leave the windows open.

However, all but one of the 22 households in bungalows would choose to live on the ground floor and in bungalows. This type of dwelling is very popular because it is more independent than a flat, there is no one overhead, and (for some people) because it has a garden.

Most people (78%) on the first floor were satisfied, but to live above this floor, without a lift, was found to be too much for most of the elderly people and the majority would move lower.

Willingness to go higher

All the people interviewed who were 65 years of age or more and living in flats were asked their opinions about living higher (up to about eight or ten storeys) if there were a lift. Just under a quarter said that they would be prepared to go higher, provided the lifts worked well.

Age made a considerable difference to the way they responded, the proportion willing to go higher fell steadily with increasing years.

A second important factor was whether they had used a lift before; of those who had, one half were willing to go higher, compared with only 13% of those who had not.

A much higher proportion who were already living on

Above left: old people's bungalows on an LCC estate at St. Paul's Cray. The undoubted popularity of this form of accommodation seems to stem from the protection it gives against noise overhead. Left: eight-storey block of flats on LCC Berner Estate, Stepney, which contains a one-roomed flat for an old person on each floor. The acceptability of this form of accommodation above ground and first floor seems to depend chiefly on whether the old person is accustomed to lifts and not too decrepit.

technical section

the third floor or above would be willing to go higher. The main reason for *not* wanting to go higher was the dislike of a lift.; 59% of the reasons were connected with the lift, 21% with health disabilities, e.g. blindness, blood pressure, and 11% with a fear of heights.

The main reasons for *wanting* to go higher were to be quieter and to have the better air. Almost a quarter said they wanted the top floor so there would be no one overhead.

Opinions on outlook

Among the people over 65 years of age about the same number preferred to look out on to a street with people and traffic going by, as preferred to see grass and trees and enjoy quietness. There was a variety of opinion on each estate regardless of their present outlook.

When a scene of activity is preferred it is usually a moderately busy street, but even where elderly people were living on a main road the majority said they preferred it to living in a quieter side turning. To a considerable extent people get used to the noise of traffic (but not that of children by the flats), and generally speaking opinions about the busyness of the road are conditioned by what they have experienced.

A school with a playground can be quite pleasant for the old people because they like to watch the children playing, giving displays, and so on. Also, amongst many elderly people there is a keen appreciation of a well-kept garden and flowers, and no doubt a popular outlook would be one of a lawn and flowers by the flats with a residential road beyond, or on the other side of the block.

On the whole, those with the strongest opinions were in favour of a street; they wanted something "lively," it cheered them up and gave them an interest in life. These people spent a considerable part of their time looking out of the window. They said it would be "dead and depressing" if they had nothing to watch.

The other people, for the most part, did not spend much time looking out of the window; they preferred instead to sew, read, knit or go out visiting a daughter or friends. Many of these people appreciated and enjoyed a "country-like" view and a quiet setting for their home. It is of interest that the replies of married couples interviewed showed that twice as many preferred grass and trees to a scene of activity, no doubt because they had company and diversions within the home.

Location of old people's dwellings

Other factors which were considered important in the location of their dwellings and were mentioned during the survey by the tenants were: shops (including a Post Office for pensions) near at hand, even if only few in number or of the "round-the-corner" type which could be used in bad weather or in an emergency; level ground because a hill or slope quickly tires an old person; a bus route fairly close as this is the only way an elderly person can get far afield; a church and/or club nearby so that there is an opportunity to make social contacts and get comfort from a spiritual life.

Design of the dwelling

The majority of the elderly people wanted the bed, dressing-table and so on to be separated from the living room. Almost two-thirds who had one large room preferred the sleeping area to be separated, mainly because they disliked the necessity to sit, eat and receive guests in what appears to them to be a bedroom. (It is interesting to note that among a number of the people who did not mind a bed-sitting room were those who had bought a bed-settee or divan.) Other reasons given were that the larger room tended to be more difficult to heat and make "cosy" in winter, while some people who had come from a house with separate sleeping rooms were critical of the lower standards.

The preference of elderly people for eating in the kitchen or living room depended mainly on whether they had one room or a sitting room with a bed recess. Among those who had a bed-sitting room, 30% ate in this room but more than twice as many (64%) either ate or would like to have eaten in the kitchen. Among those with a bed recess, half preferred to eat in the living room and only a third in the kitchen. The main reason for this difference was the reluctance of many people to eat where they sleep.

The factor determining satisfaction with the size of the space provided for living and sleeping was related primarily to personal circumstances. On the whole, the poorer the pensioner the less they could afford to spend on fuel and comfortable furnishings and the less furniture, they had to accommodate. A number of these people said the rooms were too big, mainly because they were too cold and draughty. Other people in better circumstances and with more and often big pieces of furniture, who were reluctant to sell up a large part of their former home, found that the same size "one-room accommodation" was inadequate to take all their belongings.

Design details

Many of the old people mentioned points of design that they thought essential. They liked to have a low window sill so that they could see out when seated, a balcony or French windows opening inwards, windows which are easy to clean (especially casement windows), cupboards and shelves within easy reach and low baths with hand-rails.

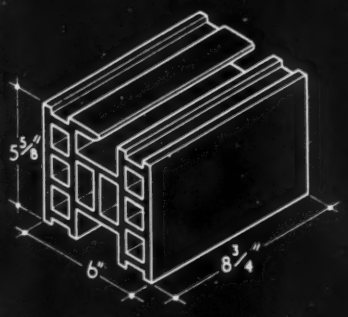
Other things they liked to have were windows low enough for them to be able to put curtains up without difficulty and danger, ventilator windows within easy reach, and a convenient and easily accessible storage place for coal.

Gardens

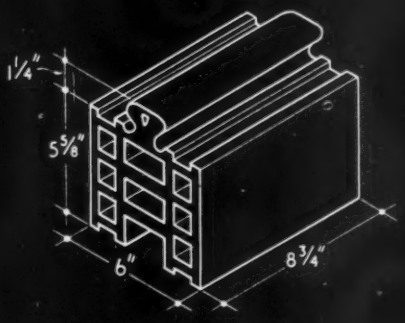
Few of the dwellings visited had private gardens and of the tenants who did have one only about a third enjoyed working it. Of the remainder, some had a relative or friend to do it and the rest either neglected it or found it a burden. However, among those without a garden about 10% during the interview mentioned they wished they had one.

BUILDING BLOCKS | HOLLOW CLAY | GENERAL DATA

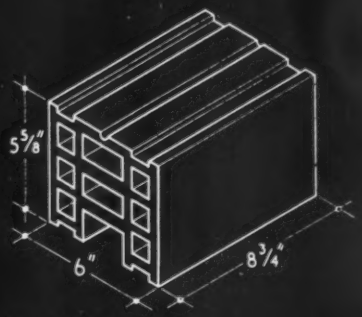
The Architects' Journal Library of Information Sheets 623. Editor: Cotterell Butler, A.R.I.B.A.



with recessed lifting bar

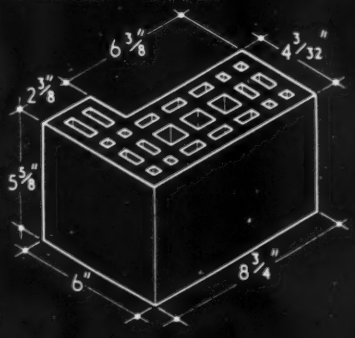


with protruding lifting bar

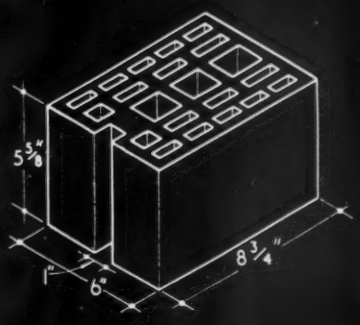


for plates and joists

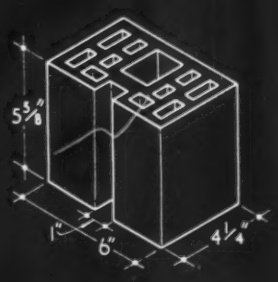
STRETCHER BLOCKS.



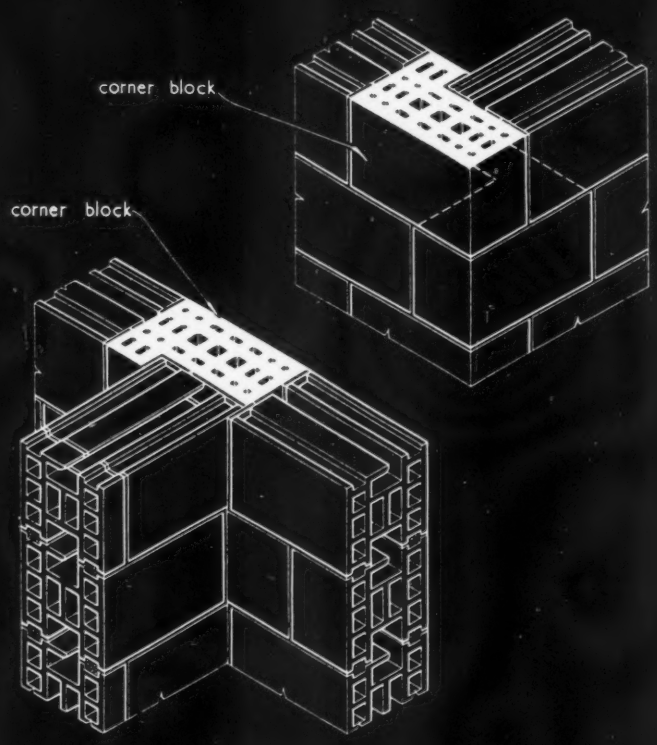
• CORNER BLOCK.



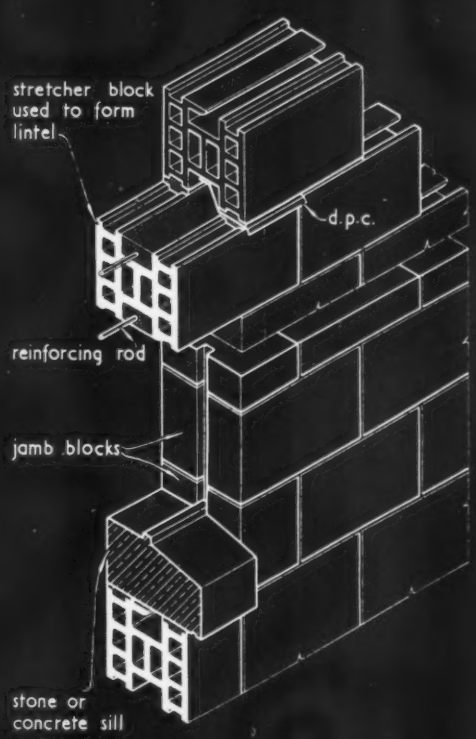
FULL JAMB AND CLOSER.



HALF JAMB AND CLOSER.



TYPICAL APPLICATIONS OF CORNER BLOCKS.



DETAIL OF WINDOW OPENING.

Manufacturer: London Brick Company Limited.

14.B3 ·PHORPRES· HOLLOW CLAY BLOCKS FOR WALLS: 2

This Sheet is one of a series on Phorpres hollow clay blocks and, together with Sheet 14.B2, describes their use for walls: these Sheets supersede all previous Sheets on this subject. Sheet 14.B1 deals with Phorpres blocks for partitions and Sheet 14.B4 with floor blocks.

Materials

Phorpres building blocks are manufactured as described on Sheet 14.B1.

Sizes and Weights of Building Blocks

Size	Wt. of blocks (lb. per sq. yd.)*		Yards per ton	
	Gault	Weald	Gault	Weald
8¾" × 5¾" × 6"	226	258	10	8¾

* 24 blocks per sq. yd.

Crushing Strength

The average crushing strength of individual blocks (calculated on the gross area of the block) is 850 lb./sq. in. Routine tests by the Technical and Research Laboratories, London Brick Company Limited. There is no British Standard Specification for this block but the LCC requirements are:

external (non-loadbearing) building blocks	500 lb./sq. in.
external or internal (loadbearing) building blocks	750 lb./sq. in.

Model Byelaw requirements are:

for single-storey buildings	400 lb./sq. in.
for two-storey buildings	750 lb./sq. in.

Strength of Walls

For the purposes of test, wall panels 8 ft. high × 4 ft. 6 in. wide × 6 in. thickness were built in 1 : 1 : 6 cement/lime/sand mortar. When crushed with a concentric loading the failing load was 94 tons and with eccentric loading 47 tons. (Strain and deflection readings on both sides of the panel were recorded.)

Thermal Transmittance

The " U " value of 6-in. building blocks rendered externally and plastered internally is 0·32* B.t.u./ft.² h. deg. F. difference in air temperature. This is slightly higher than the value (0·30) for an unventilated 11-in. cavity wall which is now regarded as the maximum for houses and flats (see *Housing Manual* 1944, page 96). The introduction of an additional cavity, as for example by plastering on lathing over battens fixed to the wall, would bring the transmittance down to a satisfactory value.

* Preliminary results from full scale tests at the Technical and Research Laboratories, London Brick Company Limited in co-operation with the Building Research Station.

Sound Insulation

The sound insulation qualities of Phorpres building blocks are superior to most light-weight forms of construction. It is generally accepted that resistance to airborne sound is directly proportional to the mass per unit area of the wall, as the denser the body the greater its resistance to airborne sound.

Fire Resistance

Made of a raw material, clay, which is absolutely non-inflammable and exposed during the process of manufacture to 980° C., the blocks have been proved by test results to be fire-resisting beyond the spalling point of reinforced concrete. When heated to a temperature of 650° C. (1,200° F.) and plunged into water, the block does not disintegrate.

Moisture Penetration

The building block has been designed to provide in one skin all the advantages of cavity wall construction. There can be no capillary attraction through the mortar joints as they are not continuous.

An unrendered panel 8 ft. high × 4 ft. wide × 6 in. thick was tested for resistance to rain penetration. It is considered that the Phorpres block provides a wall that is superior to an unrendered 9-in. brick wall in resistance to rain penetration (this standard is now regarded as a low one) and should normally give a dry interior, though dampness will sometimes appear after exposure to rainstorms of unusual severity. Tests by Building Research Station (D.S.I.R.). Since these tests were made there has been a slight modification to the internal design of the block.

Applications

A wall comparing favourably in performance to contemporary types of cavity construction can be laid in one operation. The size of the blocks and the ease with which they may be handled reduces the amount of scaffolding required to a minimum. As the units are designed to suit brick dimensions, bricks can be used at any point in the construction to line and bond with the blocks. The blocks can be readily cut where special closers are required. The special units which are available are required only at corners and openings and may be applied to any design. First floor joists and roof timbers are provided with a bearing without the necessity for cutting the block. To ensure adequate bearing at first floor or plate level the purpose-cut stretcher block is provided. Lintels may be formed for all types of opening by introducing reinforcement rods into the voids of the units and then filling with concrete, as shown in the drawing on the lower face of the Sheet.

Laying Instructions

The general practice is to lay Phorpres hollow blocks in 1 : 1 : 6 cement/lime/sand. This mix can, of course, be varied to suit particular conditions but too rich a mortar and thick joints should be avoided. Care should be taken to avoid bridging the gap between the two horizontal joints. The amount of water in the mix is reduced to a minimum owing to the texture of the material.

Finish

The standard block is faced on one side and keyed on the other. The external facing, which can be rendered if required, is known as " rug-face." Should the blocks be required smooth-faced, this can be arranged provided sufficient notice is given at the time of ordering.

This Series of Sheets on bricks and blocks covers general data on, and applications of, common, facing, cellular and keyed bricks, hollow walling, partition and floor blocks.

Compiled from information supplied by:

London Brick Company Limited

Head Office : Africa House, Kingsway, London, W.C.2.
Telephone : Holborn 8282.
Telegrams : Phorpres, Westcent, London.

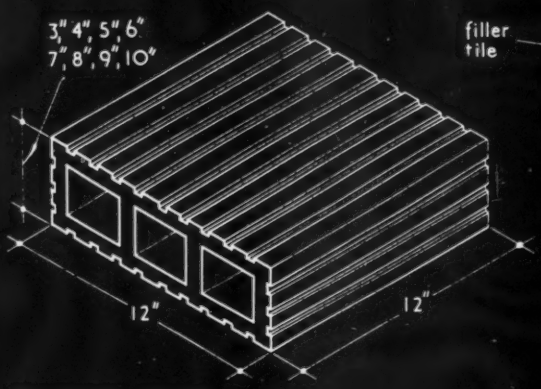
Midland District
Office : Prudential Buildings, St. Philip's Place, Birmingham, 3.
Telephone : Central 4141.

South Western
District Office : 11, Orchard Street, Bristol, 1.
Telephone : Bristol 23004/5.

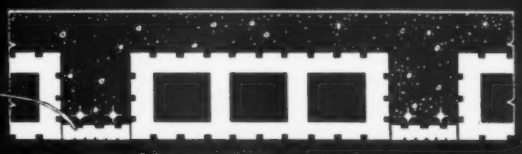
Northern
District Office : St. Paul's House, St. Paul's St., Leeds. 1.
Telephone : Leeds 20771.

BUILDING BLOCKS | HOLLOW CLAY | GENERAL DATA

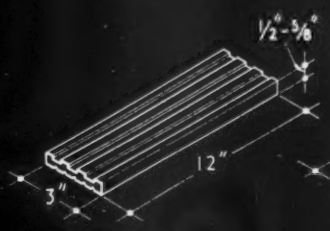
The Architects' Journal Library of Information Sheets 624. Editor: Cotterell Butler, A.R.I.B.A.



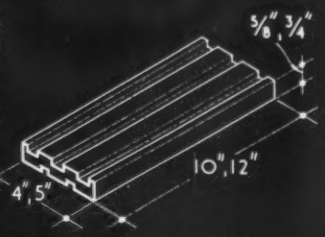
STANDARD BLOCK.



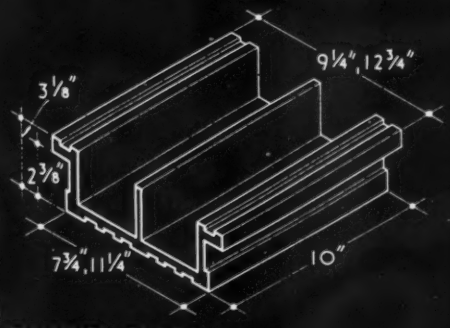
application of standard block



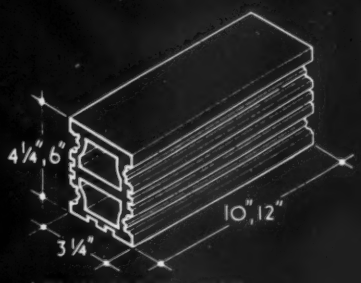
FILLER TILE.



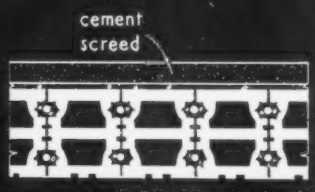
PANEL HEATING TILE.



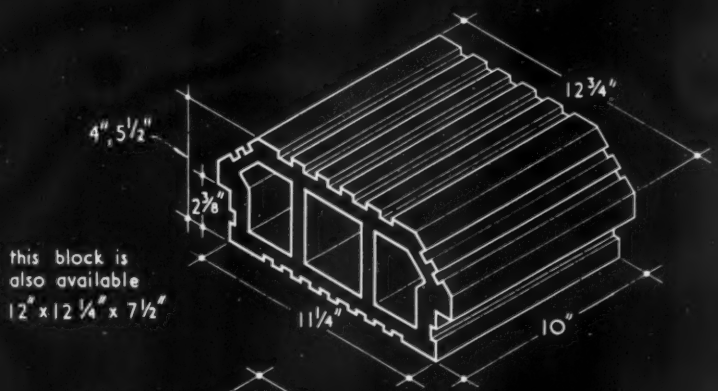
CHANNEL BLOCK.



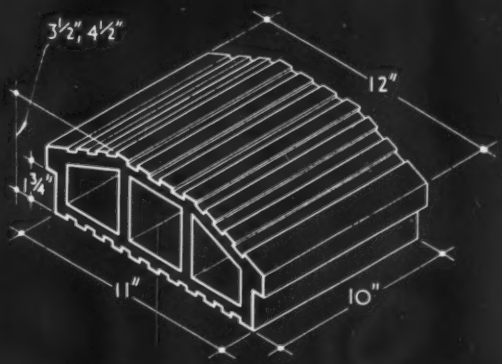
CLAY BLOCK UNIT.

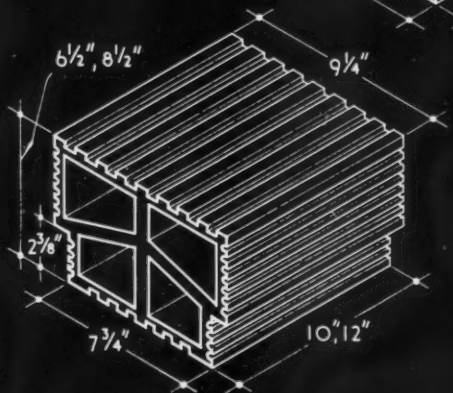


application of clay block unit



this block is also available 12" x 12¼" x 7½"





LIPPED BLOCKS.

application of lipped blocks

·PHORPRES· HOLLOW CLAY BLOCKS FOR FLOORS. Manufacturer : London Brick Company Limited.

14.B4 ·PHORPRES· HOLLOW CLAY BLOCKS FOR FLOORS

This Sheet is one of a series on Phorpres hollow clay blocks and describes their use for floors: it supersedes all previous Sheets on this subject. Sheet 14.B1 deals with Phorpres blocks for partitions and Sheets 14.B2 and 14.B3, with walls.

Materials

Phorpres floor blocks are manufactured as described on Sheet 14.B1.

Design and Construction

Three types of block are illustrated on the face of the Sheet: the standard block for use in in-situ floors with filler and panel heating tiles as shown in the drawing; the lipped with channel type for use with prestressed or precast beam construction and the clay block unit for hollow-tile beam construction.

Key for plaster: The bond or physical adhesion of a rendering or plaster is dependent upon the inherent porosity of the backing material, and in this respect Phorpres blocks possess a balanced absorption or suction value. This is further assisted by the mechanical keying provided by grooves of dovetail form. This mechanical key is of first importance in the early stages of drying and setting, when cracking may result from the vibration inevitable during construction. This vibration may also otherwise interfere with, or even prevent, the development of the necessary physical adhesion.

Sizes and Weights of Floor Blocks

Type of Block	Size	Weight of blocks (Tons per 1,000)	
		Gault	Weald
Floor Blocks (For in-situ hollow tile floors and roofs)	12″ × 12″ × 3″	5·85	5·75
	12″ × 12″ × 4″	6·3	6·75
	12″ × 12″ × 5″	7·55	8·0
	12″ × 12″ × 6″	8·4	9·25
	12″ × 12″ × 7″	10·45	—
	12″ × 12″ × 8″	12·3	—
	12″ × 12″ × 9″	13·5	—
	12″ × 12″ × 10″	15·0	—
Filler and Panel Heating Tiles	10″ × 5″ × ½″	—	10·25*
	12″ × 3″ × ½″	5·0*	6·0*
	12″ × 4″ × ½″	—	10·5*
Lipped Floor Blocks (For prestressed and concrete beam floors)	10″ × 12″ × 3½″	—	5·5
	10″ × 12½″ × 4″	—	5·5
	10″ × 12″ × 4½″	—	6·1
	10″ × 12½″ × 5½″	—	6·2
	10″ × 9½″ × 6½″	6·2	—
	12″ × 12½″ × 7½″	10·0	—
	12″ × 9½″ × 8½″	9·0	—
Clay Block Units (For prefabricated hollow tile floors)	10″ × 3½″ × 4½″	—	2·3
	12″ × 3½″ × 4½″	—	2·8
	10″ × 3½″ × 6″	—	3·0

* Weight per 10,000 tiles.

Crushing Strength

Average crushing strengths of individual blocks tested in accordance with the requirements of B.S. 1190 : 1951.

Type of block	Crushing strength (lb./sq. inch)
12″ × 12″ × 3″	3,160 (B.S. requires 2,500)
12″ × 12″ × 4″	2,600 (,, ,, ,,)
12″ × 12″ × 5″	2,920 (,, ,, ,,)

From routine crushing strength tests by the Technical and Research Laboratories, London Brick Company Limited.

Thermal Resistance

The transfer of heat from the air on the warm side of a floor or roof to the air on the cooler side is determined by the difference in air temperatures, number of air spaces, type and amount of construction materials, direction of heat flow and by the character of the surfaces.

The heat transmission coefficient (obtained for floors and roofs by tests on composite sections as for walling), allowing for a 4-in. floor block plus 2-in. concrete topping with plastered ceiling, is as follows:—

Overall transmittance (U) = 0·41 (Heat flow up)
,, ,, ,, = 0·33 (Heat flow down)

Sound Insulation

Sound transmission figures can be only approximate since the type of floor construction varies widely. The following approximate figure for airborne sound (average 256—1,024 frequencies, cycles per second) allows for a floor block 4-in. to 8-in. in thickness, 2-in. concrete topping and a plastered ceiling:—

Average loss of 55 decibels.

In floor design impact sound is probably of more importance than airborne sound. As far as is known impact sound on any type of floor can only be effectively treated by the addition of a floating floor.

Applications

Phorpres hollow clay floor blocks are manufactured to comply with B.S. 1190 : 1951 and the requirements of local authorities. They are designed for all types of hollow tile flooring system. The more recent development of prestressed concrete systems using clay blocks as essential components has further extended the range of structural floor products.

Piggery and Cattle Floors: Hollow clay floor blocks are particularly suitable for forming this type of floor. A single layer of floor blocks is bedded in cement-sand mortar upon a prepared base of well-rammed hardcore, suitably blinded out. The floor may be finished with a ½-in. to 1-in. cement-sand screed. The blocks are usually laid butted together with cement to give a maximum surface area without waste through cutting.

The construction provides cattle standing and bedding, which are both proof against damp and vermin. The good insulation enables the animals to retain their body heat and eliminates the necessity for bedding materials. The floor requires no upkeep or maintenance, is easily cleaned and dries quickly.

Sub-floors: Similar construction is utilised for sub-floors for domestic and industrial buildings.

This Series of Sheets on bricks and blocks covers general data on, and applications of, common, facing, cellular and keyed bricks, hollow walling, partition and floor blocks.

Compiled from information supplied by:

London Brick Company Limited

Head Office : Africa House, Kingsway, London, W.C.2.
Telephone : Holborn 8282.
Telegrams : Phorpres, Westcent, London.

Midland District
Office : Prudential Buildings, St. Philip's Place, Birmingham, 3.
Telephone : Central 4141.

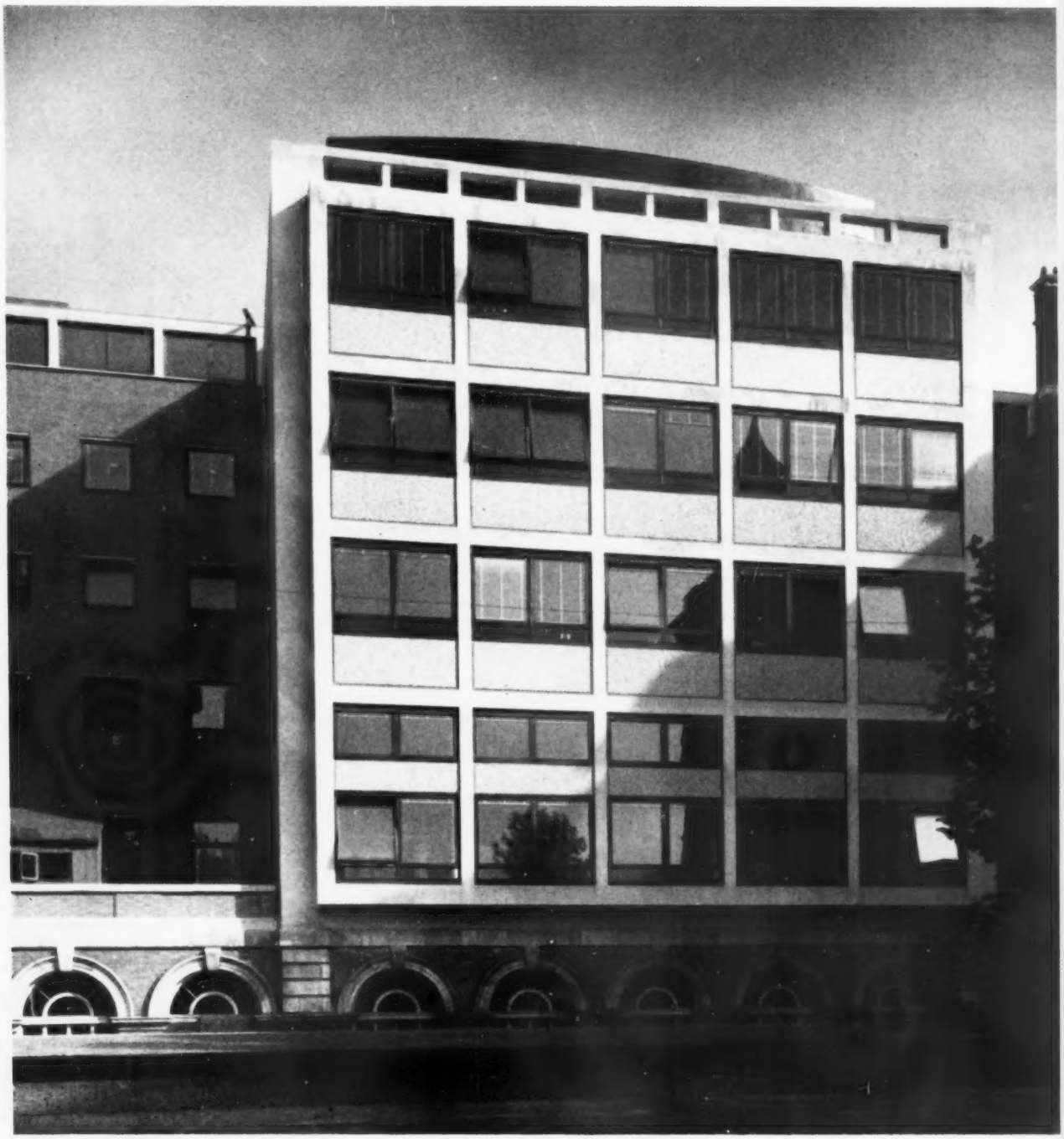
South Western
District Office : 11, Orchard Street, Bristol, 1.
Telephone : Bristol 23004/5.

Northern District
Office : St. Paul's House, St. Paul's St., Leeds, 1.
Telephone : Leeds 20771.

working detail

WINDOWS: HOSPITAL IN LONDON, S.E.1

W. G. Holford and L. G. Creed, architects

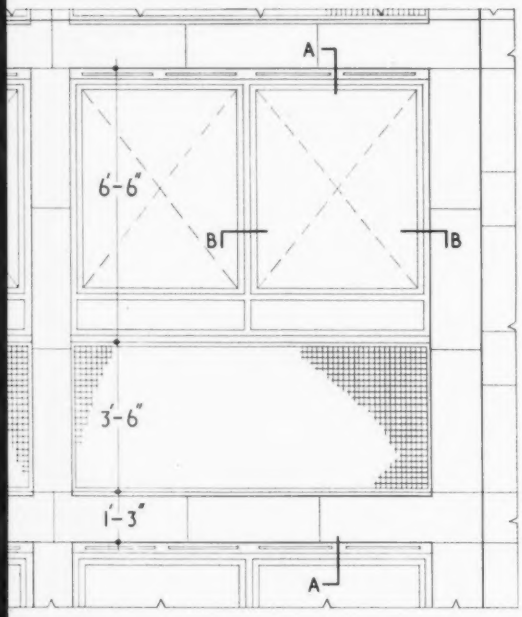


This is a very similar detail to that given of another facade of the same building published in our issue of June 6, 1957: the wood windows are of the same pattern (though here they are in pairs) and the same vitreous mosaic-faced panels are used beneath them. In the other detail these elements were framed in a brick facade with slate strings, here they form part of what is in expression a rather solid version of the curtain wall, comprising a concrete encased steel frame cantilevered forward of the main face of the building and faced with Portland stone. The facade is sufficiently solid and orderly to stand up to its classical surroundings yet makes no stylistic concessions.

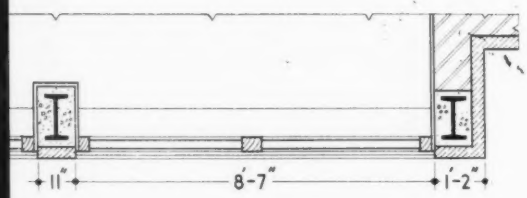
working detail

WINDOWS: HOSPITAL IN LONDON, S.E.1

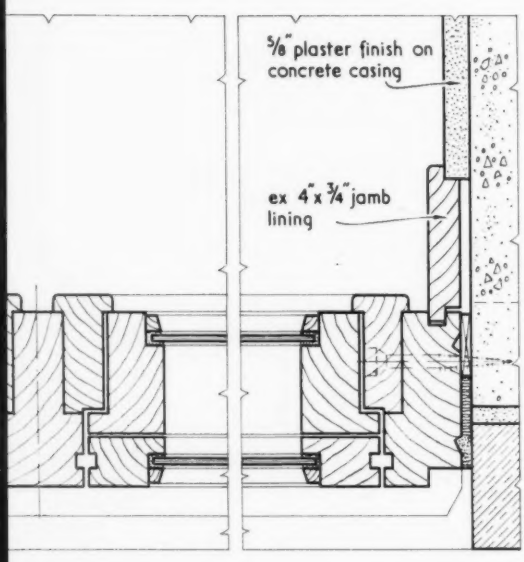
W. G. Holford and L. G. Creed, architects



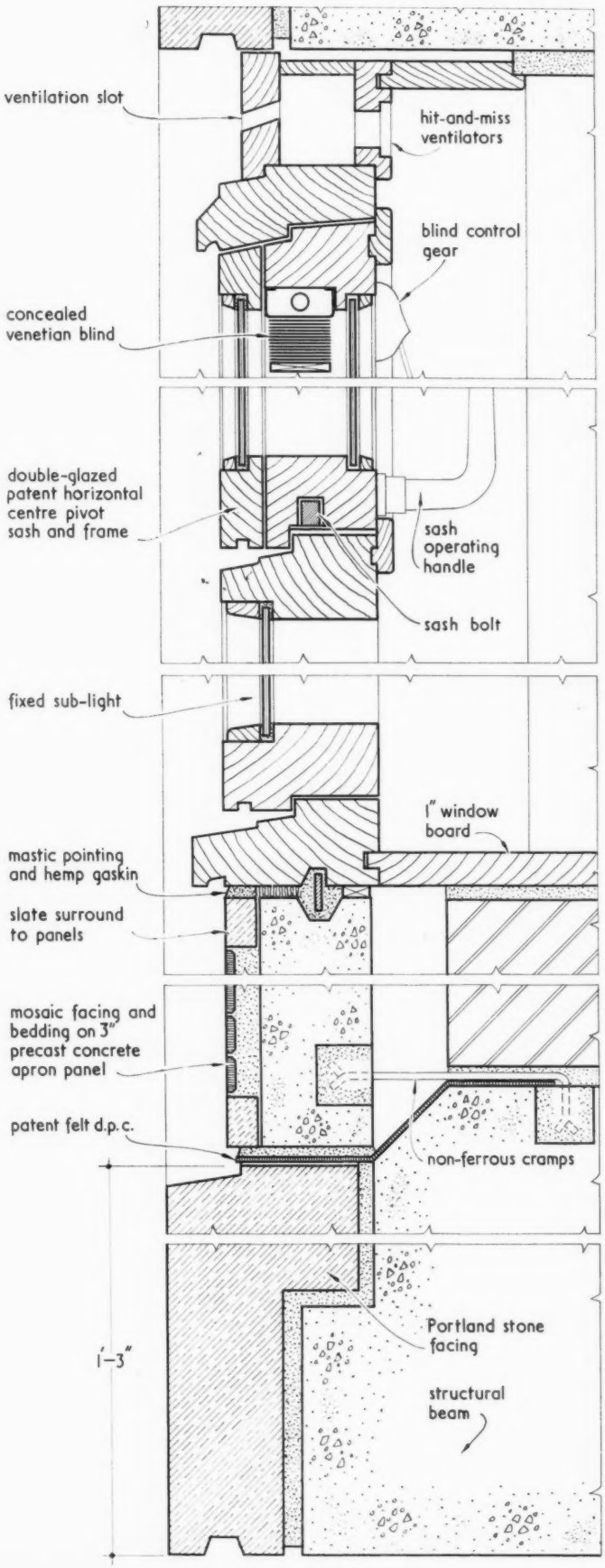
ELEVATION. scale ¼" = 1'-0"



PLAN scale ¼" = 1'-0"



PLAN AT B–B. scale ¼ full size



SECTION A–A. scale ¼ full size

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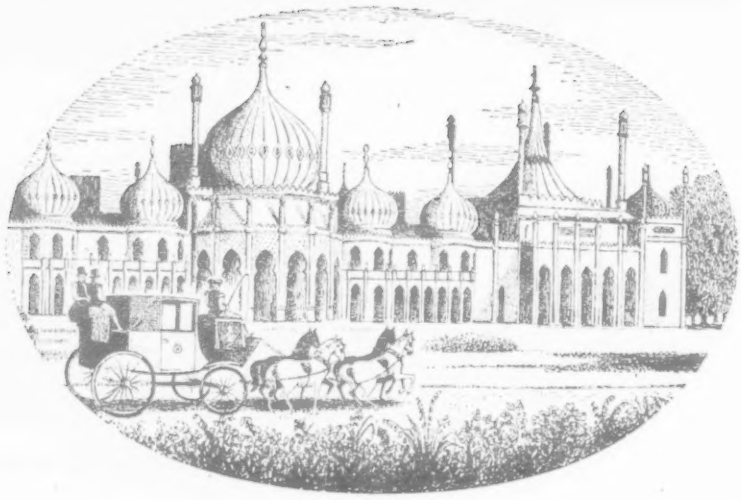

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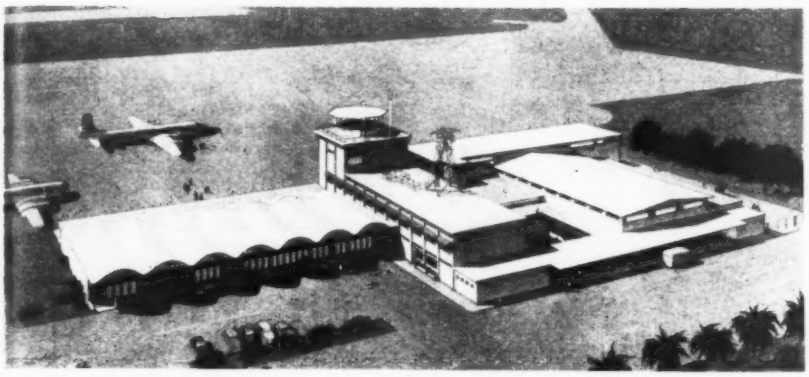

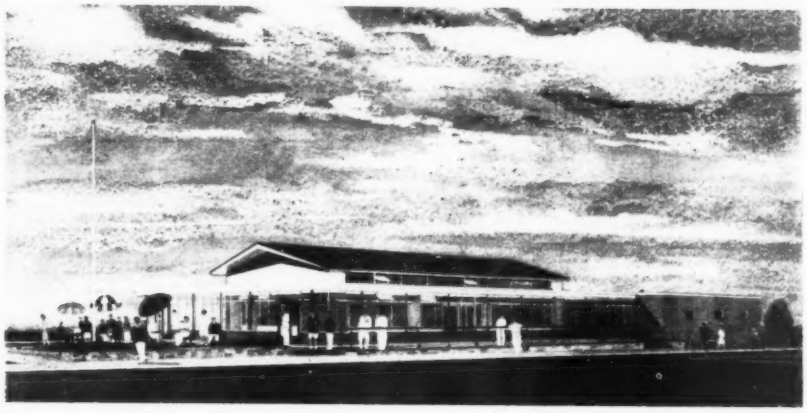

Above left: terminal buildings, Nassau Airport, Bahamas; architect: Graham Dawbarn (Norman and Dawbarn). Left: sports pavilion at Northolt, Middlesex; architects: Clifford Tee and Gale. Above: new government offices, Manchester; architect: Edward H. Banks. Previous illustrations from the Architecture Room at the Summer Show of the Royal Academy appeared in the JOURNAL *on May 9, May 23 and May 30.*

THE LIBRARY OF INFORMATION SHEETS COMPLETE TO MARCH, 1957

REPRINTS

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

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

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Announcements

Mrs. Olga Ford, M.S.I.A., of 5, Elmfield Close, 30, Elmfield Avenue, Leicester, who is a lecturer at Leicester School of Architecture, is taking a party of students, teachers, architects and artists to the 11th Triennale, International Exhibition of Modern Decorative and Industrial Arts and of Modern Architecture, in Milan which opens on July 27. The party leaves by Swiss Co. Chartered Aircraft (Viking) on July 16 and returns to London on August 1. Return fares from London are £21 3s. 0d. —this includes bus London Centre to Blackbush Airport, flight Blackbush to Basle, railway Basle to Milan, and return to London. Accommodation is booked at the students' hostel, Milan, from July 27 to 31, otherwise the party can make individual arrangements. The Secretary of the Triennale is allowing the party a 50 per cent. reduction in entrance fees and has promised to arrange special tours for students. Those who are interested should get in touch immediately with Mrs. Ford.

Bronek Katz and R. Vaughan, F.R.I.B.A., have moved to 208A, Regent Street, W.1 (telephone: Regent 5401-4).

Correction

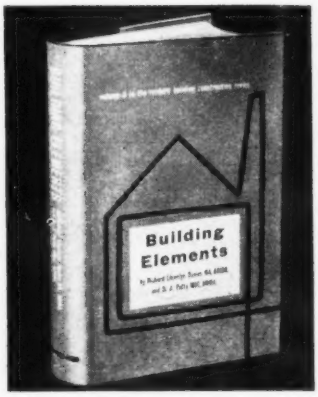
Anthony Le M. Pearce requests us to correct the mis-spelling of his name in our announcement of the results of the North of Ireland War Memorial Competition (in which he was described as Antony L. Pearce) and states that his colleague was Derek S. Bottomley, not Derek F. Bottomley.

now available: all three volumes in the new series on modern building construction

These three volumes—of which details are given below—combine to provide a definitive work on modern building construction which has been written and published at the recommendation of the Text and Reference Books Committee of the Royal Institute of British Architects. The main object of the Series, written in a manner directly related to design, is to provide information in a suitable form for architectural students. It will, however, also be found useful by practising architects, students of building, and building technicians.

building elements

by R. LLEWELYN DAVIES, M.A., A.R.I.B.A. and D. J. PETTY, M.B.E., M.A., A.R.I.B.A. Foreword by W. A. ALLEN, B.ARCH., A.R.I.B.A.



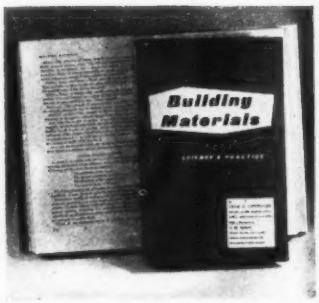
This Book deals with the structural elements of which a building consists, its walls, roofs, floors, windows, etc., and explains the functional requirements a building has to meet. It then describes how these requirements are met in the actual design of the various structural elements.

The book is divided into two parts, the first of which contains chapters on the requirements of building elements under the headings of Design and Expression; Weather Exclusion; Thermal Insulation; Sound Insulation; Fire Protection. In Part 2 chapters deal with the principal kinds of External Walls; Internal Walls; Roofs; Floors; Stairs; Flues and Fireplaces; Windows and Doors; which are in current use, and show how far and in what way, each of these elements fulfils the requirements described in Part 1.

Size: 8¾in. by 5¾in., containing 384 pages including over 190 diagrams and halftone illustrations. 37s. 6d. net, postage 1s. 4d.

building materials

by CECIL C. HANDISYDE, A.R.I.B.A. Foreword by A. H. MOBERLY.



This book provides up-to-date information on building materials in a form most useful to architectural students and practising architects. In addition to traditional materials, Mr. Handisyde deals with the many new materials which have come into use during the last twenty-five years, and takes full account of the very considerable amount of recent scientific research which has been brought to bear on both old and new materials. He examines thoroughly those problems of increasing concern to architects today—to what extent will alternative materials provide comfortable buildings, buildings that are warm and quiet and reasonably secure against fire, as well as being weatherproof and strong enough for their purpose.

Size: 8¾ in. by 5¾ in. Containing 336 pages including 58 diagrams and halftone illustrations. Second edition, 30s. net, postage 1s. 3d.

structure in building

by W. FISHER CASSIE, PH.D., M.S., F.R.S.E., M.I.C.E., M.I.STRUCT.E., and J. H. NAPPER, M.A., F.R.I.B.A., A.M.T.P.I. Foreword by W. A. ALLEN, B.ARCH., A.R.I.B.A.

Steel, concrete, aluminium alloys, etc., have revolutionised structural design, and although this field is largely an engineering one, today it is essential for the architect to understand something about it. No attempt is made in the book to give the formulae and methods of analysis and design used by the structural engineer; rather it provides the architect and student with mental pictures of how structures behave, for without the ability to 'feel' how forces act and react in the support of buildings, the architect cannot hope to put into practice the spatial conceptions of present-day architecture.

The book fills a gap in the literature on structural design and provides the architect with all the information he needs about systems of construction, their character, possibilities and limitations, to enable him to produce designs for new buildings with economy and imagination.

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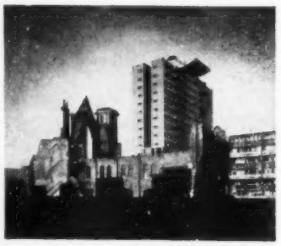
COUNTER ATTACK GROTESQUE OLIVETTI

Ian Nairn, of *Outrage* fame, will contribute a first essay on the aims and objectives of the newly-formed **Counter-Attack Bureau,** to the June issue of the ARCHITECTURAL REVIEW, and make proposals for positive anti-Outrage policies for the threatened suburban village-centres of Ewell, Colnbrook and Huyton.

Subtopian Mess at Colnbrook.

Two widely diverse Italian subjects to be discussed in the same issue will be the grotesque statuary and architecture of the Orsini garden at **Bomarzo,** considered iconographically by Dr. S. Lang, and the impressive and intelligent record of patronage in architecture, the arts, and design, of **Adriano Olivetti,** considered biographically by Georgina Masson. New buildings in this issue will be as different in type and place as the **Golden Lane** development by Chamberlin, Powell and Bon, and the **Museum at Accra** by Drake and Lasdun; the old buildings of the month will be **Balmes House,** Hackney, a forgotten, but representative piece of artisan mannerism which will be described and discussed by Priscilla Metcalf, and those in **Halifax Street,** Sydenham, another threatened area that comes within *Counter-Attack's* purview. *Skill* features of the month include a broad survey of food-preparation equipment, and in *Miscellany* Robert Melville contributes, as

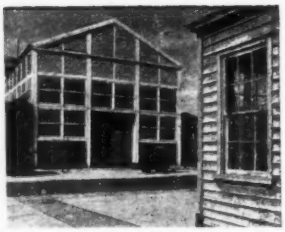


Golden Lane, by Chamberlin, Powell and Bon.

usual, his column of off-beat opinions on the world of art galleries and exhibitions.

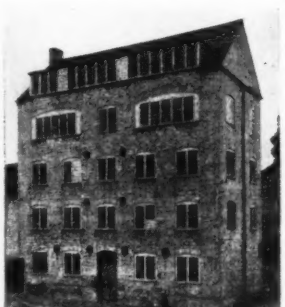
EARLY INDUSTRIAL

Mills, docks and harbours, warehouses, fences and gates, railways and canals—all bear witness to the theme of July's special issue of the REVIEW, *The Functional Tradition,* compiled and edited by J. M. Richards. In our present need to consolidate the results of the technical revolution that has overwhelmed architecture in this century, we need the discipline of an unconscious vernacular, a simple way of doing things simply, and we have no better guide for this than the monu-



Sheerness Naval Dockyard: cast iron frame extension, 1858.

ments of the functional tradition that dot the country from end to end, even in the most remote and rural areas. The tradition is not limited to any material—with its wooden water-mills, its brick warehouses, its iron framed naval boatsheds, its stonework by canal and railway—it had the adaptability we admire in the great masters of today, fitting together material, function and form, but into an unselfconscious unity. Most architects know of the great tradition's existence, have seen one or two textbook examples illustrated, have discovered one or two favourites of their own, but in *The Functional Tradition* they will find for the first time a systematic analysis of the nature and value of the tradition, supported by the results of an extended photographic campaign by Eric de Maré, which has rescued many unknown and forgotten buildings from undeserved obscurity, and also set on record for the first time the little known architecture of the warehouses, rope walks and other buildings in the dockyards of the Royal Navy.



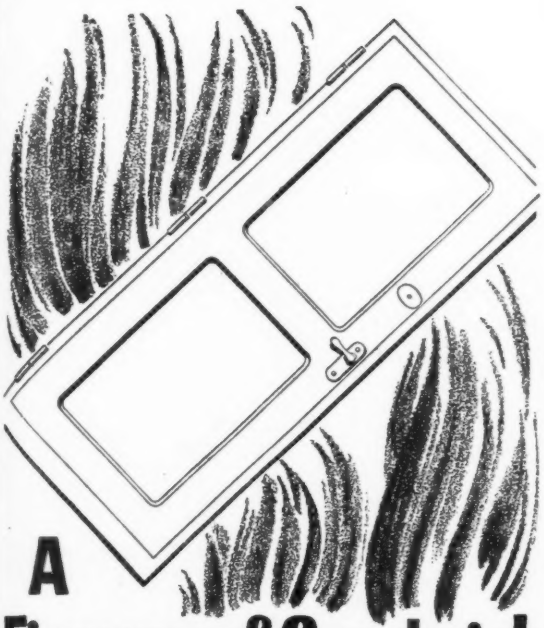
Bentley's piano factory, Nailsworth near Stroud.

DRAUGHT-STOPPERS HOTELS ADVERTISING

The year-round English draught makes **Weather-stripping** a subject of perennial interest and in the August issue of the REVIEW, Peter Whiteley will make a study of the products available for remedial work on both doors and windows, as well as the kind of preventive design that is better than even the best of cures. Two hotels of outstanding interest will be described and illustrated; the *Malmen,* by Wallander and Varhelyi in Stockholm, and Louis Erdi's *Coachotel* in Dover, both radical solutions

Model of a village at Rushbrooke, Suffolk, by R. Llewelyn Davies and John Weeks, to be illustrated with photographs of pilot houses.

in their different ways to contemporary hotel-design problems. A creative and broadminded approach to a vexed question, outdoor publicity, will be outlined in the new proposals for **Advertising in Stevenage,** and the social and architectural problems of building new **Urban Nuclei** in rural areas will be considered in an article by Hilda Selem on recent re-settlements in Italy, and a study of Richard Llewelyn Davies' and John Weeks' rebuilding programme for **Rushbrooke** in Suffolk. Historical features in this issue will cover the early romantic days at the Weimar **Bauhaus,** whose expressionist and religious fervours are recalled by Helmut von Erffa; a sheaf of notes on out-of-the-way aspects of Italian architecture, and a study of Bernardo Bellotto's four magnificent views of the mysterious **Wilanow Palace** outside Warsaw, now on view at the Whitechapel Gallery. In *Skill,* the *Interior* of the Month will be the new offices for the Orient Line, and in *Design Review,* John Blake will survey recent developments in wallpapers and furnishing fabrics.



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Apply to the Architect to the Council, (AR/ED/CTB), County Hall, Westminster Bridge, S.E.1, for application forms and further particulars. (681). 5913

LONDON COUNTY COUNCIL ARCHITECT'S DEPARTMENT

Selections for appointment are now being made from students at architectural schools who will take their final examinations this summer. Starting salary up to £676. Vacancies also for ARCHITECTS of experience at starting salaries up to £1,036. Full programme of houses, flats, schools and many other interesting buildings.

Application forms and full particulars from the Architect (Ref. AR/EK24/572), The County Hall, S.E.1. (895) 6290

BOROUGH OF BLYTH

Applications are invited for the following vacancies:—

(*a*) CHIEF ENGINEERING ASSISTANT—Salary A.P.T. IV, £727 15s. 0d. p.a. rising by annual increments to £907 2s. 6d. p.a. Applicants should have experience in Municipal Engineering and hold a recognized qualification.

(*b*) JUNIOR ARCHITECTURAL ASSISTANT—Salary A.P.T. II, £609 17s. 6d. p.a. rising by annual increments to £691 17s. 6d. per annum. Applicants should be of Intermediate standard.

The appointments are 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 suitably endorsed, must be delivered to the undersigned with names of two referees not later than 17th June, 1957.

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

Housing accommodation will be provided if required.

EDWIN W. CARTER,
Town Clerk.

Dinsdale House,
Marine Terrace,
Blyth, Northumberland. 6493

LINDSEY COUNTY COUNCIL ARCHITECT'S DEPARTMENT

Vacancies on permanent staff for TWO ENGINEERING ASSISTANTS, Grade III, £656/£784 2s. 6d., for Heating Services. Applicants should hold the Higher National Certificate or Intermediate Examination I.H.V.E. and be capable of designing and preparing heating and hot water schemes and specifications for school buildings.

In special circumstances consideration will be given to starting salary not more than two steps up the grade. N.J.C. Conditions of Service. Canvassing will disqualify. Candidates must disclose in writing whether to their knowledge they are related to any Member or Senior Officer of the Council.

Applications giving age, qualifications, experience, present salary, and the names of at least two persons to whom reference can be made to be sent not later than 30th June, 1957, to County Architect, County Offices, Lincoln. 6498

CITY OF SHEFFIELD ESTATES SURVEYOR'S DEPARTMENT

Applications are invited for posts of PROPERTY ASSISTANTS from persons who have passed or are awaiting the results of the R.I.C.S. or C.A.E.A.I. Intermediate Examinations. Salary in accordance with Grade A.P.T. II £609 to £691 per annum. 38-hour week. Payment for overtime. Alternate Saturday Morning Leave. N.J.C. conditions of service.

Experience required of Repairs, Conversions, Demolitions and Letting and Management of Urban Properties.

Applications stating post applied for, age, education and training (with dates), qualifications, present and past appointments (with dates, experience and salaries) and the names of two referees should be forwarded to me by the 21st June, 1957.

JOHN HEYS,
Town Clerk.

Town Hall,
Sheffield, 1. 6549

URBAN DISTRICT COUNCIL OF CORBY SENIOR ARCHITECTURAL ASSISTANT

Applications are invited for the appointment in the department of the Engineer and Surveyor of Senior Architectural Assistant, Grade A.P.T. V, commencing at the 4th point, £922 10s. per annum and rising to the maximum of £994 5s.

Applicants must be Registered Architects of at least five years' experience, have considerable experience in design, construction and contract administration as applied to contracts for Public Buildings and local authority housing. The work on which the successful candidate will be employed includes new cemetery buildings, mortuary, recreational buildings and housing.

The provisions of the Local Government Superannuation Acts, 1937-1953, will apply to this appointment.

Housing accommodation will be made available to the successful candidate, if married.

Forms of application may be obtained from the undersigned, to whom they should be returned not later than Friday, 21st June, 1957.

Testimonials will be required only from applicants selected for interview.

G. B. BLACKALL,
Clerk of the Council.

Council Offices,
Corby,
Northants.
28th May, 1957. 6504

ISLE OF ELY COUNTY COUNCIL COUNTY ARCHITECT'S DEPARTMENT

Applications are invited for the following appointments:—

(*a*) ARCHITECTURAL ASSISTANTS—Grade A.P.T. I or II or III (£543—£625 or £610—£692 or £656—£784).

(*b*) ASSISTANT ARCHITECTS — Special Grade (£707—£861).

(*c*) SENIOR ASSISTANT ARCHITECTS—Grade A.P.T. V (£815—£994).

Applicants should state the grade applied for, and appointments and the point of entry within the grades will be determined by qualifications and previous experience.

Applicants for posts (*b*) will be required to have completed parts I and II of the R.I.B.A. Final or Special Final Examination, or to have satisfactorily completed a course at a recognized School of Architecture. This will also apply to Students completing their course this summer.

Applicants for posts (*c*) must be A.R.I.B.A. or equivalent, with some previous experience.

Appointments are subject to the National Joint Council's Scheme of Conditions of Service, the Local Government Superannuation Act and to passing a medical examination.

Applications giving details of training and experience, together with the names of two referees, to be sent to the County Architect, County Hall, March, Cambs., not later than 21st June, 1957.

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

6536

BOROUGH OF SCUNTHORPE BOROUGH SURVEYOR'S DEPARTMENT

Applications are invited for the following appointments:—

ASSISTANT ARCHITECT, Grade A.P.T. IV (£727—£907 p.a.).

ASSISTANT ARCHITECT, Grade A.P.T. II (£609—£691 p.a.).

Housing accommodation is available if required.

Applications giving particulars of age, experience, qualifications and appointments, together with the names of two referees should be submitted to the undersigned not later than Friday, 21st June, 1957.

T. M. LISTER,
Town Clerk.

Municipal Offices,
34, High Street,
Scunthorpe.
28th May, 1957. 6503

STAFFORDSHIRE COUNTY COUNCIL COUNTY ARCHITECT'S DEPARTMENT

Applications are invited for Architectural Staff on the following salary grades:—

A.P.T. V £814 18s.—£994 5s.
A.P.T. VI £902—£1,107.
A.P.T. VII £999 8s.—£1,230.

Applicants should be Associates of the R.I.B.A. with appropriate experience. They must disclose whether or not they are related to any member or senior officer of the County Council and canvassing of members of the Council will disqualify.

The County Council will approve, for a period not exceeding six months, the payment of a temporary lodging allowance of £1 15s. per week, plus third class return fare home every two months, to newly appointed married staff whose homes are outside the geographical County and who are unable to secure housing accommodation. The Council will also consider granting financial assistance towards reasonable removal expenses.

Applications, together with the names and addresses of three referees should be forwarded to P. Woodcock, F.R.I.B.A., Deputy County Architect, County Buildings, Stafford, not later than Thursday, 20th June, 1957, giving full details of experience, past and present appointments, qualifications, and stating age, present salary and grade applied for.

T. H. EVANS,
Clerk of the County Council.

County Buildings,
Stafford.
June 1st, 1957. 6577

NORTHAMPTON RURAL DISTRICT COUNCIL ARCHITECTURAL ASSISTANT

Applications are invited for the above appointment on Grade A.P.T. II. Commencing salary within the Grade according to qualifications and experience.

The principal work will be preparation of improvement schemes for Council Houses, although from time to time, new works will be involved.

Applicants must have had a sound general experience, and preferably have passed or be studying for the Intermediate examination of the R.I.B.A.

Applications, endorsed "Architectural Assistant," with personal details and details of experience and qualifications, together with names of two referees to be sent to the undersigned by 21st June, 1957.

CLIFFORD E. JONES,
Clerk of the Council.

Council Offices,
1, Cheyne Walk,
Northampton.
28th May, 1957. 6509

HAMPSHIRE COUNTY COUNCIL SECOND DEPUTY COUNTY PLANNING OFFICER

Applications are invited from persons who, in addition to being Corporate Members of the T.P.I., are also Corporate Members of the R.I.B.A., for the post of Second Deputy County Planning Officer at a salary within Scale E (£1,515 × £55—£1,735). Previous experience in the Planning Department of a large local authority will be an advantage. The appointment will call for a high standard of design and administrative ability in the control of a new section of the staff of the County Planning Officer particularly concerned with the design of new and expanded townships and their detailed layout.

The appointment is permanent and pensionable and will be subject to a satisfactory medical report. The successful applicant will be required to live within 5 miles of Winchester. In approved cases the County Council assist with removal and other expenses. Applications, giving age and full particulars of qualifications and experience, and accompanied by one testimonial and the names of two referees, should reach the Clerk of the County Council, The Castle, Winchester, by 1st July. Canvassing is prohibited and will be a disqualification. 6576

BRACKNELL DEVELOPMENT CORPORATION

Applications are invited from Corporate Members of the R.I.B.A. for the post of ASSISTANT ARCHITECT, GRADE A.P.T. V. Salary £815—£994.

Superannuation schemes, medical examination. Housing available in due course. Apply by 25th June, 1957, giving age, education and qualifications; experience and appointments held (with dates and salaries) and names of two referees to the General Manager (A.A.), Bracknell Development Corporation, Farley Hall, Bracknell, Berks. 6533

COUNTY BOROUGH OF WOLVERHAMPTON APPOINTMENT OF PRINCIPAL PLANNING ASSISTANT

Principal Planning Assistant required in Borough Engineer's Department. Salary Grade V (£814. 17s. 6d.—£994. 5s. 0d. per annum). Candidates should be corporate members of the Town Planning Institute, preferably with an appropriate additional qualification, with considerable experience in a responsible position in a Town Planning Office.

Further particulars obtainable from the Borough Engineer, Town Hall, Wolverhampton, to whom applications should be submitted by 26th June, 1957. 6535

MIDDLESEX COUNTY COUNCIL

ASSISTANT ARCHITECTS. Architectural Assistants and Junior Architectural Assistants required in County Architect's Department in following grades:—

(*a*) Assistant Architects £707 5s.—£861. (*b*) A.P.T. III £656—£784 2s. 6d. plus £35 p.a. Westminster weighting. (*c*) A.P.T. II £609 17s. 6d.—£691 17s. 6d. plus £45 p.a. Westminster weighting. (*d*) A.P.T. I £543 5s.—£625 5s. plus £65 p.a. Westminster weighting. All salaries plus London weighting of £10 if under 21, £20 age 21-25 years, £30 for 26 years and over. Commencing salaries according to qualifications and experience. Applicants for appointment (*a*) must have passed R.I.B.A. Final Examination. Prescribed conditions. Application forms (stamped addressed foolscap envelope) from County Architect, 1, Queen Anne's Gate Buildings, Dartmouth Street, S.W.1, returnable by 26th June (Quote V.319 AJ). Canvassing disqualifies. 6553

COUNTY BOROUGH OF BURNLEY

Applications are invited for the appointment of an ARCHITECTURAL ASSISTANT in the Borough Engineer's Department at a salary in accordance with the Special Grade of the National Scales (£707—£861).

Applicants for this appointment should hold appropriate qualifications and previous experience in Municipal work would be an advantage.

Housing accommodation may be made available if required.

Form of application may be obtained from the Borough Engineer, 22/24, Nicholas Street, Burnley, and should be returned to him not later than first post Monday, 24th June, 1957.

C. V. THORNLEY,
Town Clerk.

6547

Applications are invited from persons suitably qualified and experienced for the following appointments, which will be subject to the Local Government Superannuation Acts. Applicants should state whether to their knowledge they are related to any member or senior officer of the Authority; canvassing will disqualify.

Forms of application to be obtained from: The Education Architect, Green Hall, Lichfield Road, Stafford, and to be returned by the 20th June, 1957.

1. JUNIOR ASSISTANT ARCHITECTS. Intermediate R.I.B.A. standard, Grade A.P.T. II (£609 rising to £691 p.a.).

2. ARCHITECTURAL DRAUGHTSMEN. Salary according to qualifications and experience (preferably with experience in an Architect's Office).

3. SENIOR ASSISTANT ELECTRICAL ENGINEER. Grade A.P.T. V (£815—£994 p.a.).

SENIOR HEATING ENGINEER. Grade A.P.T. VII (£999—£1,230 p.a.). Preference will be given to Associates of the Institute of Heating and Ventilating Engineers.

ASSISTANT HEATING ENGINEERS. Grades A.P.T. IV, V or VI (£727—£1,107 p.a.), according to qualifications and experience.

The Council are prepared to grant a lodging allowance of 35s. per week, to married applicants maintaining a home outside the Geographical County for a period of 6 months, and will give consideration to the granting of financial assistance towards removal expenses in appropriate cases. 6594

CARDIFF RURAL DISTRICT COUNCIL
APPOINTMENT OF ARCHITECTURAL ASSISTANT

Applications are invited from suitably qualified and experienced persons for this appointment at a salary in accordance with Grade A.P.T. IV £727 15s.—£907 2s. 6d. per annum.

The appointment is subject to the provisions of the Local Government Superannuation Acts and to the National Joint Council's Scheme of Conditions of Service. The person appointed will be required to pass a medical examination before the appointment is confirmed.

Applications stating age, qualifications and experience together with the names of two referees should be sent to the undersigned not later than 22nd June, 1957.

Canvassing, directly or indirectly, will disqualify, and applicants must disclose whether they are related to any member or senior official of the Council

S. P. YOULDON,
Engineer and Surveyor.

Park House,
20, Park Place,
Cardiff.
13th June, 1957. 6550

HERTFORDSHIRE COUNTY COUNCIL
ARCHITECTURAL ASSISTANT (Planning). Qualifications A.R.I.B.A. (A.M.T.P.I. would be an advantage). Special/V (£707—£994). Experience in Architectural Design necessary with preferably some Planning training. Successful applicant will be required to prepare schemes and designs in relation to planning applications. Vacancy is at County Hall in Design and New Towns Section of the Planning Department.

Forms available from the County Planning Officer, County Hall, Hertford, to be returned by 24th June, 1957. 6578

BOROUGH OF UXBRIDGE
ASSISTANT ARCHITECT

Applications are invited for the appointment of an Assistant Architect on the Unestablished Staff of the Borough Surveyor & Architect at a salary, depending on qualifications and experience, in accordance with A.P.T. Grade III (£656—£784 2s. 6d.) or IV (£727 15s.—£907 2s. 6d.) plus £30 London weighting at age 26 or over. Applicants should have had a good architectural training and experience and preference will be given to those with a professional qualification. The appointment will be subject to the National Scheme of Conditions of Service, the Local Government Superannuation Acts and the passing of a medical examination. Applications stating age, marital state, present and previous appointments, qualifications and experience and giving the names and addresses of three referees, should be forwarded to Harold E. G. Stripp, F.R.I.C.S., M.Inst.R.A., Borough Surveyor & Architect, 263, High Street, Uxbridge, not later than 26th June next. Housing accommodation will be made available if required. Candidates are required to disclose in writing whether to their knowledge they are related to any member or senior officer of the Council.

JOHN POOLE,
Town Clerk.
6542

EAST RIDING OF YORKSHIRE COUNTY COUNCIL

Applications are invited for the following permanent appointments on the staff of the County Architect.

ASSISTANT QUANTITY SURVEYOR, N.J.C. scales Grade II (£609 17s. 6d.—£691 17s. 6d.).

ASSISTANT ARCHITECTS, N.J.C. Special Scale (£707 5s.—£861).

Applications giving particulars of qualifications, age, experience, past and present appointments with salaries, together with the names of three referees, should be sent to the County Architect, County Hall, Beverley, not later than Friday, 21st June, 1957.

THOMAS STEPHENSON,
Clerk of the Council.
6595

UNIVERSITY OF OXFORD

Applications are invited from qualified assistants with some experience for the following appointment: SENIOR ARCHITECTURAL ASSISTANT. The person appointed must have a knowledge of contemporary techniques and be capable of taking charge of a small drawing office. In addition, his duties will include assistance in the administration of the University's major building programme. Housing accommodation will be available where appropriate. Salary about £850.

Apply for further particulars stating age, training and experience to the Surveyor to the University, 5, South Parks Road, Oxford. 6506

COUNTY BOROUGH OF SWANSEA
BOROUGH ARCHITECT'S (CENTRAL WORKS) DEPARTMENT
ASSISTANT ESTIMATOR

Applications are invited for the following Post:—

ASSISTANT ESTIMATOR. Salary grade A.P.T. III (£656 to £784).

Applicants should possess considerable experience in the pricing of Bills of Quantities, measuring and valuing of works in progress, preparation of estimates for small works from plans and specifications, and a thorough knowledge of contract procedure, and bonusable work.

Candidates must be under 45 years of age unless in Local Government Service.

The appointment will be subject to the provisions of the Local Government Superannuation Acts, and may be terminated by one month's notice on either side. The successful candidate will be required to pass a medical examination.

Forms of application may be obtained from the Borough Architect, The Guildhall, Swansea, to whom they must be returned not later than Saturday, 22nd June, 1957.

Canvassing disqualifies.

T. B. BOWEN,
Town Clerk.

The Guildhall,
Swansea.
1st June, 1957. 6551

COVENTRY CORPORATION REQUIRE

(*a*) PLANNING OFFICER, A.P.T. IV (£727—£907).

(*b*) PLANNING ASSISTANT, A.P.T. II (£609—£691).

Salaries within grade if appropriate.

Post (*a*). Knowledge of development plan work and of compulsory purchase procedure and similar administrative procedures in implementing central reconstruction projects. Ability in design work will be an advantage.

Post (*b*). Central Area Reconstruction Group with opportunity to gain experience in all sections of the office.

Housing accommodation, also loan for removal expenses, may be available.

Application forms, etc., from City Architect and Planning Officer, Bull Yard, Coventry, returnable within 10 days publication. 6575

NORTHERN IRELAND HOSPITALS AUTHORITY
HEADQUARTERS STAFF
Architectural Staff

I. SENIOR ASSISTANT ARCHITECT
Salary: £975 × £35 (1) × £30 (5)—£1,160 p.a.

II. ASSISTANT ARCHITECT
Salary—Grade I £930 × £30 (3)—£1,020 p.a.
Grade II £840 × £30 (3)— £930 p.a.
Grade III £740 × £25 (4)— £840 p.a.

The grade in which appointments at (II) will be made will depend on candidates' qualifications and experience.

Application forms and particulars obtainable from Secretary, Northern Ireland Hospitals Authority, Victory Buildings, 44/46 Queen Street, Belfast, to whom completed forms should be returned not later than 3rd July, 1957. 6598

NATIONAL COAL BOARD
NORTH EASTERN DIVISION

Applications are invited for the following appointments in the Department of the Divisional Chief Architect at Conisborough, Nr. Doncaster.

ARCHITECT GRADE II
(Salary Scale: £700 × £30 to £1,000 per annum).
Qualifications: A.R.I.B.A.

ARCHITECTURAL ASSISTANT GRADE I
(Salary Scale: £625 × £25 to £750 and up to £900 per annum in certain circumstances).
Qualifications. Preferably Intermediate R.I.B.A. or considerable practical experience.

ARCHITECTURAL ASSISTANTS GRADE II
(Salary Scale: £520 × £20 to £615 per annum).
Qualifications: Preferably Intermediate R.I.B.A. or studying for such Examination.

QUANTITY SURVEYORS GRADE II
(Salary Scale: £700 × £30 to £1,000 per annum.)
Qualifications: A.R.I.C.S.

QUANTITY SURVEYING ASSISTANT GRADE I
(Salary Scale: £625 × £25 to £750 and up to £900 per annum in certain circumstances).
Qualifications: Preferably Intermediate R.I.C.S. or considerable practical experience.

QUANTITY SURVEYING ASSISTANT GRADE II
(Salary Scale: £520 × £20 to £615 per annum).
Qualifications: Preferably Intermediate R.I.C.S. or studying for such examination.

JUNIOR QUANTITY SURVEYING ASSISTANT
Salary Scale: According to age—£4 5s. per week at 18 to £8 15s. per week at 25).
Qualifications: G.C.E. in 5 subjects including English, Mathematics, History or Geography. Five-day week; Staff Canteen.

Application forms from Divisional Chief Architect, National Coal Board, P.O. Box No. 4 Denaby Main, Nr. Doncaster. 6599

WORCESTERSHIRE COUNTY COUNCIL
COUNTY PLANNING DEPARTMENT
SENIOR PLANNING ASSISTANT, A.P.T. Grades IV—V (£727 15s.—£994 5s.) required, qualifications R.I.B.A., and A.M.T.P.I. essential.

Opportunities civic design and redevelopment; architectural draughtsmanship, perspective and experience in domestic design an advantage. Car required; pensionable; medical examination.

Application forms to be returned by 6 July, 1957, obtainable from County Planning Officer, County Buildings, Worcester (U278). 6545

LANCASHIRE COUNTY COUNCIL

SENIOR ASSISTANT ARCHITECT within the Scale £902—£1,107 to work in a Group on Education projects. Experience of Local Government work not essential.

Application forms, obtainable from the County Architect, P.O. Box 26, County Hall, Preston, to be returned by Monday, 1st July, 1957, quoting Ref. A/AJ. 6545

COUNTY BOROUGH OF CROYDON
ASSISTANT ARCHITECT

Applications for this appointment are invited from members of the R.I.B.A., to lead a small team on housing schemes and multi-storey flats. Salary scale £757 15s. to £1,137 per annum, commencing according to qualifications and experience.

If necessary, the Corporation will endeavour to assist with living accommodation at a full economic rent.

Further particulars and application form from Borough Engineer, Town Hall, Croydon.

Closing date 24th June, 1957.

E. TABERNER,
Town Clerk.
6548

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. Housing accommodation may be provided in suitable cases.

Applications stating age, training and experience, naming two referees to Borough Engineer, Town Hall, Wolverhampton, by 26th June, 1957. 6552

GOVERNMENT OF JAMAICA
TOWN PLANNER, TOWN PLANNING DEPARTMENT

To work with other planners on problems of town and country planning.

Contract appointment. Salary £1,500 p.a. Gratuity of £37 10s. for each completed period of three months' service. Free passages for officer, wife and children under 18. Assistance towards rent of quarters. Candidates must be A.R.I.B.A. and should possess physical planning training and a knowledge of the Town and Country Planning Act.

Write to Director of Recruitment, Colonial Office, London, S.W.1, giving age, qualifications and experience quoting BCD 62/32/01. 6546

CITY OF NOTTINGHAM EDUCATION COMMITTEE
COLLEGE OF ART AND CRAFTS
PRINCIPAL: ALFRED H. RODWAY, A.R.C.A., F.R.S.A.
LECTURER-IN-CHARGE: D. S. KILNER, DIPL. T.P. (Leeds), A.R.I.B.A., M.T.P.I.

Applications are invited for the full-time post of STUDIO INSTRUCTOR in the Department of Town and Country Planning, which is recognised for exemption from the Final Examination of the Town Planning Institute. The Studio Instructor may be required to participate in the work of the School of Architecture. Duties to commence as early as possible. Candidates should be corporate members of the Town Planning Institute and the Royal Institute of British Architects.

Salary: Burnham Report, 1956, Grade B, i.e. £650 × £25 — £1,025 (men), and £580 × £20 — £820, with equal pay increments (women), together with allowances, if appropriate, in respect of graduation, training, previous full-time teaching, approved professional experience, and/or war service.

Further particulars and application forms can be obtained from the Principal, College of Art and Crafts, Waverley Street, Nottingham, to whom the latter should be returned within 14 days of this advertisement.

W. G. JACKSON,
Director of Education.

Education Office,
Exchange Buildings,
Nottingham. 6605

OXFORD COLLEGE OF TECHNOLOGY, ART & COMMERCE
SCHOOL OF ARCHITECTURE AND BUILDING

Applications are invited from Architects for the post of LECTURER in Construction and Design. Qualifications should include good professional experience, the Degree or Diploma of a Recognised School of Architecture and some teaching experience. Salary in accordance with the Burnham Technical Scale for Lecturer grade.

Forms of application and further particulars from the Principal of the College, Cowley Road, Oxford, to whom applications should be returned by June 29th, 1957. 6604

HEMEL HEMPSTEAD DEVELOPMENT CORPORATION

SENIOR ARCHITECT (Vacancy No. 62). Salary scale £815—£994 p.a. Applicants must be A.R.I.B.A. and have good experience in the design and execution of large scale housing schemes. Starting salary according to qualifications and experience.

Conditions of service similar to those in Local Government. Housing accommodation available.

Applications endorsed "Vacancy No. 62" giving age, education, qualifications, experience and names of two referees, should reach General Manager, Westbrook Hay, Hemel Hempstead, by 21st June, 1957. 6607

NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD

Applications are invited for the following appointments:—

(a) ASSISTANT ARCHITECT. Good experience of design and construction necessary preferably in hospital work. Salary scale £680 × £25 (3) × £30 (2) × £35 (1) × £30 (1) × £35 (3)—£985 plus £20—£40 London weighting. Improved scale awaited.

(b) ARCHITECTURAL ASSISTANTS. To give technical assistance to professional officers. Salary scale £510 (age 21 and over) × £20 (5) × £30 (1) × £20 (1) × £25 (2)—£710 plus £20—£30 London weighting. Improved scale awaited.

Applicants for *(a)* above must be Associate Members of the R.I.B.A., and for *(b)* must have Intermediate R.I.B.A. Commencing salary above minimum may be paid to successful candidates according to relevant practical experience appropriate to the posts. Posts are subject to Whitley Council conditions and are superannuable.

Apply, stating which post and giving age, qualifications (with dates) and experience, with names of two referees to Secretary, North West Metropolitan Regional Hospital Board, 11a, Portland Place, W.1, by 1st July. 6608

COUNTY BOROUGH OF BRIGHTON

Applications are invited for the following vacancies required in connection with the design and erection of proposed new buildings for College of Technology, new College of Art and multi-storey flats.

Candidates, in their application should make particular reference to their experience in any of the above fields.

1. ASSISTANT ARCHITECTS Grade A.P.T. VII (2 posts) (£999 7s. 6d. to £1,230).
2. ASSISTANT ARCHITECT Grade A.P.T. V (£814 17s. 6d. to £994 5s.).
3. ASSISTANT ARCHITECTS Grade A.P.T. IV (2 posts) (£727 15s. to £907 2s. 6d.).
4. ASSISTANT ARCHITECT Special Grade (£707 5s. to £861).

Applicants for the above appointments must have passed the R.I.B.A. Final examination or the Special Final examination.

5. ASSISTANT ARCHITECT Grade A.P.T. III (£655 to £784 2s. 6d.).
6. ASSISTANT ARCHITECT Grade A.P.T. I (£543 5s. to £625 5s.).

Applicants for these posts must have passed the Intermediate examination of the R.I.B.A.

All the above appointments are superannuable and a mdical examination is required. The appointments will be subject to the National Joint Council Scheme of Conditions of Service.

Forms of application may be obtained from the Borough Surveyor's Office, 26/30, Kings Road, Brighton (stating for which position the application will be made) and should be returned completed to that office not later than 12 noon on 15th July, 1957.

W. O. DODD,
Town Clerk.
6609

CANNOCK RURAL DISTRICT COUNCIL
CHIEF ARCHITECTURAL ASSISTANT

Applications are invited from Associate Members of the R.I.B.A. for the above permanent post on the staff of the Engineer and Surveyor. Salary Grade A.P.T. IV (£727 15s.—£907 2s. 6d.).

The appointment will be subject to the Local Government Superannuation Acts, medical examination and one month's notice either side. The Council will endeavour to assist in the provision of housing accommodation and a travelling allowance (essential user scale) will be paid.

Applications giving full details of age, qualifications and experience together with the names and addresses of two referees to the undersigned by Monday, June 24th, 1957.

J. P. ROBERTS,
Clerk of the Council.
Council Offices,
Penkridge,
Stafford.
6611

BOROUGH OF CHATHAM
APPOINTMENT OF CHIEF ASSISTANT ARCHITECT

Applications are invited for the appointment of Chief Assistant Architect, within A.P.T. Grade V (£814 17s. 6d. × £35 17s. 6d.—£994 5s.) commencing at £922 10s. per annum.

Housing accommodation will be made available if required.

Conditions of appointment and form of application may be obtained from Mr. J. A. T. Richards, Borough Engineer and Surveyor, Town Hall, Chatham, to whom completed application forms should be returned not later than Saturday, 6th July, 1957.

ROWLAND NEWNES,
Town Clerk.
Town Hall,
Chatham.
6612

Architectural Appointments Vacant

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

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JUNIOR ASSISTANT required for city office. Write stating age, experience, and salary required to Box 6580.

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SENIOR ARCHITECTURAL ASSISTANT required by London firm of Architects with varied practice at home and abroad. Salary £1,000 per annum. Telephone Welbeck 7744, Secretaries' Office. 6570

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EXPERIENCED ARCHITECTURAL ASSISTANTS required in busy South Coast Office. Please write giving full details of experience, salary required, etc., Clayton, Black & Petch, Chartered Architects, 25, Landport Terrace, Portsmouth. 6591

ASSISTANT ARCHITECTS with experience required in London Office with general practice including hospital work. Opportunity to take charge of contracts including site supervision. Five-day week. Write giving details of experience and salary required to Box 6601.

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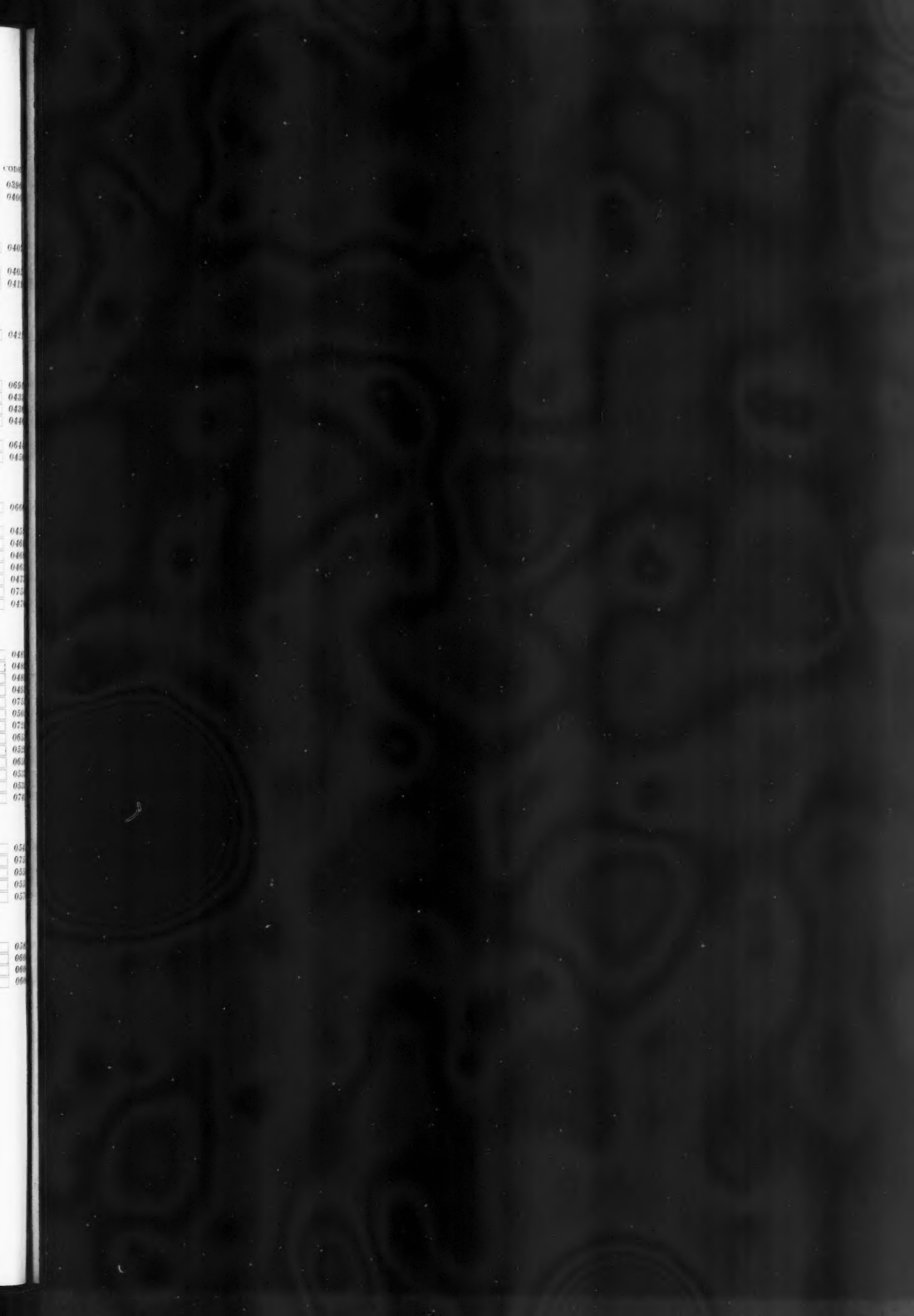

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