THE ARCHITECTS' JOURNAL

standard contents

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

No. 3233] [Vol. 125

THE ARCHITECTURAL PRESS

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Registered as a Newspaper.

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

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

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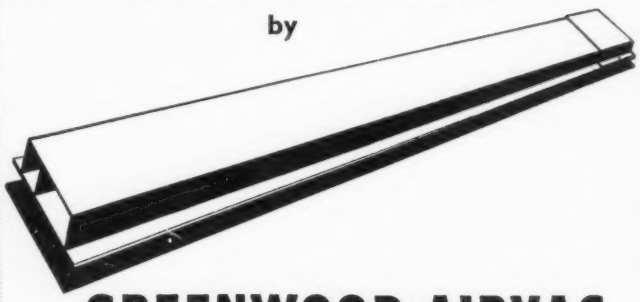
Architects: E. A. Stone, Toms & Partners, London, W.1.
Contractors: Geo. Wimpey & Co., Ltd., London, W.6.
Electrical Contractors: Berkeley Electrical Engineering Co., Ltd., London, S.W.1.

UNDERFLOOR CABLE DUCTS

by



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Architects'—here's news!

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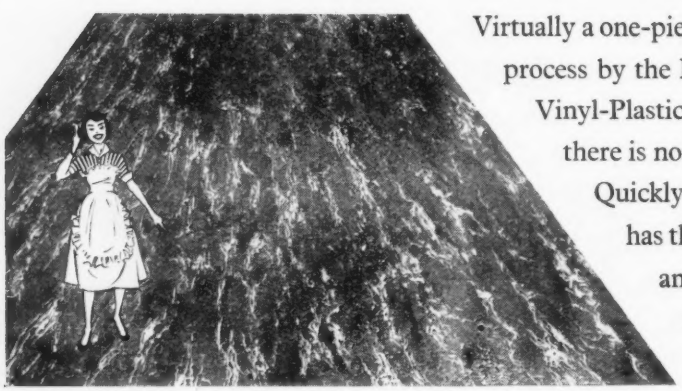

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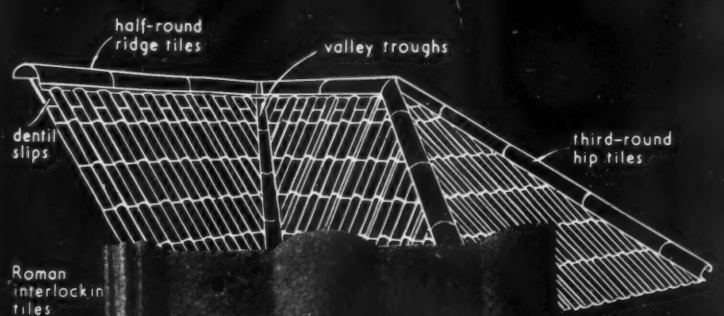
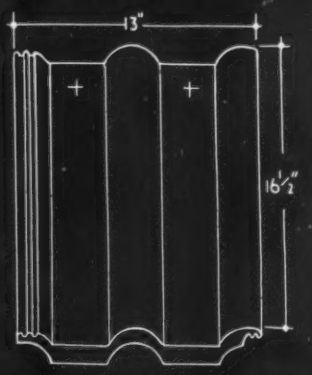




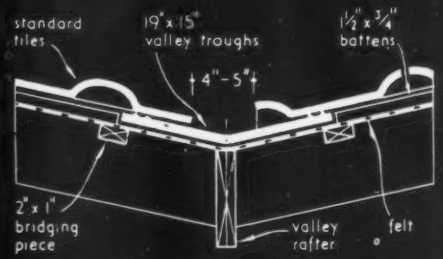
STANDARD TILE

PERSPECTI

18" x 9" half ridge tile

dentil slips

SECTION



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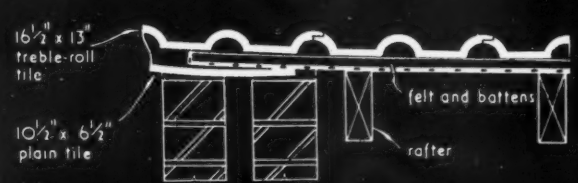
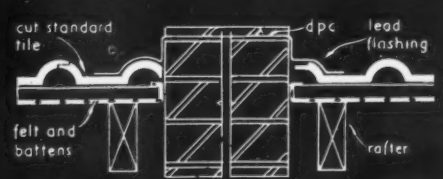
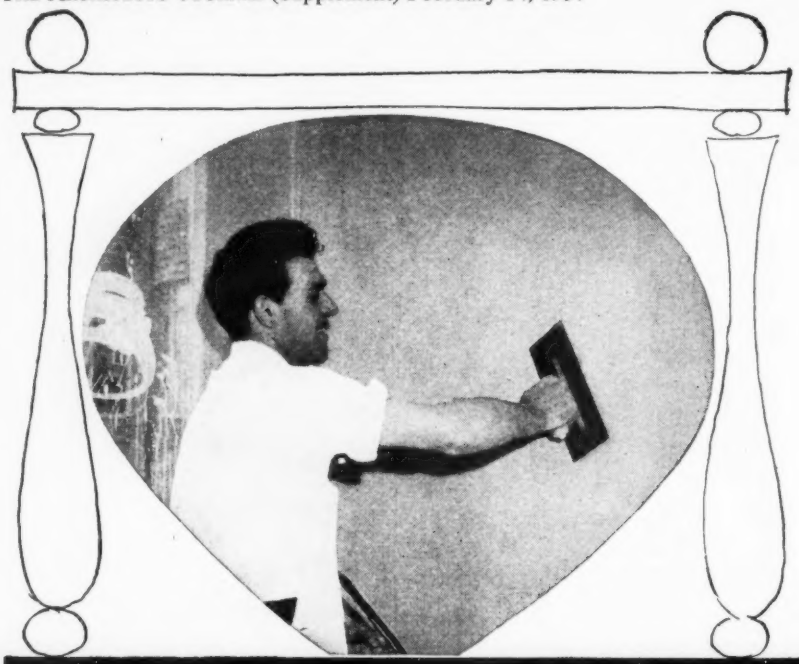


TYPICAL DETAIL AT VERGE



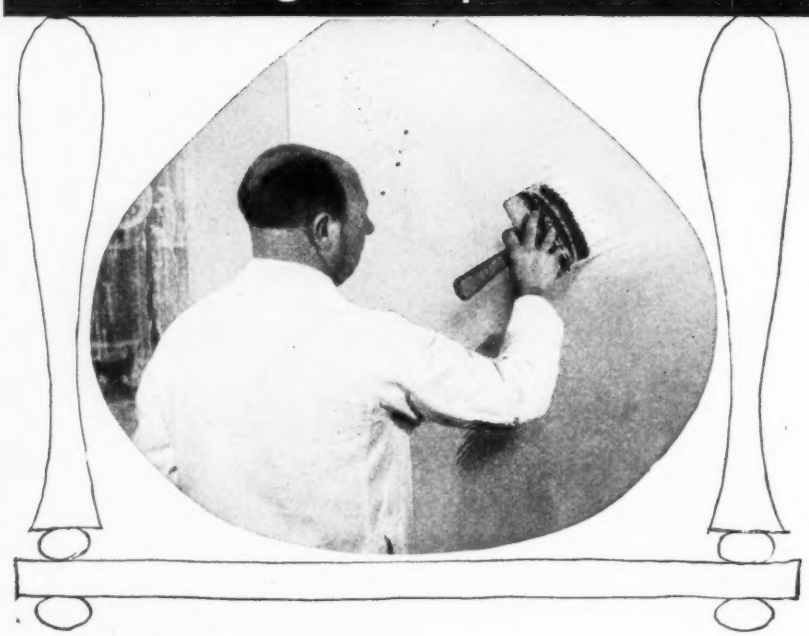
TYPICAL DETAIL AT ABUTMENTS

ROOF TILING: REDLAND 50 DOUBLE ROMAN INTERLOCKING TILES. Manufacturer: Redland Tiles Ltd



The appreciable amount of moisture contained in newly plastered interior walls together with their alkaline action has previously prevented early treatment except with non-washable or size-bound distempers. Normally the delay before paints can be applied extends up to several months. Premature treatment causes poor adhesion and subsequent blistering, the result of moisture trapped between wall and paint, if the plaster is alkaline, saponification.

Painting new plaster within 24 hours!



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Appearance: Pleasing, flat satin, with subtle sheen. *Application:* By brush, roller or spray. *Coverage:* Up to 200 sq. yds./gallon. *Colour:* 28 Pastel Shades and White. Also supplied in P.I.C.R.C./R.I.B.A. 101 range. *Drying:* From 1 to 3 hours dependent on conditions. *Resistance to Washing:* Will withstand repeated washing and even scrubbing with hot water.

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SAN/641

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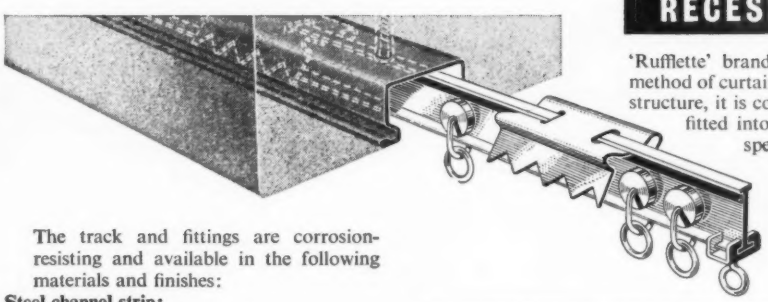
Cubicle Track installations have been made for many hospitals including Edgware Gen., Mount Vernon, Richmond, Bushey Maternity, Northwood & Pinner Gen., Liverpool Stanley, East Suffolk & Ipswich, Southmead Bristol, Newcastle Gen., Darlington, Warrington Infy., and the Liverpool Royal Infy., and also for many municipal undertakings.

SEE OUR PERMANENT EXHIBITS AT THE BUILDING CENTRES IN LONDON AND GLASGOW

RECESSED CURTAIN TRACK



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Curtain track:
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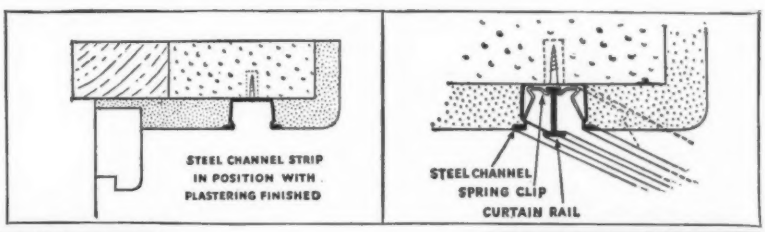
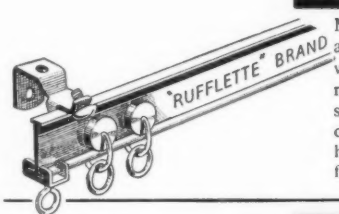
Runners:
Brass, nickel-plated.

End stops:
Pressed steel, brassed or zinc-plated.

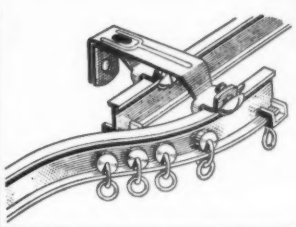


CURTAIN TRACK



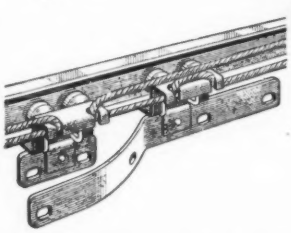
Made in brass or aluminium and suitable for all types of windows. Fixing brackets are made for top or face fixing, saving valuable time and cost on the job, and track is rigidly held in position by a single front-facing screw.

OVERLAP BRACKET



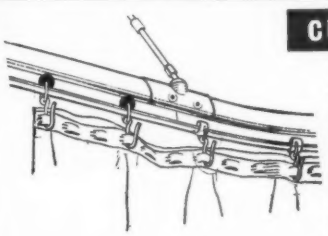
When cord-control is not used, curtain track can be cut and overlapped in the centre using the special BL7 bracket. This bracket fits over the standard fixing bracket, both being held in position by a single screw.

CORD CONTROL



Curtains can be effortlessly opened and closed on straight track with 'Rufflette' Cord Control. Wheeled master runners with a curved arm enable curtains to be overlapped without cutting track, thus avoiding the usual unsightly gap when curtains are closed.

CUBICLE TRACK



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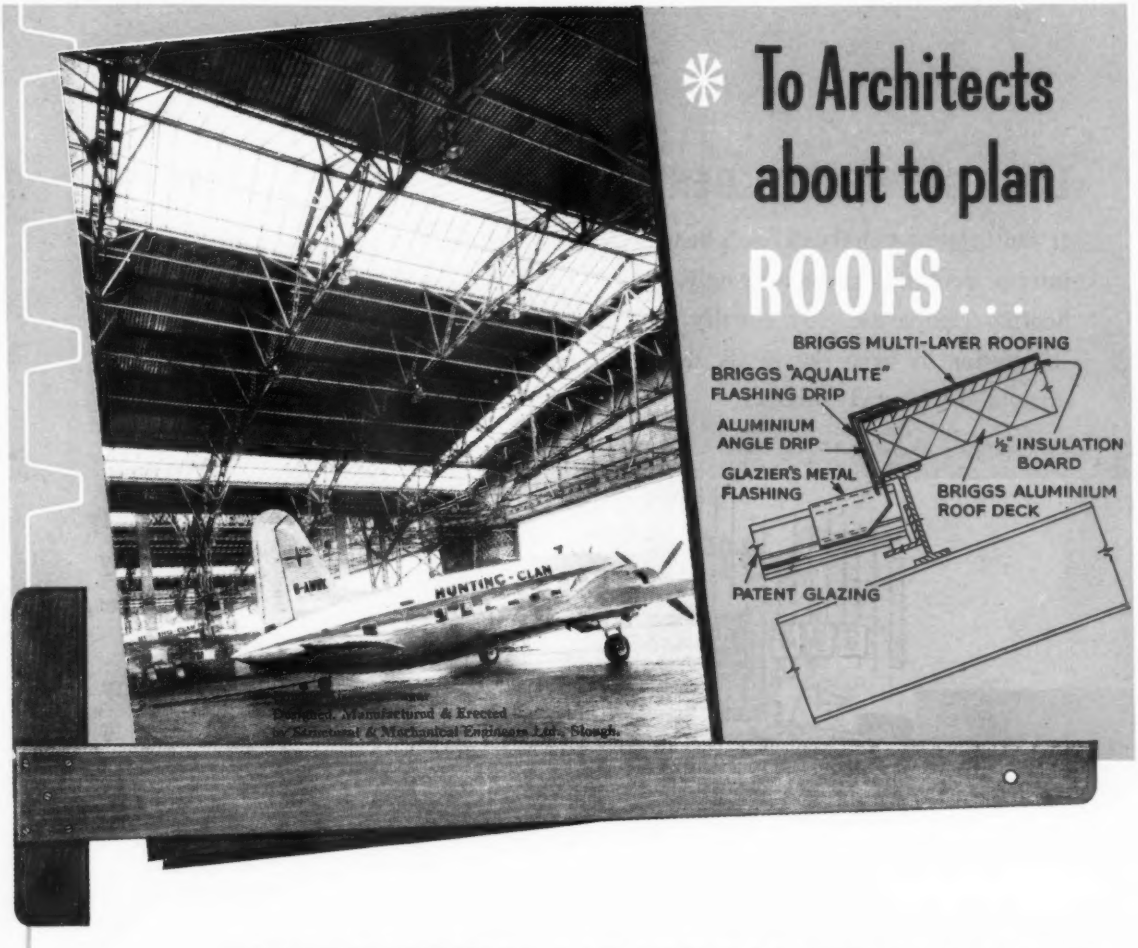

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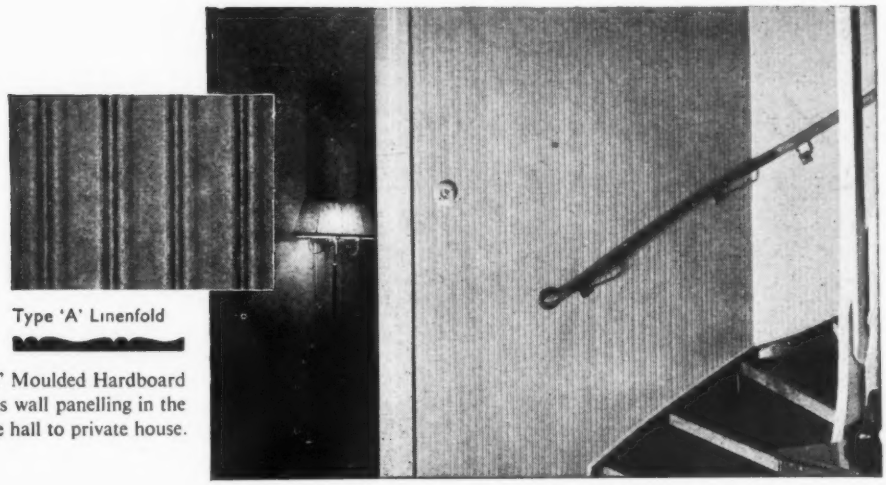

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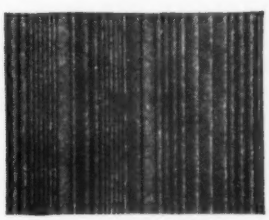
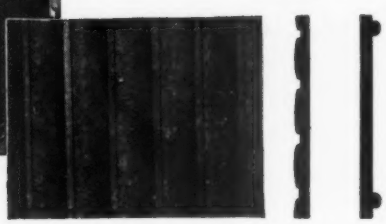


Type 'C' Striated

Type 'D' Slatted



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Type 'F' Tiled (4″ Tiles)

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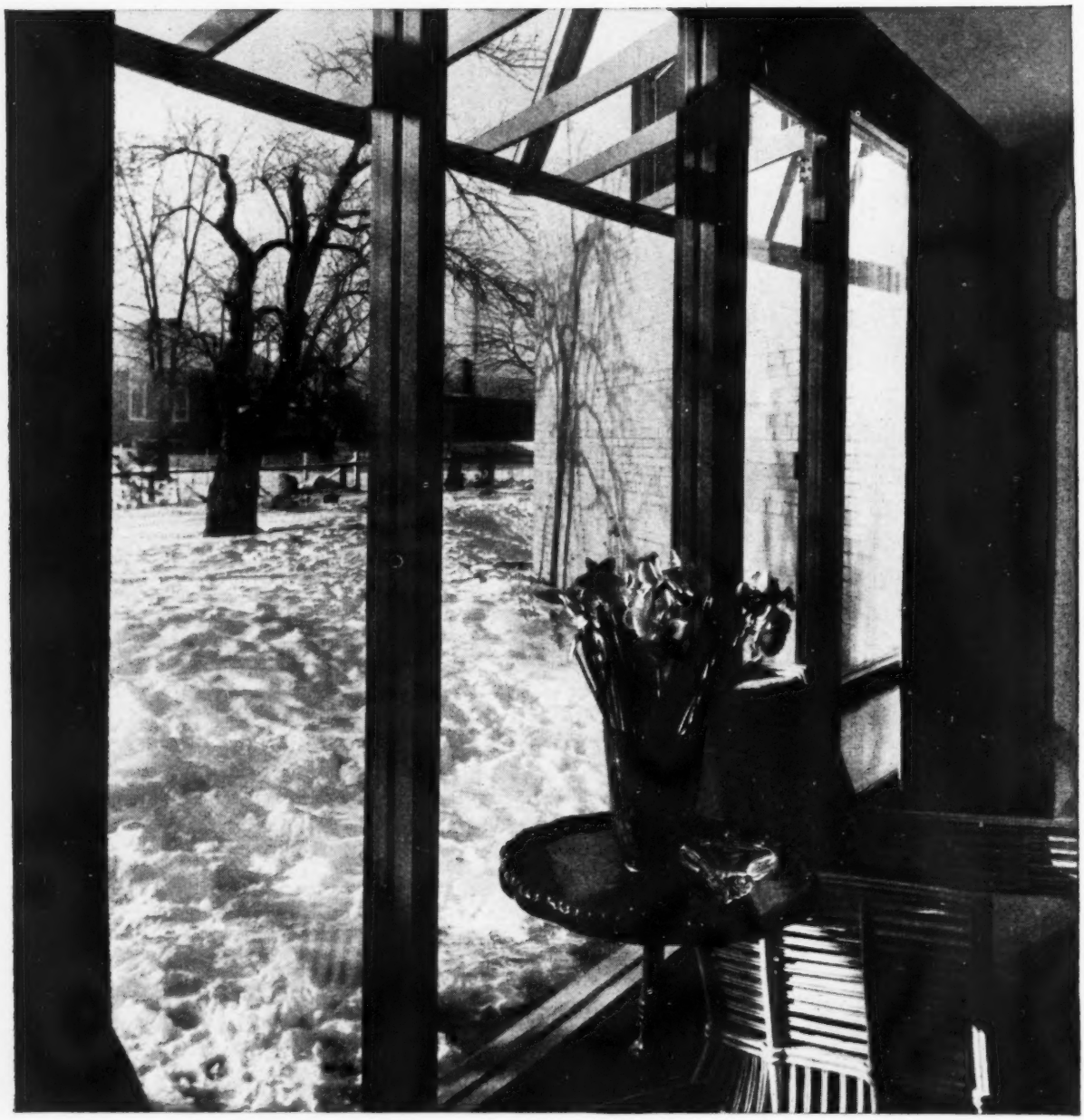

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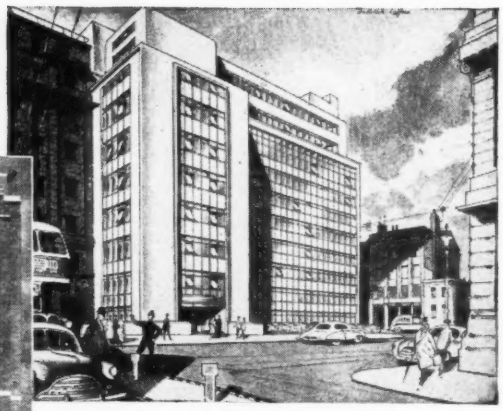
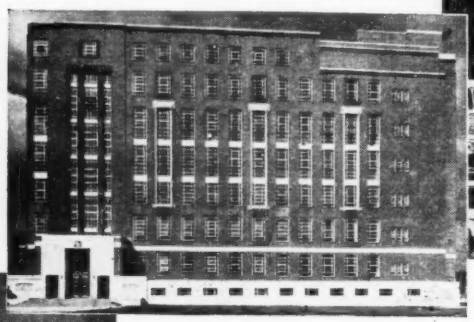
Quantity Surveyor: L. J. Newton, F.R.I.C.S.
Consulting Engineer: Messrs. Bylander & Waddell

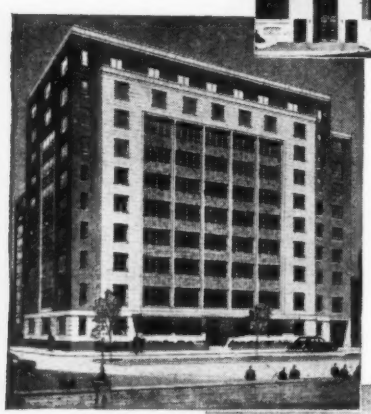


BIRMINGHAM COLLEGE OF TECHNOLOGY

Architect: H. V. Ashley and Winton Newman

Quantity Surveyor:
L. C. Wakeman & Partners



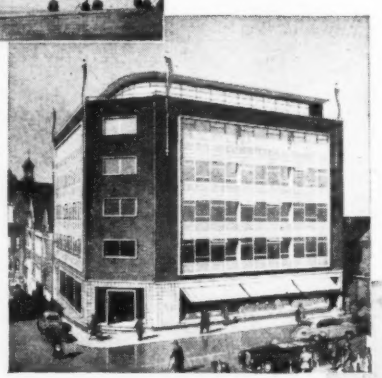


9 ALBERT EMBANKMENT · LONDON

Architect: Messrs. Grace & Farmer
Quantity Surveyor:
Messrs. Stanley Griffith & Partners

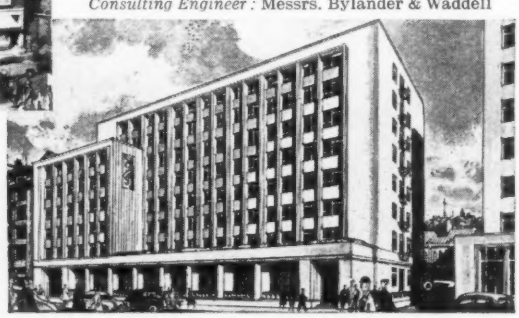
SURREY STREET CROYDON

Architect:
E. Roy Moore, A.R.I.B.A.
Quantity Surveyor:
L. J. Newton, F.R.I.C.S.



CHISWELL ST. · LONDON

Architect: Messrs. Joseph
Quantity Surveyor: Messrs. Langdon & Every
Consulting Engineer: Messrs. Bylander & Waddell



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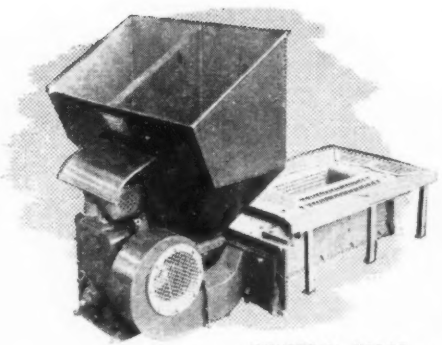

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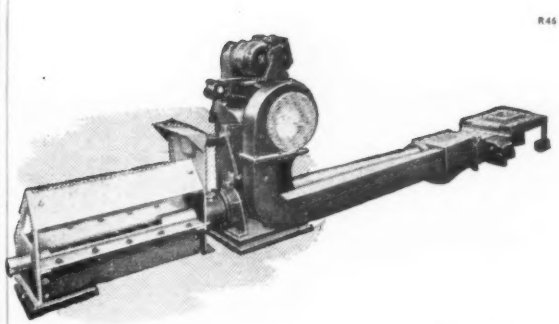
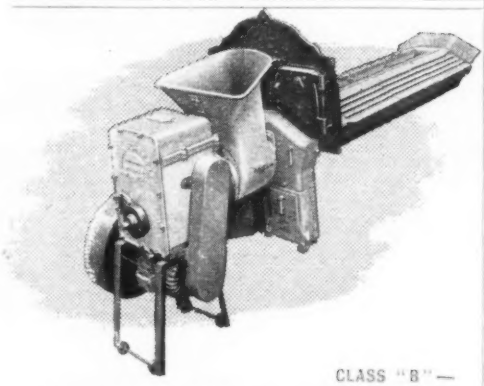
Hopper feed. For the larger vertical boilers, water tube and locomotive boilers, hot water and steam heating systems and steam processes.



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.*



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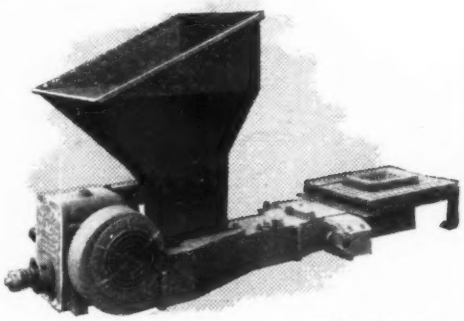
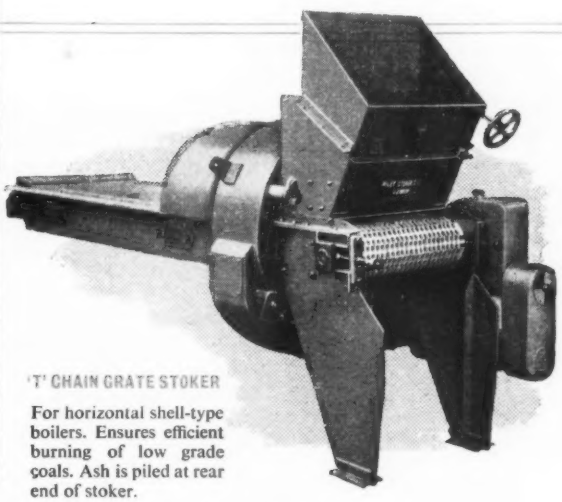


RILEY ROBOT —

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



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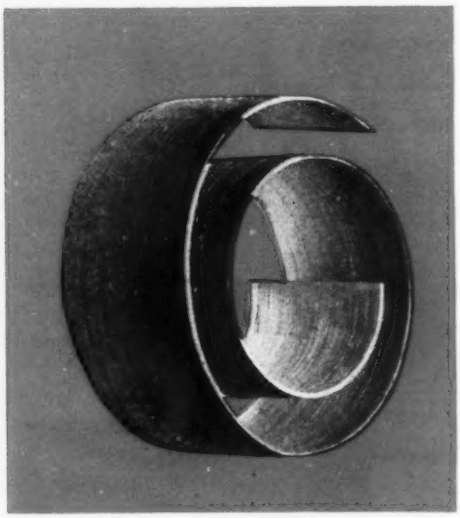

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The Interior Flush Door with the 'PLACAROL' core

Architects and Builders throughout the British Isles are now recognising the 'DURADOR' as the outstanding flush door for all housing projects. The 'DURADOR', with its balanced West African plywood facings and its 'Placarol' Core, is absolutely unequalled for quality, value and dependability.

The 'Placarol' Core, consisting of hundreds of wooden spirals bonded in immoveable unity with the plywood facings, is the most important advance in the manufacture of flush doors since their inception.

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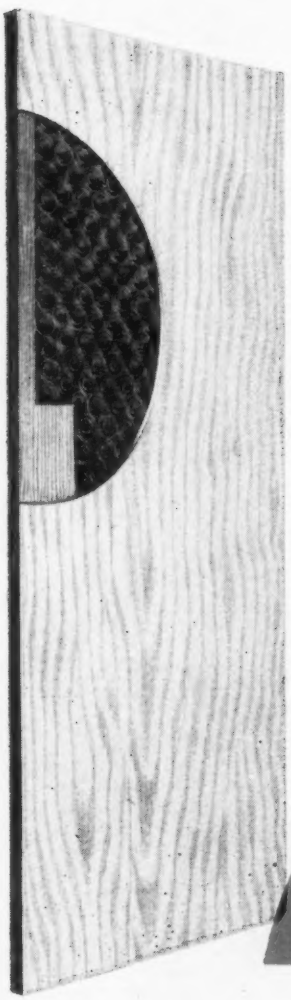

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- *Available in two grades: "A" for painting "B" for staining and varnishing*

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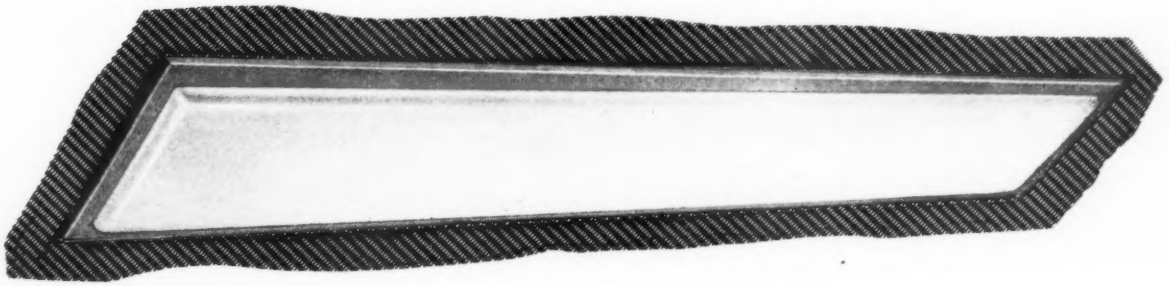
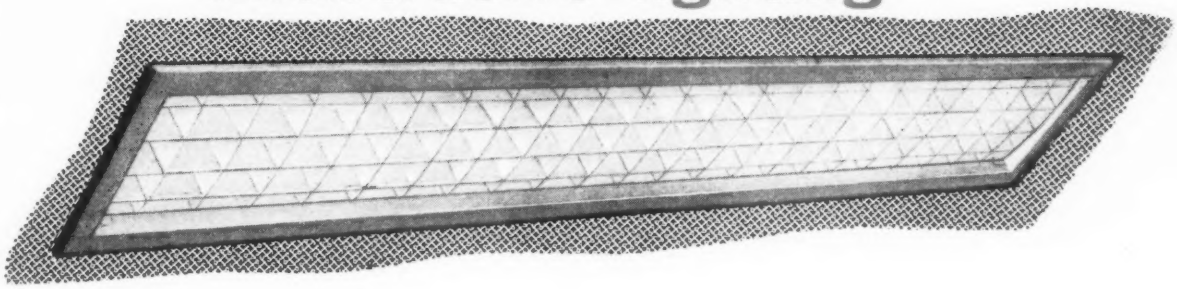
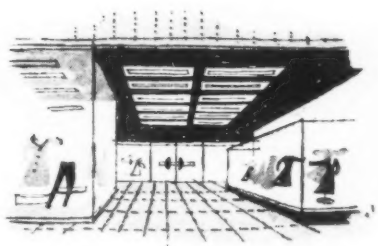


unobtrusive lighting





Superbly smart trim frames now permit the advantages of Crompton 'New-Range' standardised parts to serve the needs of recessed fluorescent lighting.

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✻ Crompton Lighting Engineers can advise on economy to good effect.

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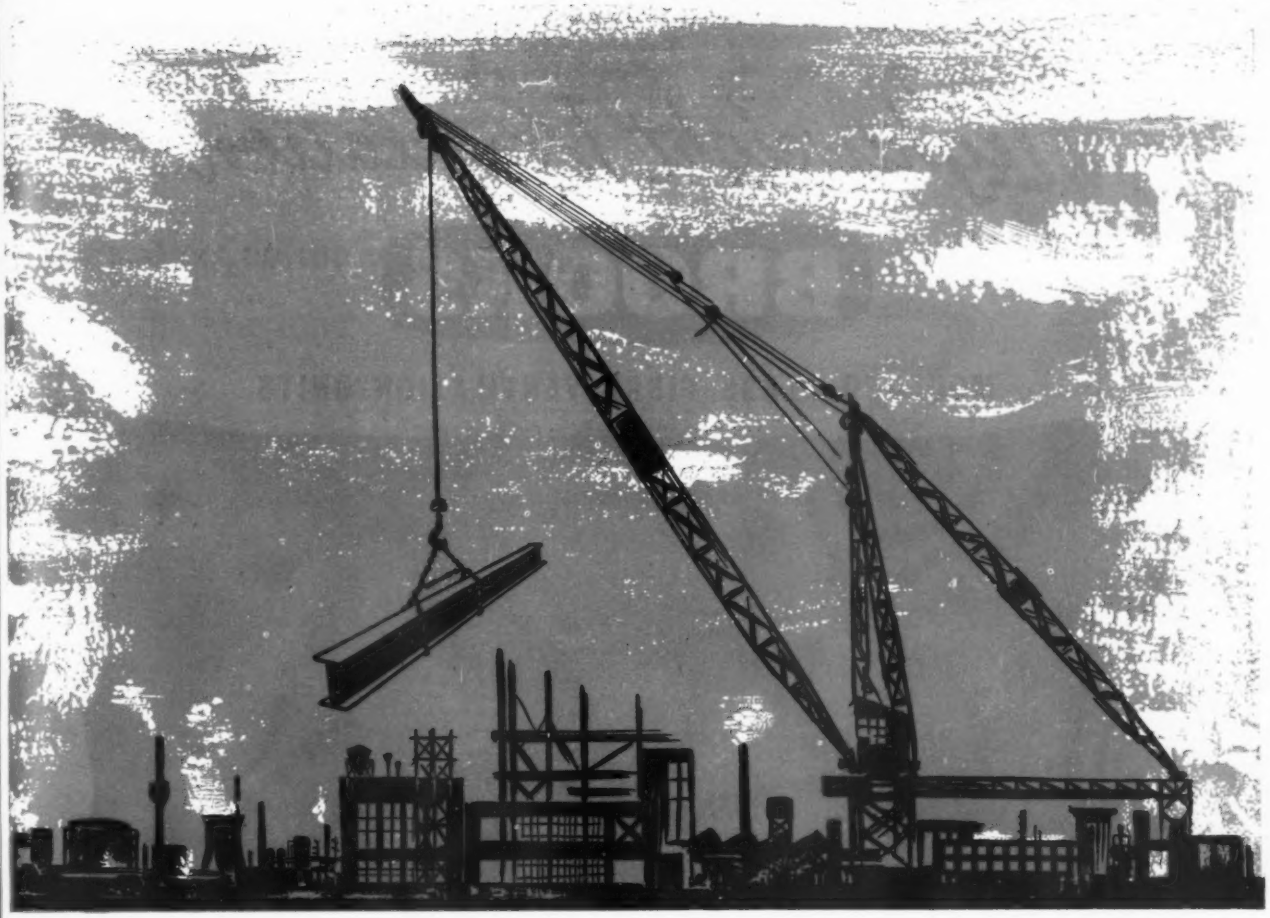

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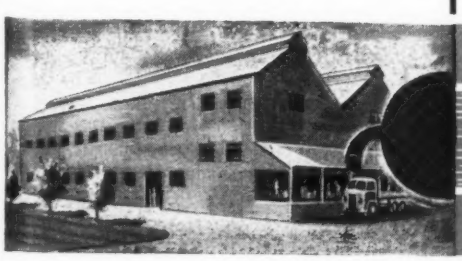
'Tis said that " mighty things from small beginnings grow." So it is with big constructional undertakings. See the foundations laid ! Watch the fabricated steel framework going up ! Come to think of it, that's where we come in. As specialists in the fabrication and erection of all types of steel structure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



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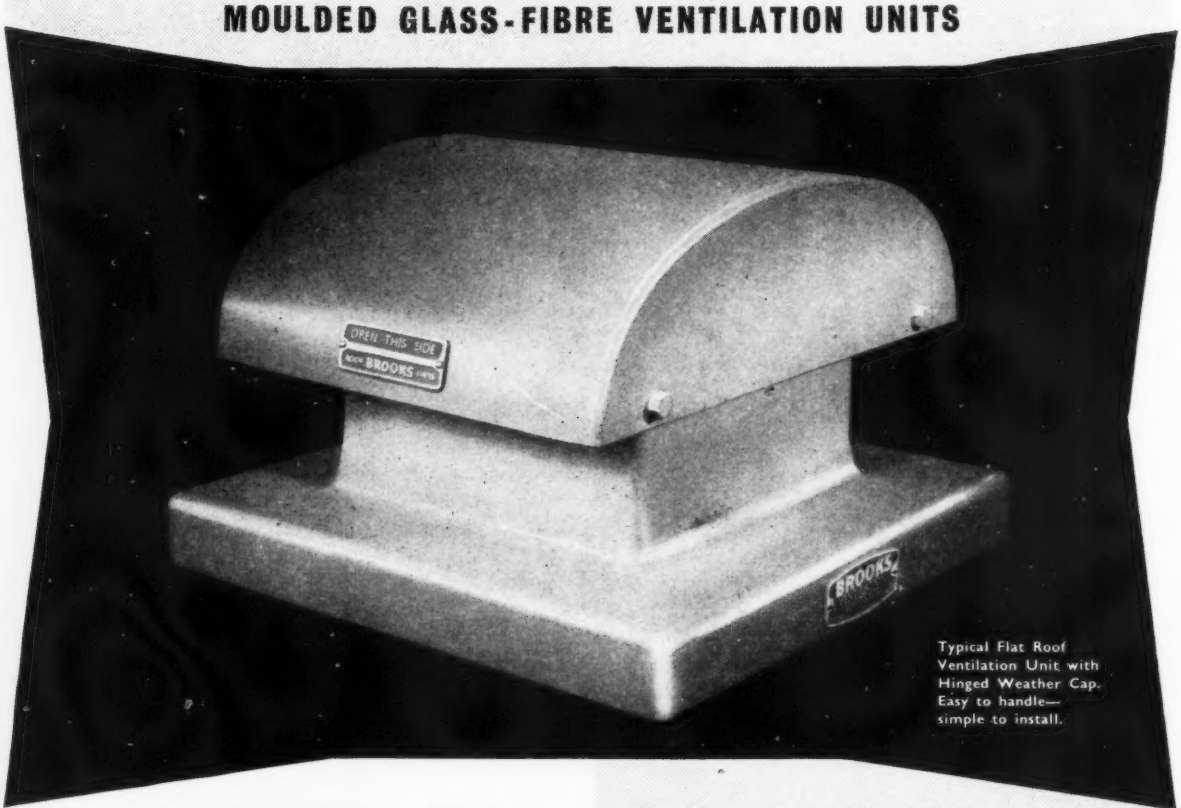

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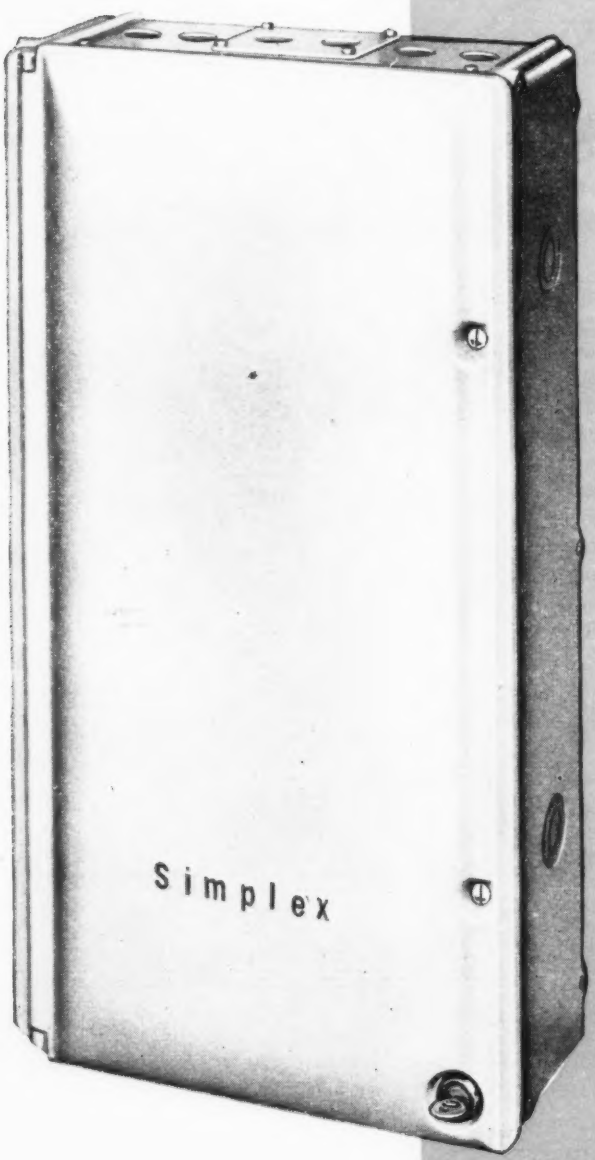
B.4



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Architect:
Harry Walters, A.R.I.B.A.

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Clay Floor Quarries

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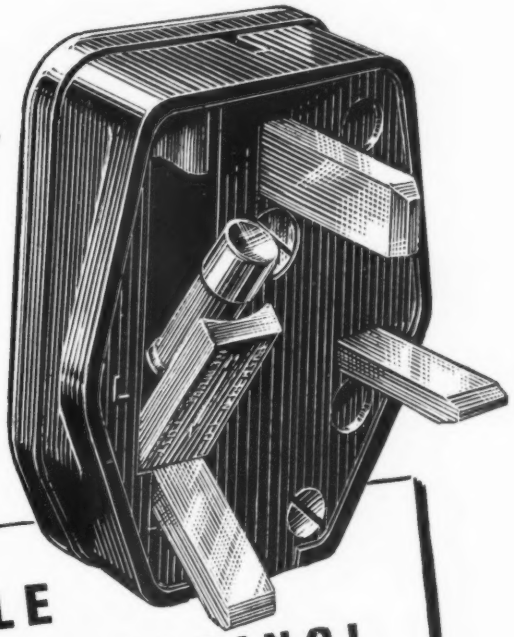

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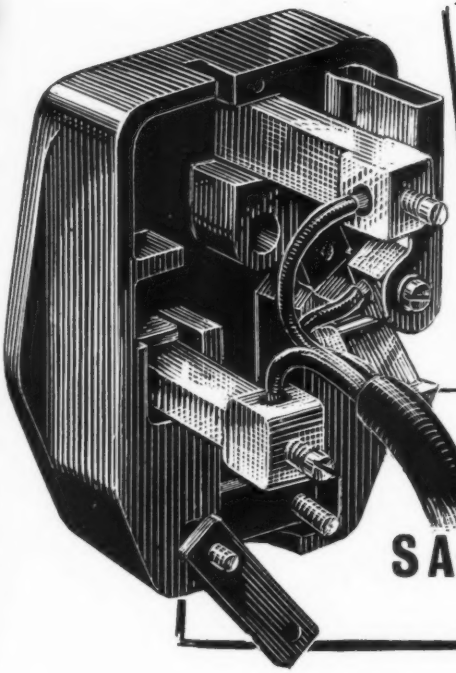

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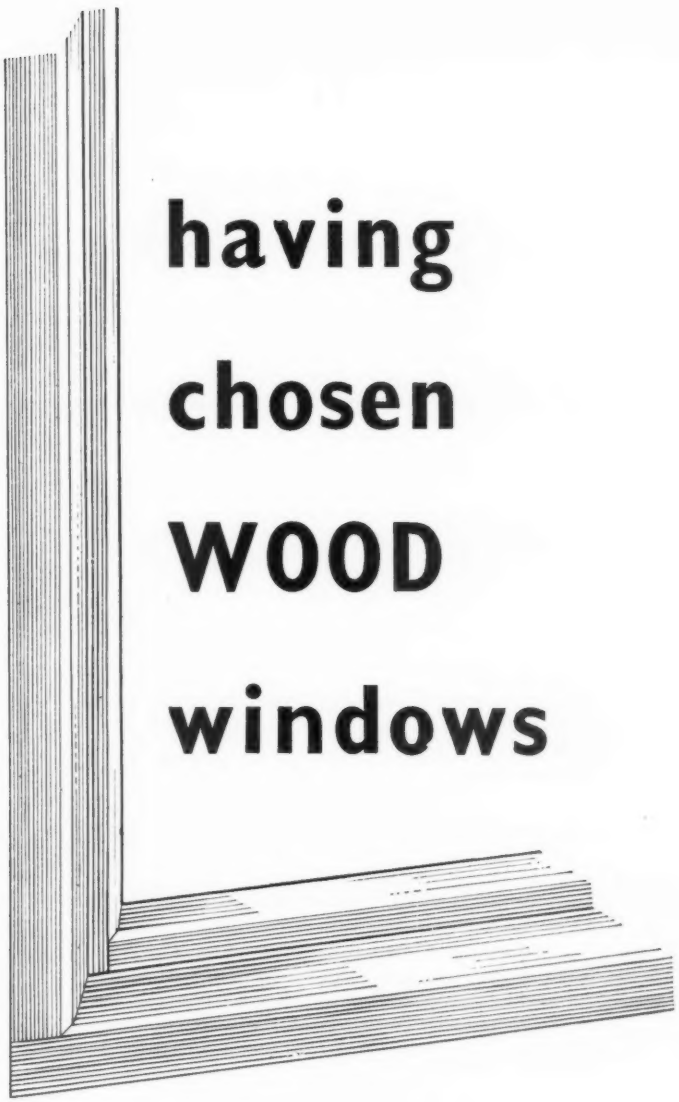

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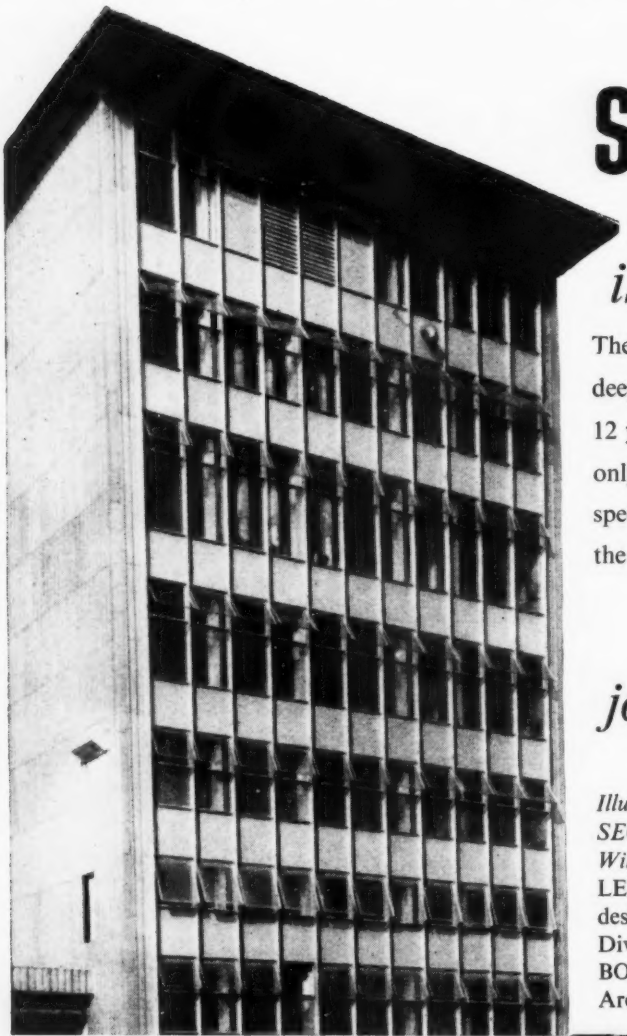

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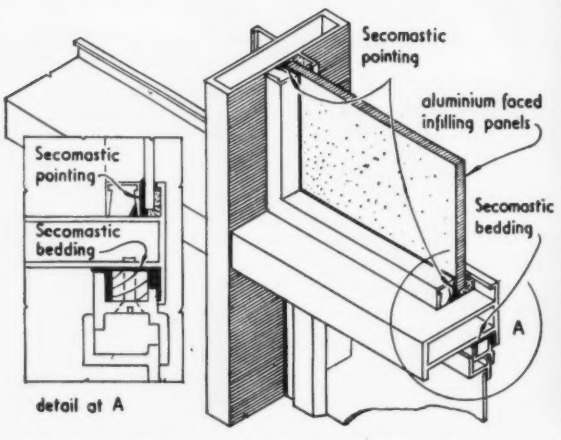
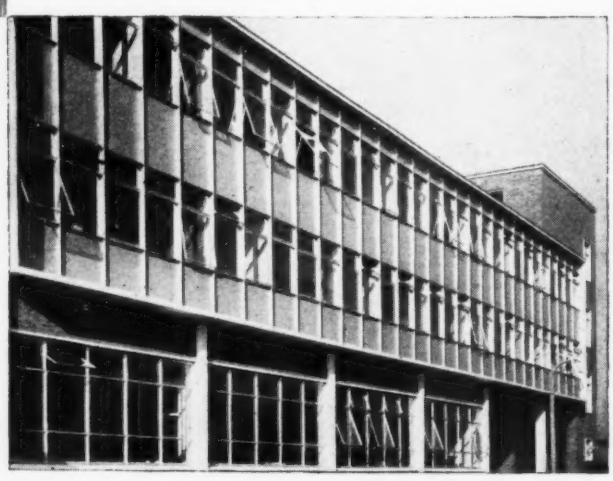
BOTTOM : T. Wall & Sons Ltd., London
Architects : J. Stanley Beard, Bennet & Wilkins.





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The primary consideration in this Secondary School

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The Illustrations of the Entrance Hall and Corridor above are at Flixton County Secondary School, Flixton, Nr. Manchester. Architect: G. Noel Hill Esq., F.R.I.B.A., M.T.P.I., County Architect, Lancs. Accotile Specialist Contractors: The Neuchatel Asphalte Co. Ltd., Manchester.

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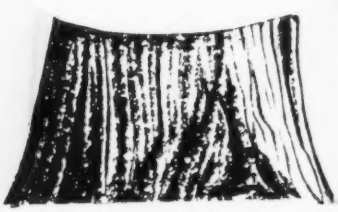

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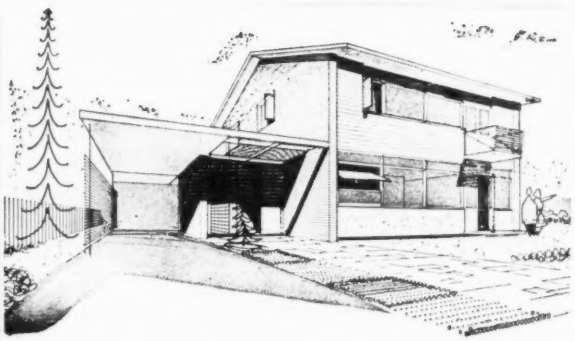

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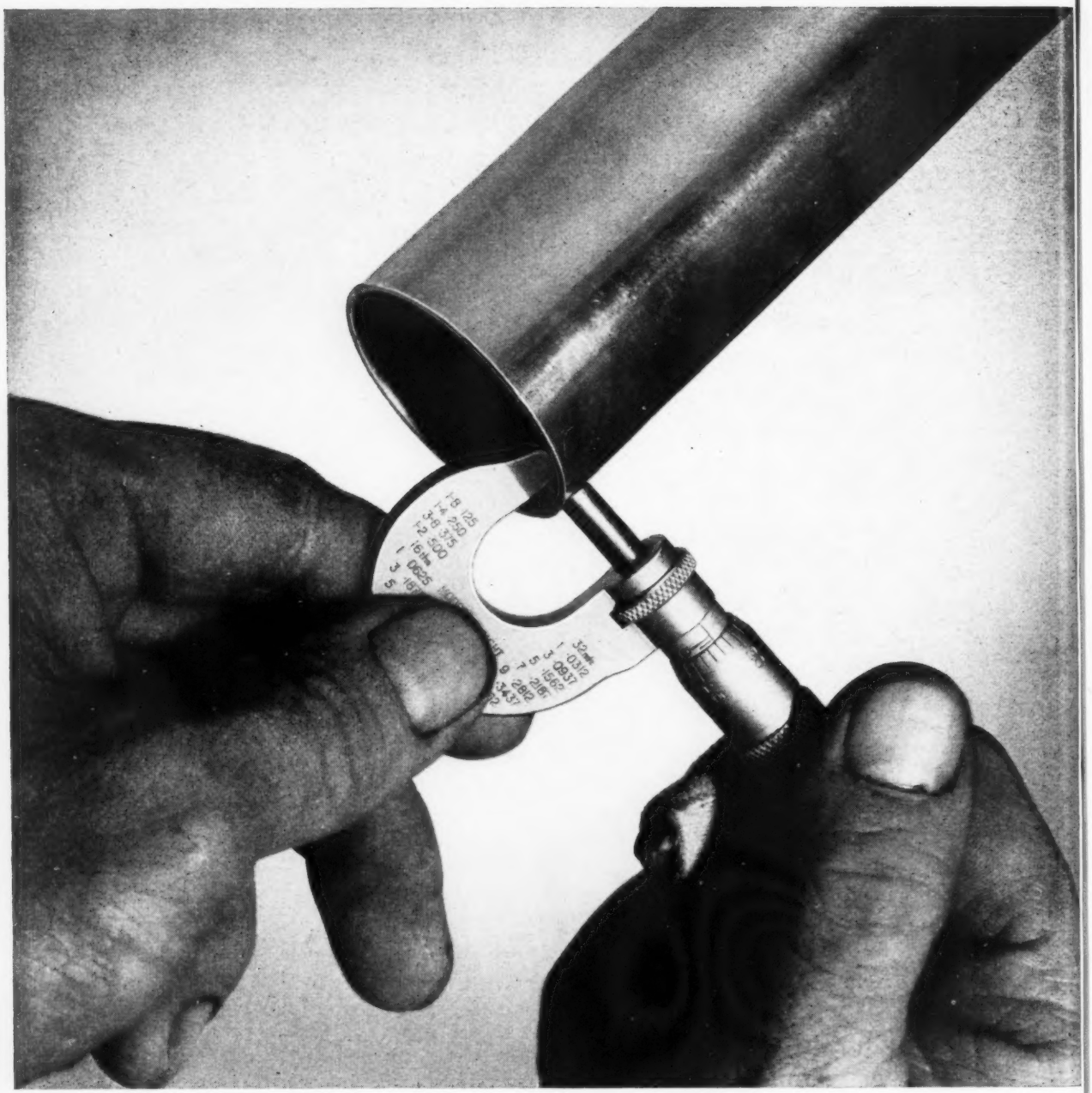
This advertisement is one of a series featuring Canadian Douglas Fir, Spruce, Red Pine, White Pine and Pacific Coast Hemlock.

TIM 4



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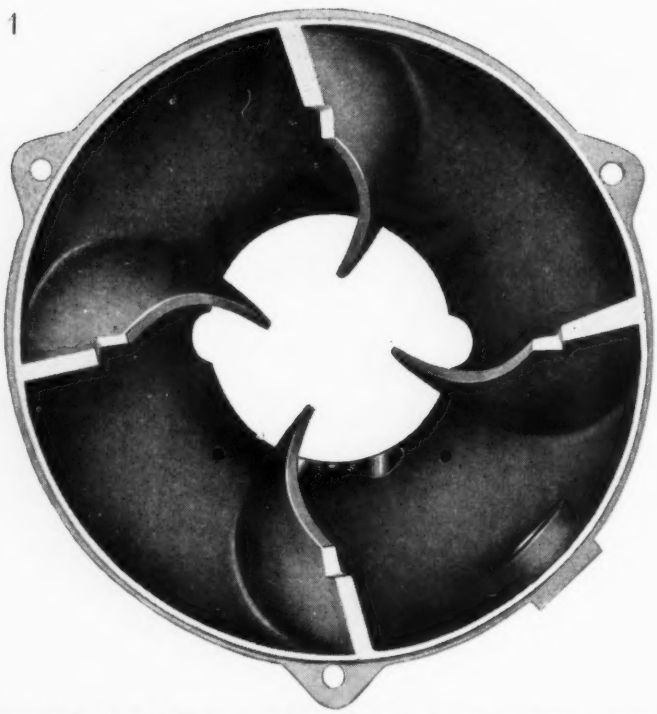

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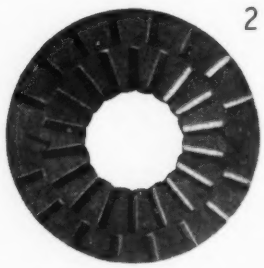

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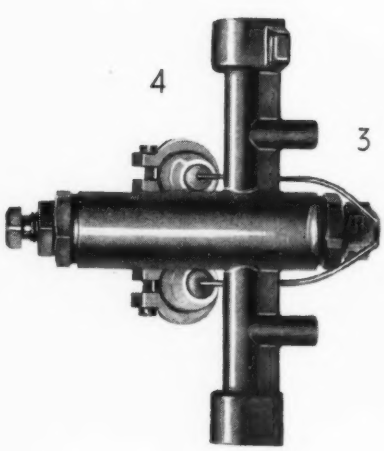

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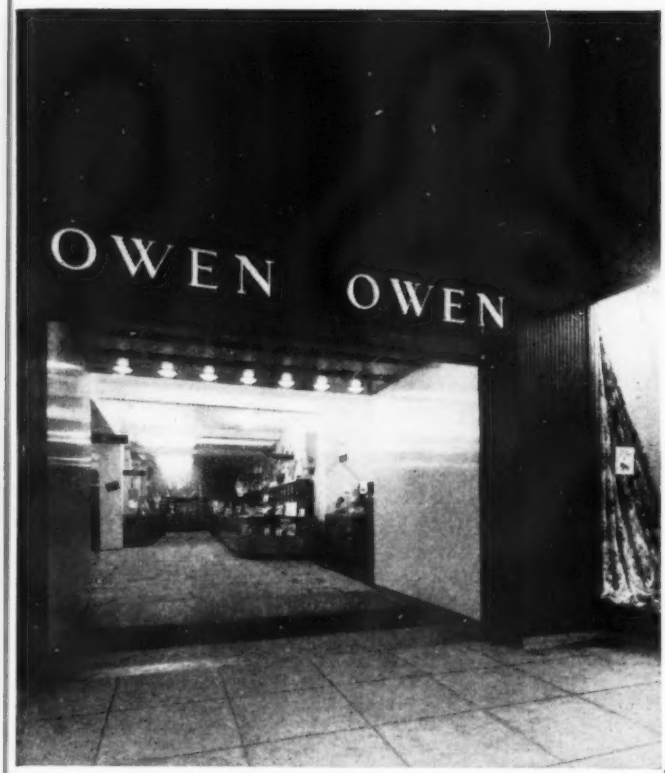

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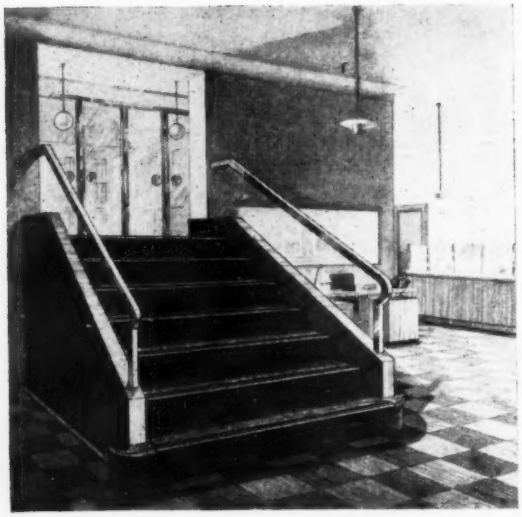

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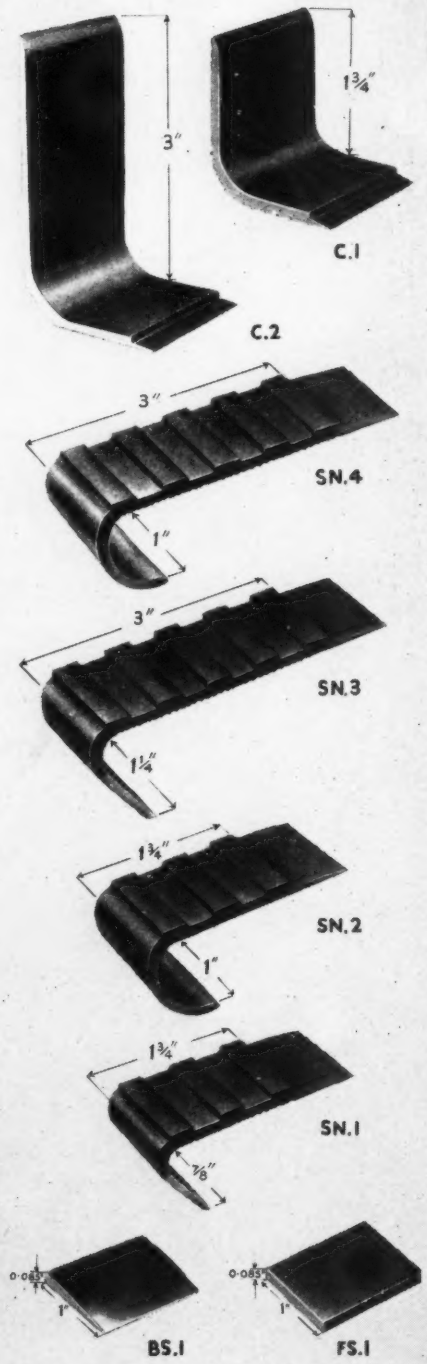

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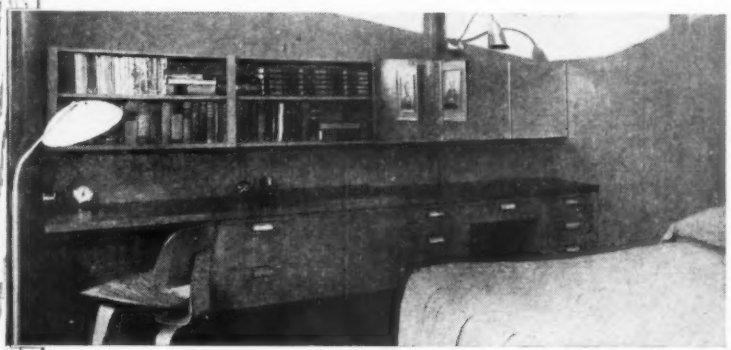

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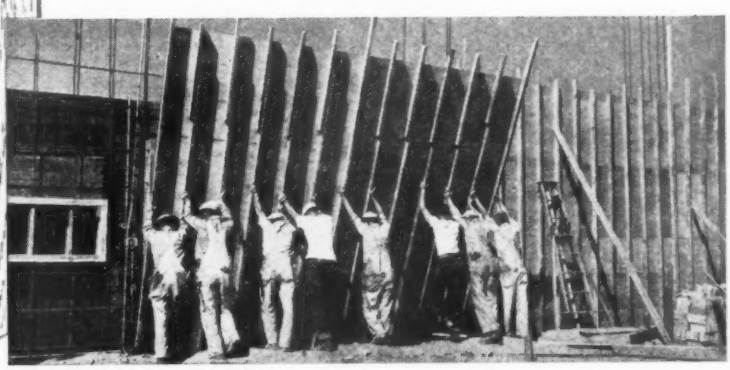

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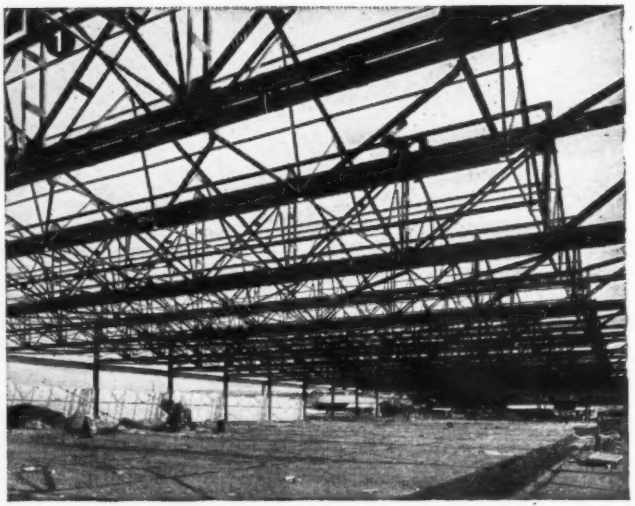

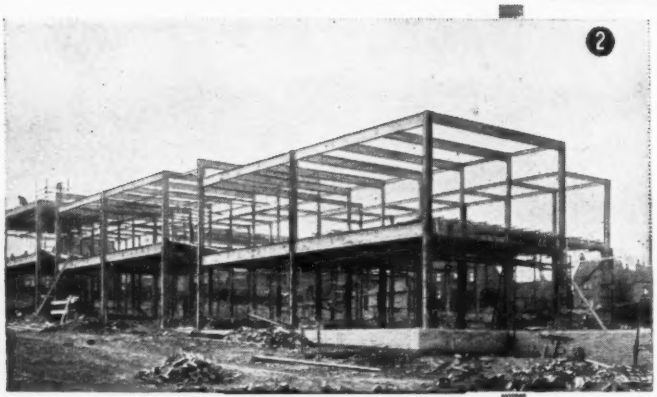

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2. The County Primary School, Crosland Moor, Huddersfield.
3. College of Further Education, Grimsby, in course of erection. Stage 1.
4. The completed College. Stage 1.

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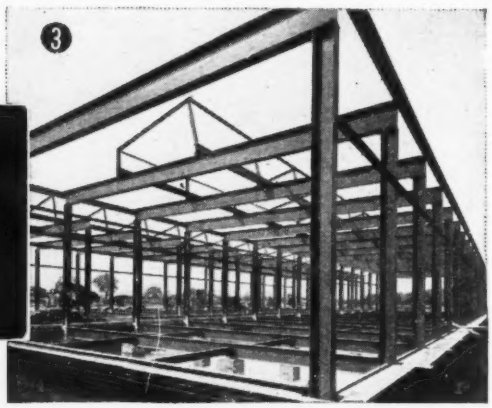

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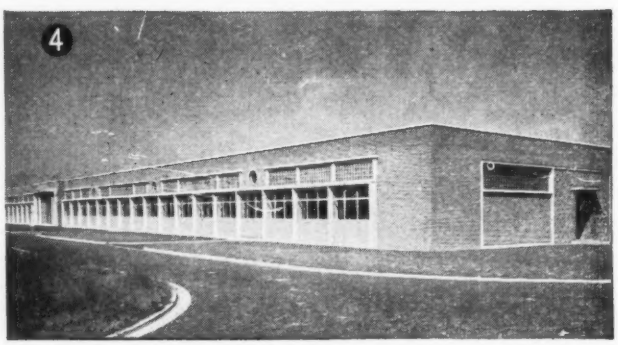

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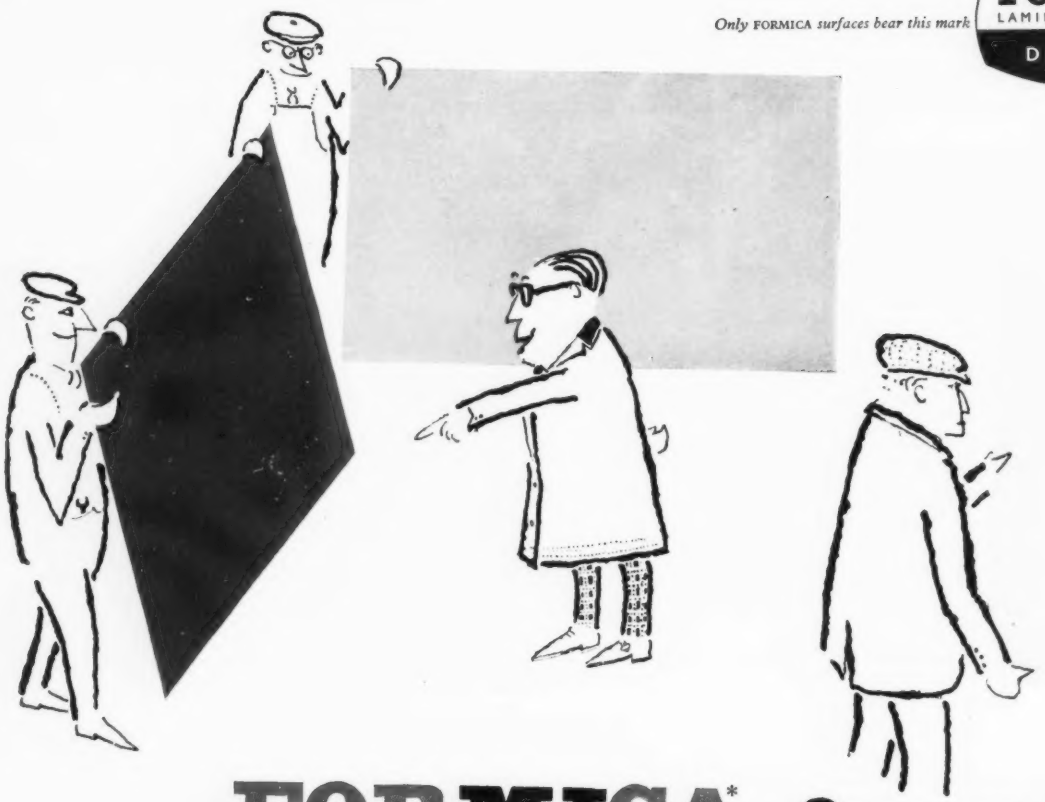

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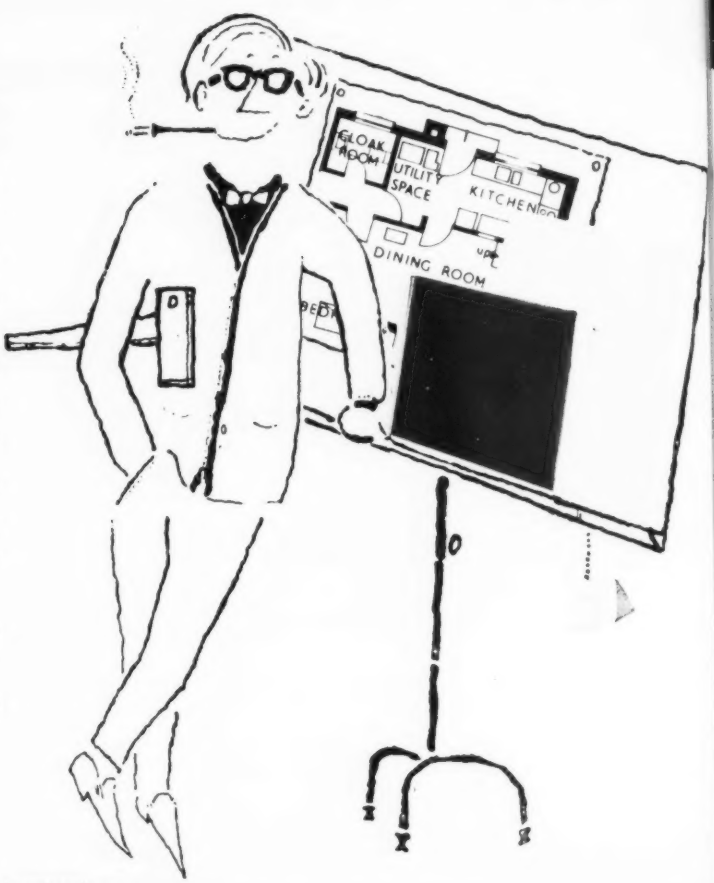

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THE ARCHITECTS' JOURNAL

No. 3233 Vol. 125 February 14, 1957

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NOT QUITE ARCHITECTURE

THE DAD-TRAP

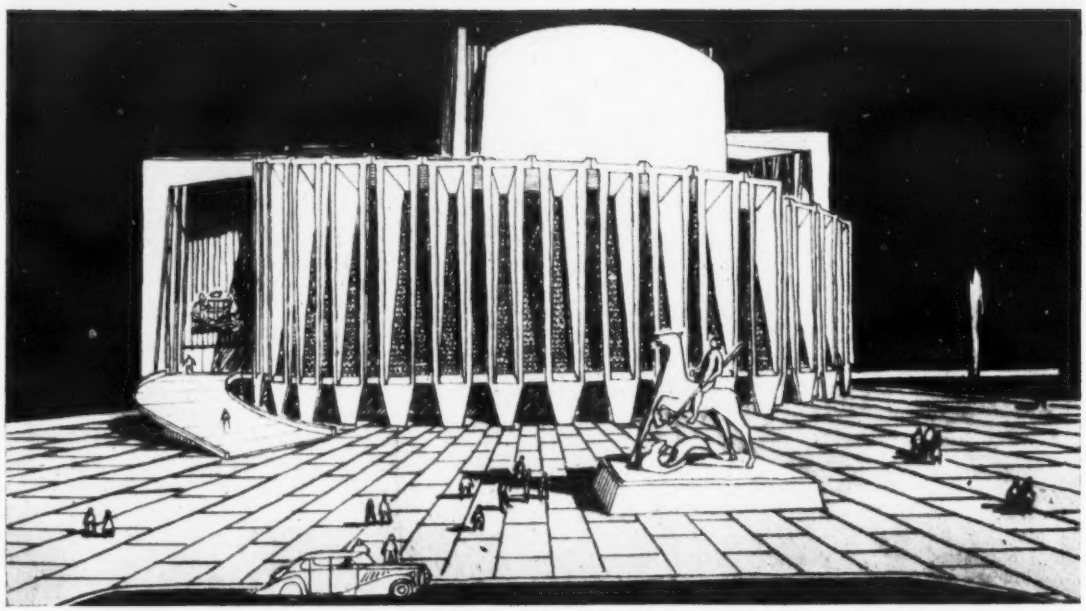
A snap survey of the late Christian festival as celebrated beyond the hair-line, in egg-head country, suggests that the traditional injustices suffered by the toddling and school-going age-brackets have been quite gratuitously augmented by a shiny new one. In addition to toy trains, jet helicopters and miniature washing machines that only grown-ups are allowed to operate, nappy-wetting dolls that only grown-ups are allowed to titter at, there is now a tantalizing fifty-two unit torture-kit called *Picture Deck* that comes in an artful package six sizes too big for it, and designed by the doyen of do-it-yourselfers, Charles Eames.

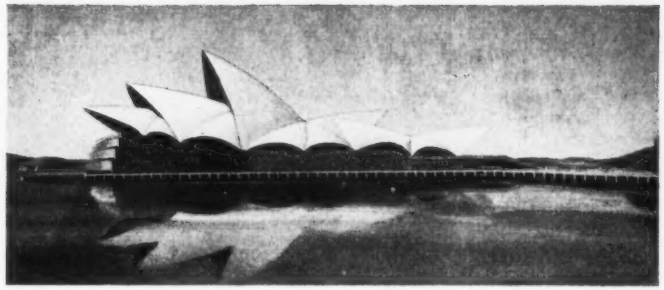
*

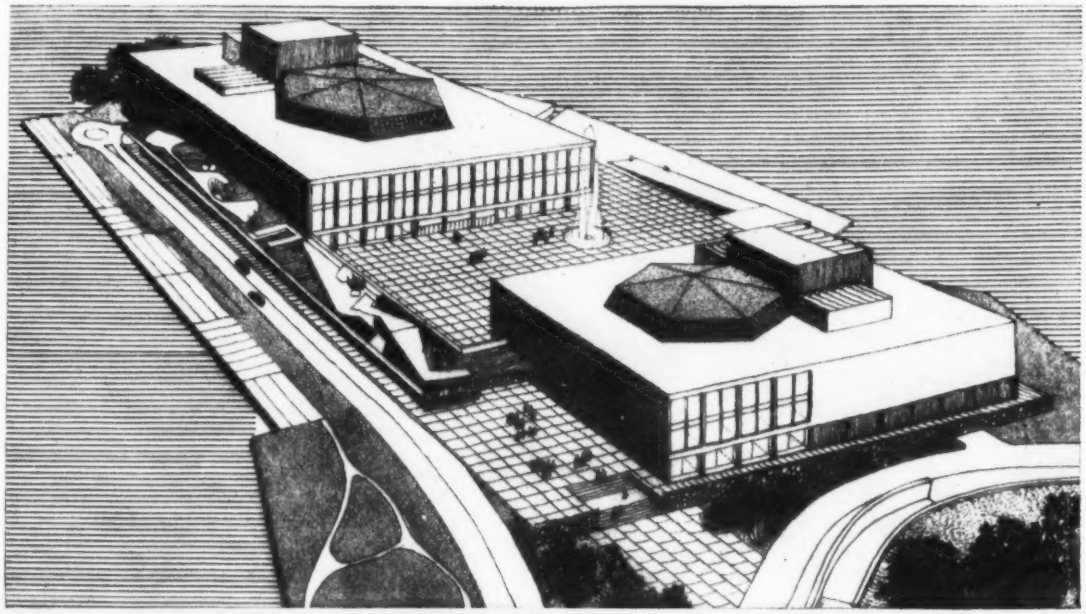
Though useless for playing snap, since none of the cards are twos-alikes, *Picture Deck* can quite well be used for time-honoured nursery pursuits like cleaning finger-nails. However, moppets who had hoped to use it for these, or fifty-four other Freudian purposes, will find themselves sitting in impotent rage while architectural dads bear the pack away, muttering "Elementary manipulative modular components with six-way connectivity options and maximal permissive symbol-making capacity."

*

All credit to the man Eames for having devised the finest dad-trap since mum came on the market—the ploybys of the world are already beating a broad path to his door. *Picture Deck's* cards, use-







The Sydney Competition

Last week we published details of the first prize-winning design in the Sydney Opera House competition and an early block model of the third prize-winning scheme. This week we show a perspective of Jorn Utzon's first prize-winning design (top), and perspectives by the second and third prize-winners (top left, by a group of American architects; and left, by Boissevain and Osmond). The photograph of the site (above) shows why the assessors were impressed by Jorn Utzon's attempt to fit his buildings into the landscape. Several British architects have been commended. They are: Laurence Prynn, S. W. Milburn and Partners, H. D. Krall, J. F. Metcalfe, George Subiotto, Plenderleath and Clark, R. A. Dunster and R. S. Staughton, and T. Bliss and M. Le Pelley. Also commended were: Professor Walter Hamer, of Germany; H. Seidler, A. G. H. Young, R. M. Parker, R. G. Fitzhardinge and R. M. Young, of Australia; Otto Leitner, of Germany; D. A. Brunton, B. H. Joyce, B. Mildren and J. T. Lilly, of Australia; D. Cobb and W. Holzbauer, of America. The work of an Australian partnership, L. P. Kollar and B. A. Korab, was highly commended.

fully slotted for assembly into sizeable structures, not only fan a dad's *Bauschmerz**, but the visual material on them is apt to catch several classes of smart lads under the wind. On one face is a standard, star-form symbol/sign that trade-marks not only the product but a whole way of forward thinking; on the other face a selection of pictures that—though they probably grow naturally *chez* Eames—are accurately beamed to transfix any number of contemporary tastes. There is pretty Victoriana for the Betjemanites; sudden faces for image-fanciers; neat classificatory sets of pins, matches, dominoes, for information indexers, and sundry gatherings of marbles, pills, vegetables for the randomizers. All presented in lush, *Life*-like four colour half-tone to catch the addicts of the technicoloured arts, and, taken all round, the kind of tat that collects, willy-nilly on the average magpie-minded architect's mantelpiece.

*

You might think this was only good clean fun, but the current *Design* has a solemn editorial sermon about it, and if you refer to the *AA Journal* for August last year, you will see that it is also something to do with complexes of formal semantic relations that commit the user to a chain of decisions, and other high-level stuff that seems intended to convince toybox-raiding dads that they are on to something big and important. Be that as it may, *Picture Deck* is a pretty sharp personality test for architects. When it gets built up into a neat rectangular structure with all the stars outwards, tacked together with balsa-cement, then a real, square architect stands revealed, complete with longings for permanency. When you find the cards mounted on black paper on the fire-place wall, someone's *House and Garden* complex has got the better of him; and when loose asymmetrical constructs on polygonal plans are found crumbling on a drawing-board, then there is a residual Sharawaggist or frustrated Buckminster-Fuller about.

*

But—but—if you should find them under the hearth-rug, in the dog's dish and down the lav. then walk reverently; the house has love in it, natural-born parents are in charge—and dad has bought a *Picture Deck* of his own.

REYNER BANHAM

* A disease which attacks students in fourth year ; the victim beats h's head against his year-master, whimpering "I must *build* something."

The work of an Australian partnership, L. P. Kollar and B. A. Korab, was highly commended.

The Editors

THE NEW MINISTERS

THE change in government has brought new men to those Ministries which have the greatest responsibilities and the greatest opportunities in the fields of architecture and planning. In congratulating Henry Brooke, the Minister of Housing and Local Government, and Hugh Molson, the Minister of Works, we can give them the assurance that the architectural profession is eager to co-operate in bold measures to tackle the great and baffling problems that are crying aloud for an urgent solution.

Both Ministers start with the advantage that they should be able to get to grips with the problems without having to spend months familiarizing themselves with the unfamiliar. Mr. Molson has already served his apprenticeship as Parliamentary Secretary at the Ministry of Works, where he showed the keenest interest in the Ministry's technical and experimental work, in scientific research, and in historic buildings. Mr. Brooke has been intimately concerned with housing and planning for many years, both as an influential member of the LCC and as a member, from 1944 to 1954, of the Central Housing Advisory Committee of the Ministry of Health and its successors. They take office at a time when public opinion has been aroused, and expects action to check the onward march of Subtopia. It is, moreover, clearer than ever that our planners, architects and engineers must create an efficient and a pleasing environment in which we can make the fullest use of our limited resources, and exploit to the utmost our brains and technical capacity, which are now our principal assets. Mr. Brooke's first speech as Minister at the NFBTE's recent dinner suggests that he is aware of the need for action at the highest level, and that he is the man to ensure that action is taken. He is not, of course, the first Minister to say that sprawl must be stopped; but is it too much to hope that his actions will speak even louder than his words ? The disappearance of the word "Planning" from the title of his Ministry some years ago was, unfortunately, symptomatic of a real state of affairs. There is today all too little evidence to enable us to feel confident that the vast developments in atomic energy, the road programme, the transference of industry,

commerce and population within and without the conurbations, slum clearance and industrial expansion will proceed according to a well-thought-out national plan. Here, above all, is the opportunity for Mr. Brooke, in co-operation with other Ministers, to show that planning has a constructive purpose, not merely to avoid the waste and confusion that must result without it, but to benefit and enrich the nation.

Mr. Brooke also deplored the fact that too much of an old-fashioned character " in the worst sense " was being built today, and insisted that Britain's building industry could only meet the challenge of the times if it increased efficiency and reduced costs. These words are doubly welcome, both because they are to the point, and because Mr. Brooke and Mr. Molson are both in a position to help and to prod the industry into a systematic reduction of costs without reduction of standards. It would, for example, be of enormous assistance if the Ministry of Housing's technical officers would make the most thorough cost analyses of all forms of house and flat construction, not with the object of cheese-paring, but to obtain better value for money through efficiency.

Mr. Molson assumes responsibility for a Ministry which builds to the tune of £25 to £35 million a year, and for that very reason should be, as we said on a previous occasion, " the nation's pacemaker for research and development in building, for quality, speed of erection and value for money." Hitherto, the Ministry of Works seems to have lacked the drive from the top that would cut through red tape and make the Ministry a leading force in architecture. There is a niche in the gallery of fame for Mr. Molson if he cares to occupy it.

CRITICISM: THE FIRST IN THE SERIES

As we announced at the beginning of the year, J. M. Richards has undertaken to write a regular series of articles in the JOURNAL in which he criticises recent buildings. The first article in the series appears this week on pages 242-244. The building chosen for criticism is a school by H. T. Cadbury-Brown. Next week we hope to publish the architect's reply to J. M. Richards' criticism, and we shall also welcome comments from readers on the building and on the opinions expressed by the critic or by the architect, Mr. Cadbury-Brown.

We know there is a great demand for regular criticism. All the younger generations of architects have trained under the " crit " system, and it is a proven method of testing architectural theory and practice, of helping to improve architectural standards, and of establishing an understanding of different approaches to design. We are confident that readers will study these articles, and the architects' replies, and will put forward their own views with this idea dominant: that the ultimate aim of criticism is not mere fault finding but the creation of better buildings.

RIBA CRITIC: 1957

Wasn't it Beerbohm Tree's performance of Hamlet which excited the comment " extremely amazing without being in the slightest degree vulgar "? Much the same might be said of Sir Hugh Casson's criticism of the entries for last year's RIBA prizes and scholarships given at Portland Place last week. Certainly the audience roared with laughter as Sir Hugh, in his surprisingly deep voice, plunged no mere dagger but a bloody claymore into the weaknesses of the entrants. And if some of those attending felt a momentary pique that many hours of work were dismissed with a devastating phrase they had the satisfaction that they had at least been mentioned (for Sir Hugh, unlike some critics, was very thorough). In addition, they had provided a laugh, they had heard the profession's most accomplished and witty speaker, and they could be quite certain that Sir Hugh himself was not entirely happy about such a one-sided battle. He would have welcomed a more informal evening in which the students were able to defend their schemes.

HOLDING A CANDELLA

Jorn Utzon, the Danish winner of the Sydney Opera House Competition, promises to contribute as impressive a development in concrete shell construction as Candella is producing in Mexico. No doubt Utzon's design will

come as a surprise to architects almost as much as it will to laymen. Here is the epitome of romantic sculpture on the grand scale. Evocative shapes—petals? sails?—cluster over a great plinth and seemingly cover and conceal ordinary stage-towers and so forth. Here is the romantic modern architect's split from the old, simple idea of expression of function and building form. But it will only be on such luxury buildings as opera houses that such delicate extravagances as freely-shaped external envelopes will be practicable.

*

No doubt there will be controversy over this design—controversy over competition results is inevitable nowadays anyway, but the citizens of Sydney should congratulate themselves: the design will always be of interest, however the theorists may argue, and will be worth travelling many a mile to see, admire and wonder at. Sydney need have no doubts that its policy in holding an international competition has been absolutely right.

CLINK, CLINK, ANOTHER RENT

ASTRAGAL, when given the option of paying a fine or going to jail, invariably pays the fine. Edward Henry Bastow, of Lake Avenue, Rainham, Essex, is a man of tougher fibre. For years he has successfully defied Hornchurch Urban District Council, which in 1951, in a praiseworthy effort to tidy up the landscape, refused him planning permission to develop his land as a caravan site. In 1952 an enforcement notice was served, but Mr. Bastow dodged this for a time by the familiar manœuvre of appealing to the Minister. When this failed he was prosecuted, in 1953, and fined £20 for an offence under section 24 of the Town and Country Planning Act, 1947. He was fined £30 in January, 1954, and £75 in April, 1954, but instead of paying the £75 he went to jail for a month. The council then decided to charge him with a continuing offence for 278 days, for which the maximum penalty was £20 a day, or £5,560 in all. The magistrates fined him £100, but Mr. Bastow preferred three months in jail.

*

Two years elapsed, during which the caravan site went merrily along, while the council presumably scratched their heads and eventually persuaded the Attorney-General to take up the case. So last week, six years after planning permission had been refused, the High Court issued an injunction to restrain Mr. Bastow. Whether the Attorney-General and the High Court can enforce planning law remains to be seen, as Mr. Bastow says he is ready to go to jail again. What is hard to understand is the failure of the magistrates to fine Mr. Bastow £20 a day, which would have amounted in four years to £29,200—a sum calculated to deter even Mr. Bastow, who is reputed to draw £4 a week each from 40 caravans. What does stand out a mile is the need for local authorities that are trying to clean up mess and muddle to have more effective powers at their disposal, and for magistrates to treat Subtopian outrage as a serious offence.

"*Now in* my *concert hall the reverberation time. . . .*" *Three concert-hall designers met last week at the Ritz. In the centre is Jorn Utzon, the winner of the Sydney competition, whose designs were illustrated in last week's* JOURNAL. *(See also page* 236.) *The other two architects, who helped to assess the designs, are Professor J. L. Martin (left) and Eero Saarinen.*

BUILDERS GO BACK TO SCHOOL

A booklet arrived the other day on my desk. It begins:—"Should an Employers' Federation concern itself with the managerial efficiency of its individual members?" and goes on to report, in glowing terms, courses on management and similar subjects arranged by the Eastern Region of the NFBTE. There was a week-end course of lectures and discussions for general foremen, a five-day course for "management" students—presumably those *not* going up the hard way—and a five-day course for "senior executives."

*

Similar activities are planned for this year. It is an interesting development: years ago we were all agreed that builders were an incurably conservative crowd determined not to adopt new methods. In the last four or five years, about half a dozen of the London firms seem to have changed overnight into efficient streamlined organizations, bustling with qualified engineers, management experts, and (some of them) architects.

*

Now it seems that the progressive movement—a kind of managerial

The announcement that the Forth Road Bridge is actually to be built, at a cost of £14,300,000, is as welcome as it is surprising in these days of cuts and squeezes. The view above shows the proposed design of the bridge, looking north towards the Fife shore. The present railway bridge lies a mile to the east, a challenge to the engineers, Mott, Hay and Anderson, and to Sir Giles Gilbert Scott who is perpetuating a tradition that dies hard by, "adding the architecture." Since this sketch was prepared the design has been modified, and it is said that the massive anchorages at either end of the suspension bridge may be more strictly functional in appearance than the castellated structures shown above.

functionalism—is spreading to the provinces. So, congratulations to the Eastern Federation. Whose turn will it be next? And how long now before a country builder, watching (someone else's) building operations, says to himself: "That's an un-functional way of doing things."

POOLING THE DEPUTY

The chief architect of a local authority recently had a proposition to make to his four group captains. He suggested that, instead of re-appointing a deputy chief architect at £2,000 a year, he should instead persuade the local authority to share that salary amongst the four team captains, whose responsibilities would be raised correspondingly to resemble those of a deputy. Now one would have thought that the team captains would welcome such an idea, particularly when the criticism of the local authority pyramid is so strong. It would seem, however, that the bait of the post of deputy was too strong a lure, and, when it was put to the vote, three of the group captains, no doubt confident of their chances of getting the deputy's job, decided against the scheme. The reason put forward by some was that the absence of the chief architect through sickness, or holidays, would complicate responsibility too much in the running of the office and in reporting to committees.

*

No doubt there are snags in the scheme, but the position of deputy has never seemed to ASTRAGAL a particularly good one—too senior to do much work except administration, and not junior enough to do any architecture. He may be essential in the very large office, and to help decrepit chief architects, but isn't the alternative of improving the status and remuneration of the group leader worth considering? Might the large public office be thus broken down to small, largely autonomous groups, similar in spirit and performance to the small private practice, but with the advantage of having a guaranteed building programme? What are readers'—and particularly young readers'—views?

BUILDERS' SUEZ

What has happened to the pipe-line of building information? The other day an audience comprising—to judge from the cars outside—many builders, went to the Brixton School of Building to hear Edward Mills and G. W. Mack (of BRS) talk about "Contemporary Cladding Techniques." Edward Mills put on a repeat performance of a talk on a visit to America (in 1953, wasn't it?), and G. W. Mack gave a lucid First Year lecture on the principles of keeping out the cold and the wet and the noise. It is inconceivable that any practising man went home any the wiser.

*

The trouble is that development is all done by commercial firms and no public servant will talk about the merits or demerits of any specific developments for fear of making trouble. This means that architects and builders must be kept scrupulously in the dark, wasting their clients' money right and left, and enlightened only by the odd, veiled hint and the Delphic reply.

*

There are rumours that the Brixton School is to form the nucleus of the Builders' University. If those concerned cannot do better than this it will be a sort of kindergarten for builders approaching their second childhood.

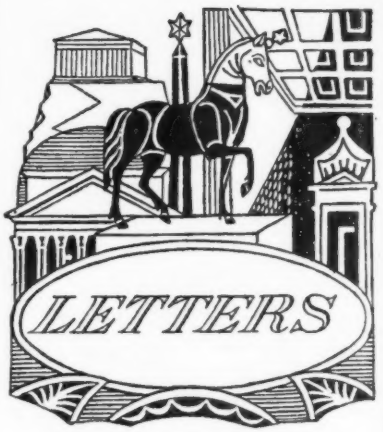
NOT YET IN THE BAG DAD

Opera houses are all the rage just now. Frank Lloyd Wright has just issued a court circular (or should it be hexagon?) from Spring Green announcing that he has been invited to design an opera house for Baghdad. "I would not give a hoot to build in New York or London, but Baghdad is a different story. . . . I shall have two acres in the middle of the city, a completely free hand and there are no limitations as to costs."

*

While ASTRAGAL admires the optimism of this great American veteran, he permits himself a cynical smile. Not only has Mr. Wright in his long career had a full measure of unbuilt projects, but the Middle East is a notorious graveyard for such things. Anyone who went to hear Max Lock at the AA the other day will realize this and will have some idea why it is so. We wish Mr. Wright every success, but shall believe it when we see it.

ASTRAGAL



Kenneth Jack, A.R.I.B.A.

George Berry, A.R.I.C.S.

M. H. Thackray,
Chairman of Quantity Surveyors Committee, R.I.C.S.

Eric Bird, Chief Technical Officer, Building Centre

Frederick Hill, F.R.I.B.A.

Criticism

SIR,—J. M. Richards's articles entitled "Criticism" will be welcome additions to the JOURNAL, but his introduction (January 31) does not explain the nature of "routine criticism," since the implied limitations to this type of criticism are not stated.

Mr. Richards claims quite rightly that the critic's first duty is to inform those less well informed, architects and laymen alike, about what architects are doing. It is one thing, however, to say that the glass and aluminium curtain wall is "in," but quite another to say whether it ought to be. This, surely, is the critic's second, but equally important duty, and is one which presupposes that there are such things as good and bad architecture. No single critic can state with finality what these are, but he can and must say what he thinks constitutes them.

If the demand for "routine criticism" of current architecture is genuine, it will not be satisfied by less than a consideration of the three classical questions: what did the architect set out to do? did he do it? was it worth doing? The answering of the first two of these requires information; the answering of the third requires standards of judgment which must be stated. Criticism is only "unfair" if it states facts incorrectly, or if it does not state its standards which are themselves subject to criticism.

KENNETH JACK.

London.

Mr. Richards writes: By "routine criticism" I simply meant criticism appearing as part of a magazine's publishing routine—*i.e.*, at regular intervals and occupying a regular place in its pages—rather than on special occasions only.

Elemental Bills

SIR,—The enthusiasm for Elemental Bills is almost confined to architects. Very few quantity surveyors or estimators are convinced that this is the answer to the present shortcomings. It is difficult to see what the architect expects to find in the elemental bill. Of what use, for design purposes, is an analysis of the lowest tender for a pre-

vious building? It proves nothing except to point out how the estimator arrived at his total price; entirely his own concern.

It need not and probably does not conform to prices for other contracts at the same time, and the adjustment of those prices to future contracts is necessarily not accurately predictable, depending on the contractor's business position, who the architect is, and many other factors. The uncertainty is not less on negotiated contracts, and the quality of design stage collaboration from a builder obviously varies greatly. Is the long term result of this process, a few enormous building organizations, the desired effect?

Pre-planning must come before any other move; the present Trade Bill of Quantities was designed for a state of pre-planning and functions best when it represents a fully designed and finally agreed building.

For this, and for the reasonable number of variations envisaged by the form of contract, the trade document is first-class. Estimators find it easy to abstract for obtaining sub-tenders and a competent surveyor has no difficulty with interim valuations.

The elemental bill is clumsy and retrogressive, and tends to perpetuate the unsatisfactory method of designing during construction. Perhaps this is the reason for its popularity in one or two quarters of the industry, for the efficient estimator wins easily on an accurate bill with full details available for inspection.

It seems to me that the catch word "pre-planning" is no more than doing the job properly, and that elemental bills are only confusing the discussion of how to return to the conditions which the framers of the standard form of contract had in mind.

It would be interesting to see the result of an approach to the builders for revision of clause 2, which inhibits the elemental bill as it stands, to allow use of their estimating labours for semi-public and obscure purposes.

GEORGE BERRY.

Sale.

SIR,—With reference to your editorial (January 31) on Elemental Bills, I should be most grateful if you would remind me when and where "the RICS has consistently declared that the main function of a quantity surveyor is to produce a bill and the main use of the bill is to get prices by competitive tender."

M. H. THACKRAY.

London.

[The statement which Mr. Thackray quotes was intended to convey what seems to us the majority opinion of the many quantity surveyor members of the RICS with whom we have had contact since we began to urge the need for better methods of cost control. As a literal statement of the official attitude of the RICS, the words are, of course, not true, and we apologize if they were misleading.—The Editors.]

Fireproof Forsooth

SIR,—No doubt the cost study "Fireproof Construction" (AJ, January 24) is arithmetically correct, but from the point of view of fire-protection technique it is nonsensical.

First, there is no such thing as "fireproof" construction. Any building element will fail if the fire be hot enough or continue long enough. There is only "fire-resistance," a quality expressing endurance under a given fire severity. I refer your contributors to BS 476 and Post-War Building Study No. 20.

Their comparison is, in fact, between a building which has some *combustible* elements and one which has them all incombustible. The timber floor has a Grade E (½ hour) fire resistance and the concrete floor a Grade C (2 hour) resistance. Confusion of thought between fire-resistance and incombustibility is a common error.

But the fundamental misconception in the cost study is that incombustible structure is necessarily preferable to combustible from a fire protection point of view. It usually is, but not as used in the buildings shown as examples. The reason for having a concrete upper floor is presumably to prevent the spread of fire from the lower storey to the upper. For some unexplained reason the upper storey windows in the concrete floored building have timber panels from floor line to cill line. This timber would be ignited at once by fire issuing from the windows below, transmitting it to the contents of the upper storey in a matter of minutes. In fact, the timber floor, plus the breast walls of brickwork, would delay the upward spread of fire longer than would the concrete floor and timber panels. Why have an expensive concrete floor if it can be quickly outflanked? Right use of fire resistance in elements of structure is as important as the grading of the elements.

Your contributors describe their two buildings as "traditional" and "for want of a better word, contemporary." This reveals another misconception; æsthetics have nothing to do with fire resistance. If they want "better words" they will find them in the numerous publications on fire protection technique.

ERIC L. BIRD.

London.

The authors, Stillman and Eastwick-Field, reply:

We really have fallen from grace, and Mr. Bird has obviously enjoyed castigating us. We wholly admit our error in misleading people from the current terms and definitions of the technique of fire protection, by using in a loose sense an old-fashioned word: it was certainly careless of us and we regret having done so. Nevertheless, we cannot help but think that most people will have recognized that the study was *not* specifically about the technique of fire protection but about the cost of building in the particular way illustrated and described (however stupid Mr. Bird may think it!). It was suggested in the introduction that one reason for building in this way and especially for having a reinforced concrete instead of a timber floor might be the requirement of fireproof (should have read "fire-resisting") construction, to satisfy building by-laws. The title arose because of the difficulty of finding a suitable generic term for the kind of construction we were considering and once again we apologise for it. May we emphasise in these studies the designs are intended only to show by comparison the cost of alternative forms of construction: they are not examples of complete forms of construction nor of buildings intended for any particular purpose. The "better words" we were looking for were to distinguish between the kinds of construction used in the two schemes shown and although no doubt your readers could provide any number of such words, we should be surprised to find them where Mr. Bird suggests!

EDITORIAL NOTE: the description "... for want of a better word, contemporary" was written by us, not the authors. Like them, we also found it difficult to hit on a suitable generic term for the kind of building described.

Sydney Opera House

SIR,—How delightfully reserved was the JOURNAL'S initial reception to the winning design. One could feel the hushed tension and imagine the lengthy policy discussions round the bar of the "Bride of Denmark."

Well, Dr. Martin can hardly go wrong and we have been plugging Saarinen for years and this chap was a pupil of Aalto's.

We look forward in my office with fascinated anticipation, if not apprehension, to your coming "party line."

FREDERICK HILL.

Birmingham.

NEWS IN BRIEF

The new Housing Minister's first important decision is a good one (writes a correspondent). Henry Brooke has over-ruled the objections of the Poplar Borough Council to the proposed 19-storey point block of maisonettes in Tidey Street, in the Stepney-Poplar Reconstruction Area. It would have set a most depressing precedent if the council's objections, based apparently on their contention that high blocks of flats were "just a load of trouble," had persuaded the Minister to withold his approval from the Tidey Street scheme. As it is, by approving the scheme, and even actively commending it, the Minister has shown a sympathetic understanding of the difficulties experienced by the LCC's planners and architects, and has recognized the merit of their solution. Tidey Street, planned at a density of 136 to the acre, and cheek-by-jowl with gasworks and industry, is not an ideal housing site, nor is it the sort of place one would select for a high tower block as a distinctive city landmark. But, in order to develop at that density, and to make the best possible use of the site, a tower block was essential, if only to secure a lower and more open lay-out in the vicinity of the gasworks and industry. Tidey Street is unlikely to prove the best advertisement for tower blocks: but it is a great deal the better for having one, and may even convince the Poplar Borough Council that some of the objections of their tenants to high blocks can be overcome by improved design.

Building employers will not pay fourpence an hour more to the million or so operatives who have asked for it. The operatives, who have just been awarded an increase of one penny an hour under the industry's sliding-scale agreement, received an increase of 2½d. an hour in arbitration last April. Employers say they cannot afford to add further to their costs at present. (The new claim would cost about £40m. a year.) At the request of the NFBTO the claim will be referred to a sub-committee of the industry's national joint council. If this committee fails to get what the operatives want the matter will probably go to arbitration.

Changes in planning administration will be recommended by Derek Senior, of the *Manchester Guardian*, when he opens a discussion on "Local Government Reform and Planning" at the TCPA on February 28 (at 6 p.m.). Tickets for this meeting, which will be held at the Planning Centre, 28, King Street, W.C.2, can be obtained from that address at 2s. 6d. each. Another discussion meeting, entitled "Planning in London is Unsatisfactory," will take place in March.

Britain's first chair in structural engineering has been created in the Faculty of Technology of the University of Manchester and the Manchester College of Science and Technology. Dr. William Merchant has been appointed to the chair.

Just a reminder that the competition for a memorial to Enrico Fermi, Chicago, which was banned to British architects, has been taken off the black list "in view of certain modifications in the conditions and the clarification of some points." The closing date has been postponed to March 10.

CRITICISM

by J. M. Richards

PRIMARY SCHOOL at HORNSEY, LONDON, N.6
designed by H. T. CADBURY BROWN

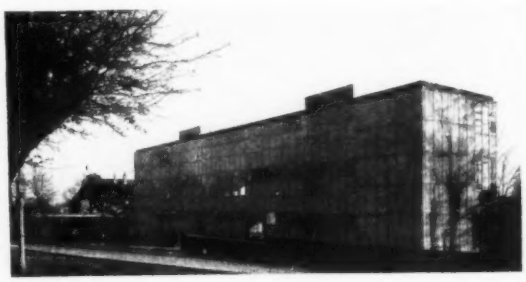
I have chosen for my first subject a primary school at Hornsey, just completed for the LCC by H. T. Cadbury Brown. Readers' first reaction may be that it is rather boring to discuss another school, seeing that schools are things we are conscious of doing well in this country, and the modern English school has already been the subject of endless comment. But I would answer that it is too easy to assume that all modern schools that conform to the somewhat familiar pattern are therefore good, and to become complacent about the achievement they represent. The present achievement consists of a number of useful principles of planning and construction, which do not by themselves guarantee good architecture.

This Hornsey school uses the Hill system of light steel construction with curtain walling, a system that has contributed a great deal to the development of the modern school, yet even those who have used it most effectively have left many problems unsolved ; so much so that I sometimes feel that most of these schools are still only at the stage of displaying the structural elements of a promising architecture, rather than being themselves architecture.

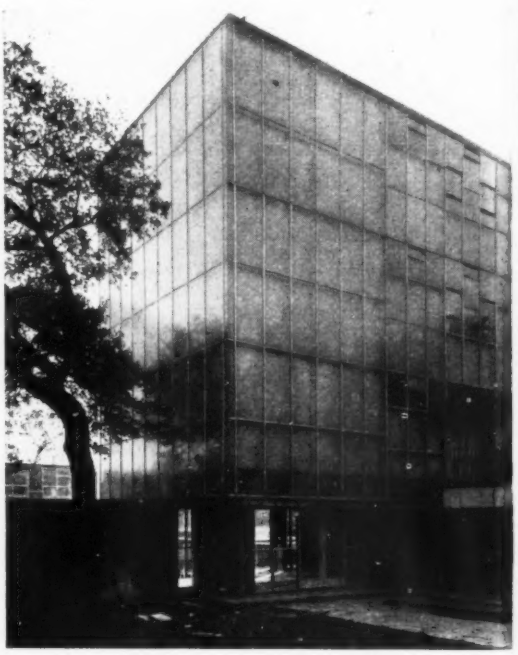
The difference is often only a matter of detail, but it is the mastering of the problems of detail that civilizes this type of structure. I am thinking particularly of the detail where a wall-surface terminates or where one material joins another. In his Hornsey school Cadbury Brown has paid thoughtful attention to these. For example, the finish of the curtain walling at the top: this is often done by providing a kind of cornice or projecting coping in precast concrete or similar material—a flat lid that contradicts the nature of this form of construction, which is that of a skeleton with a membrane stretched over it. In this school, instead of being contradicted it is emphasized by the black metal capping covering the top structural member, which slopes down and laps over the curtain wall, creating no projection in front of it.

The logic of this type of construction has clearly been in the architect's mind throughout. The steel stanchions—or, rather, the pinkish plaster in which they are cased for fireproofing reasons—is visible through the glass facing, and not only along the façade but at the corners as well, where a glass angle unit encloses the stanchion. A similar angle unit is used on the infants' block behind the main junior classroom block, even though the return wall here is of brick. It is more usual in a case like this simply to butt the curtain walling against the brickwork, which is made to project a little beyond the face of the glass. This generally looks rather clumsy, besides creating difficulties at the top, unless the whole glass wall is to be set inside a solid frame. Taking the glass round the corner stanchion, and then continuing with brickwork on the same face, makes it clear that the brick wall—just as much as the glass curtain wall—is a membrane.

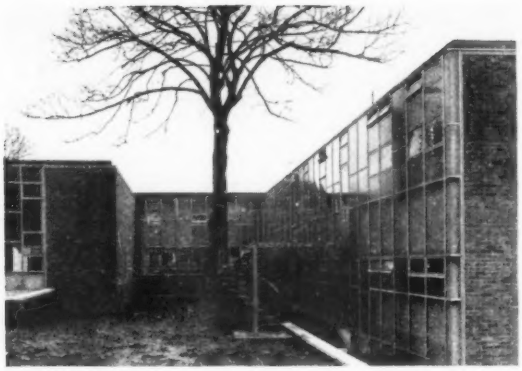
This principle of, as it were, checking every design decision against the demands of logic can easily lead



The school from Hornsey Lane, showing the curtain-walled main (junior) classroom block. Beyond it, on the left, is part of the lower block containing the assembly halls.



Corner of the main classroom block, illustrating a number of points mentioned in this article: the curtain wall with a special angle unit taking it round the corner stanchion; the change in pattern at the end of the block, where no windows occur; the way through to the playground at lower ground-floor level; the planning of the buildings around existing trees.

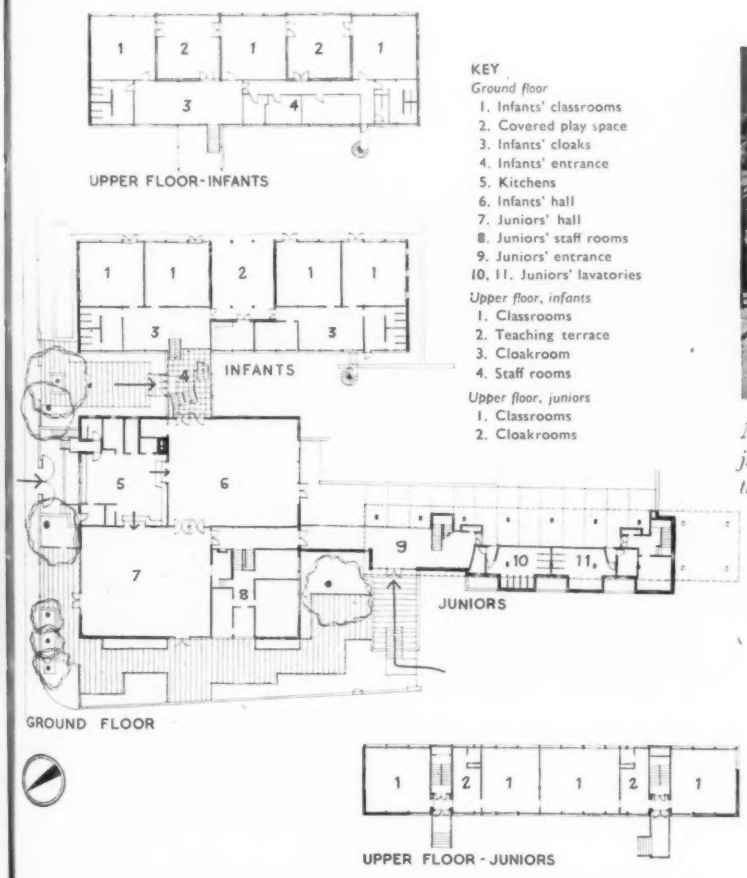


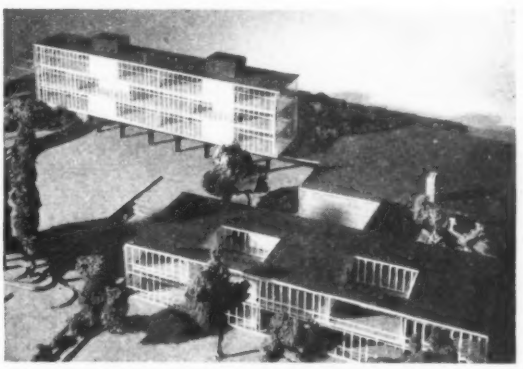
Infants' classroom block from the playground, showing (right) curtain walling taken round the corner, flush with brick side wall. The picture also shows the level roofline referred to at the end of this article and the planning round existing trees.

to an over-intellectualized architecture. It is an exercize that naturally appeals to the architect but is no substitute for the purely visual judgments, not necessarily based on logic, of which the process of designing, it goes without saying, also consists. In this school it is obvious that a sensitive eye has been at work as well as a logical mind, but there are one or two products of the latter that I would suggest ought to have been over-ruled by the former. In colour, the effect of the curtain-walled façade of the main block is a rather sad greenish grey, the infilling wall panels being seen through the obscured glass that is used wherever windows do not occur. This infilling consists of wood-wool slabs, rendered and left the rendering's natural grey colour—a rather non-committal colour that could be justified, I suppose, on the principle that there is virtue in materials "as found." But is there so much virtue in the "natural" colour of a material which is in fact synthetic? Is not this an opportunity thrown away of giving more vitality, by the use of more positive colour, to the main block which, without it, is a little dull. It seems to me to lack the sparkle and richness that curtain-wall construction invites.

And apart from this, some added colour would have covered up the stains and blotches that naturally occur on newly applied rendering and are now sealed for ever behind the glass panels. They are only faintly visible, so I mustn't make too much of them, but are such stains and blotches—to say nothing of the spiders' webs and whatever other matter may intrude in time into the spaces between the glass and the infilling—to be regarded as inseparable from the material "as found"? Finally, I find this greenish-grey colour of the curtain-walling and the pinkish colour of the plaster casing of the stanchions not very happy together, but I know that views on colour relationships are to a large extent subjective, so I won't make too much of this point either.

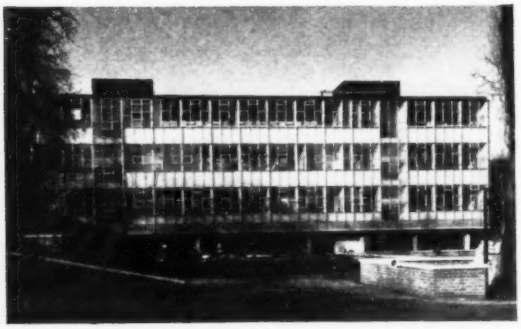
At each end of the main elevation of this block, where there are no windows, the grid pattern formed by the aluminium coverstrips on the face of the curtain





Model of the school: infants' classrooms in foreground; junior classrooms in background; linking them, on the right, the block containing the two assembly halls.

walling has been simplified, and consists of larger units than elsewhere. Which is logical enough, though many architects would have marked this change of pattern by a break in the façade and perhaps made sure it lined up vertically with the face of the brick basement retaining wall, which in fact it misses by three bays. Cadbury Brown, in refraining from doing either, has presumably felt that continuity of surface was the



The rear of the main classroom block from the playground, showing the covered playing space beneath. The blocks containing assembly halls and the infants' classrooms are off the picture to the right.

thing that mattered most if the membraneous character of curtain walling was to be emphasized.

The other side of the main block, facing the playground, is more lively with its continuous horizontal range of classroom windows, with which the vertical staircase windows do not conflict too much because, once again, the continuity of the wall surface has been preserved. The fall of the ground has been taken advantage of to provide a covered playing space beneath the three storeys of classrooms, the remainder of the lower floor being used largely for lavatories. At this level the exposed concrete structure of the platform that carries the Hill framework is left as it comes from the shuttering—another application of the "as found" philosophy, logical enough as long as the surface can be counted on not to become shabby-looking as the atmosphere gets to work on it.

The basement screen walling at this point is rendered, but in other parts of the building—for example the infants' wing—the unglazed walling is brick. The use of brick here, but not in equivalent positions in the main block, is, I take it, based on the idea that a brick wall should rise from the ground and that in the main block the first-floor slab is, in effect, the ground and brickwork sitting on the edge of this would be inappropriate; an intellectual distinction which is in this case, I think, completely justified visually, and the architect has found plenty of other means of giving a common character to the different parts of the scheme

The plan of the school strikes me as first-rate. It is very simple; a three-and-a-half storey junior classroom block (the main block I have chiefly been discussing), a two-storey infants' classroom block and, between them, a single-storey block containing the two assembly-dining halls and the shared kitchen, the three blocks being linked but clearly articulated. Their exact placing has been, I believe, partly determined by the position of trees on the site but also fits in very well with the slope of the ground.

The plan allows the junior and infant departments to be run if necessary as self-contained schools, and the detailed planning seems to me very economical. There are no corridors, a pair of classrooms being reached at each level from each of the two staircases in the main (junior) block. It may be noted that cloakrooms and lavatories are not, as used to be customary, planned together. The cloakrooms are planned alongside the classrooms and the lavatories all together in the basement.

There is only one aspect of the planning I would query: connected with the circulation. The architect has placed the main entrances to the junior school at the upper level—the level of Hornsey Lane—in order, I understand, that this should be regarded as the ground floor, and the main block therefore as a three-storey building, avoiding the regulations that apply to higher buildings, in spite of the ground at the back being one floor lower. This is sound enough, but it means that the children enter at classroom level, whereas they are required to go straight to the playground when they first arrive at school, and only to have access to the classrooms when it is time for lessons to begin. A new approach path is now being made leading from the side street (Ashmount Road) to bring the children in at the lower level, which will leave the other entrance doors unused. Does this, I wonder, indicate that the circulation as originally planned was unsatisfactory, or does it represent some later change of policy on the part of the school?

The infants' school has its own entrance lower down Ashmount Road, and a more secluded outlook. This last is the proper way to adjust the scale of such buildings to suit the small size of their occupants. The attempts I have seen elsewhere to design the actual rooms that are to be used by infants on a smaller scale are, I think, nonsense. The infants have to live in full-size houses and go about in full-size streets; and in any case their teachers are not dwarfs. What should be reduced in scale so as to give the infants an added sense of homeliness and protection is not the rooms but the spaces seen from the rooms.

One last point of interest: it will be noticed that, apart from the main block, the whole school has a level roof-line—infants' wing, assembly-hall block and the link between—yet to the eye these various parts build up to make a quite interesting skyline. This may be helped by the fall of the ground, but nevertheless it illustrates a truth that is often forgotten: namely that the most successful compositions are often those in which the architect makes the laws of perspective do his work for him.

Finally, about cost. School buildings are greatly circumscribed by cost and cannot be compared unless cost is taken into consideration. So I conclude this article by mentioning that the total cost of the Hornsey school was £119,300, and the cost per place was approximately £166—not at all an extravagant job.

7 PRACTICE

drawing office equipment
3 draughting equipment and drawing storage

Having already discussed drawing materials (AJ, January 10, 1957) and presentation (AJ, January 31, 1957) John Read completes his survey by describing the more massive gadgets which have been designed to ease drawing office life, making a special reference to those which enable the draughtsman to work on a near vertical instead of a near horizontal surface. He also discusses storage and drawing instruments and computes some of the costs of office re-equipment.

The draughting equipment normally found in an architect's drawing office falls into two categories—office property and assistants' property. One might almost say large and small equipment, except for a number of expensive or seldom used small items over which an assistant would think hard before buying, but which might well form part of the office's standard equipment.

Of the large equipment it is proposed to deal here with those items which directly affect drawing technique, omitting artificial lighting but touching on drawing storage and the type and layout of equipment most suitable for offices of different shape and size.

The ideal layout of a drawing office must be considered in conjunction with the type of equipment used and the capital available. The more comfortable the equipment is to use, the more efficient will be the working of the office, and although traditional types of large equipment may constitute the furniture of most offices today, there are, nevertheless, three ways in which it is possible to increase the comfort standard of work, depending on budget: (*a*) immediate replacement with up-to-date equipment; (*b*) gradual replacement over several years; (*c*) improvement of existing equipment by labour-saving additions.

Increase of working efficiency depends to a large extent on comfort and space economy. It will be seen below that many of the draughting machine combinations deal with both simultaneously. Furthermore, architects equipping small offices from scratch may find it useful to know the available basic equipment which is suited to their needs and pockets.

Of the large equipment in the office the four basic items are the drawing board and its support, the T-square, parallel motion, or draughting machine, drawing storage, and stools.

Drawing boards and supports

Drawing boards. As an alternative to the standard type of drawing board, which is made of pine, spruce or cedar, there is now a board available with a surface of green composition material on a laminated softwood base. This makes a backing sheet unnecessary and discourages the use of pins, thus extending the life of the board. The usual ledges, straightedge, etc., are incorporated. The board is made by Technical Sales, 32, Lupus Street, S.W.1.

Probably the greatest stride in drawing office equipment in recent years has been the development of a number of drawing stands and tables. Manufacturers have made the drastic, but very obvious, assumption that less fatigue will be incurred working at a fairly steeply inclined board than at one which is nearly flat. With the former, working from either a stool or the standing position, any point on the board can be reached without damaging physical contortions.

Newcomers to this type of equipment take a little time to become accustomed to it, but general opinion seems to affirm its long-term benefits. There are two initial drawbacks: a normal T-square cannot be used, and some method of disposing of the clutter which invariably surrounds and often half covers an architect's board must be devised. For the first, there are a number of devices such as T-square grips and parallel motions, which are described below. For dealing with the clutter, a parallel motion, if used, usually incorporates a ledge for taking pens, pencils, rubber and scale, and a small swivelling tray attached to the stand or table should cope with the ink and other articles in constant use. There would seem to be a demand, nevertheless, for an independent unit for assistants' personal equipment and books, possibly in the form of a small trolley on casters to make it easily movable.

Drawing stands are generally sold complete with a parallel motion, which is considered the most gener-

technical section

Fig. 1 (extreme left). The Admel "Monarch" hydraulic drawing board stand. The illustration shows the stand used in conjunction with a draughting machine and adjustable lamp. These, however, are separate from the stand, which may be used with a parallel motion or other suitable device. Fig. 2 (left). The Angula "Tractable" counter balance drawing board stand. This may also be obtained for use with parallel motion, some adjustment of the counterbalance weight being necessary. Fig. 3 (below left). An adjustable wall stand by Angula.

ally efficient substitute for the T-square. They can, however, be obtained separately, and alternatives to the parallel motion will be discussed later.

Counterbalance and hydraulic types. These, which are the most expensive, are capable of being adjusted to any angle from horizontal to vertical and, simultaneously, to any height. The hydraulic type has a foot pedal elevator and a hand-operated locking lever capable of adjusting the inclination in 10 degree intervals. The model illustrated, Fig. 1, costs £66 19s., D.E. size, including parallel motion.

The counterbalance type, Fig. 2, can be locked or partially locked in any position. When folded to its most compact position it takes up a space no more than 3 ft. 6 in. high and 1 ft. 6 in. deep and, to facilitate moving, it can be dismantled into two parts by removal of four nuts. The cost, including parallel motion, is £44 18s., D.E. size.

Adjustable wall stand. This stand, Fig. 3, is particularly useful where space is limited, and where all boards are not in constant use, as it may be folded almost flat against the wall, to which it has four simple fixings. It is perfectly rigid and may be adjusted to height or angle by means of the telescopic tubes and quadrant nuts. The cost, inclusive of parallel motion, is £25. It is manufactured by Angula.

Portable folding stands in timber, steel angle or alloy tube. Again the angle and height of the board can be easily adjusted. This is essentially a lightweight type and can be easily moved and stored. Prices complete range from £20 to £30.

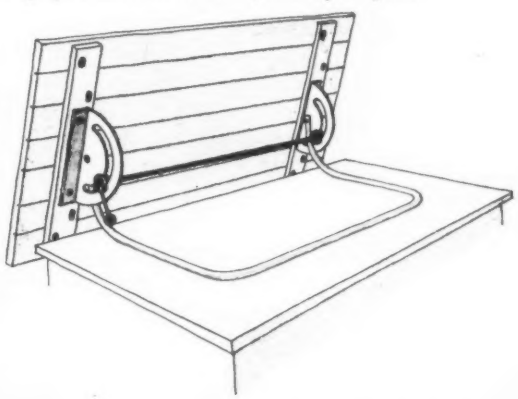
Tubular table stand. This is possibly more rigid than a folding stand. The angle and height are again easily adjustable and the stand is light enough to be easily moved, Fig. 4. Made by Angula, the cost, complete with rack and pinion-type parallel motion, is £27 10s. 6d.

Small drawing board supports. Into this category fall a number of different and often ingenious devices for improving an existing drawing board arrangement or, in a newly created office, providing an inexpensive system going a long way towards ideal working conditions.

It is safe to say that most offices in this country are at present sworn to the type of layout involving drawing boards whose top edges are precariously supported by a couple of bricks or lengths of four-by-two resting on boards and trestles, or similar tables, the continual complaint being lack of reference space.

If it is possible to arrange the boards in two or more

Fig. 4. Tubular table stand, made by Angula.



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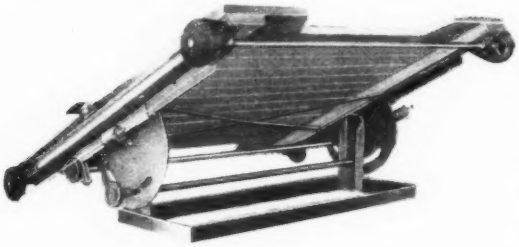

Fig. 5. Quadrant drawing board stand.

rows, then a quadrant drawing board support, Fig. 5, can fulfil a number of useful rôles. It may be fixed to an existing fairly rigid table or bench, and the angle is normally adjustable through 90 degrees. When the board and parallel motion is screwed to the support, the whole provides a simple and comparatively inexpensive drawing stand. Because it is fixed only at

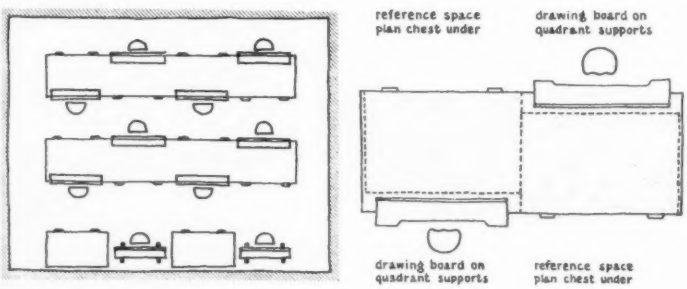

Fig. 6. Economical drawing office arrangement.

the front edge of the bench, the space behind the board is left free for reference. This method can be most economically used if the office arrangement is similar to that shown in Fig. 6.

A further economy can be made if the quadrant support is clamped to a plan chest. Prices for D.E. models range from £3 12s. 6d. to £7 16s.

If space is not at a premium, and something simple is required to adjust the inclination of the board, adjustable board slopes may be the answer. The slopes have adjustable brass-tipped arms controlled by wing nuts. They cost £2 a pair. Another simple stand consisting of an adjustable angle iron frame costs £3 12s. 6d. D.E., while tubular telescopic leg supports, Fig. 7, are £2 10s.

Dust covers and instrument trays. Permanent roller dust covers in green plastic can be fitted to top edges of D.E. drawing boards at a cost of £1 12s. Instrument trays for fixing to drawing stands vary in price from £1 7s. 6d. to £4 10s. 9d.

T-squares, parallel motions, and draughting machines

The choice of T-square is largely a matter of personal taste. The types at present available are: (*a*) mahogany with ebony ruling edge (D.E. size £2 8s. 6d.); (*b*) mahogany with transparent plastic ruling edge (D.E. size £2 15s.); (*c*) perspex or transparent plastic blade (D.E. size £2 4s.); (*d*) laminated plastic (phenolic resin) with mahogany veneer (D.E. size £1 17s.).

It should be noted that some plastic T-squares tend to whip when above Imperial size.

A useful attachment is the T-square grip, which leaves both hands free when in use and is particularly handy when stencilling. It is screwed to the underside of the T-square and engages on a hardwood batten or steel rib fixed under the board. The T-square can consequently be fixed at any position on the board. This attachment would be essential if a normal T-square were to be used with an inclined drawing stand in preference to a parallel motion, although it is felt that the latter is more desirable. Three different makes cost 15s., £1 and £1 3s. 6d. respectively. The only other alternative, if the drawing board is to be steeply inclined, would be the magnetic T-square and drawing board costing £11 0s. 6d. complete, guaranteed by the makers for 20 years.

Parallel motions. These are parallel straight edges giving maximum board coverage and controlled centrally; they are the normal answer when boards are used at a fairly steep angle. There are three basic types: counterweight, spring wire and rack and pinion.

The counterweight type, Fig. 8, is the oldest, consisting of a set of wires, pulleys and counterweights at each side of the board, allowing the straight edge to

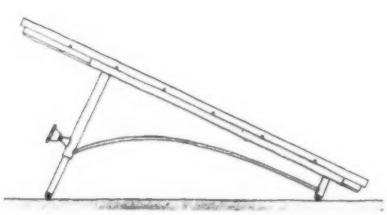

Fig. 7 (left). Adjustable angle-iron frame support.
Fig. 8 (top). Counterweight type of parallel motion.
Fig. 9 (above). Spring wire type.

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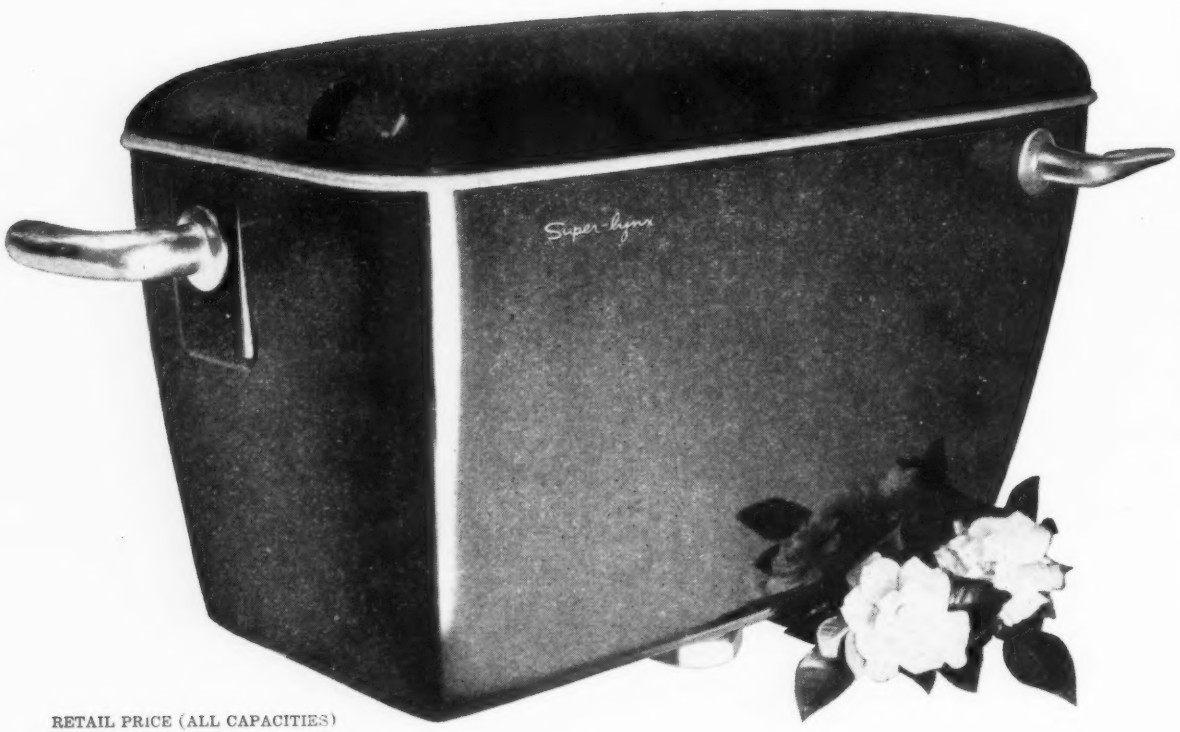

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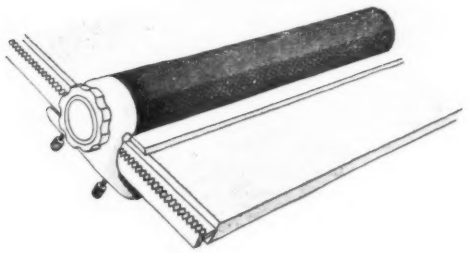


Fig. 10. Rack and pinion type of parallel motion.

move freely up and down. This type necessitates either a cut-out or a dead space at the bottom of the board, which is covered by the parallel motion while drawings are being fixed and removed. Cost is about £10 for a D.E. size.

The spring wire type has two ball races no thicker than the drawing board and fixed to the bottom corners of the board, Fig. 9. The spring tension wires run up the sides and across the top of the board, eliminating counterweights. This system can be used with boards on a flat bench whereas the counterweighted type cannot. It is very neat and simple in operation. The cost is also about £10 for the D.E. size.

In the rack and pinion type the straight edge moves up and down on a rack, Fig. 10, and has an additional micrometer adjustment. It may be used at a horizontal position on a bench top, and has an advantage over the others of no exposed wires and so is probably better suited to a bench-type drawing board of low inclination than the spring wire type. On the other hand, the large roll on the top of the straight edge makes it less comfortable in use. Cost is about £10 15s.

Draughting machines. It is generally considered by architects that draughting machines are more suitable for engineers' use than for architectural drawings. This may be justified to some extent, as the limited length of the straight-edges makes the smooth drawing of long horizontal lines difficult. However, the judgment of many may be based entirely on the experience of having used a draughting machine only once or perhaps a few times; the device takes some time to get used to and only after some practice does one come to recognize the considerable advantage of speed which it offers.

The machine does the work of T-square, adjustable set-square, and scale. Consequently all clutter is eliminated, and a pencil and rubber are all that are needed further. Ink drawings, particularly with a Graphos pen, are difficult to do because the bevel on the straight-edges comes right down to the paper without a vertical face, to avoid parallax error in the use of the scales. It is suggested that these machines might be used more by architects for working drawings in pencil. Many models are available, varying in price from £20 to £45. If a counterbalanced model is used with a counterbalanced drawing stand, the balance weight on the stand must be adjusted to suit the added weight.

Drawing storage

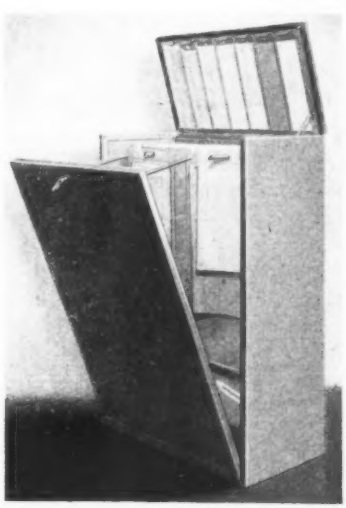
Drawing storage presents possibly the most pressing space problem in an office. The most commonly used solution is the plan chest in hardwood or steel (usually the former), built up in sections of three or more drawers, slightly larger than standard drawing size. Although they are very bulky and awkward to place in a small room they may, in certain circumstances, be used as reference tables, possibly in the manner already described.

Steel and timber chests are built in four- and three-drawer units respectively, but it is possible to obtain an eight-drawer steel unit of approximately the same height as a six-drawer timber one. The saving in space may warrant the extra cost, taking also into consideration the fact that the steel drawers usually run more smoothly than the timber and are more durable. Comparative prices from a reputable manufacturer are as follows:

	steel (8 *drawer*)	*timber* (6 *drawer*)
Double Elephant	£70 10s. 11d.	£34 7s.
Antiquarian	£77 2s. 7d.	£40

Normal chests which store drawings horizontally make reference and withdrawal from a full drawer quite difficult; an alternative is the steel vertical plan file. There are several variations of this, and the drawback of the common variety is that unless the file is fairly full (when, incidentally, drawings again become difficult to withdraw), the drawings tend to curl at the bottom of the cabinet, even though they are usually in manilla folders. A fairly recent type, Fig. 11, catering for about 600 tracing paper drawings, suspends each drawing on its own holder, *i.e.*, a specially supplied parchment or plastic manilla perforated strip fixed to the edge of the drawing. The drawings are indexed on the lid of the file and can be located very quickly; they are less prone to damage and creasing

Fig. 11. Chest holding 600 tracing-paper drawings, each on its own holder.



technical section

than when other types of cabinet are used. Available from The Nig Manufacturing Co. Ltd. and Lawes Rabjohn Ltd., the price is about £60. The holder strips are £3 5s. 8d. per 100 for parchment, £1 2s. 6d. per 100 for plastic manilla.

Magpie Furniture Ltd. are among those who have felt it their duty to improve the appearance of standard bench and storage equipment and their current range, Fig. 12, seems a big step forward. It has been designed

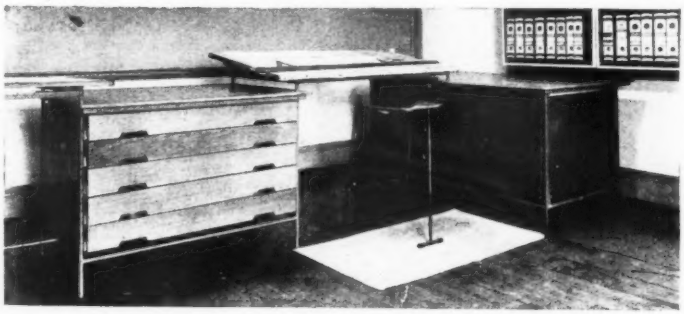


Fig. 12. "Magpie" drawing office bench.

on the unit principle and varying flexible space-saving arrangements can be adopted to suit conditions. An assembly consisting of plan chest with reference top and board stand costs £43 4s. 4d.

Stools

There is a great range of stools on the market, varying in price from 30s. to £8 for the adjustable variety. An interesting newcomer, however, is a steel stool with rubber joints, which respond to every slight movement of the user and so minimize fatigue. Also, due to the flexibility of the stool, the legs adjust themselves to an uneven floor. This stool has been in great demand since it was introduced about two years ago and costs £4 3s. 8d. without back support.

Cost of re-equipping

To summarize, it will be seen that for an architect equipping an office for the first time and with fairly limited financial resources, to provide places of work for himself and, say, three assistants using, for instance, wall-type stands and parallel motion, with stools and one-drawer wooden plan chest would involve an outlay of about £150.

An architect employing 12 men at the board could, if he wished to do it cheaply, find places for three or more by adapting quadrant supports and parallel motion to existing boards at an extra cost of approximately £11 10s. per place. If, on the other hand, he wished to make a splash, though still saving several places, he could instal hydraulic stands with all the trimmings for about £70 per place.

Smaller equipment

Scale rules. These are manufactured in boxwood, plastic or ivory, in that ascending order of price, and are obtainable 6-in., 12-in., 18-in. or 24-in. long. The normal types are available either oval or flat, the latter having markings on one side only, but a useful alternative is the triangular scale which is less likely to move on the paper when in use and has three scale edges instead of two.

Of the several different types of scale, the draughtsman's scale is probably the most useful to the architect. This has one scale per edge, two per side and consequently four scales altogether. It is more easily read than the type which carries two scales per edge and eight scales altogether.

The above scales are open-divided with fully-divided sections at the ends, whereas the engineer's scale, which is preferred by some, is fully divided.

A 12-in. oval section boxwood scale should cost between 9s. and 11s., while a 12-in. boxwood triangular scale would be about 21s. 6d.

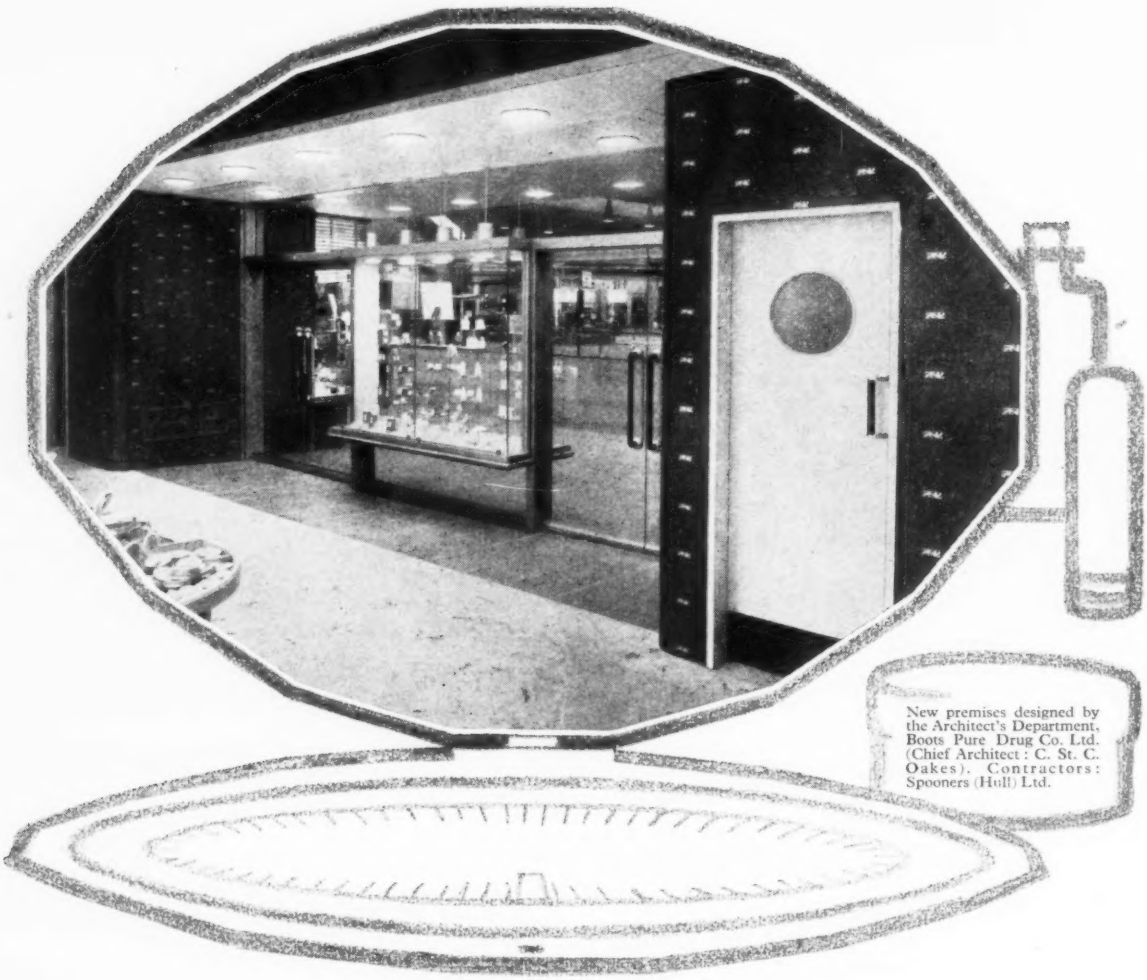
For large offices or those engaged in considerable survey work, sets of cheap plastic ordnance scale rules covering all scales are available. For more detailed information, reference should be made to BS. 1347/1956, which was commented on in the AJ Information Centre (January 10, 1957), where attention was drawn to the undoubted usefulness of extending the 12-in. scale to cover 100 $\frac{1}{8}$-in., 50 $\frac{1}{4}$-in., etc.

Drawing instruments. Generally, drawing instruments are part of one's personal equipment and are affected by financial considerations, but it is advisable to choose wisely and build up slowly rather than buy a cheap full set and curse it item by item for the next ten years.

A useful addition to the list in recent years is the pair of pump spring-bow compasses which enables one to draw very small circles without the danger of the point slipping; used in conjunction with the Bomaster 6-in. radius spring-bow the entire range of normally required radii is provided for. Another item worth consideration economically and as a timesaver is a spring-bow with reversible pen and pencil points.

Beam compasses are only found in "presentation" instrument sets, but purchased separately they are invaluable in all sizes of office. They are particularly useful when setting up surveys and other large drawings. A point worth watching is that some aluminium alloy beam compasses oxidize in storage, the oxide becoming a nuisance if it gets on the fingers and then on to the drawing. The price of a compass in steel and alloy is £4 10s. 9d.

Proportional dividers should also be a part of standard office equipment. They are used for enlarging or reducing the scale of drawings, the adjustable legs of the dividers being engraved with marks indicating enlargement or reduction. A dimension pricked off a drawing with one end of the dividers can be reproduced to a chosen ratio from the other end of the instrument. They are useful for equally dividing circle perimeters and straight lines. Great care should be taken of proportional dividers, as damage to one point may necessitate re-grinding of all four and re-calibration of the shafts. The type with hook points has the advantage that re-grinding does not alter the operative length.



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Standard ruling pens. For those who prefer to use a normal ruling pen rather than one with interchangeable nibs, there are three types which commend themselves; (*a*) this has a hinged nib and an index screw to regulate the thickness of the line. The screw is numbered for various thicknesses; (*b*) quick-set pens in stainless steel which can be opened for cleaning without altering the thickness of the line, as the nib is spring-hinged on a swivel; (*c*) the barrel-filled type.

To save time on drain runs, etc., a useful instrument is the dotting pen. This consists of a ruling pen with four interchangeable wheel attachments.

Graphos pens (interchangeable nib type): Although introduced into this country before the last war from Germany, this type of pen has only achieved universal popularity in the last few years. It consists of a barrel with interchangeable nibs for varying line thickness and with interchangeable feeds for regulating the flow of ink.

In the ruling pen range there are nine thicknesses of nib available for normal work, but there are several other different types including script and stencil nibs. The stencil nibs match the German stencils mentioned in the previous article. This type of pen has a great advantage over most ruling pens as it cuts down charging and cleaning time and always produces an exact line thickness. Technical drawing nibs for ruling work cost 1s. 6d. each. The holder and feed are 13s., and a velvet-lined box containing a holder and 12 nibs is 36s. 6d.

Graphos also make a viscous sponge box for dampening the nib after interruptions, and this should help to overcome the main snag with this type of pen—the difficulty in maintaining ink flow unless work is continuous.

Rapidograph (stylo type). This is made in four sizes, the finest being fine and regular enough for quick finished design work but possibly not for detail working drawings, the latter depending on one's standard. The larger types are excellent for sketch design work, bordering, and free-hand sketching.

With the two smaller sizes less clogging trouble will be experienced if non-waterproof Indian ink is used.

The Rapidograph is barrel-filled like a fountain pen and a quick shake moves an internal plunger which frees any ink blockage.

UNO Elite (barrel stencil pen). This is made in two small sizes only and is primarily for use with small stencils. It can, however, be used as a ruling pen. It is completely demountable and the wire nib is self-aligning after refilling or cleaning.

Flomaster (felt-tipped barrel pen). Having replaceable felt tips, this pen is useful for sketch drawings, giving a solid broad line.

Compass attachments. These are available for both the Graphos and Rapidograph type pens. The former firm makes two: the compass clip for attaching the whole pen to the compasses, and the compass attachment which makes the completed ink compasses much less cumbersome than the former. The Rapidograph attachment also makes the completed instrument awkward for use except for drawing large circles.

Inks. The choice of Indian waterproof ink depends largely on personal experience and the shape of the bottle. There are about half-a-dozen recognized top-grade inks from which it would be unwise to deviate, but personal preference may dictate whether the ink is dispensed by quill, pipette or capsule. The pipette type of insertion for ruling pens seems to be the most generally useful. Pelican Fount-India ink may be used in most fountain pens, and is supplied in an extremely sensibly shaped bottle which cuts down wastage and prevents inky fingers after filling.

Heavy moulded rubber ink bottle holders are strongly recommended for those offices (about 99 per cent. of all) where the open bottle tends to get buried beneath a pile of drawings.

Furniture templates. The most comprehensive furniture template available in this country is of German manufacture, the Standardgraph. It is made to three scales: $\frac{1}{50}$, $\frac{1}{100}$, and $\frac{1}{200}$, which correspond closely enough to $\frac{1}{4}$-in., $\frac{1}{8}$-in., and $\frac{1}{16}$-in. Formed from amber transparent plastic it covers items such as chairs, tables, sanitary fittings, etc., and may be useful as a timesaver or for laying on a drawing to determine whether certain fittings will go into the available space.

Technical stencils. These can be obtained in template or stencil form and are available for pipe junctions and bends, door swings, polygons, circles, triangles, squares, etc.

Parallel rule and radius gauge. The Simplon Tangent gauge has several uses, *e.g.*, drawing pencil lines parallel to curves and straight edges, drawing circles and door swings of various radii, and cross-hatching when used in conjunction with a set-square. The radii spacings are clearly marked on the transparent template. Cost: 5s.

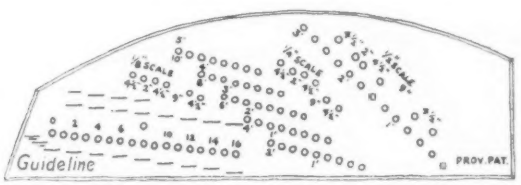

Fig. 13. The Guideline stencil.

The Guideline (Fig. 13) has similar uses to the above and is invaluable for drawing brick courses and spacing lines for free-hand lettering. It also caters for all thicknesses of brick wall, excluding 11-in. cavity. Cost: 4s.

The Paraline, also in transparent plastic, has the basic uses of the Guideline, but also parallel lines can be drawn to set spacings ranging from 4 in. to $\frac{1}{32}$ in. It also fulfils some of the functions of the adjustable set-square. The price is 5s.

These last three gauges are all perforated to take a pencil point.

The Arclight radius curve (transparent plastic). This is particularly suitable for drawing door swings and corner curves, giving radii from $\frac{1}{32}$-in. to $\frac{1}{2}$-in. The price is 5s. 3d.

building illustrated

Laboratories at Egham, Surrey

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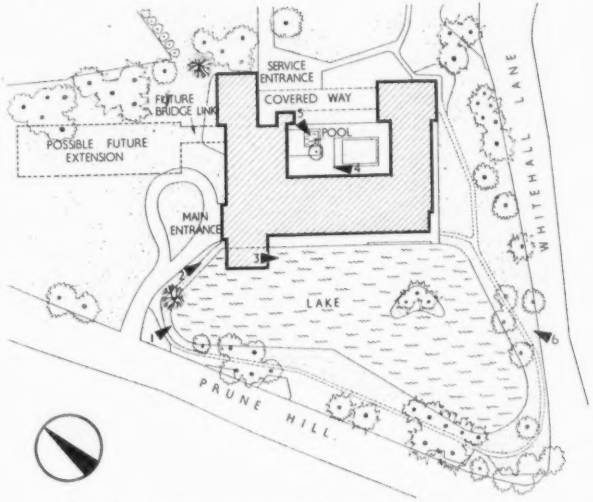
These service laboratories were designed for research connected with the sale of petroleum derivatives at home and abroad and include two pilot manufacturing plants for testing and developing petro-chemicals. Complete flexibility in the laboratory layout was required. The building was also to be sited near a lake "to give a Dutch atmosphere," and careful landscaping and the use of contracting areas of brickwork help to achieve this effect. This low-lying wooded site is on the edge of the green belt, and is located within convenient reach of London Airport, since close contact is maintained with overseas countries. This building is the second industrial research laboratory to be analysed in the JOURNAL. The first (for colour television) at Enfield was published on November 15, 1956.

Viewpoint 1: the conference room on the south-west elevation projects over the lake.

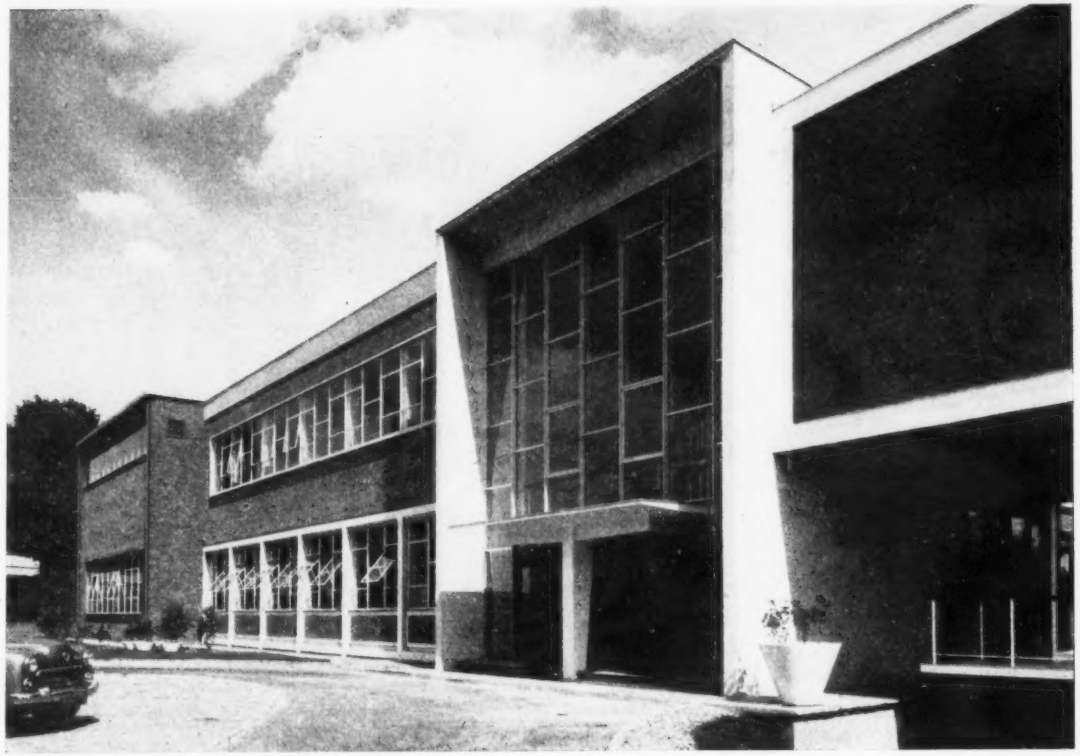


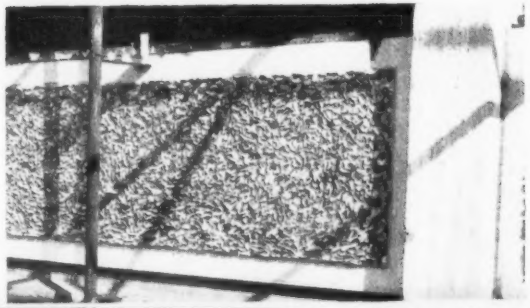
Key plan showing photographic viewpoints

LABORATORIES

at EGHAM, SURREY

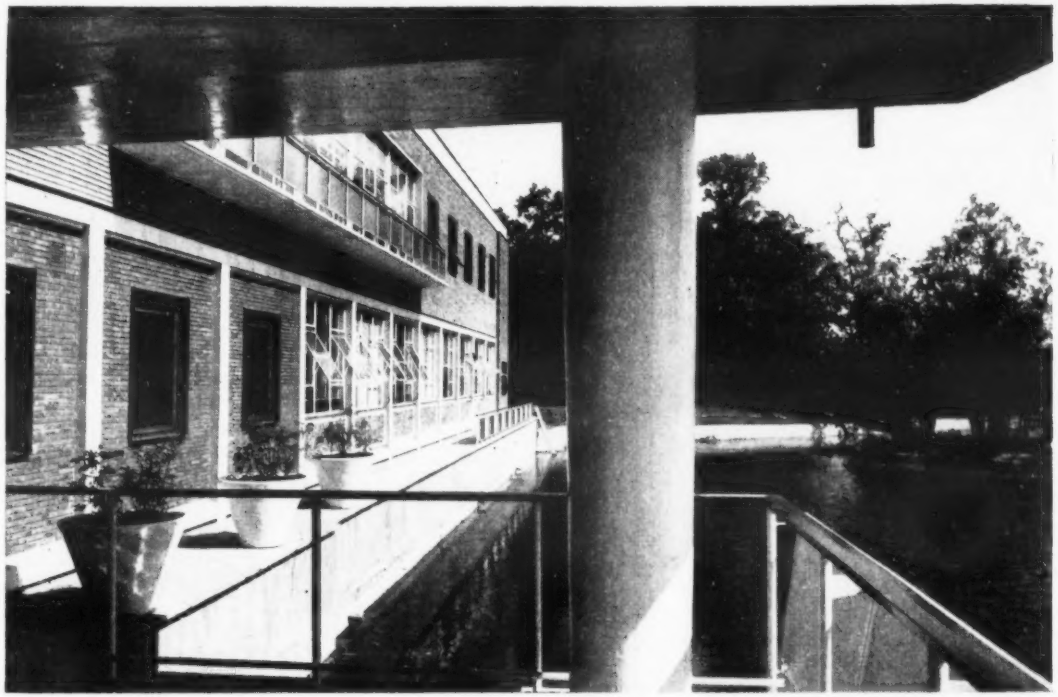
designed by P. A. CRANSWICK





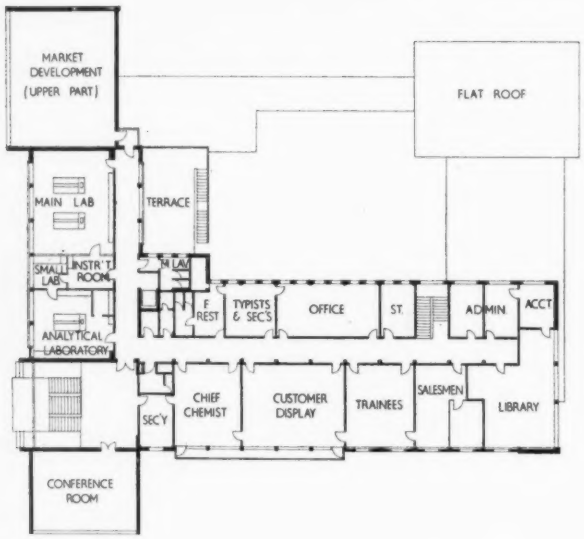
Viewpoint 2 (above right): shows the south-west corner, where the 6-in. concrete flank walls of the main entrance hall form a box which stiffens the framed structure in each wing. Over the ebonized mahogany entrance doors the structural stair landing projects with external support. Beyond is the general chemicals laboratory and the first floor here is given over to a fundamental research group headed by Sir Robert Robinson. The detail photograph (right) shows the exposed aggregate spandrel facings at ground level. The aggregate is Sutton shingle from pits near Dartford, Kent.

ground level. The aggregate is Sutton shingle from pits near Dartford, Kent.

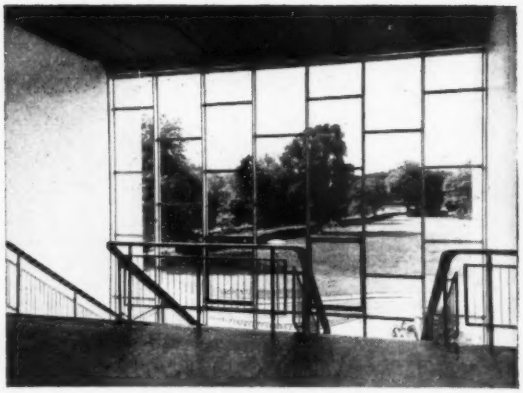


Viewpoint 3 (above): the south-west facade from under the conference room, which projects over the lake. The soffit is painted blue and the paving at ground level covers a periphery duct from which laboratory services are taken into the building. This ring duct system has the advantage of reversible flow and frees the internal floor area. The columns at 10 ft. 1 in. centres express the structural frames which span 24 ft. and carry a lightweight hollow pot floor and aluminium roof decking with a finish of mineralized felt. Owing to the steel shortage at the time of design, concrete columns were chosen, having connecting plates and through bolts to carry steel lattice girders 2-ft. deep. This depth allows for service pipes up to 10-in. diam., concealed by a suspended ceiling, which contains radiant heating panels. This zoned heating system allows free wall space in laboratories and provides a high, even temperature. Temperate filtered air is circulated independently to compensate for excessive ventilation through fume cupboards. Viewpoint 4 (above right): this shows the independent stair in the courtyard, which has reinforced concrete spine and prop with precast granolithic treads. 2-in. light golden wirecuts have been used generally, and 2-in. purple-brown handmade bricks for end walls. A lap bond of 2-in. was insisted upon, dark mill mortar being used throughout. Horizontal joints are raked out. The columns in the foreground are painted black and bedded round with flints. The dwarf wall on the right encloses a pool (viewpoint 5, below left) for surface water collection. Viewpoint 6 (below right): the south-west facade. A water table 1 ft. 6 in. below ground level, together with the danger of pumping out fines in the soil, necessitated underwater concreting and sheet piling on this face. The services ducts into the building were designed as beams to stiffen the ground slab. The tapered columns rest on 72-in. diam. caissons let into the bed of the lake, which provides cooling water for mechanical plant and collects surface water drainage.

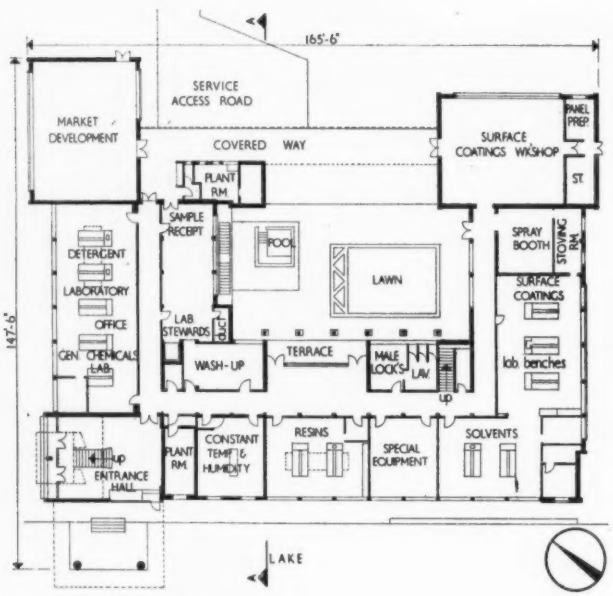
building illustrated



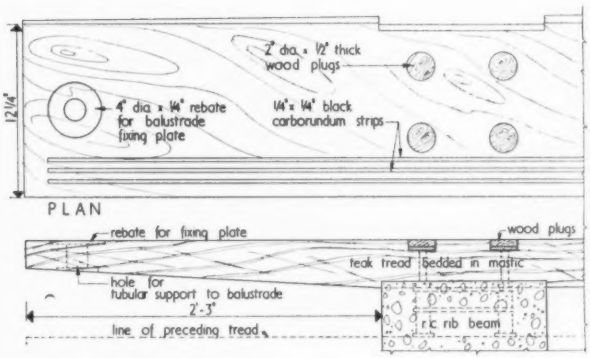
First floor plan



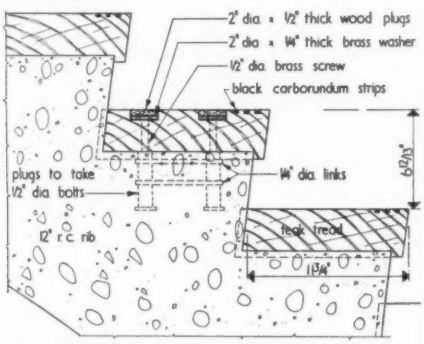
The main staircase seen from the first floor landing. The 8¾-in. deep aluminium mullions are 24-ft. high without intermediate supports and frame this fine view. The boldly-designed plywood panels, painted red, hang from a black ceiling. 2½-in. deep transomes reduce the vertical emphasis of the glazing.



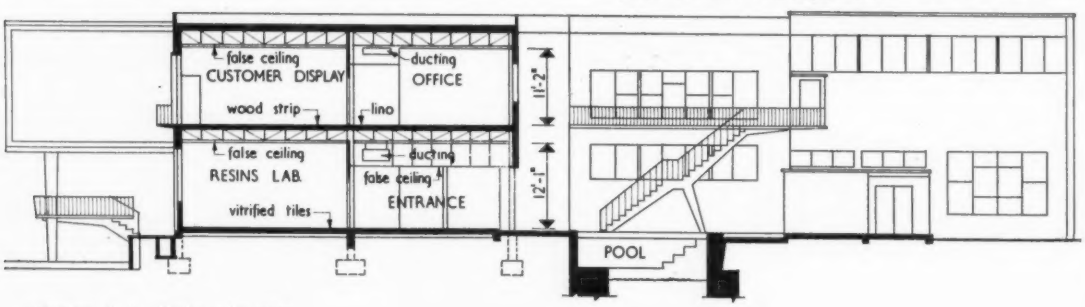
Ground floor plan [Scale: $\frac{1}{16}$" = 1' 0"]



Part plan and section B-B [Scale: 1" = 1' 0"]



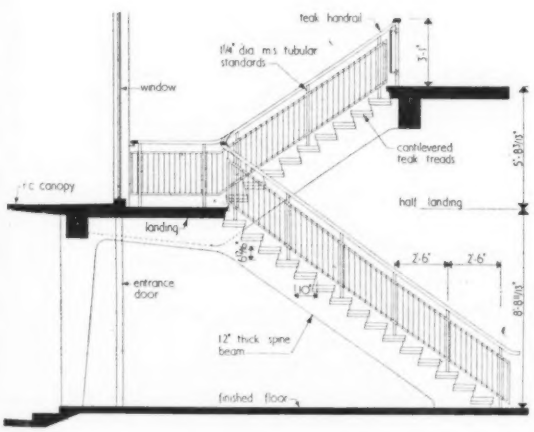
Cross section through treads [Scale: 1" = 1' 0"]



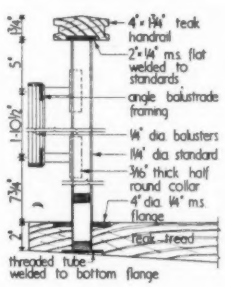
Section A-A [Scale: $\frac{1}{16}$" = 1' 0"]

building illustrated

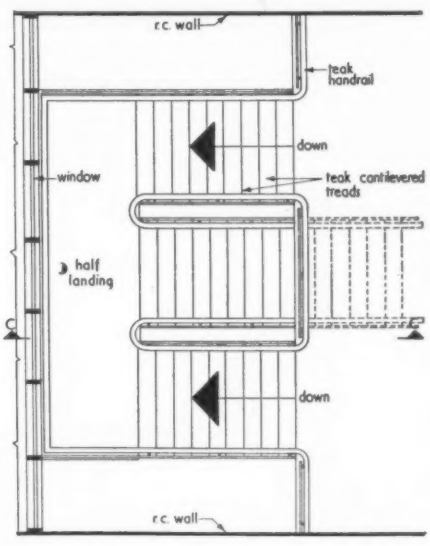
A view of the main staircase, with 4-in. thick cantilevered teak treads supporting baluster posts and handrail. Bracketed independently and painted white is an angle frame into which ¼-in. diam. m.s. balusters are welded. The heated floor is finished in patterned grey mosaic. The black and white photo mural of shells was designed by Geoffrey Wickham.



Section C-C through ½ landing main staircase [Scale: ⅛" = 1' 0"]



Section of balustrade
[Scale: 1" = 1' 0"]



Plan at ½ landing [Scale: ⅛" = 1' 0"]

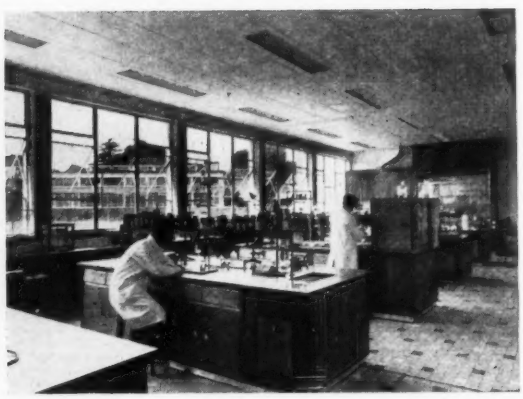
LABORATORIES

at EGHAM, SURREY

designed by P. A. CRANSWICK

building illustrated

A high-level view of the solvents laboratory, which shows a typical office formed by demountable partitions on the left. A typical mobile fume cupboard is seen in the background. (This will be illustrated as a Working Detail in a future issue.) The sequence of the various chemical processes virtually decided the plan shape of the whole building. Administration (executive offices, library, etc.) covers 22% of the floor area; a joint staff canteen is situated nearby.



A typical laboratory, showing benches (designed by the architects) which were required to be placed as shown or alternatively turned through 90° with the minimum of interruption. The bench length of 10 ft. was also stipulated, and this dimension determined the column grid and plus or minus depth of room, a tolerance of $\frac{1}{8}$ in. being maintained. Bench working surfaces are either Moulmein teak or stainless steel, other woods used being sycamore and Japanese oak. The eight different services and wastes to each bench run in an 8-in. central rack. The floor is finished in grey patterned Swedish vitrified ceramic tiles and the ceilings generally are painted with pastel yellow, heat-resisting paint. The 8-ft. wide fume cupboards have independent fume extraction to avoid mixing of gases.

LABORATORIES

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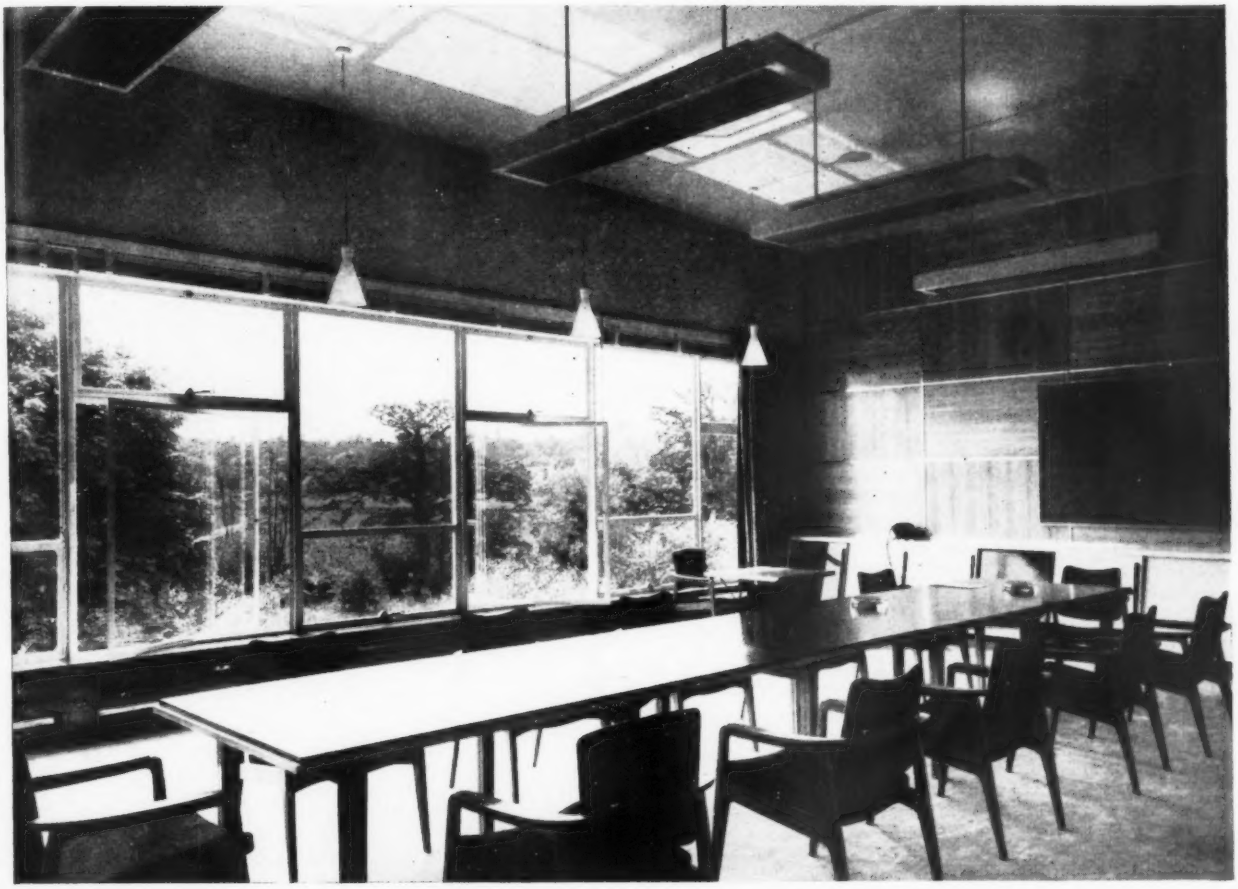
Opposite page, top: this photograph shows the conference room overlooking the lake. The conference table was designed in five sections. The close-fitted carpet is mustard yellow, and the selected chair design has charcoal grey upholstery. Olive veneered panels set in alloy extrusions cover end walls; the other walls are grey and white emulsion-painted. Heating for this room is by means of convected warmed air from grilles at floor level and 4-ft. deep upstand beams under this floor provide compartments for equipment and heating plant. Opposite page, below: a view of the lobby which staff enter from the courtyard. Clear and obscured glazing in a chequer pattern has been set in a polished mahogany frame. The floor surface is 4.5 mm. linoleum in 18-in. squares coloured light grey and dark green and the reveals of projecting columns on the left are painted rich red. On the right of the corridor is the central wash-up for all laboratories, where brilliant overall lighting ensures that cleaned glassware can be inspected without interference from shadows. On the left of this corridor is the constant temperature and humidity room, where tested samples are subjected to a humidity of between 70% and 90% within 1% accuracy and a controlled temperature within 0.5°F. Accordingly, this room is insulated with 3-in. cork, and has non-actinic double glazing with venetian blinds. 3-in. clinker blocks were used for the permanent corridor partitions which are 10 ft. wide and 14 ft. high. This economical thickness was made possible by prestressing the partitions with diagonal wires which are bedded in rendering. Rainwater downpipes have been used decoratively by piercing the entrance hall in copper tubes polished and lacquered. 4-in. stoneware drains run to dilution tanks where the chemicals are neutralized in a chamber lined with chlorinated rubber before being pumped up 14 ft. into the public sewer.



analysis

LABORATORIES

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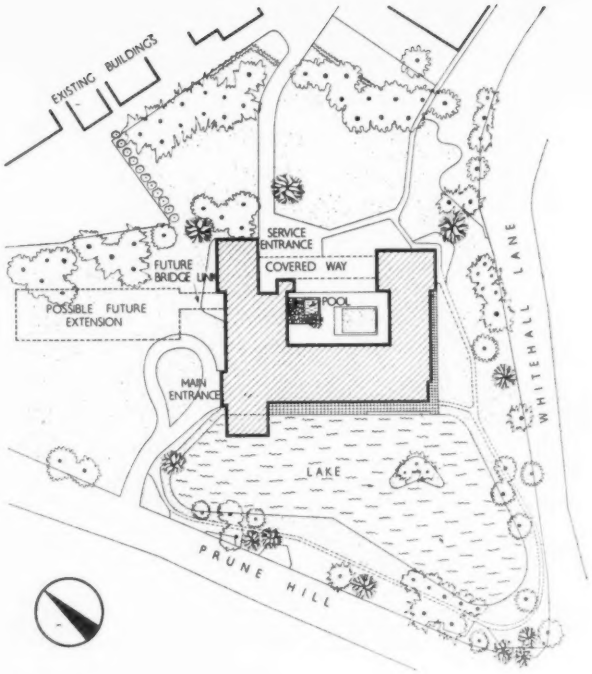
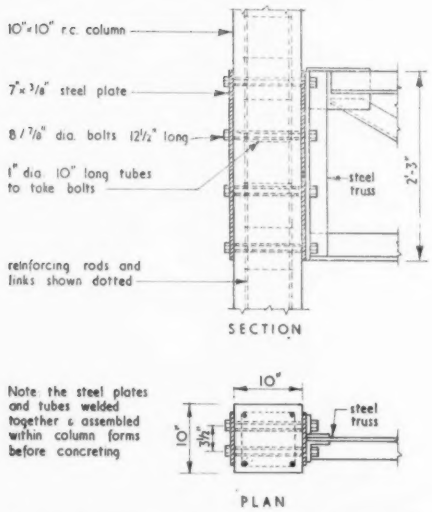


Site plan

CLIENT'S BRIEF: his stated requirements

The laboratories are closely linked with the sale of petroleum derivatives at home and abroad and the prestige value of the building was stressed. Although the initial functional programme could be defined, developments within the chemical industry are such as to demand the maximum flexibility and it was a requirement that the whole internal layout of the laboratories including partitions, benches, fume cupboards, etc., should be capable of rapid and radical alteration without serious interruption to a continuous research and development programme. Because of the need for the closest integration of laboratory services, furniture and equipment, the architects were commissioned to design the whole of the laboratory furniture on a standard unit principle. This standard laboratory bench thus became the basic design module. The major laboratories were to be located on the ground floor, the buildings were to be sited as closely as possible to an existing lake and because of the use above benches of extended equipment a floor to floor height of 15 ft. was required, allowing space above the suspended ceiling for ducting and providing a minimum clear floor to ceiling height of 12 ft. A removable floor to a gallery at first floor level was required in one of the two pilot plant units. Other requirements were a constant and controllable temperature and humidity in certain areas, a centralized wash-up for laboratory glass-ware, administration accommodation, a technical reference library, a large conference room divorced from other activities, good access for delivery of samples and materials, and a large paint spray unit having controlled temperature. Provision was also to be made for future extension. An initial programme of 15 months was given from commission to occupation. It was suggested that because of the Dutch influence within the company a Flemish character in the building would be desirable. The following services were required to each bench or possible bench position: laboratory waste, gas, cold and pressurized water, vacuum, compressed air, electricity, together with connections for the future provision of steam, condense and nitrogen. Steam and condense were required to the two pilot plant units.



Plan and section, typical connection of lattice steel beam and in-situ r.c. column [Scale: ½" = 1' 0"]

SITE: topography, surroundings, access and planting

The site formed part of the grounds of Rusham House, Egham, at the junction of Whitehall Lane and Prune Hill on the fringe of the green belt and surrounded by wooded fields. The ground is largely flat, waterlogged and marshy in places, falls of about 1:10,000 were encountered in local surface water drainage. Finished ground level was raised an average of 18 in. above natural ground using excavated material derived from cleaning and extending the lake and subsequently turfed and planted. The lake, which is about ¾ acre in area, was badly overgrown, had no defined bank and necessitated the removal of about 4 ft. of silt before a reasonably clean gravel bottom was established. It forms part of local surface water drainage and is fed by underground springs the existence of which was unknown at the outset. Water from the lake is now used for cooling the constant temperature and humidity plant.

PLAN: general appreciation and relation of units

The functional relationship of the various units is rigid and virtually dictated the plan shape. There are basically 3 laboratory units. 1, surface coatings, 2, market development, 3, research, the first two of which are directly related to the pilot plant units being located on the ground floor. These two units are separated by the main entrance. The research laboratory on the first floor is occupied by a group headed by Sir Robert Robinson. The rest of the first floor provides administration accommodation, etc., while the conference room achieves a sense of isolation being projected over the lake. The building forms three sides of a square with a covered way on the fourth side. Service access is by means of this covered way while the staff entrance is across the internal court thus formed. The square plan shape lends itself to the use of an external peripheral duct giving access to all main services without disturbing the interior of the building. The ring main principle of services distribution permits a reversible flow if it is necessary to isolate any unit. The use of the laboratory bench as a planning module together with allowances for partition and plaster thicknesses was found to be fully justified and dictated the structural grid of 10 ft. 1 in. Tolerances of ⅛ in. were permitted and adhered to.

MAIN CONSTRUCTION: general appreciation

Excavation—difficult in waterlogged ground, pumping inadvisable because of withdrawal of

analysis

fines. Wherever possible underwater concreting techniques were employed. Sheet piling was necessary along the lake frontage and along deep drain trench excavations. Foundations generally were concrete except for two columns supporting the conference room which were cast inside 72-in. diameter concrete tubes used as caissons within the lake. The frame was originally to be steel but was changed to a composite structure because of delays in obtaining structural steel. Except for the two pilot plant units all columns are reinforced concrete having steel lattice beams designed to permit passage of ducting between top and bottom booms. Stiffness is provided by the use of reinforced concrete box frames for the main entrance and conference room. The walls are generally of cavity construction using 2-in. facings externally with 3-in. clinker block internally. The ground floor is a floating slab supported on ground beams used as walls to internal floor ducts. The first floor is of hollow pots and the roof aluminium decking. The main entrance window is of extruded aluminium sections, elsewhere windows are either of steel projected top hung or timber horizontally centre pivoted. The roof ring beam forms a parapet and is constructed of precast sections with in-situ joints.

	cost per sq. ft.	s	d
preliminaries, insurance, contingencies, quantity surveyors' fees, a proportion of pumping costs and extra cost of importing labour		**17**	**8½**

STRUCTURAL ELEMENTS

Work below ground floor level, foundation type, basement	*Location*	*Materials*	*Finish*	*Reasons and comments*		
Sheet piling	Lake front and deep drainage pits and trenches	Steel		Waterlogged ground		
Column foundations	General	Mass concrete using under-water techniques		As above		
Ground beams	Ground floor	Reinforced concrete		Lateral ground beams at approximately 10-ft. centres formed walls for lateral service ducts		
Main service duct	Periphery	Concrete floor, 9-in. brick walls				
Ground floor slab	General	6-in. reinforced concrete suspended slabs		Floor is raised 18 in. above mean ground level		
Discontinuous floating slabs	Paint rooms	6-in. reinforced concrete floating on cushion of sand insulated from adjoining structure	Waterproof rendering	To prevent transmission of vibration and penetration of damp		
				work below ground floor level	**9**	**10½**

External walls and facings	*Location*	*Materials*	*Finish*	*Reasons and comments*		
Cavity construction	Throughout	Inner lining 3-in. clinker blocks	Plaster			
Facing bricks	Main walls	2-in. light golden wire-cuts	Set in dark mill mortar, horizontal joints raked out, perpendiculars flush. A lap bond of 2 in. was insisted upon	A Flemish character in brickwork was desired		
	End walls	2-in. purple brown hand made				
Precast textured panels	Spandrels to ground floor windows	Exposed aggregate (black and white)		Non-structural panels		
Reinforced concrete	Flank walls to conference room and main entrance		Textured rendering in grey-green colour	Surface to concrete		
Plywood	Spandrels to conference room windows	Specially treated for weathering	Oiled mahogany	Light iron structural cladding of sympathetic appearance		
Hardwood boarding	Corner of library	Mahogany planking	Oiled	To give vertical emphasis		
				external walls and facings	**7**	**3¼**

Frame or load-bearing element	*Location*	*Materials*	*Beam spans*	*Column grid*	*Reasons and comments*
Columns	Generally except pilot plant	Reinforced concrete			Originally to be steel, changed to reinforced concrete because of difficulty in obtaining steel
Columns	Pilot plant	Steel			Necessary to be built into walls to avoid internal projections
Beams	Throughout	Steel lattice beams	23 ft. 8 in., 22 ft. 6 in. and 2 ft. deep	10-ft. 1-in. centres	Necessary to allow passage of ducts between top and bottom booms
Floors	Ground floor	Reinforced concrete			Structurally necessary
Floors	First floor	Hollow pot			
Box frame	Main entrance and conference room	Reinforced concrete	6-in. thick		Structurally necessary to give stiffness to an otherwise light structure
	Floor to conference room	Timber board and joist with access panels			Deep upstand beams supporting the conference room floor provide three compartments below the floor 4-ft. deep for location of items of permanent equipment and heating plant

analysis

					s	d
Upper floor construction	*Location*	*Materials*	*Finish*	*Reasons and comments*		
Hollow pot	General	6-in. hollow pots, 2-in. structural topping occasional solid areas to provide suspension points below	See floor finishes	Location of pots influenced by need for suspending heavy services below and for forming duct openings, etc.		
Solid slabs	Entrance hall and balcony	8-in. reinforced concrete				
	Canopies	6-in. reinforced concrete				
	Staircases	9-in. × 12-in. spine beam with r.c. cantilevered treads				
				frame and upper floor construction	**13**	**4**
Staircases	*Location*	*Materials*	*Finish*	*Reasons and comments*		
Main staircase (going 15 ft.)	Main entrance combined with canopy which is continuation of landing	Reinforced concrete spine propped with one central external column	Cantilever treads 5 ft. long out of solid teak 4-in. thick open risers. Fair-face concrete spine, painted	The intention was to use the staircase as the main design feature of the entrance hall without the creation of a visual barrier, which might have resulted from the use of a solid staircase		
Secondary staircase	North side	In-situ reinforced concrete carriage	Terrazzo, using white marble aggregate with carborundum inserts			
External staircase	Courtyard	In-situ reinforced concrete centre spine and prop	Precast granolithic cantilever treads, open risers	Organic conception, "Dinosaur" profile reflected in design of metal balustrading		
				staircases	**1**	**5¼**
Roof construction	*Location*	*Materials*	*Finish*	*Reasons and comments*		
	Generally	Aluminium decking on steel purlins	½-in. insulation board, three-ply bitumen felt with granite chippings	Lightness and ease and speed of erection		
	Entrance hall and conference room	Reinforced concrete slab	1-in. insulation board, three-ply bitumen felt granite chippings	Structurally part of box frame		
	Terrace	As first floor	2-in. lightweight screed reinforced bitumen felt paved 1½-in. granolithic divided into 1-ft. 6-in. × 3-ft. rectangles	Alternative means of access to first floor laboratories		
				roof construction	**3**	**3½**
Windows	*Location*	*Materials*	*Finish*	*Reasons and comments*		
	Main entrance	Extruded aluminium sections	Polished	The front of the entrance hall is fully glazed from floor to roof with no intermediate supports		
	Laboratories	Hot dip steel galvanized windows projected top hung	Painted white	Projected top hung windows chosen to avoid any internal projection when open and to give even natural ventilation when required		
	Offices, north side	As above	As above			
	Offices, south side	Hardwood	Polished	All windows have slate or polished asbestos sills and smaller windows are set in slate surrounds		
	Constant temperature rooms	Hardwood double-glazed sashes using non-actinic glass externally		For purpose of insulation Venetian blinds are introduced between glazing		
				windows	**4**	**7¾**
External doors	*Location*	*Materials*	*Finish*	*Reasons and comments*		
	Main entrance	Fully glazed in ebonized mahogany frames with sycamore glazing beads. A panel of zebrano veneered plywood is used over the doors	Polished push-plates are armour-plate glass. Pulls are bound in black leather on bronze frames	A clean, simple design was considered appropriate		
	Rear entrance	Fully-glazed Georgian wired glass in mahogany frames	Polished	Designed as part of large glazed screen on to inner court		
	Service entrances	Flush plywood, mahogany faced	Waxed and polished, transparent plastic finger-plates and aluminium kicking plates	All with double action floor springs		
				external doors		**4½**
Glazing	*Location*	*Materials*	*Finish*	*Reasons and comments*		
	Generally	32-oz. clear glass		Window units designed so as to avoid need for ¼-in. plate		
	Lavatories	Reeded glass				

analysis

Glazing: continued	*Location*	*Materials*	*Finish*	*Reasons and comments*	s	d
	Doors	Georgian wired polished plate		Safety		
	Constant temperature and humidity room	32-oz. clear glass internally, 32-oz. non-actinic glass externally		For insulation and to reduce solar gain		
	Screens	Alternately clear and obscured sheet		Decorative effect		
				glazing		11½

PARTITIONING

Internal partitions	*Location*	*Materials*	*Finish*	*Reasons and comments*		
Permanent	Corridors	3-in. clinker block prestressed with diagonal tension wires	Rendered and plastered	Due to the excessive floor to floor heights the slenderness ratio would have required all partitions to be at least 6-in. thick. By use of simple prestressing principle half this thickness was found satisfactory		
Demountable	Offices and laboratories	2-in. thick proprietary using aluminium framing and stove enamelled hardboard panels with sandwich insulation	Stove enamelled in epoxide paints, colour, grey-blue	Flexibility of partitioning was a requirement. Epoxide paints were chosen because of their resistance to wear, particularly in a chemical-laden atmosphere		
				internal partitions	4	11½

Screens	*Location*	*Materials*	*Finish*	*Reasons and comments*		
Glazed screen	Rear entrance from courtyard	Mahogany frame divided into squares having glazing in alternate clear and obscured sheet glass	Polished	For decorative effect and to light ground floor corridor		
				screens		2¼

W.C. doors and partitions	*Location*	*Materials*	*Finish*	*Reasons and comments*		
Doors	Lavatories	Flush plywood	Painted gloss			
Partitions	Lavatories	2-in. precast terrazzo using white marble aggregate	Polished			
				w.c. doors and partitions		2½

Internal doors	*Location*	*Materials*	*Finish*	*Reasons and comments*		
	Throughout	Flush plywood faced on solid core	Gloss painted			
Laboratory doors		Vision panels glazed with Georgian wired polished plate		To avoid accidents arising out of collision when opening doors. All laboratory doors are closed automatically to prevent interference with ventilation system		
				internal doors		10¾

Ironmongery to internal doors	*Location*	*Materials*	*Finish*	*Reasons and comments*		
	Generally	Locking roller bolt catches with transparent plastic push plates and nickel finished pull handles		Lever handles are not desirable in laboratories where it is often necessary to open doors while hands are carrying something or may be contaminated. A push-pull action is preferable		
				ironmongery to internal doors		10½

FINISHINGS

Floor finishes	*Location*	*Materials*	*Finish*	*Reasons and comments*
Granolithic	Plant rooms	Granolithic, 1½ in. thick	Hardened dust free surface	Cost per sq. yd. 23s. 0d.
Tiles	Ground floor terrace (rear entrance)	Quarry tiles, 6 in. × 6 in.	Dark blue, with narrow joints parallel with building, wide joints across building	Cost per sq. yd. 40s. 0d.
Tiles	All laboratories	Fully vitrified ceramic tiles, set on expanded metal lathing to prevent movement, acid resisting pointing	Grey with occasional white and grey-green inserts to pattern	Swedish tiles were chosen because of the following qualities: hard wearing, easily cleaned, resistant to acid and alkali, good appearance. Cost per sq. yd. 41s. 0d.
Monolithic	Pilot plant units	Patent material solvent resisting	Epoxide based finish. Ebonite strips as expansion joints	A hard wearing and inexpensive material resistant to most chemical spillage. Epoxide resins are manufactured by the clients. Cost per sq. yd. 16s. 1d.

analysis

					s	d
Floor finishes : continued	*Location*	*Materials*	*Finish*	*Reasons and comments*		
Linoleum	Ground floor corridors	4·5-mm. thick laid in 18-in. squares	Alternate colours, dark green and light grey	A good hard wearing material of pleasant appearance at reasonable cost. Cost per sq. yd. 17s. 7d.		
P.V.C.	First floor corridor	⅛-in. thick laid in 18-in. squares	Light grey mottled finish	Quiet and resilient, used as a demonstration of materials manufactured by the clients. Cost per sq. yd. 38s. 0d.		
Hardwood	Laboratory manager, exhibition room, library, salesmen's rooms	1-in. nominal missanda strip in random lengths laid on tanalised battens	Waxed and polished	Quality and appearance. Cost per sq. yd. 40s. 0d.		
Cork tiles	Administration offices (north side)	12-in. × 12-in.	Waxed and polished	Quiet and resilient. Cost per sq. yd. 35s. 0d.		
Carpet	Conference room	Softwood, t. & g. board, foam-rubber underlay and close carpet	*House and Garden* "mustard" broad-loom	Sound insulation required an absorbent finish. This carpet forms the major decorative item within the room. Cost per sq. yd. 64s. 9d.		
Mosaic	Main entrance	Vitrified tesserae to pattern designed by architect		Applied over under-floor heating coils. Cost per sq. yd. 78s. 0d.		
				floor finishes	6	6½
Wall finishes	*Location*	*Materials*	*Finish*	*Reasons and comments*		
Panelling	Conference room, end walls only	Stripey olive wood veneered panels in alloy framing as built up insulation lining to concrete walls	Waxed and polished	Aluminium framing was used rather than timber studding to keep the inner skin independent of the outer wall to increase insulation and prevent deterioration in timber		
Wall tiling	Wash up	White glazed tiles to door head height		Cleanliness and good reflective quality		
	Toilets	Dark blue tiles as splash backs and behind fittings only		For cleanliness and to give contrast against white fittings		
Plaster	Elsewhere	Anhydrous patent plaster	Emulsion paint			
				wall finishes		10
Ceiling finishes	*Location*	*Materials*	*Finish*	*Reasons and comments*		
Decking	Pilot plant units	Exposed underside of aluminium roof deck		No further treatment was considered necessary		
Panelled	Main entrance	Suspended plywood panels	Panels painted rich red, ceiling behind painted black	The cofferred effect of floating panels gives dramatic interest and masks projecting beams		
Plaster	Conference room	Plastered direct to curved underside of concrete roof	Painted blue grey			
Perforated aluminium	Elsewhere	Suspended heated and acoustic ceiling in perforated aluminium panels 24 in. × 24 in.	Painted yellow in heat resisting paint	A suspended ceiling was required to conceal the considerable extent of ducting and services and to provide the source of heat		
				ceiling finishes		2½
Decorations	*Location*	*Paint types*	*Munsell or other reference*	*Colour scheme and comments*		
	Walls generally	Emulsions		The scheme generally is based on Munsell and *House and Garden's* references, using white and pastel shades on large areas broken by panels of bright colour		
	Ceilings	Epoxide based paint (heat resisting)				
	Wood work	Hard gloss		The use of "epikote" based paints was suggested by the clients to be used wherever possible		
	Flush doors	Epikote based		The mural decoration in the main entrance hall was designed in association with the architects and drawn by Geoffrey Wickham from shells in the "Shell Tankers" collection. Tankers in the "Shell" fleet have been named after these shells		
	Concrete surfaces	Cement paints				
	Partitions (removable)	Epikote based				
	Steelwork (where exposed)	Bituminous emulsion protective primer and hard gloss finish				
	Hardwood	All hardwood waxed and polished				
				decorations	2	8¼

FITTINGS

Fittings	*Location*	*Materials*	*Finish*	*Reasons and comments*	s	d
Laboratory benches	Throughout	Tops in Moulmein teak, under-bench units in teak, oak and sycamore and ribbed aluminium plinths	Tops oiled elsewhere treated with epoxide resins	The whole of the laboratory furniture was designed by the architects. The laboratory bench was the basic planning unit. It is based on unit construction and is entirely standard throughout the laboratories. A central service rack to each double-sided bench houses the following services: gas, water, air, vacuum, electricity, wastes. All of which are permanently fitted but capable of immediate disconnection from main or branch service points in the floor. They can be placed end to end, repositioned on a 5-ft. grid, or turned through 90° without alteration to services other than a simple reconnection.		
	Surface coatings	Tops stainless steel, under bench units as before				
Fume cupboards	Throughout	Framed in teak and lined with stainless steel, having teak working tops at two levels and adjustable extract at three levels		The fume cupboards are completely self-supporting units 8-ft. long with service connection as for benches. They can be moved as required. Exhaust connections can be extended, reduced or repositioned. Remote control is provided to all services. The cupboards are lined with stainless steel		
				fittings	**14**	**1**

Office furniture	*Location*	*Materials*	*Finish*	*Reasons and comments*		
	Throughout			With certain minor exceptions, the whole of the furniture was designed or selected by the architects		
				office furniture	**3**	**6½**

SERVICES

Laboratory services	*Location*	*Materials*	*Finish*	*Reasons and comments*		
Town gas	To all benches, fume cupboards and hoods	Screwed barrel	Banded to B.S.C.P. identification colours	All main services are run in the external peripheral duct with branches at 10-ft. (10-ft. 1-in.) centres into laboratories feeding two-ways		
Compressed air	As above	As above		All connections to island benches immediately accessible for adjustment and to allow for moving of benches		
Pressurised water	As above	Galvanised mild steel tube, screwed joints				
Vacuum	As above	Screwed barrel				
Steam and condense	As above	Facilities only provided at this stage				
Nigrogen	As above	As above				
Mains water	To wash-ups and toilets	Screwed barrel				
Cooling water	To plant room	Galvanised pipe				
Power	To all benches, fume cupboards and hoods	Vulcathene covered cables within benches, conduit in screeds and walls. 2 batteries of 4 × 13-amp. socket outlets to each bench with flexible lead to floor sockets		The benches and fume cupboards are wired as a unit terminating with a 30-amp. screwed plug which is connected to a watertight socket-outlet within a concealed floor box two of which are provided to each 10-ft. 1-in. bay. Repositioning of benches does not involve any rewiring		
Pilot plant units				All the above services are provided by means of overhead piping on the ring principle with down drops and tappings as required. Steam is generated on the packaged principle by an electrode boiler located within the main plant room. The whole of the electrical installation within these areas is flameproof		
				laboratory services	**12**	**10½**

Rainwater disposal	*Location*	*Materials*	*Finish*	*Reasons and comments*
Down pipes	Internal pipes generally in vertical ducts	Cast iron where concealed, copper where exposed	Copper pipes, polished and lacquered	The main roof has a very slight fall to the centre from which flanged outlets connect to down pipes

analysis

					s	d
Rainwater disposal: continued	*Location*	*Materials*		*Reasons and comments*		
	External pipes	Vitreous enamelled steel				
Gutters	Pilot plant units	Integral with aluminium decking		These roofs have a one-way pitch		
				rainwater disposal		8
Plumbing internal: waste disposal	*Location*	*Materials*	*Finish*	*Reasons and comments*		
Soil wastes	From W.C.'s in vertical ducts or suspended below first floor	Cast iron LCC pattern		All pipework and plumbing is concealed but readily accessible in removable ducts		
Laboratory waste	From all benches and fume cupboards within service rack	1½-in. tellerium lead waste pipe and 1½-litre mercury trap having easily removable visual reservoir for trapping solids		Capable of withstanding excessive heat as well as resistant to acid, alkali and solvent attack. Ease of maintenance		
	In floor ducts and externally to dilution tanks	2-in. diameter chemical stoneware with acid and alkali resistant joints		Blanked off Y junctions are provided at two points in each 10-ft. run to facilitate rodding and to provide for future connections		
				cost included with services		
Hot water storage	*Location*	*Materials*	*Capacity*	*Reasons and comments*		
	Locally to lavatories and wash-up	Grouped electrical storage units		These were considered more economical than a piped domestic hot water system with separate calorifiers because of different temperatures required		
				hot water storage		1¾
Cold water storage	*Location*	*Materials*	*Capacity*	*Reasons and comments*		
Main water tank	Existing 25,000 gal. capacity tank located with existing buildings on site	Pressed steel sectional tank		Water supply to laboratory benches passes through an auto-pneumatic booster plant to maintain required and constant pressure of 25 p.s.i.		
				cold water storage		2½
Plumbing: sanitary fittings	*Location*	*Materials*	*Finish*	*Reasons and comments*		
Wash basins	Generally	Glazed fireclay	White glazed	Easy maintenance. Hard wearing. Waste and feed pipes in chromium		
W.C.'s	Generally	Low level suites		Backed against soil drainage run		
Urinals	Male lavatories	Glazed fireclay	Bowl type	Individual fittings preferred		
Drinking water taps	In each lavatory (except management)	Chrome bib taps		Placed over lavatory basin centred to pillar taps		
				plumbing: sanitary fittings		3½
Heating installation: heat exchanger type	*Location*	*Critical temp. and air change rate*		*Reasons and comments*		
Concealed hot water convectors	Pilot plant units	Designed to give 65° when outside temperature is 30° F. Two-speed axial flow fans give ventilation at 8 air changes per hour		The system throughout the building has been designed for low-pressure hot water with pumped circulation. The boilers are oil-fired using 200-sec. oil and situated to serve a further laboratory on the same site giving a total capacity of 6½ million B.Th.U./hr. from which the chemical building use 3 million B.Th.U./hr.		
Convectors	Conference room	Six concealed convectors in cells located under floor with outlet grilles at floor level. Each convector consisting of a gilled tube element supplied with hot water from the circulating mains to each unit		Concealed method of heating necessary to leave free wall space for fittings. Heat discharged under fittings at plinth level		
Gilled tube		Under window		For anti-condensation		
Acoustic heated ceiling	Ground and first floor including corridors	Zonal thermostatic controls operate to maintain a temperature of 65° in all laboratories, offices, etc., and 60° F. in the entrance hall, corridors, store-room, etc., with an external air temperature of 30° and a temperature of 180° consistently maintained at boilers. In the laboratories fresh filtered and tempered air is supplied to replace that removed by the fume extract systems (see ventilation)				
Embedded copper coils	Entrance hall—ground and first floor	½-in. bore copper tubing encased in circulating sleeves to enable hot water at full circulating temperatures to be passed through the tubes without producing excessive surface temperatures on the floor		Due to the heat loss of the window wall the limited area of heated ceiling was not sufficient to maintain a temperature of 60°.		
				heating installation	14	1

analysis

s d

Kitchen ventilation	*Location*	*Reasons and comments*
Fan type—15 paddle blade type centrifugal fans each capable of extracting 900 c.f.m. from the fume cupboards with sashes 1 ft. 6 in. open. The insides of the fan casings and the impellers are treated with epoxide based paint to protect metal from corrosive action of fumes	On the roof	The system of extract ventilation for the fume hoods and cupboards was designed in such a way as to permit their being moved and repositioned as required. Fifteen fume extract fans were provided and from each fan, groups of multi-way asbestos ducts were carried down and run horizontally in the false ceiling in the corridors. To each fan was connected one way of a multiple duct and to each way branches were connected, communicating with the laboratories to which each fume cupboard or hood may be connected. It was necessary to provide separate ducts to each cupboard due to incompatibility of gases. To prevent the heat loss due to the air extracted from the laboratories by the fume cupboard fans, a supply fan with air filters, air heater battery and a system of distribution ductwork was provided to supply tempered air into the laboratories. In the wash-up a 12-ft. × 6-ft. extract hood is provided with ducting to a fan on the roof

ventilation 7 2

Drainage	*Location*	*Materials*	*Finish*	*Reasons and comments*
Surface water	Throughout	Cast-iron spigot and socket pipes under building, salt-glazed elsewhere		There is no main surface water disposal system in the area, use was made of the lake for this purpose. Surface water from the rear of the building is collected in an ornamental pool in the internal court
Soil drainage	Throughout	Cast iron within building, salt-glazed externally		A sewage pumping station was necessary to lift effluent around 14 ft. to local authority's sewer. Depth of sewage collecting chamber fixed by drainage from other buildings on site
Chemical drainage	Throughout	Chemical stoneware pipes to local dilution chambers then in salt-glazed		Dilution chambers for all chemical effluent were essential to prevent corrosion of pumps and contamination of public sewer

drainage 3 7½

Electrical installation	*Location*	*Materials*	*Illumination level*	*Reasons and comments*
Light fitting types. Special 5-ft. twin tube to be fluorescent fittings	Laboratories, offices		Final values after depreciation are 27 lumens with a consumption of 1·9 watts per sq. ft. of floor area but excluding choke boxes	These fittings were designed by the architects in collaboration with both the heating and electrical engineers
Flameproof tungsten installation employing dispersive reflectors	Pilot plant units		As above	The use of flameproof fittings and switchgear in the workshops was essential. The use of tungsten against fluorescent being partly economic and partly due to extended deliveries
6½-in. internal diameter soffit ring fitted to acoustic panels and suspended through it by 1 in., a 7-in. × 5-in. diameter aluminium reflector with external finish in terra-cotta	Corridors, lavatories, rest room, locker room		9-12 lumens sq. ft.	Use of fluorescent fittings would have occupied too great an area of heated ceiling. Tungsten fittings as designed by architects considerably cheaper and more satisfactory
All bracketed tungsten lights	Entrance hall, ground and first floor			General decorative effect
Recessed tungsten ceiling fittings	Soffit to first floor ceiling			The same design as used in the corridors was applied in this instance again in conjunction with the acoustic ceiling
Suspended fluorescent fittings	Conference room	Twin 5-ft. 80-watt units finished with egg crate louvres		It is so arranged that high illumination by fluorescent lighting is given over the table and a more subdued result can be obtained by the tungsten fittings which are spaced symmetrically around the room. The degree of "sparkle" produced from simultaneous use of both tungsten and fluorescent was desired
Tungsten lighting	Conference room	Opal glass fittings on 4-ft. satin finish brass tube suspension		
Spot lights	From underside of projecting room	Concealed directional floods		To illuminate viewing platform below conference room and to produce parallel sided beam effect

Wiring and switching types	*Location*	*Materials*	*Reasons and comments*
Lighting fittings	Laboratories, corridors, offices	V.I.R. cables in phase colours harnessed in trunkings. Flush fitting micro-gap switches in white	Trunking necessary to permit future repositioning of fittings and to provide support for cables above the heated ceiling with tee-off conduit drops to switches. Trunking 6 in. × 6 in. and 4 in. × 4 in.
Lighting fittings	Pilot plant units	Surface run conduit	Feed to flame-proof lighting installation

Power supply type	*Location*	*How distributed*	*Reasons and comments*
Laboratory services	Within laboratories	V.I.R. cable in trunking to nautical type floor boxes in pairs for use in alternative positions. Located under axis of service rack	It was necessary to provide flexible electrical services for bench positions without disturbing the overall floor pattern. Flexible leads are taken from the floor box to the socket outlet box mounted on the 8-in. wide service rack. In the main laboratories 13 amp. socket outlets average one per 17 sq. ft. of floor area. Those on walls and partitions are in twin groups at 5 ft. c-c and 6 in. above bench level

analysis

				s	d
Power supply type: continued	*Location*	*How distributed*	*Reasons and comments*		
	Generally	From 1,000 KVA mains transformer to bus-bar chambers of 1,000 amps. capacity. Three out-going feeders serve the laboratories. One for laboratories generally, two to the pilot plant units each terminating in distribution switchboard	Flexibility of the bus-bar and ring main system answered the laboratory requirements of economics and ease of installation, maintenance and subsequent modifications. Total number of power points installed are 442 with a 70·4 K.W.S. The spray-booth and associated tempered air equipment provide an additional load of 110 KVA (air movement 75,000 c.f.m. at controlled temperature)		
		From switch boards cable trunkings are fitted in the false ceilings and carry all sub-mains to both power and lighting distribution boards in the corridors. Conduits enclosing final circuits all radiate from these trunkings on the ring main principle			
	Pilot plant units	Copper sheathed cables direct wired from main distribution board (external) to powered equipment	Main isolating switches provided outside escape doors for emergency use		
		4 separate 30 amp. F.P. switch fuse units provided for future use in each unit			
			electrical installation	**14**	**7½**

Lifts	*Location*	*Capacity and speed*	*Motor room position*	*Reasons and comments*		
Goods lift	Sample receipts, stores and wash-up	10-cwt.	Over-head motor room	Necessary to convey heavy apparatus to first floor laboratories from ground floor stores and to facilitate glassware traffic to and from wash-up		
				lifts	**1**	**1½**

External works and landscaping	*Location*	*Materials*	*Finish*	*Reasons and comments*		
Lake	Extent of main south facade	Retaining wall along building steel sheet piling encased with concrete where exposed using ribbed asbestos shuttering		The lake, badly overgrown and silted up, formed an existing feature which the clients' wished to retain. After removing 4 ft. of silt, the lake and island were remodelled to form a geometric pattern in relation to the landscaping generally. It now provides a source of cooling water for the refrigeration plant to the constant temperature and humidity room. Second-hand sheet piling was used and since its resale value was nil, it was decided to retain it in position		
		Banks formed out of sand bags filled with weak concrete and given a concrete surface with spade finish				
Roads	Link roads between the two buildings and canteen complex and entrance road to chemical building	Consolidated metalling as base	Bituminised macadam as stated preference by clients	Access and circulation		
Paving	Around peripheral of building and internal courtyard	2-in. thick pre-cast concrete slabs	To pattern	To form walking areas and trim to grass and flower bed areas. Also used as removable covers to peripheral duct		
Fencing	Main road boundary and boundary of car park	6-ft. high chain link		For security purposes. The fences have been placed behind quick thorn and holly. In time the appearance will be of an evergreen hedge		
Planting	Grass and trees and flower beds generally			Planting has been generally chosen for coloured and patterned foliage with the use of small defined flower beds to give punctuation and isolated masses of colour. Great care was taken to preserve as many existing trees as possible and these were brought into the landscape design		
				external works and landscaping	**12**	**0**

FIRE

Structural precautions	*Grade of protection apparatus*	*Reasons and comments*		
Fire doors	Providing at openings to flameproof areas	Steel doors painted		
Fire hoses and extinguishers	Fire fighting equipment fitted to the ends of laboratory benches. Blankets housed on the walls	Company's regulations		
Fire alarm system	Automatic system installed on both floors	No dry or wet hydrants were provided because of lack of mains pressure and availability of lake water		
		fire precautions		**2**
		total net cost per sq. ft. of floor	**160**	**10½**

analysis

TIME SCHEDULE

Work commenced	*Work completed*	*Type of contract*	*Sketch design agreed*
November, 1954	Partial occupation of building during January, 1956	RIBA with approximate bills of quantities subsequently remeasured	April, 1954

RATIOS

Area of enclosing walls / Total floor area	= 0·85 / 1	Area of windows (including external doors) / Total floor area	= 0·27 / 1
Area of solid wall / Total floor area	= 0·58 / 1	Total roof area / Total floor area	= 0·61 / 1

COST SUMMARY

Total floor area	*Total cost of building equipped*	*Cost of building excluding furniture and equipment*	*Cost of building excluding furniture, equipment and laboratory services and power requirements*
25,500 sq. ft.	£205,114—cost per ft. super of floor area 160s. 10½d.	£182,614—cost per ft. super 143s. 3d.	£138,427—cost per ft. super 108s. 7½d.

The architects wish to emphasize that the cost analysis is based so far as is possible upon actual costs and these have in no way been modified or adjusted. The following points are worth noting. 1. The figure for preliminaries is high since under this head is included the very high costs of importing labour. 2. The substructure costs reflect the cost of carrying out foundation work in waterlogged ground. 3. The landscaping costs include in addition to roads the virtual formation of the lake together with its revettments. 4. The cost of laboratory furniture and fittings represents 10·7 per cent. of the total cost. 5. The cost of laboratory services and power requirements providing for the degree of flexibility desired represents 21·25 per cent. of the total cost. 6. These two together represent 31·95 per cent. of the total cost.

COST COMMENTS

Where "time is of the essence" and there is need for a high class appearance and a finish of "prestige value" it is obvious that cost planning down to a fixed target has been of secondary importance. A client's brief calling as it did for an initial programme of 15 months from commission to occupation and containing such needs as a site close to an existing lake, has its repercussions on the ultimate cost.

One effect was no doubt the decision to go out for tender on approximate quantities with subsequent remeasurement—never a cheap method of building. Now that the work has been completed with due speed the actual cost of the building has been analysed at 160s. 10½d. per ft. super.

The following factors should be noted.

1. The cost comments which the architects have themselves made in the analysis. (see above)
2. When comparing costs per ft. super of buildings it is not usual to include external works and landscaping which in this contract amounted to **12s. 0d.**
3. Heating installation at 14s. 1d. includes boilers capable of serving future laboratories.
4. The use of extended equipment above the benches resulted in a 2-storey building some 28 ft. high which is considerably higher than normal and tends to give an increased cost per ft. super especially with the relatively high perimeter to floor area ratio of 0·85.

Taking these factors into account the cost per ft. super begins to assume more normal proportions and with flooring at an average cost of 58s. 6d. per yard super, a fair idea of the high standard of finish given to the client can be appreciated.

SITE ORGANIZATION

Site labour and equipment: All labour on site was recruited and controlled by a general foreman through leading hands and a ganger. Local labour was not available in the strength required, and the majority of the men came from the London area and travelled daily. In the early stages of the contract an engineer was on the site until foundation work was completed. Normal builders plant was used throughout the contract, but excavation equipment was used in connection with dredging and sheet piling the lake and digging and sheet piling to the sewage pump house.

Job management: the management of the contract was carried out from head office and visits were made by the contract manager at least twice weekly. An assistant manager and surveyor were resident on the site most of the time. At the commencement of the contract a progress programme was prepared, and at each fortnightly site meeting with the architect and main subcontractors this was reviewed. A partial incentive scheme was introduced and operated successfully.

CONTRACTORS

Clerk of Works: A. E. Why. *General Contractors:* Trollope & Colls Ltd. *Sub-contractors—Heating, ventilation and services:* G. N. Haden & Sons Ltd. *Heated acoustic ceilings:* Frenger Ceilings Ltd. *Landscaping:* Turfsoil Ltd. *Electrical:* Central Electric Company. *Flooring:* Dennis Williams Ltd., Hollis Bros. Ltd., John Lewis & Co. Ltd., Phoenix Rubber Co. and Semtex Ltd. *Windows:* Crittall Manufacturing Co. Ltd. Holcon Ltd. and Williams & Williams Ltd. *Window surrounds:* Bow Slate & Enamel Co. Ltd. *Window sills:* Bow Slate & Enamel Co. Ltd. and G. R. Speaker & Co. Ltd. *Roofing:* William Briggs & Sons Ltd. *Steelwork:* S. & C Walmsley Ltd. *Ironmongery:* J. D. Beardmore & Co. Ltd. *Doors:* Jayanbee Joinery Ltd. *Sanitary fittings:* Adamsez Ltd. *Laboratory benches:* Sotos Ltd. *Furniture:* Hille of London Ltd., John Lewis & Co. Ltd., Liberty & Co. Ltd. and Terrence Conran. *Curtaining:* Primavera *Light fittings:* E. Heffer & Co. Ltd. and Merchant Adventurers of London Ltd.

working detail

COVERED WAYS AND CANOPIES: 20

CANOPY: FACTORY AT AALBORG, DENMARK

Preben Hansen, architect

(material supplied by Michael Andrews)

The form of the canopy was dictated by three considerations: the desire to give a sufficient height at the front edge (actually 11 ft. 6 in.) to enable lorries to unload in the dry, to provide good daylight at the back of the loading bay, and to provide a neat method for disposing of rainwater.

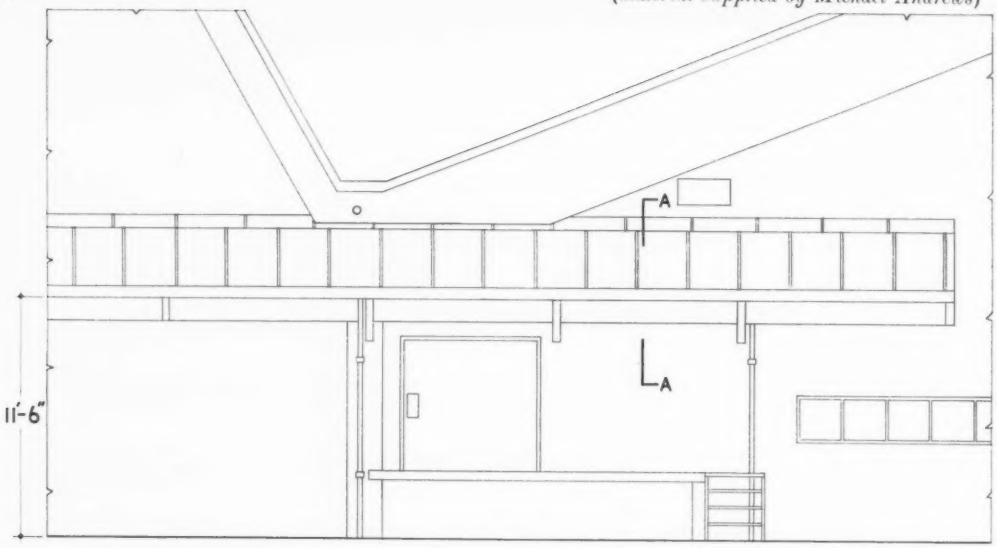
working detail

COVERED WAYS AND CANOPIES: 20

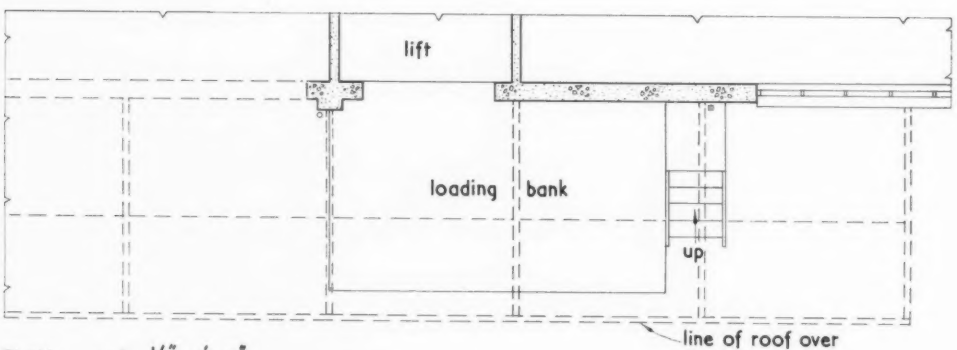
CANOPY: FACTORY AT AALBORG, DENMARK

Preben Hansen, architect

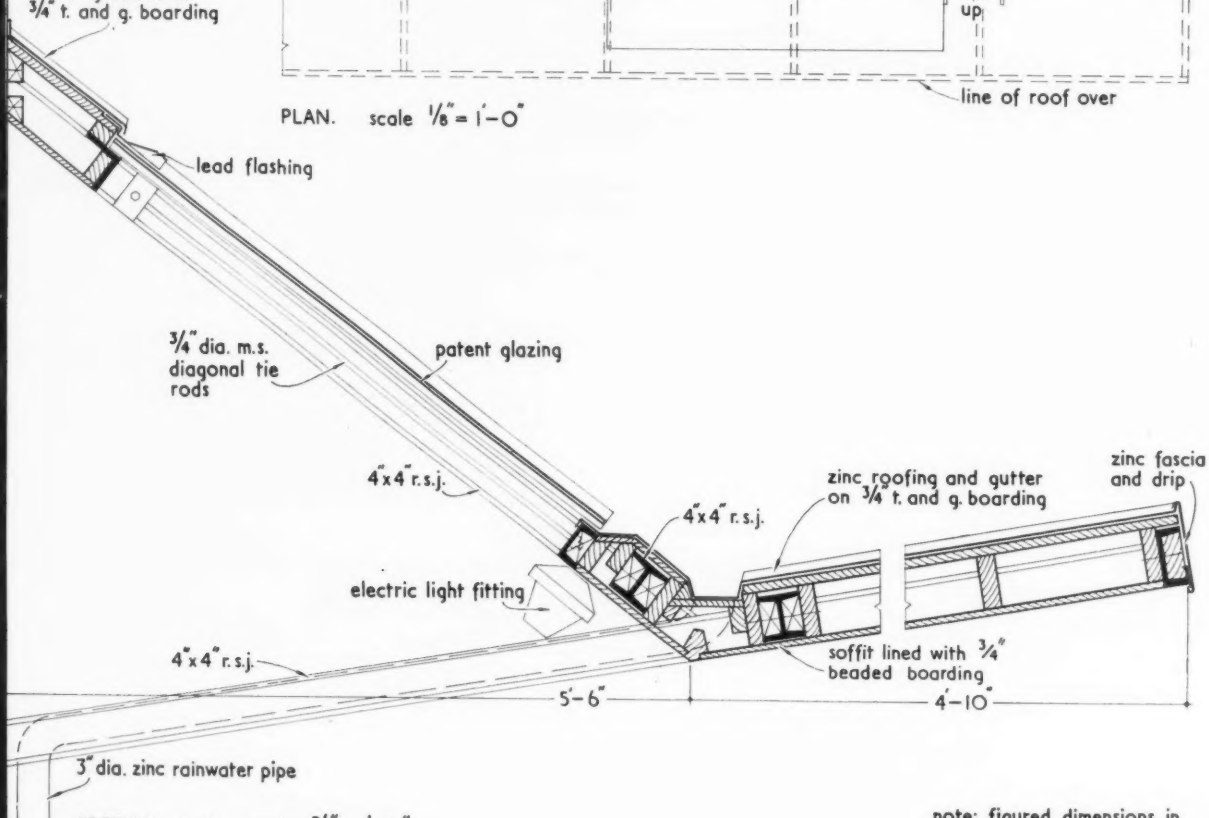
(material supplied by Michael Andrews)



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



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



SECTION A-A. scale 3/4" = 1'-0"

note: figured dimensions in feet and inches are approximate

working detail

WINDOWS: 48

WINDOW: FACTORY AT AMAGER, DENMARK

Preben Hansen and Alf Cock-Clausen, architects (*material supplied by Michael Andrews*)

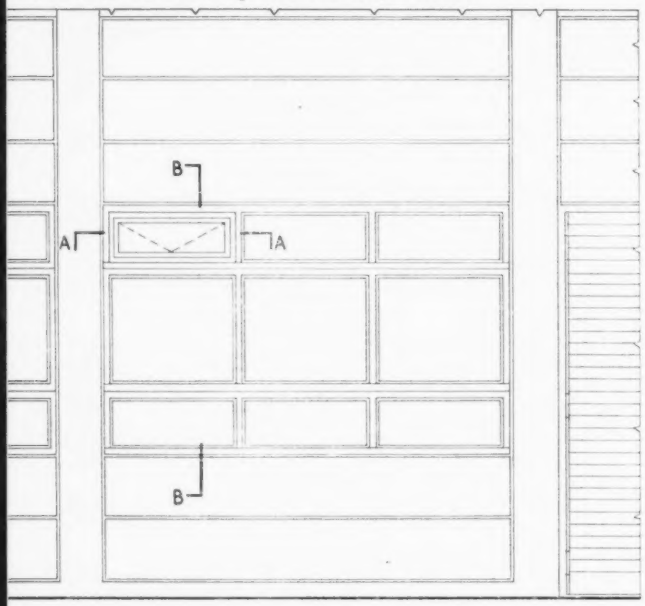
This detail shows one of many combinations of factory-type window units in precast concrete for use with standard precast concrete wall panels. As will be seen, the precasting is of an exceedingly high quality and the skilful use of mouldings gives to the material a delicacy comparable to that of wood. Wood is used only in the opening lights and fixing beads. Wood members are secured to the concrete surrounds by copper screws and are bedded in mastic.

working detail

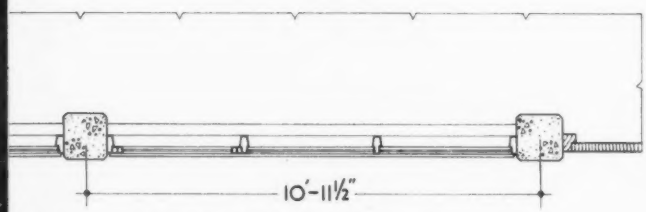
WINDOW: FACTORY AT AMAGER, DENMARK

Preben Hansen and Alf Cock-Clausen, architects

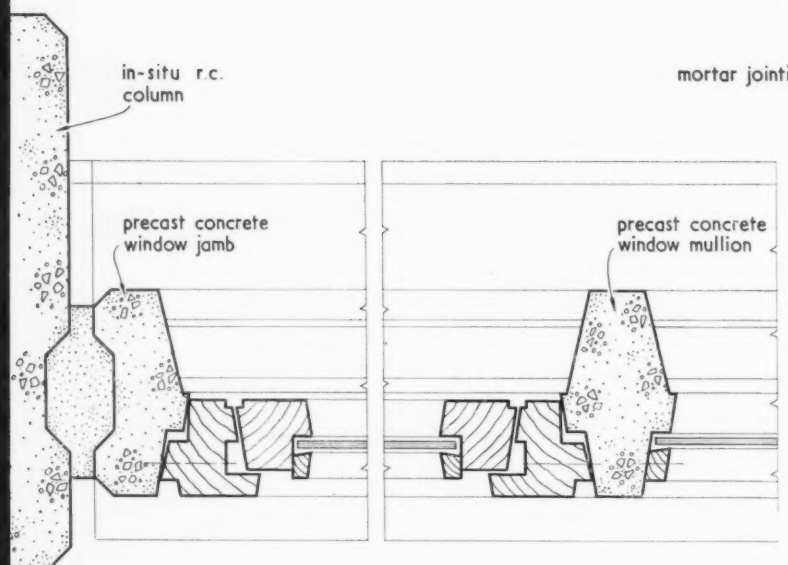
(material supplied by Michael Andrews)



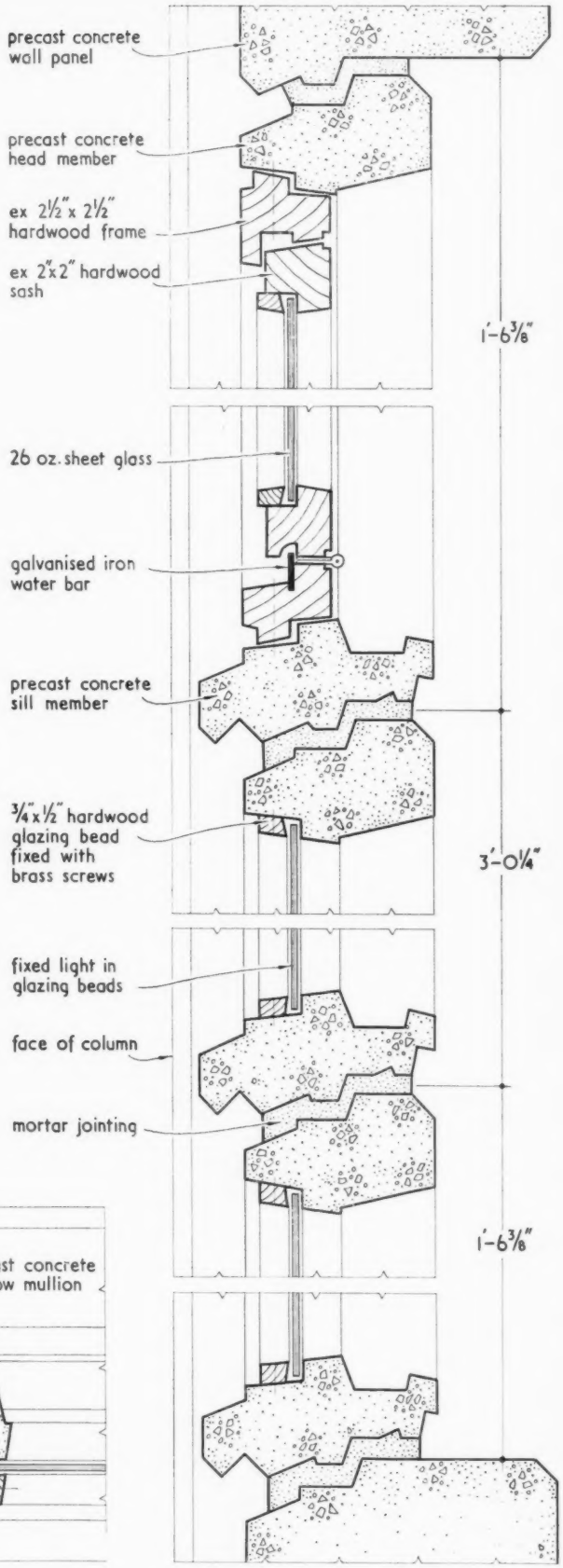
ELEVATION scale ¼" = 1'–0"



PLAN. scale ¼" = 1'–0"

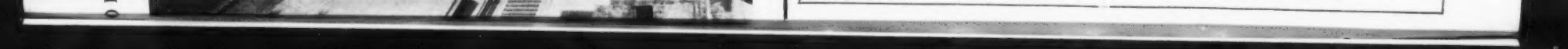


PLAN AT A-A. scale ¼ full size

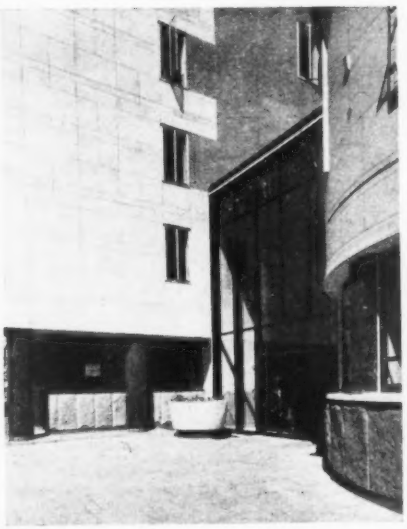


SECTION B–B. scale ¼ full size

note: dimensions figured in feet and inches are approximate



OFFICES IN GRESHAM STREET, LONDON, E.C.2



Barrington House, 59-67 Gresham Street, in the City of London, is a new block of offices owned by the Legal and General Assurance Society Ltd., and designed by Sir John Burnet, Tait and Partners in association with Felix Wilson and Partners. The site is 1·2 acres; the nine floors of offices have an area of 181,200 sq. ft. The building was formally named after the Hon. W. B. L. Barrington on January 24, 1957. The illustrations show, left, the view along Gresham Street looking east; above left, the main entrance to Gresham Street; above right, looking into the main entrance from the first floor gallery.

SURGERIES AT OTTERY ST. MARY, DEVON

This building, at Ottery St. Mary, Devon, contains surgeries for a group of four doctors and two dentists. It was designed by Anthony Lamb and was built at a cost of £5,288. Walls: rendered and painted externally, plastered and distempered internally. Roof: dun-colour, double Roman clay tiles on felt. Ceilings: plasterboard, with skim coat of plaster generally; accousti-celotex in corridors. Windows: standard galvanised steel. Heating: night storage heaters in the doctors' wing; tubular heaters (electric) in the dentists' wing. Flooring: accotile thermoplastic tiles generally; granolothic in dark room and cloakrooms.

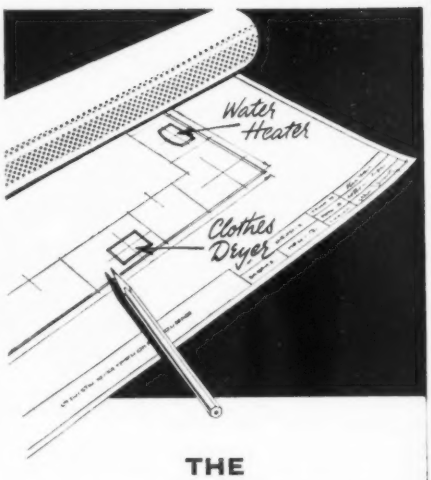
GOVERNMENT OFFICES AT WIESBADEN

Paul Schaeffer-Heyrothsberge, Architekt B.D.A.

MARLEY FLOOR TILES SPECIFIED TO COVER 31,600 SQUARE YARDS

The Marley Tile Company Ltd., Sevenoaks, Kent. *Sevenoaks 55255* EX.3

TWO POINTS TO REMEMBER WHEN PLANNING FOR KITCHENS

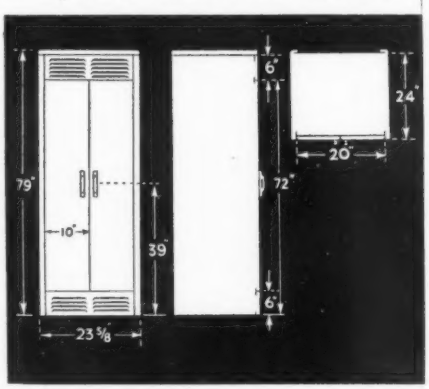


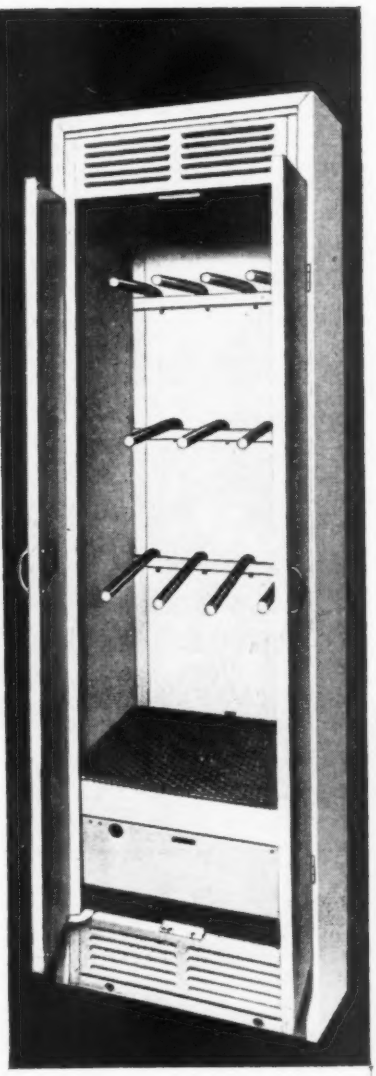
THE FLAVEL GAS-HEATED 'SUNTRAP' CLOTHES DRYER

(for single dwelling installations)

THIS CLOTHES DRYER is strongly constructed of zinc-coated steel sheet, finished in cream enamel paint. Fitted with double doors, and heated by means of a gas-burner unit in the base, the Dryer is large enough to contain an average weekly wash. The clothes are hung on eleven tubular bakelite rails at three different heights. A guard is provided above the burner unit and the gas-rate is controlled by means of a constant-pressure governor. Gas rate 10,000 B.Th.U. per hr. (20 cu. ft./hr. of 500 C.V. gas). Connection ¾ inch B.S.P.

The Flavel 'Suntrap' Clothes Dryer is constructed so that it can be supplied either as a complete unit or, alternatively, for building into a recess or corner by utilising the main frame assembly and such component parts as may be necessary.





THE FLAVEL 'NATIONAL' INSTANTANEOUS SINK GAS WATER HEATER

Provides a full half-gallon of piping hot water every minute, at a farthing a gallon. A broken feed type heater, with all working parts totally enclosed. Designed for wall fixing, it works equally well on both hard and soft water.

★ ★ ★

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

★ ★ ★

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

★ ★ ★

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

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

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

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

HAVE YOU ANY PROBLEMS ON

KITCHEN PLANNING and CATERING HYGIENE?

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This 28-page booklet is a complete step-by-step guide to planning and equipping large-scale kitchens for schools, hospitals, hotels, restaurants, industrial and institutional canteens. Send now for *your* copy (ref. no. 11.K.P.) to be sent free of charge and remember that our Advisory and Planning Departments are always at your service.

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To Small & Parkes Ltd. (Stairtreads Dept.), Manchester 9
PLEASE SEND ME YOUR ILLUSTRATED CATALOGUE GIVING DETAILS OF NOSINGS, COLOURS & DIMENSIONS OF DON STAIRTREADS—and names of depots and suppliers.

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CLASSIFIED ADVERTISEMENTS

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

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

Public and Official Announcements

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

AIR MINISTRY Works Designs Branch requires in London and Provinces ARCHITECTURAL ASSISTANTS, experienced in planning/preparation of working drawings and details for permanent and semi-permanent buildings. Salaries in London up to £790 p.a. for men and £735 for women. Somewhat lower in Provinces. Starting pay dependent on age, qualifications and experience. Long term possibilities, with promotion and pensionable prospects. 5-day week, 3 weeks 3 days leave a year. Liability for overseas service. Normally natural born British subjects. Write, stating age, qualifications, employment details, including type of work done, to any Employment Exchange, quoting Order No. Borough 1000. 5141

COUNTY BOROUGH OF MERTHYR TYDFIL
PERMANENT APPOINTMENT OF TWO SENIOR ARCHITECTURAL ASSISTANTS

Applications are invited for the above appointments at a salary in accordance with grade A.P.T. V of the National Scheme of Conditions of Service.

Applicants must be Associate Members of the Royal Institute of British Architects and must have had good all round experience in the architectural work usually undertaken by the Local Authority. Planning experience would be an advantage.

Housing accommodation will be provided if required, and reasonable removal expenses of the successful applicant will be paid.

The appointment will be subject to the Local Government Superannuation Acts and to the passing of a medical examination. The appointment will be terminable by one month's notice on either side.

Applications stating age, past and present appointments, qualifications and experience, together with copies of three recent testimonials should be delivered to the undersigned not later than 12 noon on 16th February, 1957.

Canvassing in any form will disqualify.

T. S. EVANS,
Town Clerk.

Town Hall,
Merthyr Tydfil
29th January, 1957. 5176

CITY AND COUNTY OF THE CITY OF EXETER

Applications are invited for the following appointments on the establishment of the City Architect's Department:—

(*a*) PRINCIPAL ASSISTANT ARCHITECT (Design). Salary within A.P.T. Grades VI/VII (£902 to £1,230).

(*b*) SENIOR ASSISTANT ARCHITECTS. Salary A.P.T. Grade IV (£727 to £907).

(*c*) ASSISTANT ARCHITECT. Salary Special Classes Grade (£707 to £861).

Applicants for all posts must be Associate Members of the R.I.B.A. or hold equivalent qualifications.

Applicants for appointment (*a*) must have had considerable experience in all phases of modern design and construction related to schools, colleges and civic buildings, and in the control and organisation of drawing office staff. For appointment (*b*), preference will be given to those experienced in the design and construction of schools and civic buildings. For appointment (*c*), preference will be given to those experienced in housing and school work.

The appointments will be subject to one month's notice on either side and to the provisions of the Local Government Superannuation Acts 1937-1953. The successful applicants will be required to pass medical examinations.

Canvassing will disqualify, and applicants must disclose whether, to their knowledge, they are related to any member of the Council or to the holder of any senior office under the Council.

Applications, stating age, qualifications, previous and present appointments and salaries, with full details of experience and earliest possible date when available, should be sent to H. B. Rowe, F.R.I.B.A., A.M.I.Struct.E., City Architect, Municipal Offices, Exeter, not later than the 23rd February, 1957.

C. J. NEWMAN,
Town Clerk.

Exeter.
February, 1957. 5198

BOROUGH OF BARKING
CLERK OF WORKS

Applications are invited for the above appointment on grade A.P.T. II (£609 17s. 6d. × £20 10s. to £691 17s. 6d. per annum, plus London weighting £20 to £30 per annum according to age).

Applications on forms obtainable from the Borough Architect, Town Hall, Barking, should reach the undersigned not later than 9 a.m., 22nd February, 1957.

E. R. FARR,
Town Clerk.

Town Hall,
Barking. 5240

QUANTITY SURVEYING ASSISTANTS required by Air Ministry Works Directorate in London and Provinces. Grade and commencing salary based on not less than 3 or 5 years' previous experience under Quantity Surveyor or Building Contractor. Approved full time study will count towards 5 years period. Normally technical qualifications in Builder's quantities or building, e.g. C. & G. final or O.N.C. or proof to equivalent standard. Duties include abstracting and billing, site measurement and preparation of estimates. Salary range £515 to £790 London rate starting pay dependent on age, qualifications and experience. Salaries somewhat lower in Provinces. Pensionable and promotion prospects. 5-day week, 3 weeks leave a year. Applicants normally should be natural-born British subjects. Write stating age, qualifications and previous appointments including type of work done to AA.879/80, London Appointments Officer, Ministry of Labour and National Service, 1-6, Tavistock Square, W.C.1. No original testimonials should be sent. Only candidates selected for interview will be advised. 4833

BOROUGH OF LEYTON

Applications are invited for the appointment of SENIOR ARCHITECTURAL ASSISTANT at a salary of £814 17s. 6d. rising to £994 5s., plus London Weighting (£30 p.a. at age 26 years or over), in accordance with Grade A.P.T. V of the National Scheme of Salaries.

Applicants must be Associates of the Royal Institute of British Architects and have had considerable experience of local authority building projects of all types.

The Council is unable to assist with the provision of housing accommodation.

Forms of application with full details of the appointment can be obtained from the Borough Engineer and Surveyor by whom completed applications must be received not later than Saturday February 23rd, 1957.

D. J. OSBORNE,
Town Clerk.

Town Hall, Leyton, E.10.
February 4th, 1957. 5252

ESHER URBAN DISTRICT COUNCIL
APPOINTMENT OF ARCHITECTURAL ASSISTANT, GRADE APT. II
READVERTISEMENT

Applications are invited for the above-mentioned appointment at a salary in accordance with Grade APT. II (£609 17s. 6d.—£691 17s. 6d.) plus London Weighting. The starting point in the grade will be dependent upon qualifications and experience. The Council is prepared to assist with the provision of housing accommodation if required.

Form of application and further particulars obtainable from the Engineer and Surveyor, Council Offices, Esher, to whom applications must be returned by 25th February, 1957.

FREDERICK EDWARDS
Clerk of the Council.

Council Offices,
Esher. 5253

BOROUGH OF NEWCASTLE-UNDER-LYME requires a SENIOR ASSISTANT QUANTITY SURVEYOR in the Borough Engineer and Surveyor's Department. Salary in A.P.T. IV according to qualifications and experience (£727—£907).

Applicants will be required in connection with taking off for new Schools and Housing contracts. Favourable consideration will be given to the provision of housing accommodation in suitable cases. Application forms and conditions of appointment may be obtained from the Borough Surveyor, Lancaster Building, High Street, Newcastle, Staffs., and must be returned to him not later than Monday, 25th February, 1957.

C. J. MORTON,
Town Clerk.

5258

GOVERNMENT OF CYPRUS
ARCHITECTS, PUBLIC WORKS DEPARTMENT

To prepare, under the direction of the Senior Architect, plans and designs for government buildings, and may also be required to supervise building projects under construction.

Contract appointments. Salary range £1,677 to £2,101 p.a.

Point of entry according to qualifications and experience. Gratuity £37 10s. for each completed three months' satisfactory service. Free passages for officer, wife and family up to five persons in all. Quarters, if available, at low rent. 3½ days' leave for each month of resident service.

Candidates must be A.R.I.B.A. with at least 5 years' approved experience.

Write Director of Recruitment, Colonial Office, London, S.W.1, giving briefly age, qualifications and experience quoting BCD 112/17/06. 5264

CANNOCK URBAN DISTRICT COUNCIL
SENIOR QUALIFIED QUANTITY SURVEYOR

Applications are invited for the above-named appointment in the Architect's Department.

Salary A.P.T. V (£814 17s. 6d. to £994 5s.) or VI (£902 to £1,107 per annum), commencing point to be fixed according to qualifications and experience.

Housing accommodation available for successful married applicant, if required.

Further particulars and forms of application available from the undersigned.

Closing date, 27th February, 1957.

W. C. SPEEDY,
Clerk of the Council.

Council House,
The Green,
Cannock, Staffs.
1st February, 1957. 5244

BOROUGH OF SWINTON AND PENDLEBURY
ARCHITECTURAL ASSISTANT

Applications are invited for this position within the Grades A.P.T. III-IV (£656—£907 2s. 6d. per annum), the commencing salary being determined having regard to qualifications and the gradings for Special Classes of Officers (N.J.C. Circular 113A). The work will be mainly in connection with housing development.

Form of application, obtainable from the Borough Engineer, Town Hall, Swinton, Lancs., must be returned so as to reach me not later than Monday, 4th March.

Canvassing will disqualify.

VINCENT COLLINGE,
Town Clerk.

524

CITY OF PLYMOUTH

Applications are invited for the appointment of:—

(*a*) SENIOR PLANNING ASSISTANT (one only on establishment, ranking next to Chief Planning Assistant). Applicants must be suitably qualified, and should have had experience in urban planning. Salary will commence at a point within Grade A.P.T. IV (£727 15s.—£917 2s. 6d. according to qualifications and experience.

(*b*) PLANNING ASSISTANT, Grade A.P.T. II (£609 17s. 6d.—£691 17s. 6d.). Applicants must have had some planning experience.

Age limit 40, or 45 if serving with L.A. Positions pensionable, subject to medical examination. Housing may be made available, and part of removal expenses refunded.

Applications returnable by 28th February, 1957, on forms obtainable from me.

J. PATON WATSON, C.B.E., M.I.C.E.,
City Engineer and Surveyor.

Guildhall,
Plymouth. 5237

STAFFORDSHIRE COUNTY COUNCIL
EDUCATION ARCHITECT'S DEPARTMENT
ASSISTANT INSPECTOR OF BUILDINGS

Applications are invited for the post of Assistant Inspector of Buildings in the South-East Divisional Area, based at Wednesbury, from persons having practical experience in the building trade, the preparation of specifications and estimates, and who are car owners. Salary will be in accordance with Grade A.P.T. II (£595—£675 per annum).

Forms of application, which must be returned within 10 days from the date of this advertisement, may be obtained from: A. C. H. Stillman, Esq., F.R.I.B.A., Green Hall, Lichfield Road, Stafford.

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

524

LANCASHIRE COUNTY COUNCIL
DEPUTY ASSISTANT PLANNING OFFICER

required in the Development Section at Headquarters; salary A.P.T Grade VII (£999 7s. 6d.—£1,230).

This officer will, through the Assistant County Planning Officer, assist in the execution of policy relating to Development Plan preparation, submission and modification and appropriate co-ordination with outstationed offices.

Experience is required in the reception of overspill population including schemes under the Town Development Act. Applicants must have a sound knowledge of general planning and development legislation and experience of development control procedure, consultation and administration.

Candidates should have one or more of the following qualifications: a University Degree in Planning or Estate Management, A.R.I.C.S., A.M.I.C.E., A.M.I.Mun.E., A.M.T.P.I.

Applications stating age, qualifications, present appointment, experience and two referees to the County Planning Officer, East Cliff County Offices, Preston, by the 22nd February, 1957, in envelopes marked "D.A.P.O." 5234

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

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

Applications should reach the Clerk to the Leeds School of Architecture and Town Planning, 43a, Woodhouse Lane, Leeds 2, from whom further details may be obtained, by the 18th February, 1957.

GEORGE TAYLOR,
Chief Education Officer.

Education Department,
Leeds, 1. 5235

HEMEL HEMPSTEAD DEVELOPMENT CORPORATION

WOMAN TRACER (Vacancy No. 26). Salary in scale rising to £513 per annum with G.C.E. or to £430 without G.C.E. Ability to draw essential, and experience in a planning, architectural or civil engineering office an advantage.

Conditions of service similar to those in Local Government.

Starting salary according to age, experience and qualifications.

Applications, endorsed "Vacancy No. 26," giving details of age, experience, and names of two referees, to reach General Manager, Westbrook Hay, Hemel Hempstead, by 21st February. 5236

COUNTY OF CORNWALL

Applications are invited from qualified architects for the appointment of ASSISTANT ARCHITECT on the salary range £707 5s. to £994 5s.

The commencing salary will be within the above grade, dependent upon the candidate's qualifications and experience. This salary scale allows for continuous progression to the maximum of A.P.T. V, subject to satisfactory service. The architect required for this post must have a progressive outlook, be willing to accept a maximum amount of responsibility and will work in a Group under the general supervision of the architect in charge.

The appointment is subject to the usual conditions of Local Government Service. Applications, accompanied by the names of two persons to whom reference can be made, should reach Mr. F. K. Hicklin, A.R.I.B.A., County Architect, County Hall, Truro, not later than Monday, 25th February, 1957.

E. T. VERGER,
Clerk of the County Council.

County Hall,
Truro.
7th February, 1957. 5286

SHIPLEY URBAN DISTRICT COUNCIL

Applications are invited for the appointment of ARCHITECTURAL ASSISTANT in the Surveyor's Department. Salary within combined Special Grade and A.P.T. Grade IV (£727 15s.—£907 2s. 6d.), commencing according to experience and qualifications. Position superannuable and subject to the provisions of the National Scheme of Conditions of Service.

Applications giving age, details of training, qualifications and experience, together with names and addresses of two referees, to the Engineer and Surveyor, Town Hall, Shipley, Yorkshire, by 10 a.m. on Saturday, 2nd March, 1957.

Housing accommodation will be provided if required.

ERNEST PEARS,
Clerk and Solicitor.

Town Hall,
Shipley.
6th February, 1957. 5298

GOVERNMENT OF NYASALAND
ARCHITECTS
PUBLIC WORKS DEPARTMENT

To design housing, African and European, as well as a wide variety of public buildings, make site surveys and surveys of existing buildings and conduct such departmental correspondence as may be required.

Contract Appointment. Salary £1,450 p.a. Gratuity of 10% of total salary drawn, payable on satisfactory completion of contract. Free passages for officer and wife and assistance towards passages for children up to cost of one adult passage. Quarters, if available, at low rent. Five days' leave for each month of resident service.

Candidates must be A.R.I.B.A. with five years' experience since qualifying. Previous overseas experience an advantage. Write Director of Recruitment, Colonial Office, London, S.W.1, giving briefly age, qualifications and experience, quoting BCD.112/4/022. 5268

CITY OF OXFORD
CITY ARCHITECT AND PLANNING OFFICER'S DEPARTMENT
ARCHITECTURAL ASSISTANTS

Vacancies for two temporary ARCHITECTURAL ASSISTANTS; one Junior Assistant up to and including Intermediate standard. R.I.B.A., within the salary range of £184 10s.—£692; one qualified Assistant within salary range £707 10s.—£861. Housing accommodation will be made available for the latter post if required.

Details and application forms from the City Architect and Planning Officer, Town Hall, Oxford, to be returned completed by 23rd February, 1957.

HARRY PLOWMAN,
Town Clerk.

Town Hall,
Oxford. 5246

STAFFORDSHIRE COUNTY COUNCIL
APPOINTMENT OF AREA PLANNING OFFICER

Applications are invited for an appointment as an AREA PLANNING OFFICER on J.N.C. Scale B (£1,175 to £1,405 per annum), to take charge of the Central and Eastern Areas at Stafford and Lichfield.

Applicants must be corporate members of the Town Planning Institute and should hold in addition a recognized qualification in architecture, engineering or surveying.

The person appointed will be required to assist in work on the Development Plan and Town Maps and will be responsible for the control of development in the Central and Eastern areas.

Applicants should give details of age, education, technical training, qualifications, present and previous appointments and experience, and the names of two persons to whom reference can be made. Applications, in which relationship to any member or senior officer of the County Council should be disclosed, should be sent to D. W. Riley, County Planning and Development Officer, 41a, Eastgate Street, Stafford, not later than 27th February, 1957.

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

5277

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 (£814 17s. 6d.—£994 5s.), commencing at £814 17s. 6d. per annum.

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 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 the first post on Saturday, 2nd March, 1957. Testimonials will be required only from applicants selected for interview.

G. B. BLACKALL,
Clerk of the Council.

Council Offices,
Corby,
Northants.
6th February, 1957. 5290

CUMBERLAND COUNTY COUNCIL
COUNTY ARCHITECT'S DEPARTMENT

Applications are invited for the following appointments to the Architectural Staff. N.J.C. Service Conditions. Posts pensionable. Subject to medical examination.

(*a*) ASSISTANT ARCHITECT: A.P.T. Grade VI (£902—£1,107). Must be A.R.I.B.A. with experience of large contracts and supervision of staff.

(*b*) ASSISTANT ARCHITECT: A.P.T. Grade V (£814 17s. 6d.—£994 5s.). Must be A.R.I.B.A. with experience of handling large contracts.

(*c*) ASSISTANT ARCHITECT: A.P.T. Grade IV (£727 15s.—£907 2s. 6d.). Must be A.R.I.B.A. preferably with Schools experience.

(*d*) ARCHITECTURAL ASSISTANT: A.P.T. Grade III (£656—£784 2s. 6d.).

Application forms and further particulars may be obtained from John H. Haughan, F.R.I.B.A., County Architect, 15, Portland Square, Carlisle, to whom completed applications should be returned not later than Monday, 11th March, 1957.

G. N. C. SWIFT,
Clerk of the County Council.

5292

WEST SUSSEX COUNTY COUNCIL
APPOINTMENT OF AREA PLANNING OFFICER

Applications are invited for the appointment of an Area Planning Officer for the Worthing Area of the County covering six District Councils and including a population of approximately 144,000. Salary: A.P.T. Division Grade VI (£880—£1,080 p.a.).

Applicants must be corporate members of the Town Planning Institute. The person appointed will be in charge of an office at Worthing. Applicants should have had experience of planning practice, and in particular the control of development in urban and rural areas. A car is provided by the County Council.

Application forms and Conditions of Service may be obtained from Mr. John G. Jefferson, M.I.C.E., M.T.P.I., M.I.Mun.E., County Planning Officer, County Hall, Chichester, and should be returned to him by Saturday, 2nd March, 1957.

T. C. HAYWARD,
Clerk of the County Council.

5245

CHESTERTON RURAL DISTRICT COUNCIL

(*a*) DEPUTY ARCHITECT (A.P.T. V, £814 17s. 6d.—£994 5s.).

(*b*) SENIOR ASSISTANT ARCHITECT (A.P.T. III, £656—£784 2s. 6d., or Special Grade £707 5s.—£861).

Applications are invited for the above appointments in the Architect's Department.

Applicants for (*a*) must be fully qualified architects (A.R.I.B.A.) and have had considerable all round experience.

Applicants for (*b*) must be suitably qualified and the commencing salary will be fixed according to qualifications and experience.

The appointments are subject to the National Scheme of Conditions of Service, the Local Government Superannuation Acts, a satisfactory medical examination and to one month's notice on either side.

Housing accommodation will be provided if required.

Applications stating age, present salary, details of training and experience, previous appointments held together with one recent testimonial and the names and addresses of two referees, should be sent to the undersigned not later than March 2nd, 1957.

W. H. HAYWARD,
Clerk of the Council.

County Hall,
Hobson Street,
Cambridge. 5293

BOROUGH OF HOLBORN
BOROUGH ARCHITECT'S DEPARTMENT
JUNIOR ASSISTANT ARCHITECT required. R.I.B.A. Intermediate or equivalent. Salary A.P.T. II/III (£609 17s. 6d.—£784 2s. 6d.) plus London Weighting. Application together with the names of two referees to Town Clerk, Town Hall, High Holborn, W.C.1, by 2nd March, 1957. 5259

BOROUGH OF LUTON
TECHNICAL STAFF

Applications are invited for SENIOR QUANTITY SURVEYING ASSISTANT, Salary A.P.T. V (£814 17s. 6d.—£994 5s.). Fully qualified, preferably R.I.C.S., with experience of taking off for large contracts of all types and settlement of final accounts.

Housing accommodation available. N.J.C. Service Conditions.

Application forms from Borough Architect, Town Hall, Luton, returnable by 4th March, 1957. 5275

HUYTON-WITH-ROBY URBAN DISTRICT COUNCIL

ARCHITECTURAL ASSISTANT, A.P.T. Grade II (Salary £609 17s. 6d.—£691 17s. 6d.)

Applicants should have had a sound architectural training and several years' office experience. The person appointed will be required to assist with the design of new type houses, flats, shops and community centres.

Housing accommodation will be considered.

Applications, stating age, qualifications, experience, present position and salary, together with the names of two referees must be sent in envelopes endorsed "Architectural Assistant" to the Architect, Architectural and Housing Department, "Grasscroft," Archway Road, Huyton, Lancs, by the 1st March, 1957.

H. E. H. LAWTON,
Clerk of the Council.

Council Offices,
Huyton. 5271

Architectural Appointments Vacant

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ASSISTANT ARCHITECTS AND SHOPFITTING DRAUGHTSMEN. Co-operative Wholesale Society, Ltd., invite applications for the following appointments: (1) Assistant Architects capable of preparing working drawings from preliminary details. (2) Shopfitting Draughtsmen with experience in Shop Equipment and modernisation of Interiors.

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CO-OPERATIVE WHOLESALE SOCIETY LTD. ARCHITECT'S DEPARTMENT, MANCHESTER SHOPFITTING DRAUGHTSMAN required, experienced in shop equipment and modernisation of interiors.

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POST-INTERMEDIATE ASSISTANT required, in large London Office with widely varied practice. Lewis Solomon, Son & Joseph, 21, Bloomsbury Way, London, W.C.1. Telephone HOLborn 7082. 3152

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SOUTHAMPTON.—SENIOR ASSISTANT required in busy office working on a varied programme of commercial and industrial building. Permanent and progressive post for man with initiative.—Applications to W. H. Saunders & Son, L./A R.I.B.A., 1, Carlton Crescent, Southampton. 5191

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MORRISON AND PARTNERS require additional Staff for interesting new projects, including one person to take charge of development of new structural system. 5-day week. Salary according to qualifications and experience.—103, Belper Road, Derby. 5169

Vacancies exist at Head Office of the Architect's Department, Ind Coope & Allsopp Ltd., The Brewery, Burton-on-Trent, for INTERMEDIATE ARCHITECTURAL ASSISTANTS. Salary range is £500—£700 per annum, according to experience, and applicants must be of Intermediate R.I.B.A. standard.

The Department has a considerable and interesting programme in hand; a five-day week is in operation and amenities include Canteen and Sports Ground.

Particulars of training, experience, past and present appointments, and qualifications, together with testimonies, and stating age and whether married or single, should be sent to The Chief Architect, Ind Coope & Allsopp Ltd., The Brewery, Burton-on-Trent. 5232

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ARCHITECTURAL ASSISTANT with office experience and capable of preparing working drawings required immediately in busy private practice for varied and interesting works. Deacon & Laing, 9, St. Paul's Square, Bedford. 5149

SEELEY AND PAGET have a vacancy in their City office. Intermediate standard. The work is varied and covers Ecclesiastical, Colleges, Schools, Domestic and General Work. Salary by agreement, according to experience. Telephone CEN. 0321. 5175

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WILLIAM HOLFORD & Partners require ASSISTANT, experienced in preparation of working drawings and details. Salary £650—£750 p.a. Write stating age and experience to 2, Angel Court, Throgmorton Street, E.C.2. 5220

ARCHITECTURAL ASSISTANT required by Rolls-Royce at Derby. Candidates should be of R.I.B.A. Intermediate standard or equivalent. Those interested should write, stating their age, qualifications and salary required, to the Staff Appointments Officer, Rolls-Royce, Ltd., P.O. Box 31, Derby. 5180

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ARCHITECTURAL ASSISTANT required for Housing Development. Age 21-25. Intermediate standard. Write, stating experience and salary required to New Ideal Homesteads Ltd. (Chief Architect), 61, South Street, Epsom, Surrey. 5237

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THE FACULTY OF ARCHITECTS AND SURVEYORS will be holding professional examinations from May 27th to May 31st, 1957 (inclusive), in the Intermediate and Final grades of the Building and Quantity Surveyors' Sections. The examinations will be held in London and certain provincial centres. Applications from candidates for permission to sit must be with the Secretary not later than April 30th, 1957. All information obtainable from the Secretary, F.A.S., 68, Gloucester Place, London, W.1. (WELbeck 9966).

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