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★ **A glossary of abbreviations of Government Departments and Societies and Committees of all kinds, together with their full address and telephone numbers. The glossary is published in two parts—A to Ie one week, Ig 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. 5, 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
ArchSA	Architectural Students' Association. 34/36, Bedford Square, W.C.1.	
ARCUK	Architects' Registration Council. 68, Portland Place, W.1.	Langham 8738
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
BRDB	British Rubber Development Board. Market Buildings, Mark Lane, E.C.3.	Mansion House 9383
BRS	Building Research Station. Bucknalls Lane, Watford	Garston 2246
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. 4, Vernon Place, W.C.1.	Holborn 8146/7
CABAS	City and Borough Architects Society. C/o Johnson Blackett, F.R.I.B.A., Civic Centre, Newport, Mon.	Newport 5491
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.	Sloane 5255
CCP	Council for Codes of Practice. Lambeth Bridge House, S.E.1.	Reliance 7611
CDA	Copper Development Association. Kendals Hall, Radlett, Herts.	Radlett 5616
CIAM	Congrès Internationaux d'Architecture Moderne. Doldertal, 7, Zurich, Switzerland.	
COID	Council of Industrial Design. Tilbury House, Petty France, S.W.1.	Abbey 7080
CPRE	Council for the Preservation of Rural England. 4, Hobart Place, S.W.	Sloane 4280
CUC	Coal Utilization Council. 3, Upper Belgrave Street, S.W.1.	Sloane 9116
CVE	Council for Visual Education. 13, Suffolk Street, Haymarket, S.W.1.	Reading 72255
DGW	Directorate General of Works, Ministry of Works, Lambeth Bridge House, S.E.1.	Reliance 7611
DIA	Design and Industries Association. 13, Suffolk Street, S.W.1.	Whitehall 0540
DPT	Department of Overseas Trade. Horseguards Avenue, Whitehall, S.W.1.	Trafalgar 8855
EJMA	English Joinery Manufacturers' Association (Incorporated). Sackville House, 40, Piccadilly, W.1.	Regent 4448
EPNS	English Place-Name Society. 7, Selwyn Gardens, Cambridge.	
FAS	Faculty of Architects and Surveyors. (Temporary address) 96, Madrid Road, S.W.13.	Riverside 6437
FASS	Federation of Association of Specialists and Sub-Contractors, Artillery House, Artillery Row, S.W.1.	Abbey 7232
FBBDO	Fibre Building Board Development Organisation, Ltd. 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.	
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.	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 4041
GBPA	Gypsum Building Products Association, 11, Ironmonger Lane, E.C.2.	Monarch 8888
GC	Gas Council. 1, Grosvenor Place, S.W.1.	Sloane 4554
GG	Georgian Group. 27, Grosvenor Place, S.W.1.	Sloane 2844
HC	Housing Centre. 13, Suffolk Street, Pall Mall, S.W.1.	Whitehall 2881
IAAS	Incorporated Association of Architects and Surveyors. 75, Eaton Place, S.W.1.	Sloane 5615
ICA	Institute of Contemporary Arts. 17-18, Dover Street, Piccadilly, W.1.	Grosvenor 6186
ICE	Institution of Civil Engineers. Great George Street, S.W.1.	Whitehall 4577
IEE	Institution of Electrical Engineers. Savoy Place, W.C.2.	Temple Bar 7676
IES	Illuminating Engineering Society. 32, Victoria Street, S.W.1.	Abbey 5215

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The contract that got away

One of the pleasant things about a Williams & Williams Area Manager (or representative for that matter) is his *lack* of high pressure salesmanship. Peter Buckingham* who manages the Crawley Office covering Kent, Sussex and Surrey will cheerfully admit to the contract that got away—after a lot of time spent on preparatory work in his drawing office. "But that sort of thing is all part of the Williams & Williams service" says Mr. Buckingham, looking extraordinarily like one of those casual gentleman farmers. "We're here to help the architect get the best out of our products, not to sell an extra window or two."

* MR. H. P. BUCKINGHAM, WILLIAMS & WILLIAMS LTD., 5 Broad Walk, Crawley (2200).

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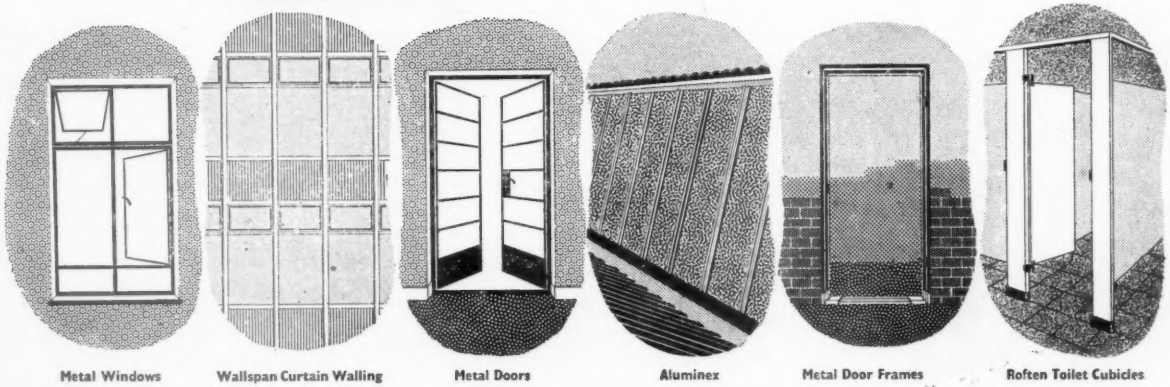

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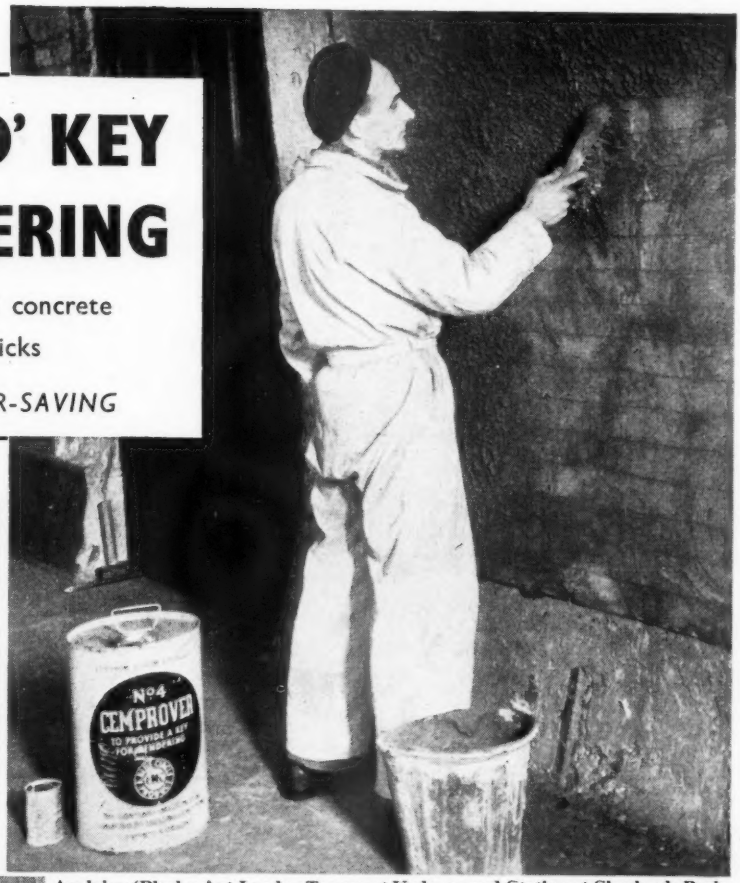
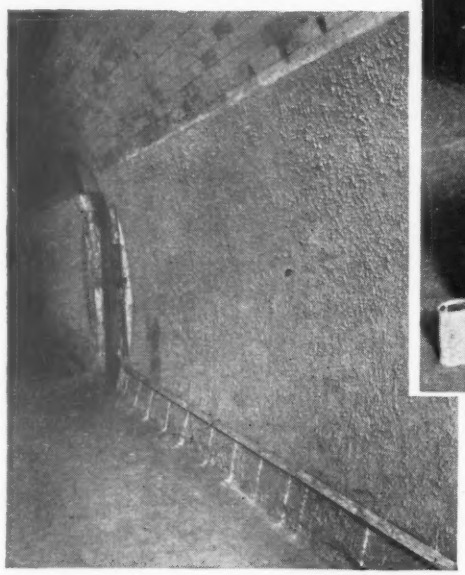


Applying 'Plaskey' at London Transport Underground Station at Shepherds Bush.



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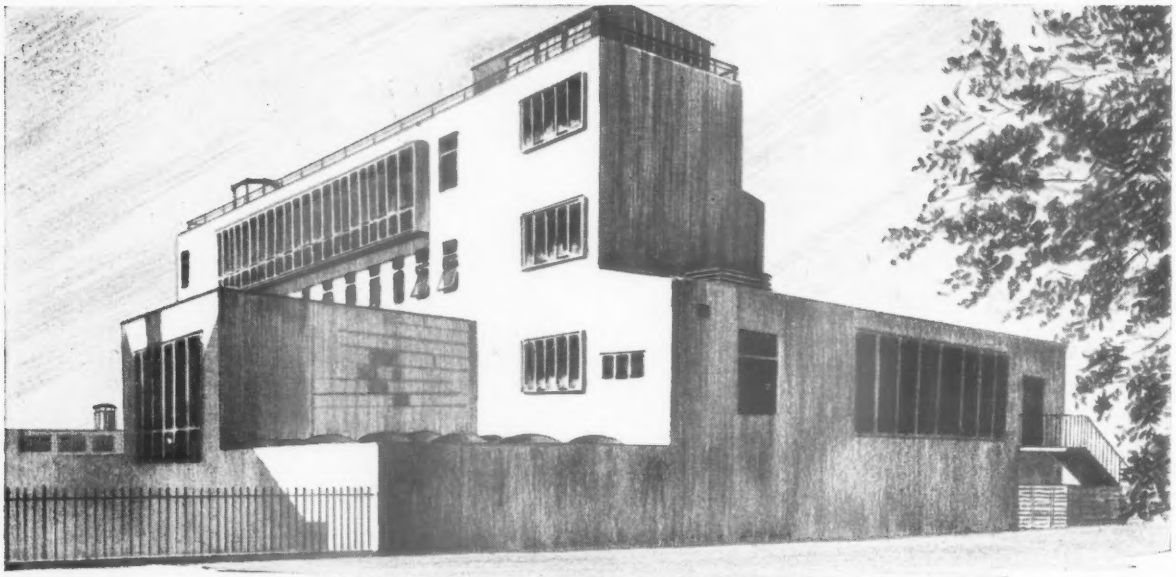

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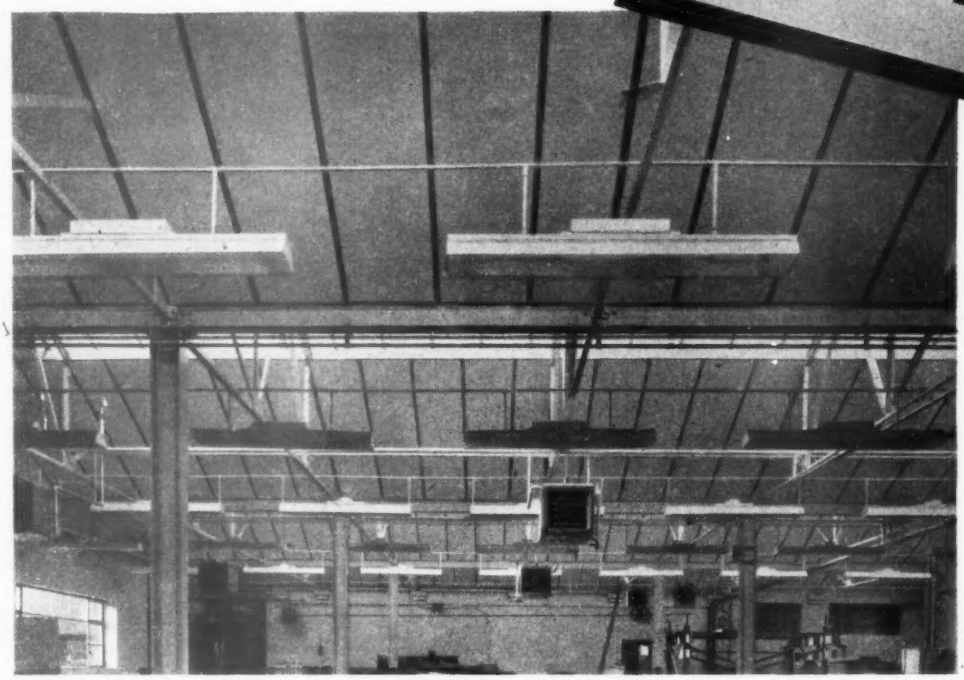

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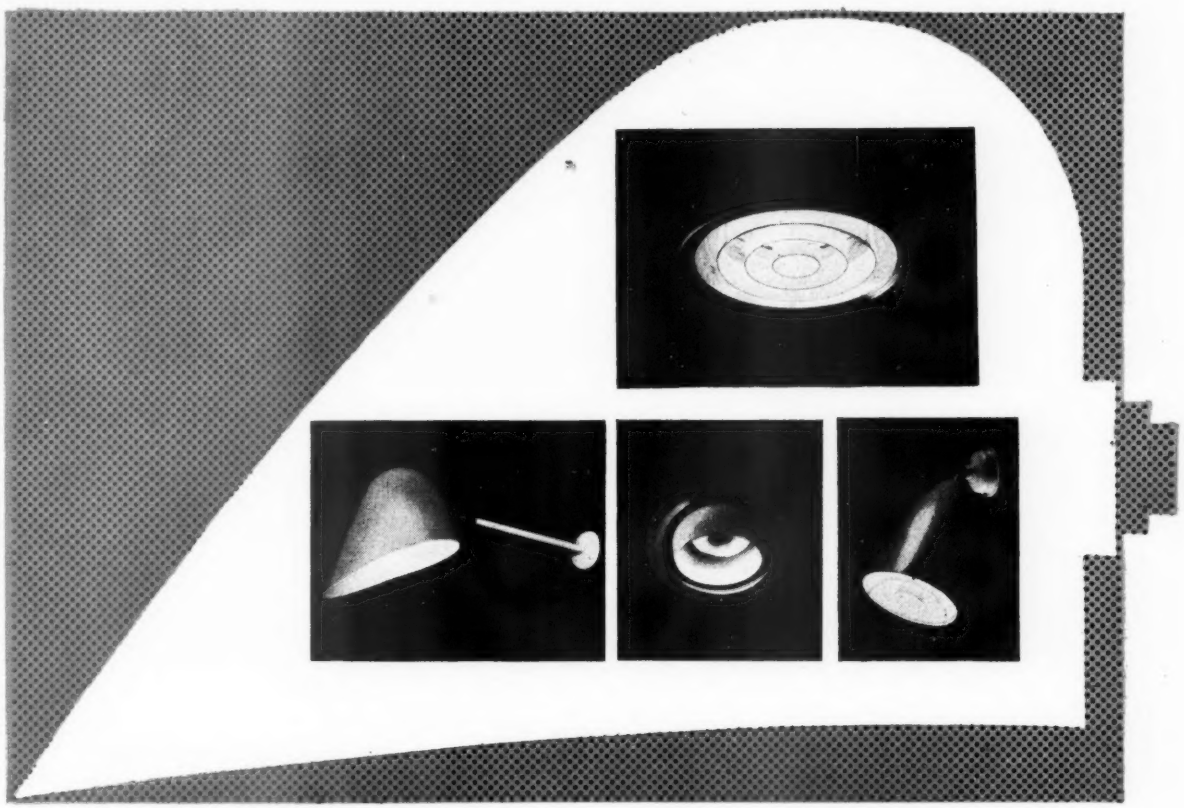

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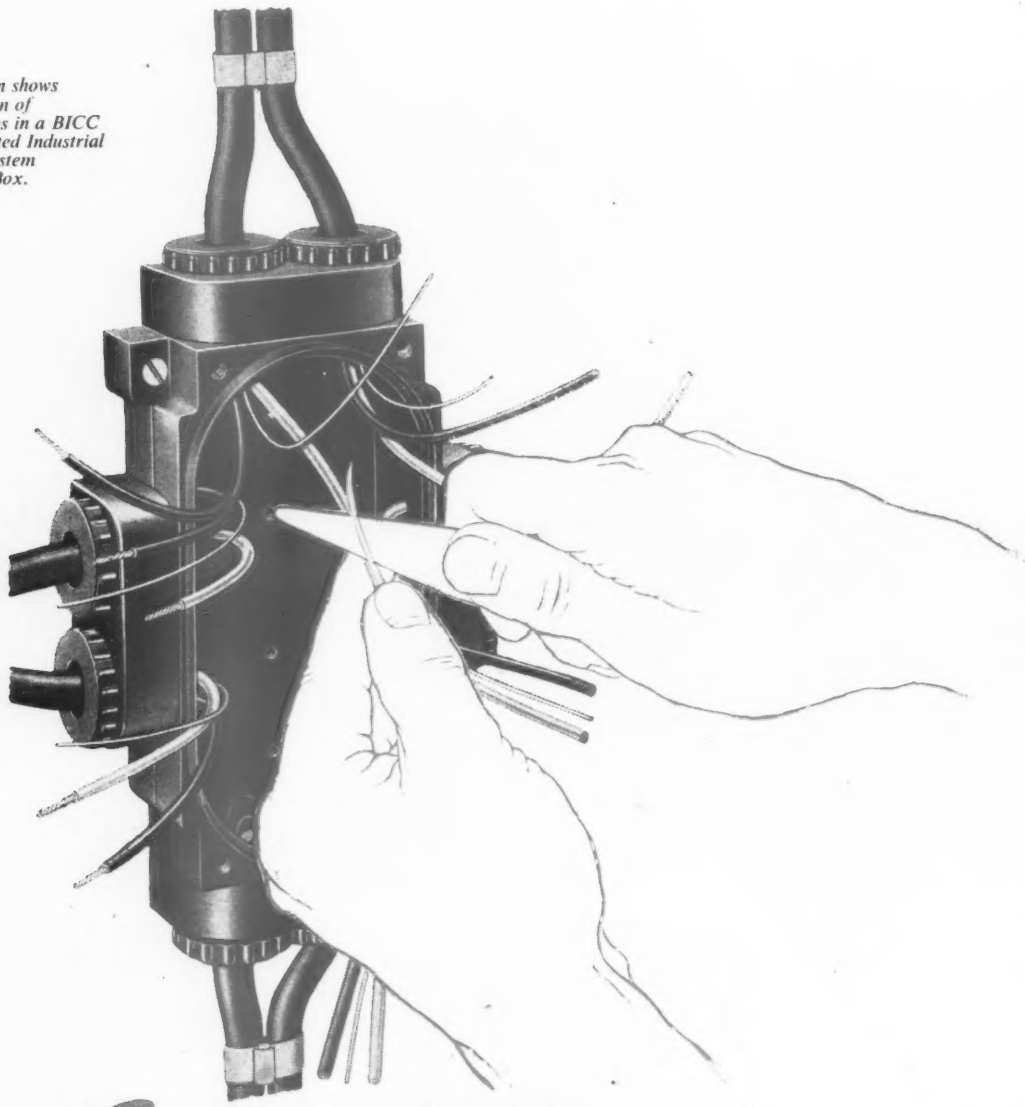

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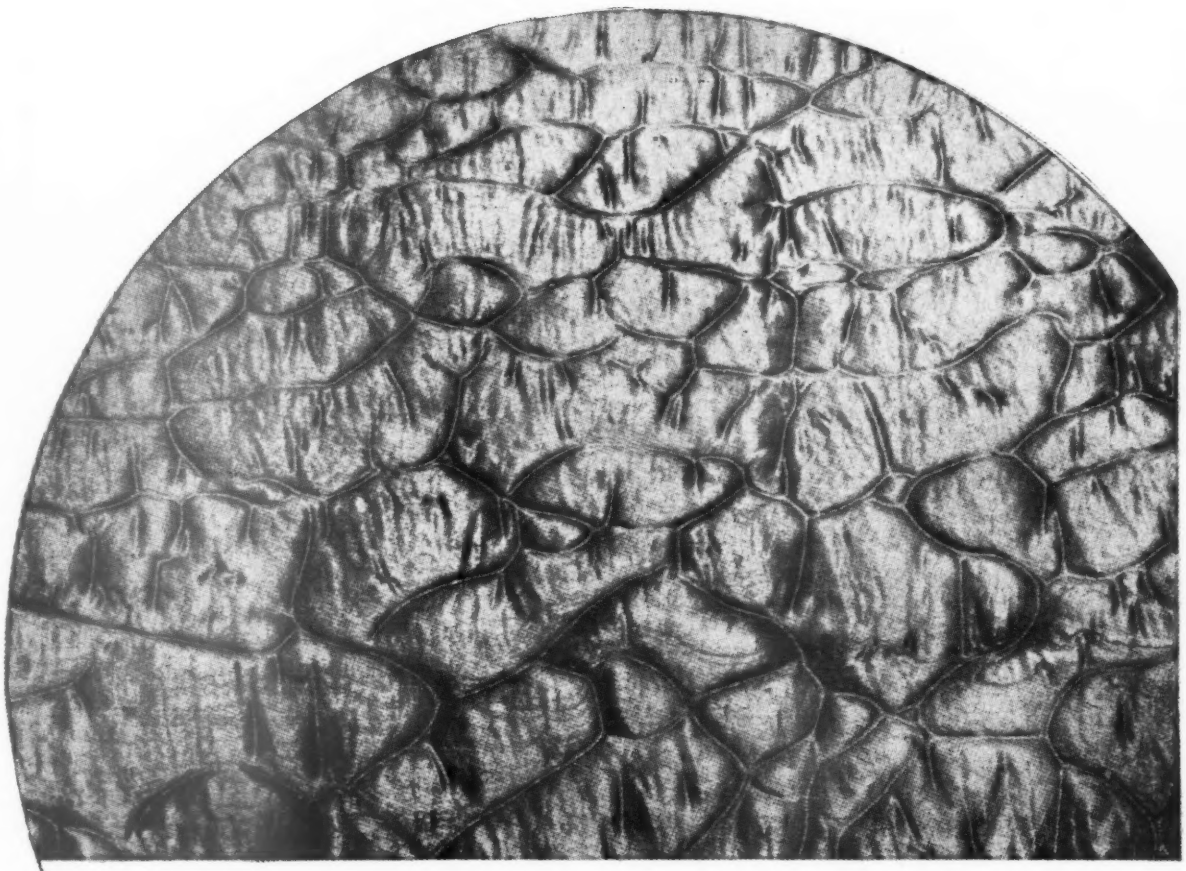

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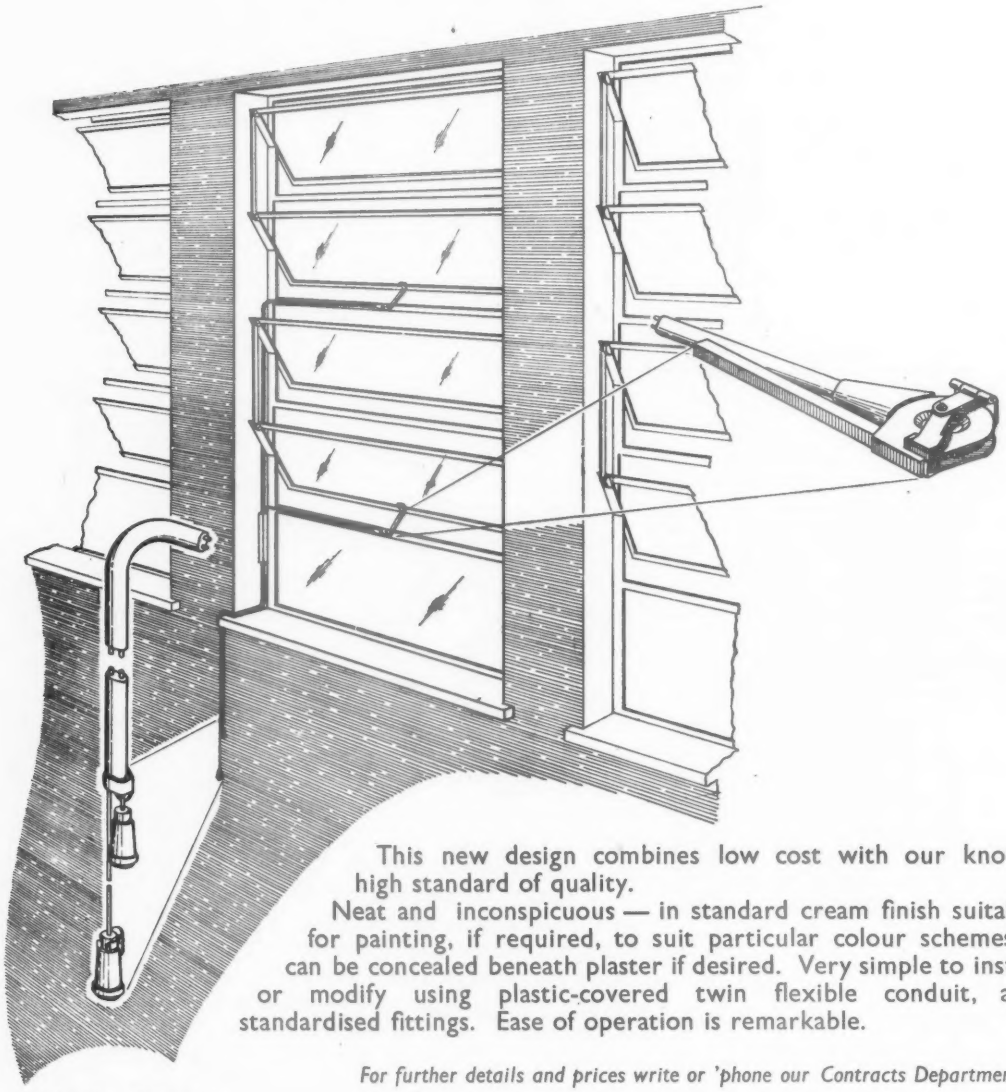

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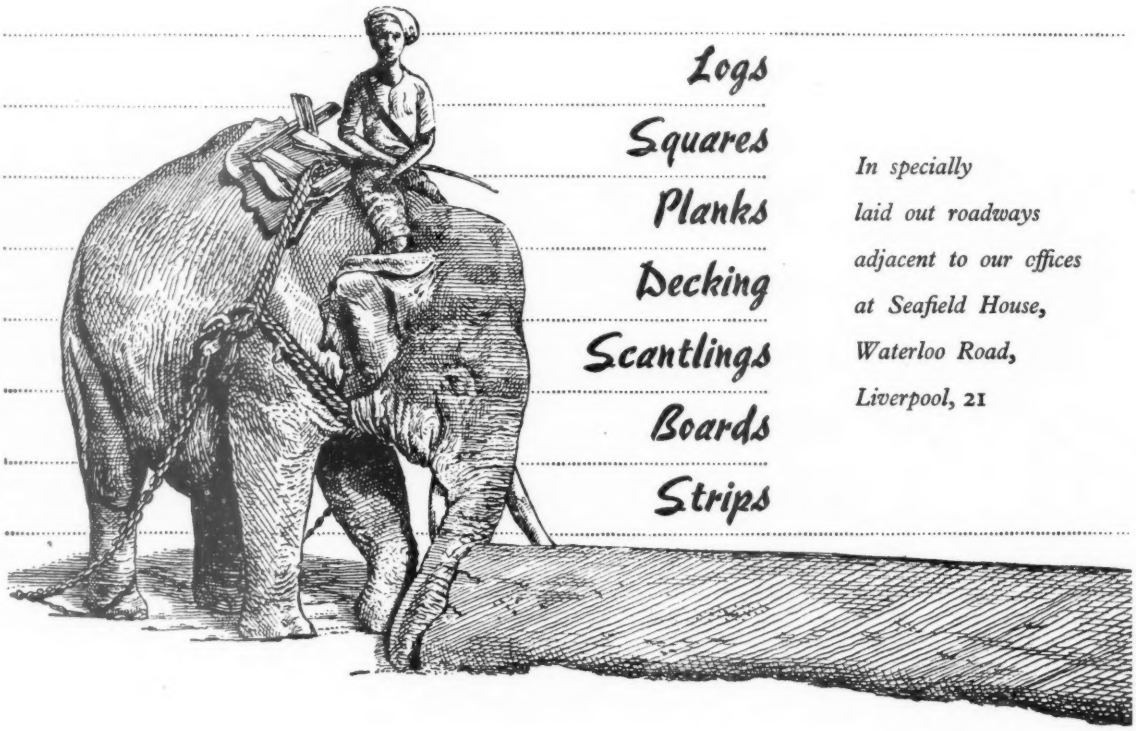

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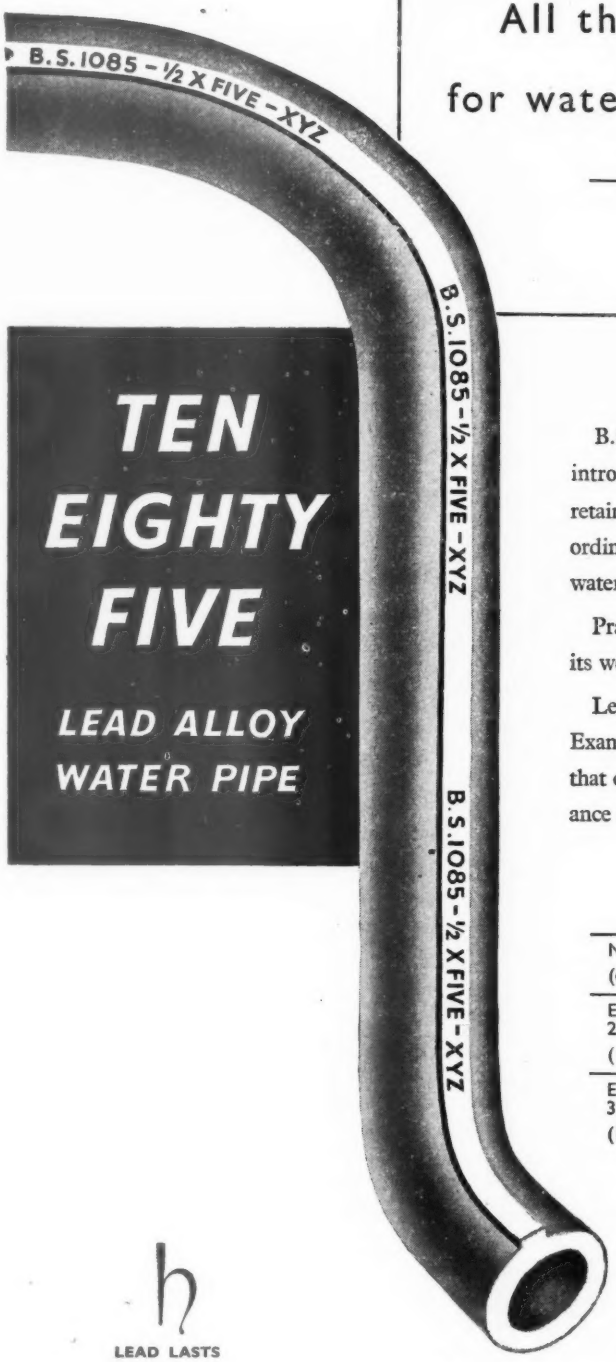

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Water pressures	Bore	Ordinary Weight lb./yd.	B.S.1085 Weight lb./yd.
Not exceeding 150 ft. head of water	½"	6	5
(65 lb. per sq. in.)	¾"	9	6
Exceeding 150 ft. but not exceeding 250 ft. head of water	½"	7	5
(108 lb. per sq. in.)	¾"	11	8
Exceeding 250 ft. but not exceeding 350 ft. head of water	½"	9	6
(152 lb. per sq. in.)	¾"	15	12

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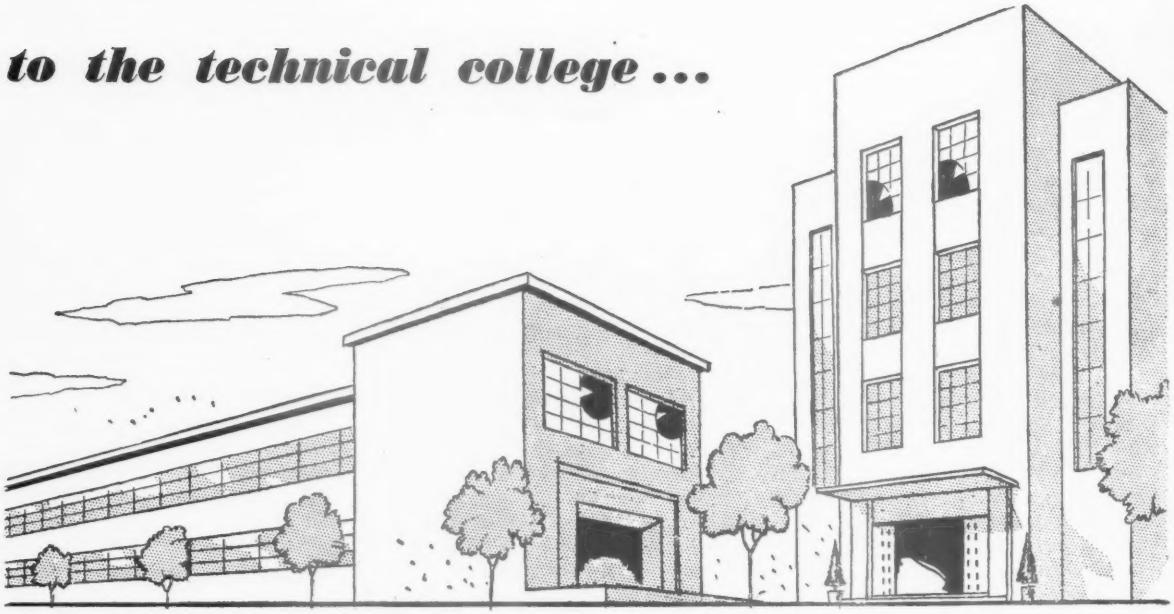
as the block of flats said to the technical college ...



FLATS Don't look now, but do you know that the hospital up the road has leaky windows — and it hasn't been up three years !

TECH Is that a fact ?

FLATS One of my tenants went to see a patient there, and she says there are stains and rust marks dribbling down the walls.

TECH My dear, how disgusting. And in a hospital, too ! Didn't the builders know about Arbomast B.1 ? All my four hundred windows are bedded in Arbomast B.1 and glazed with Arbolite Metal Casement Putty, and I've never had a leak anywhere.

FLATS You talk as though glass and metal were the only glazing problem. What about buildings like me, where metal windows are set in beautiful wood frames? I tell you, I'd have had a packet of trouble if my windows were not bedded and caulked with Arbomast B.1.

TECH Oh, I grant you both are excellent. But surely every builder in the land uses one or the other, these days.

FLATS You'd be suprised how many still try and get by with ordinary putty. Well, look at the hospital.

TECH My architect would never have allowed that !

ARBOMAST B1

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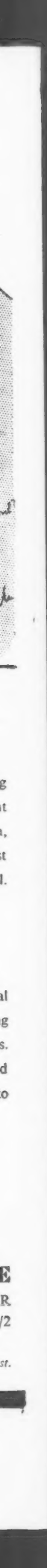


6 fresh views on flooring

FELLO ATKINSON *(in this issue)*
HUMPHREY SPENDER
OLIVER COX
F.H.K. HENRION
PRUNELLA CLOUGH
LAURENCE SCARFE

and edited by
Sir Hugh Casson R.D.I., M.A., F.R.I.B.A.

In seeking a theme for a series of features on flooring as an integral element of interior design, the manufacturers of Semastic Tiles commissioned Sir Hugh Casson to make his recommendations.
He proposed that a number of leading designers be given the opportunity to express their views on this matter by designing floors for a number of imaginary projects which he himself would suggest by way of initial plans and briefings.
He has, therefore, in association with these designers, prepared plans for :—

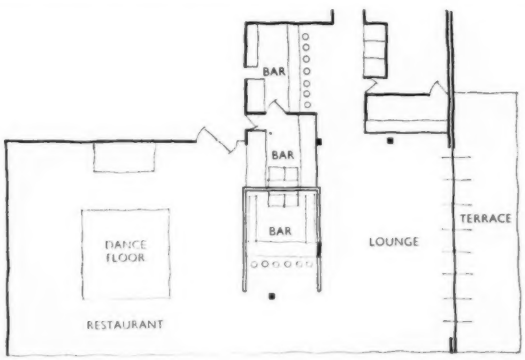
an Airport Waiting Lounge
a Youth Hostel Dayroom · a Works Canteen
a Restaurant · a Clinic · a School Entrance Hall

Each of the six designers selected has been invited to choose one of these projects and to consider it from the aspect of floor-design in order to demonstrate the scope of Semastic Decorative and Vinyl Asbestos Tiles. The materials which may be used are as follows:

Semastic Tiles. Decorative and domestic grades. These are thermo-plastic, resin-bonded tiles which are available in a very attractive colour range, in plain and marbled finishes. By cutting to shape and by contrasting and blending colours, design possibilities are virtually unlimited.
Vinyl Asbestos grade. One of the latest developments in floor surfacing. Vinyl Asbestos Tiles are designed to combine the greatest visual appeal with years of faultless service. In devising the balanced range of nineteen colours there has been close collaboration with the British Colour Council.

THE PROBLEM AS SET TO FELLO ATKINSON

A new decor is required for the restaurant of an existing hotel, one of the few in Accra, Gold Coast. It is situated near a travel terminus and has a large non-residential clientele. The public space treated is, therefore, expected to serve many varied functions, some confined to definite areas, others of a more general circulatory nature.



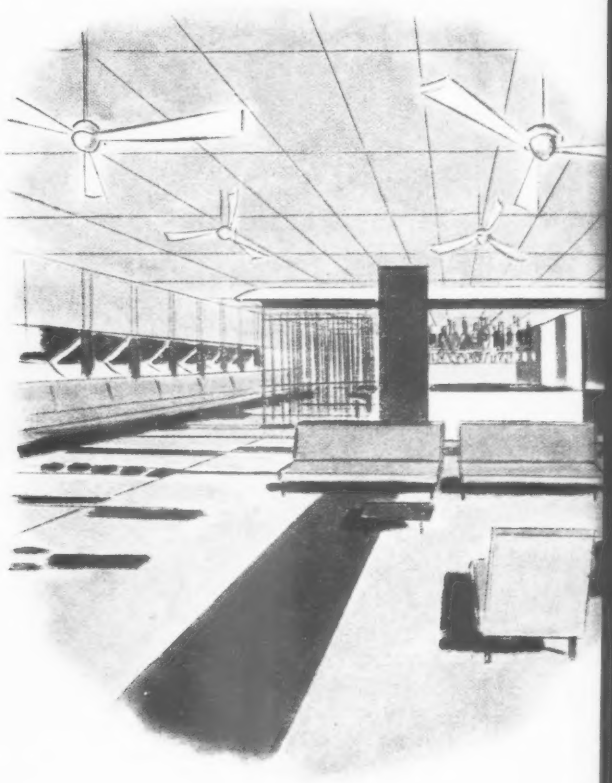
5 SE. 52

2 OF SERIES

Fello Atkinson

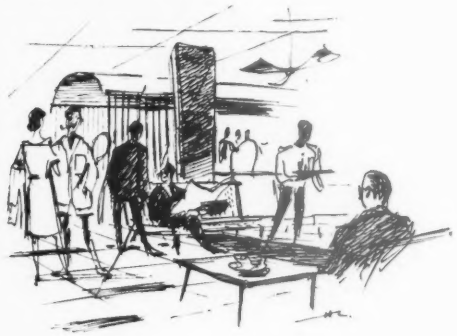
of James Cubitt & Partners

RESTAURANT and BAR LOUNGE



As this impression indicates, a well conceived design in Semastic Tiles can achieve an effect of cool simplicity, most welcome in a climate of Gold Coast intensity. But it is more than an appearance of coolness, for these tiles have a useful K factor of 3.5 British Thermal Units. Further, they have the additional advantages of being resistant to the attacks of white ants or termites and to the formation of mould or fungus.

Where the functions of the space are confined to definite areas, these have been emphasised by the use of pattern. Elsewhere the pattern is used more generally, suggesting circulation by: (a) Drawing a line in strong contrast to its background. (b) Describing an imaginary line by shapes which border on it.



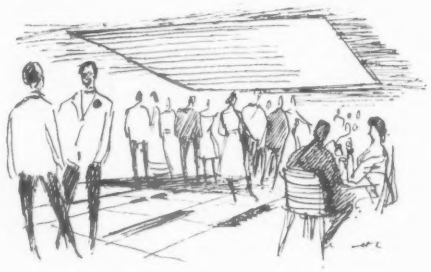
In designing the floor for it we were guided by three considerations:

(1) Tropical light and general colouring make strong colour less desirable than in temperate climates. Composition of pattern is therefore more important than a large range of colours.

(2) Restraint in quantity of pattern is necessary if the design as a whole is to be "read." Single tile "runs" of one colour, which contrast with the background, "read" more forcibly than large areas of colour where the spaces are mainly circulatory; but in "static" spaces one overall colour can be used to give definition to a specific function, e.g. dance floor.

(3) The contemporary idiom as used in fittings, furniture, etc. calls for related rectangular patterns in the floor. This, of course, is particularly relevant when using a square tile as the basic element.

Visual interest is also increased by introducing part of the floor pattern in a different plane, for example, the green strip leading from the doorway to the bar, is carried up in a vertical panel of the same colour, behind which, and of the same width, is the bar counter. This counter and the low drinks tables would be covered in materials which would blend or contrast with the surrounding tiling.



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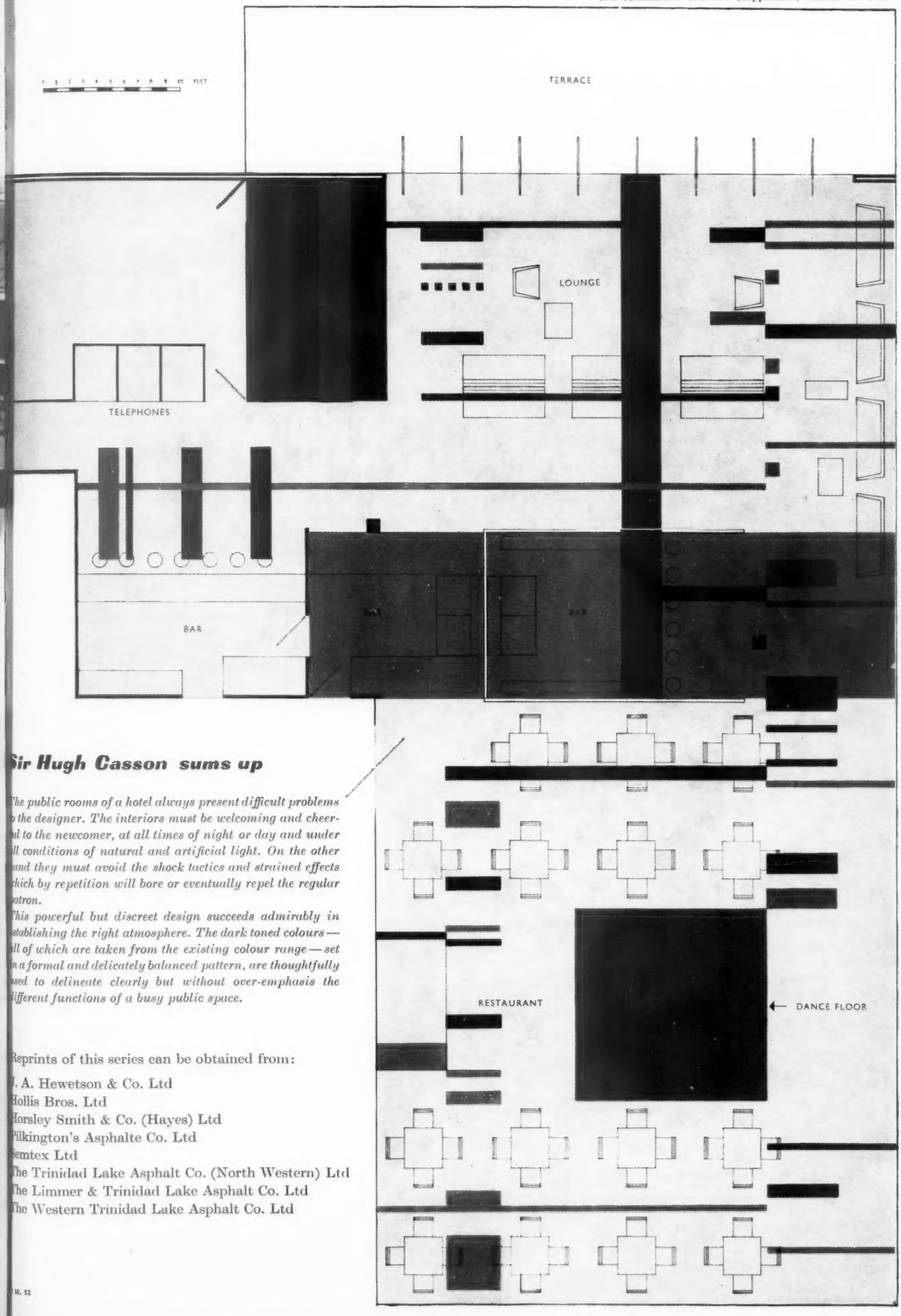

Sir Hugh Casson sums up

The public rooms of a hotel always present difficult problems to the designer. The interiors must be welcoming and cheerful to the newcomer, at all times of night or day and under all conditions of natural and artificial light. On the other hand they must avoid the shock tactics and strained effects which by repetition will bore or eventually repel the regular patron.

This powerful but discreet design succeeds admirably in establishing the right atmosphere. The dark toned colours — all of which are taken from the existing colour range — set in a formal and delicately balanced pattern, are thoughtfully used to delineate clearly but without over-emphasis the different functions of a busy public space.

Reprints of this series can be obtained from:

J. A. Hewetson & Co. Ltd
Hollis Bros. Ltd
Horsley Smith & Co. (Hayes) Ltd
Pilkington's Asphalte Co. Ltd
Semtex Ltd
The Trinidad Lake Asphalt Co. (North Western) Ltd
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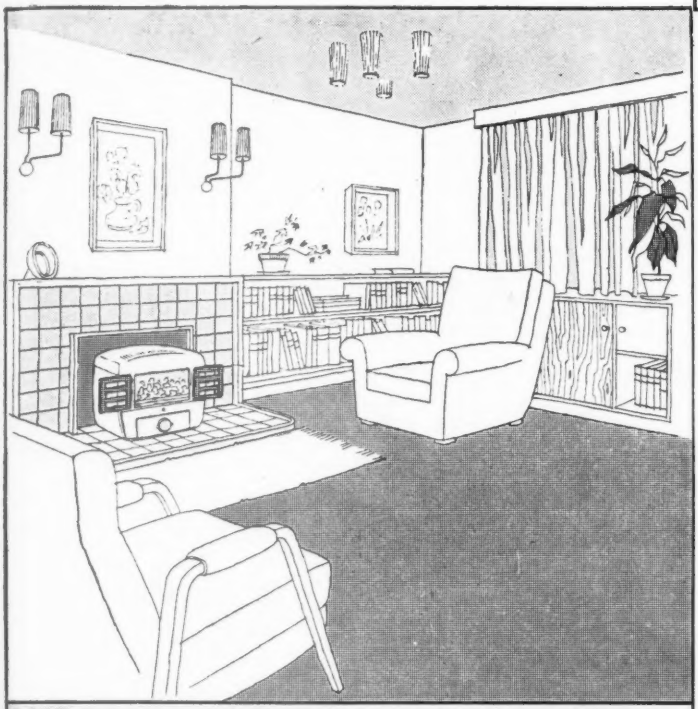


A low lintel and an openable stove are no longer incompatible

now there's the PANDA

SPECIFICATION Vitreous enamel cast iron outer casing. Two side hinged fire doors with mica panels. Cast iron lining to firebox. Externally operated shaking bottom grate and removable front bar. Spinwheel air control. Mild steel ashpan. Operating tool.

COLOURS Beige mottle, fawn mottle or black, Alisheen black, bramble, copper, bronze or green.

FLUE CONNECTION

Height to top of flue outlet ..	15⅞ ins.
Outside diameter	4¾ ins.

The design and construction of the Panda are to a very high standard. Accurate control over the rate of combustion is a feature which ensures fuel economy.

For further details of the Panda Stove write to the Housing Division of:—

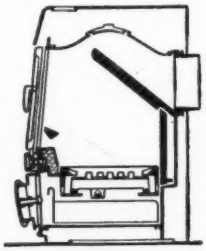
NOTES

Unusual and very attractive 'longways' shape is valuable in long, low fireplaces where a stove of conventional upright design would appear awkward.

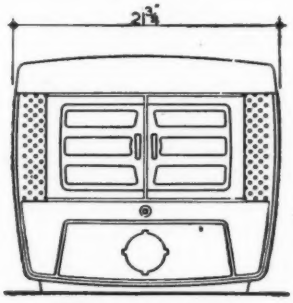
Side hinged fire doors fold back to give a good view of the fire.

Heats from 1,500 to 3,000 cu. ft. by convection and radiation.

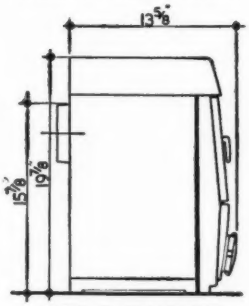
Burns continuously—for 10 hours without attention—on all domestic fuels including coke.



CROSS SECTION



FRONT ELEVATION



SIDE ELEVATION

DIMENSIONS

Width	21¾ ins.
Height	19⅞ ins.
Depth overall	13⅝ ins.
Depth at hearth level ..	11½ ins.

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Polyflex

Patent pending and registered trade mark

The 'Polyflex' toilet seat has a *flexible mounting*. Breakages are very unlikely. 'Polyflex' includes a flexible PVC rod attached to the seat and firmly fitted into Polythene seat pillars. The pillars, reinforced with a threaded brass insert, are self-centering in the WC pan with polythene washers secured by wing nuts. The 'Polyflex' seat can be fitted by the housewife without any tools, and, because of the flexible mounting, it will stay firmly in position. The 'Polyflex' is hygienic. The seat, hinge, and pillar heads cannot corrode or peel. All are easily cleaned. The 'Polyflex' is available in black, white and a range of standard pastel shades.

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Shires are the largest manufacturers of moulded cisterns in the country. They also make WC pans and seats, flush-pipes and complete WC suites.

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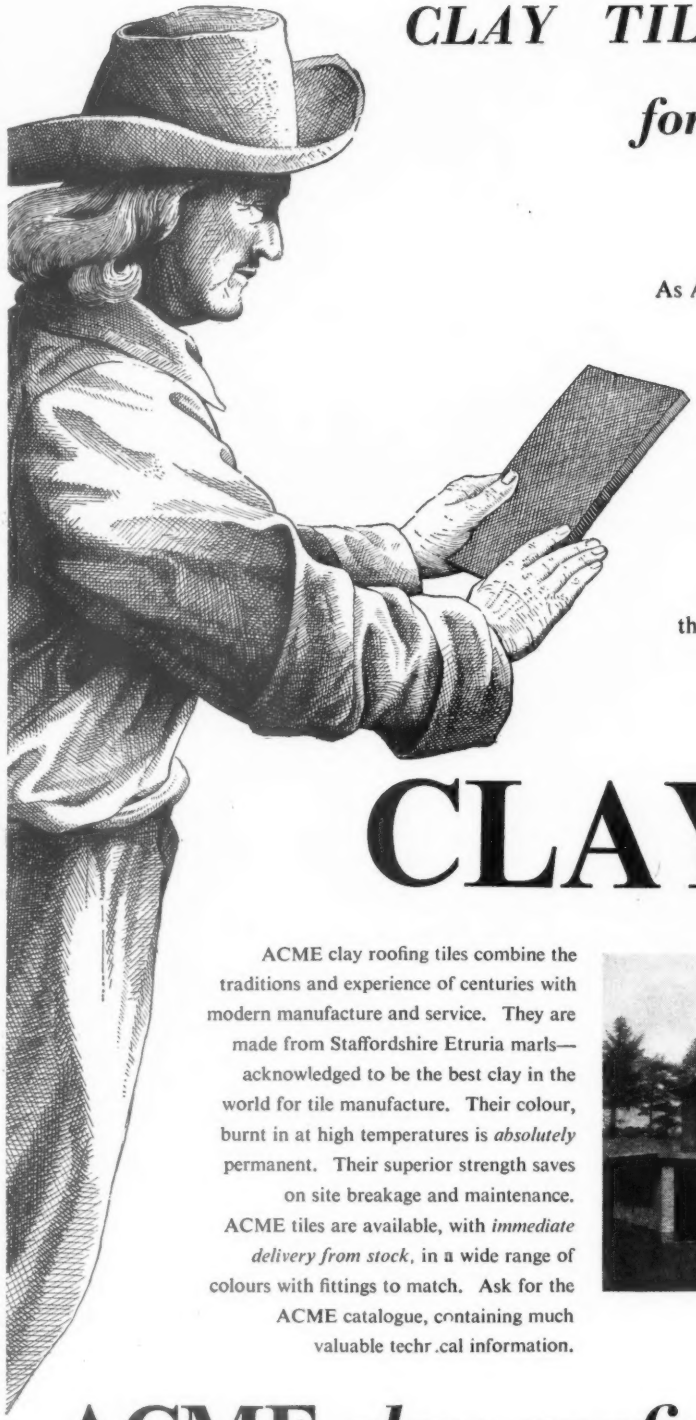

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for eight centuries England's roof . . .

As Agricultural Britain changed to a land of industry, new materials, new methods supplanted the old and traditional crafts began to give way to the first stirrings of mass production. A new, blacker, busier country was born, ruled by the new masters of coal and iron. The revolution had begun. Amongst the few unaffected members of the materials aristocracy was the clay roofing tile, for nothing—since the days of the Normans—has been found to take its place . . . for the simple reason that there's no roof like a clay tiled roof.

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ACME clay roofing tiles combine the traditions and experience of centuries with modern manufacture and service. They are made from Staffordshire Etruria marls—acknowledged to be the best clay in the world for tile manufacture. Their colour, burnt in at high temperatures is *absolutely* permanent. Their superior strength saves on site breakage and maintenance. ACME tiles are available, with *immediate delivery from stock*, in a wide range of colours with fittings to match. Ask for the ACME catalogue, containing much valuable techr .cal information.

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ACME *clay roofing tiles*

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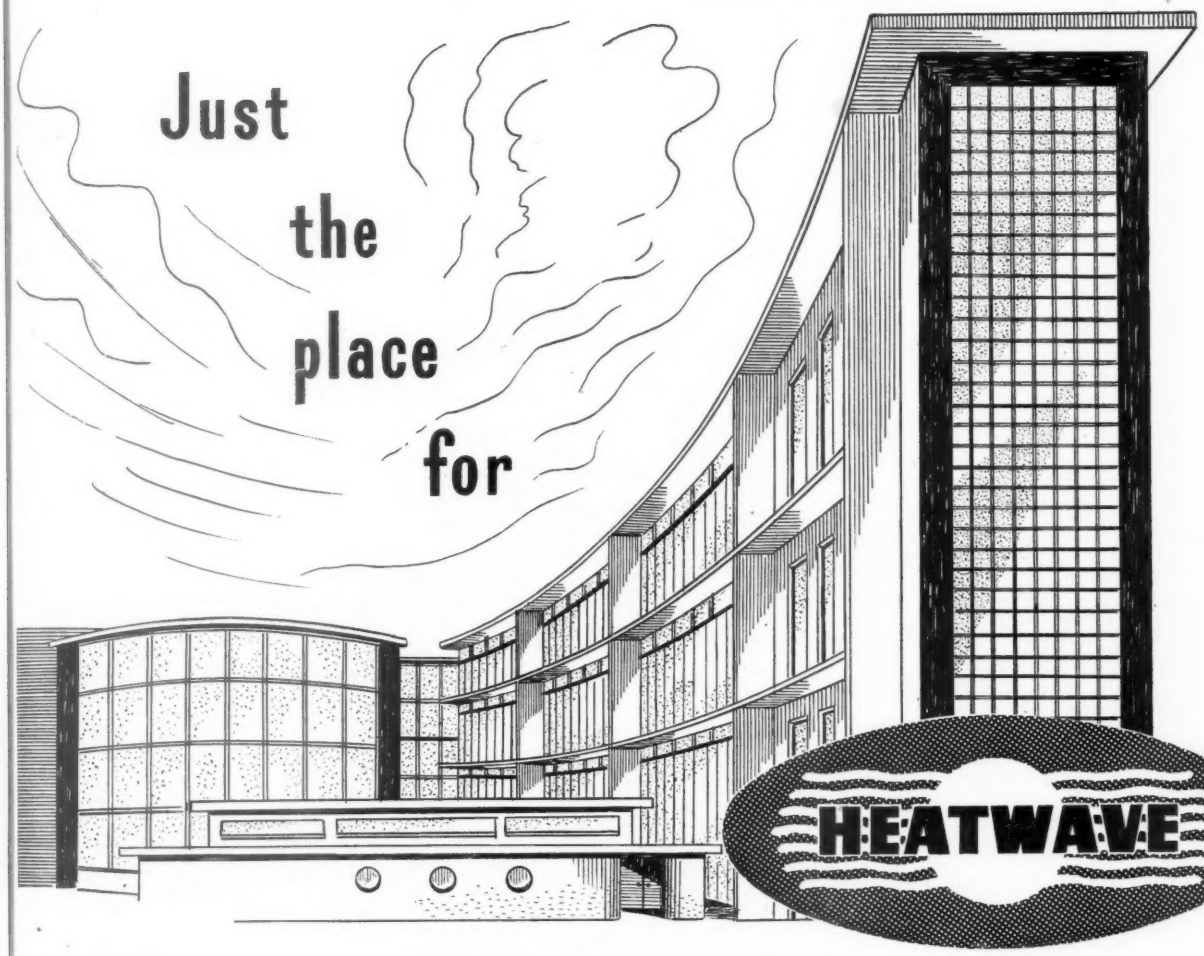

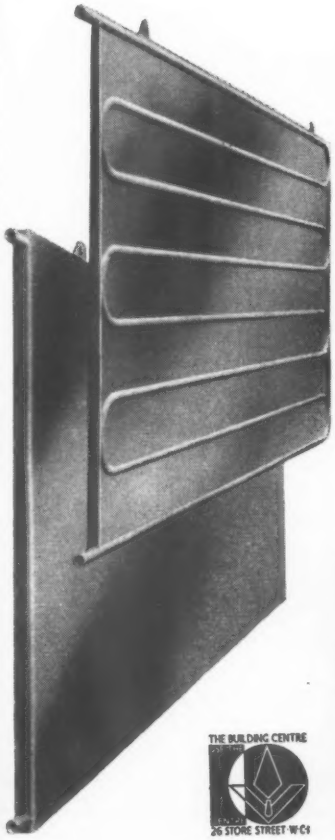

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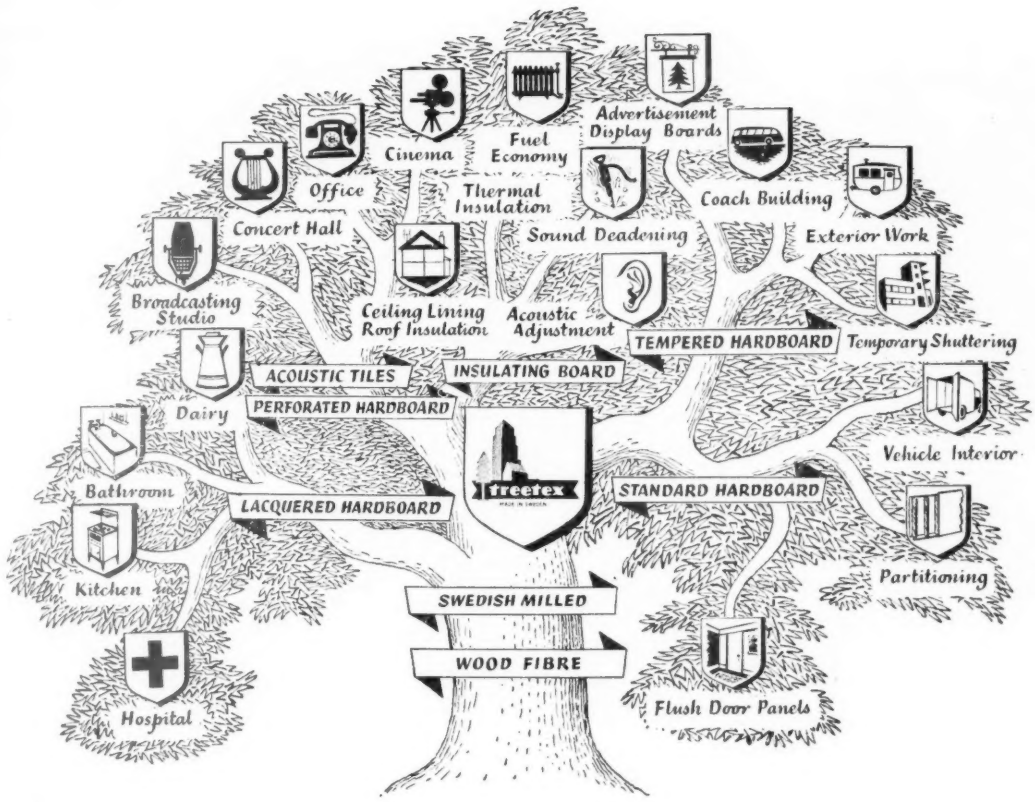

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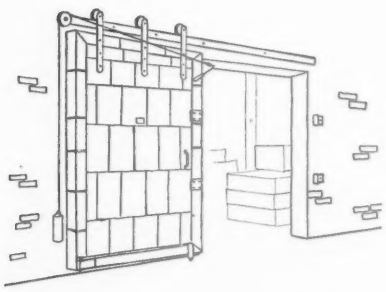

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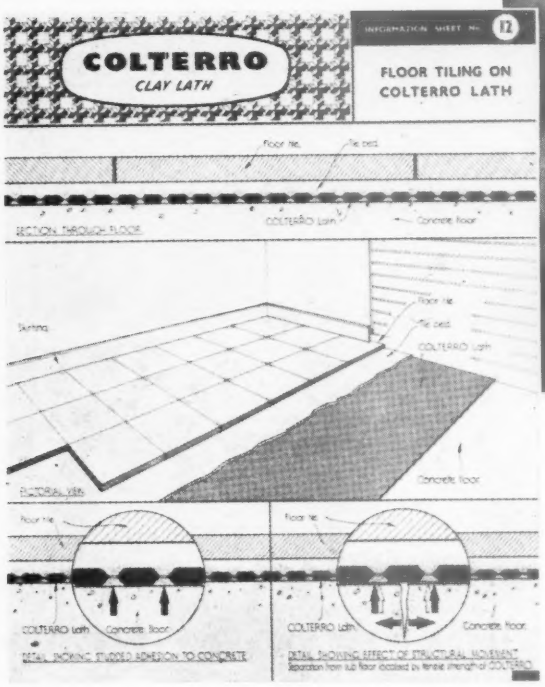

QUIL-LATH Flooring being laid at Messrs. Lewis's, Ranelagh St., Liverpool

Architects : G. de C. Fraser, Son & Gearey, A./A.R.I.B.A.
Specialist Flooring Contractor : A. Quiligotti & Co. Ltd.

Only Colterro Lath will give him this confidence as it consolidates and reinforces the tile bed and allows a spotted adhesion to the sub-floor. This eliminates transference of structural cracks and excessive shrinkage of the bed itself.

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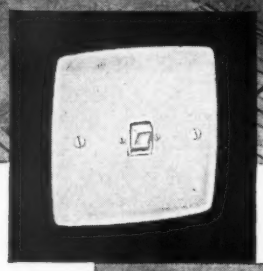

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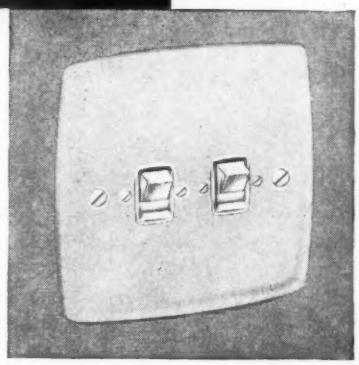

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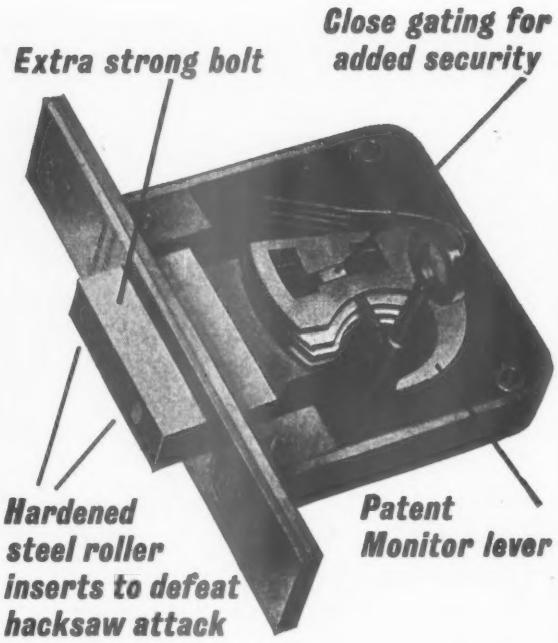

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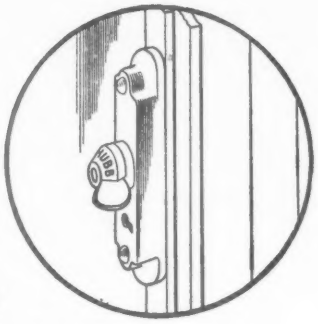

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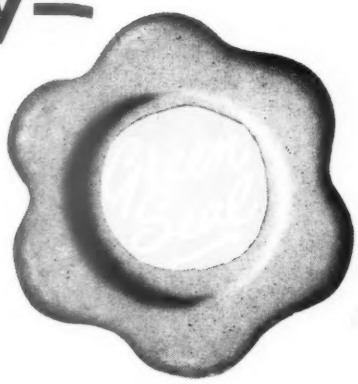

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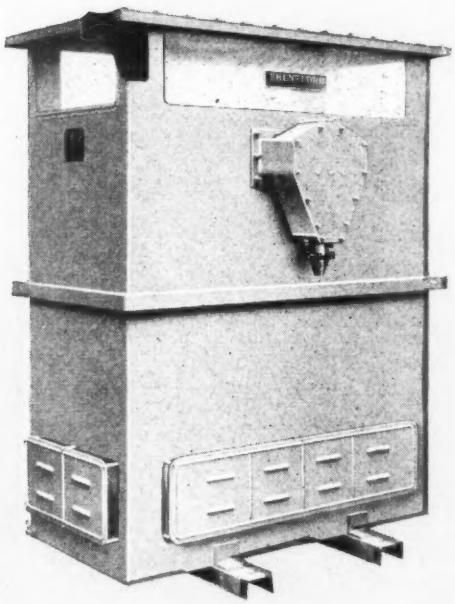

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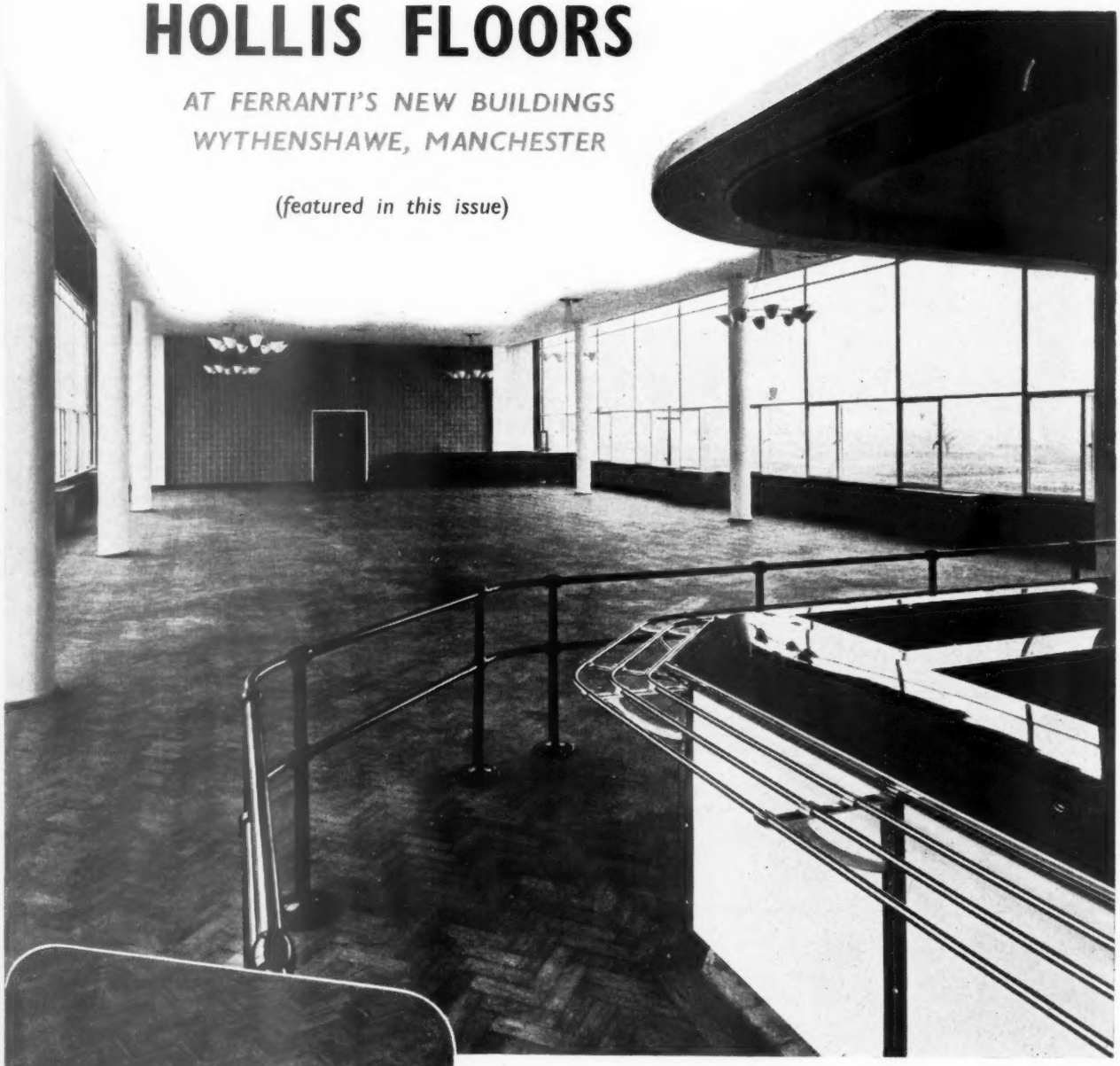
WYTHENSHAWE, MANCHESTER

(featured in this issue)



ARCHITECTS: *Cruikshank & Seward, F.R.I.B.A.*

SPECIFICATION: *Staff and Works Canteens—700 yds. super 1" nom. East African Muhuhu Blocks.*
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If you should ever visit the Crittall factory at Braintree (and you would be very welcome) you would observe many products which have never featured in a Crittall catalogue—and some that never will. For Crittalls look upon it as an important part of their work in windows to be experimenting with the new and improving the old. The Crittall projected windows are a case in point. Before reaching the stage of development shown in the recently published leaflet 172, you may be sure that they have passed every critical test of quality and performance as a product worthy of the Crittall organisation.

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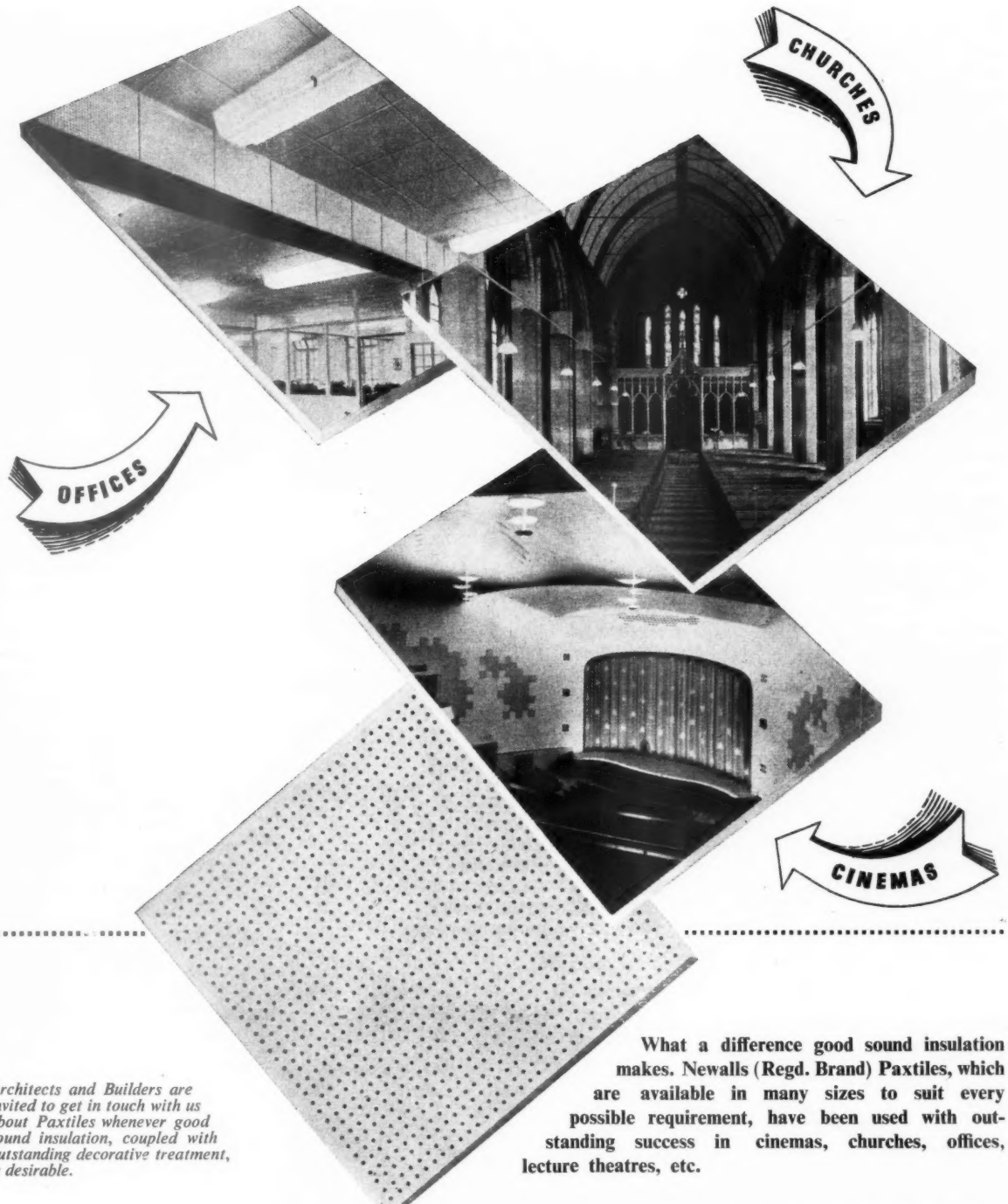

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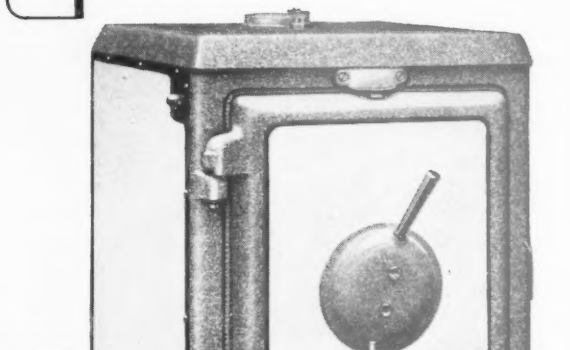

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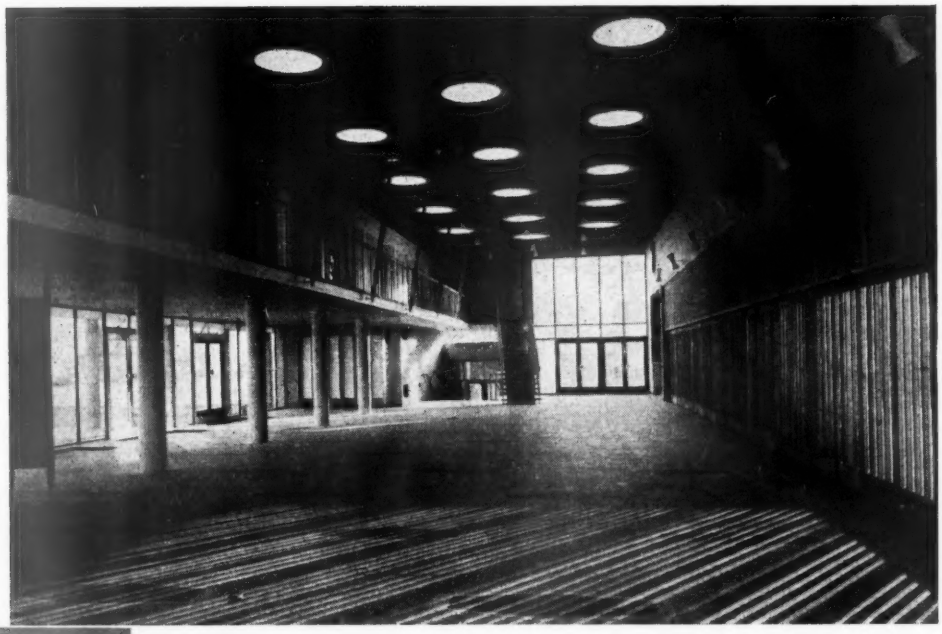

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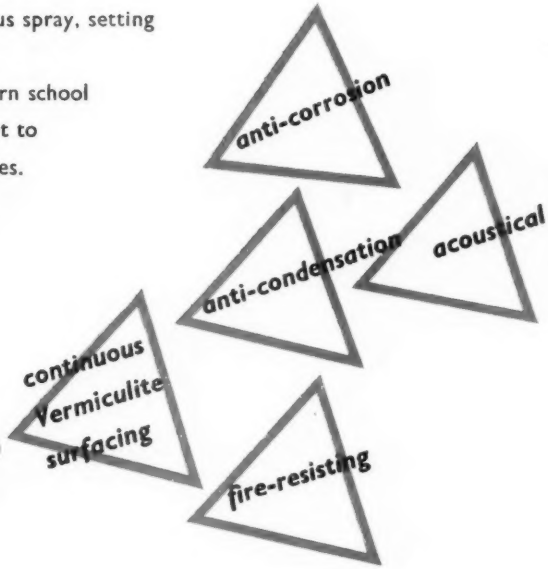

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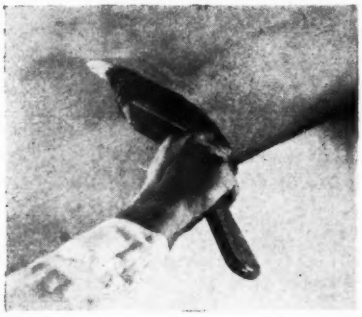

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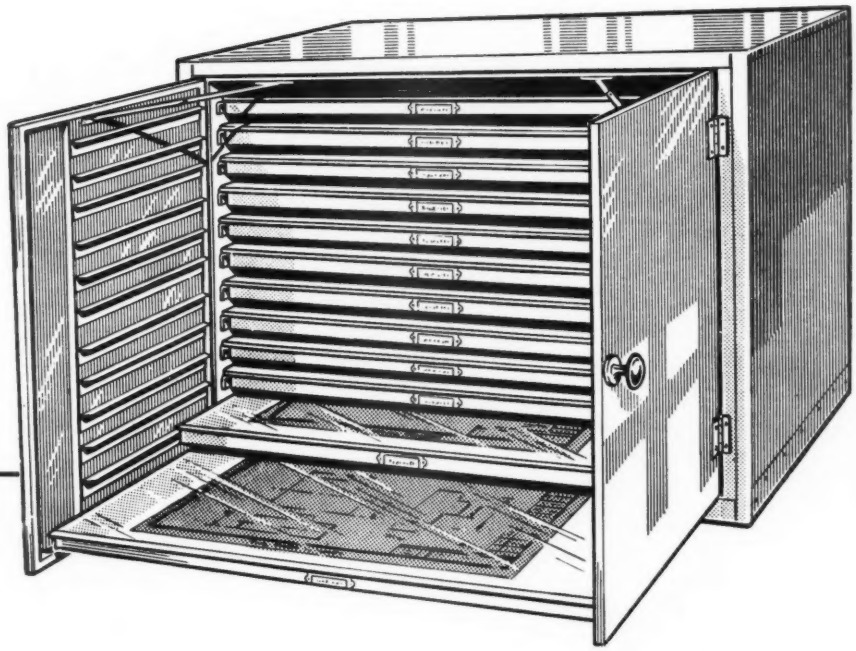

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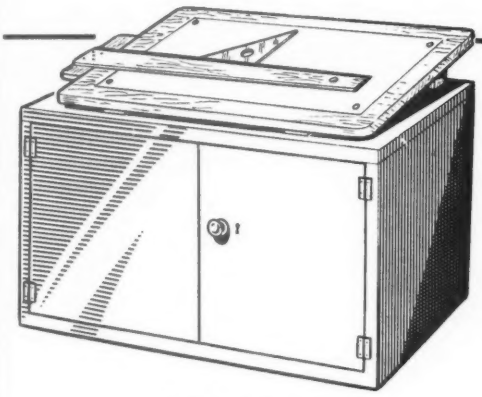

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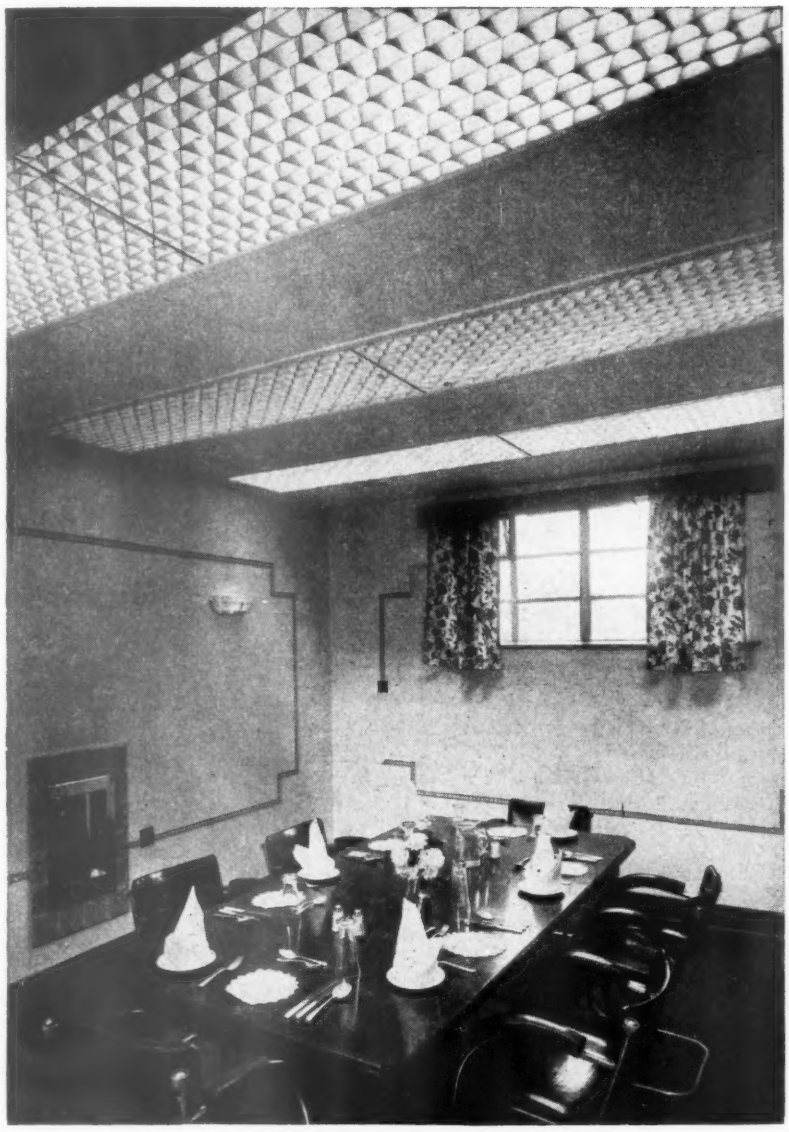

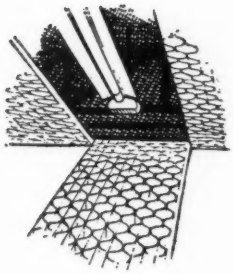

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THE ARCHITECTS' JOURNAL

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KNOTT CONTEMPORARY

"At a time when the public generally is probably more conscious of colour and design than ever before the Westbury (the new American hotel in Bond Street) offers an interesting challenge. The décor has been lavishly conceived and is"—one can picture the publicity man groping for the precise word—"distinctly modern, although contrast is provided by some period rooms." Overleaf you can sort out which is which. One public room is known as the Regency Room and the Press hand-out says that the architect, Michael Rosenauer, "has caught an echo of the period in the new hotel."

*

Connoisseurs of the period will no doubt agree that the echo is very faint, but it was enough to make Professor Richardson comment to a *Daily Telegraph* reporter: "the building represents the first sign of an attempt towards refinement in street architecture. It is still not warm enough and has far to go to equal the gracious buildings of eighteenth-century London . . . it is like the first gleam of spring prophesying summer after a long, harsh winter." The same reporter quoted James Knott, the chairman of the hotel company, as saying that the hotel "stands out like a sore thumb now against the neighbouring buildings, which are old. I have no doubt that in a few years time it will tone down and harmonize with them."

*

It is puzzling that Richardson sees more hints of an eighteenth-century summer in this little violet than in the primroses that bloom around St. Paul's, but the million conservative readers of the *Telegraph* will doubtless lap up a lead given on taste from such an eminent source. The answer to this essay in pseudo semi-regency comes from Rosenauer himself. While professing that he admires regency design, he admits that his use of it in this hotel is in the nature of a joke—a bit of interior decoration to amuse the sophisticated or make the raw mid-Westerner feel at home. He had not forsaken the modern movement in architecture, he assured me, that movement which he had helped to introduce years ago into this country. As regards the exterior, he was endeavouring to develop the solid wall, pierced with voids, as a change from the monotony of the glass wall.

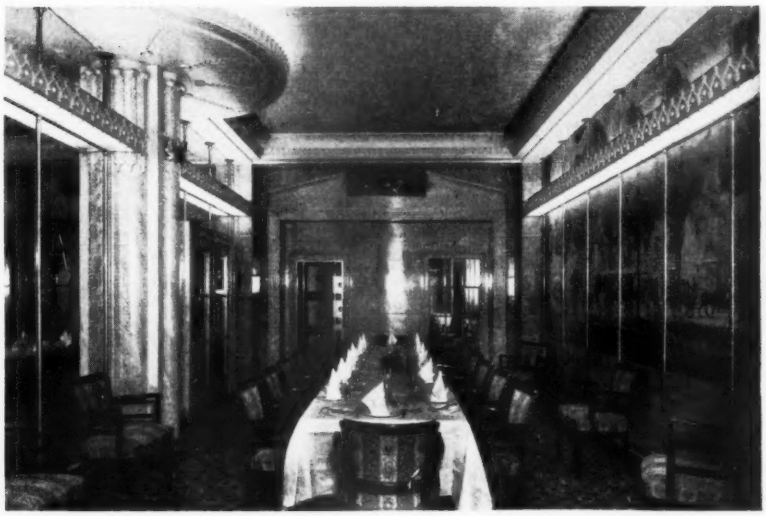
It would certainly be odd for the architect who picked such eminent contemporary designers to collaborate on the Time Life interiors to become suddenly a tradionalist. Nevertheless, ASTRAGAL diffidently suggests that Mr. Rosenauer's humour is slightly premature and capricious, and likely to be misunderstood. Much of the hotel can be judged from the photographs. What we have not shown are the well-equipped bathrooms, slightly cramped, in American fashion, and the fake regency furniture. The saddest point about the whole building is the poor standard of some of the fittings and decoration, due, no doubt, to economy. It is not the exemplar of fine British craftsmanship which one might have hoped would have confronted American visitors.

DR. BRONOWSKI

ASTRAGAL must now return to a subject he discussed last week — Dr. Bronowski's paper "Architecture as a Science and Architecture as an Art" which was given at the RIBA on March 2, because, as one might have expected from such a brilliant and versatile speaker, Dr. Bronowski elaborated considerably on his printed text and gave us a most lively exposition of his theme. It was only to be regretted that the audience was inadequate for the discussion which followed, and one was grateful that the chairman, Rowland Pierce, whose terse, seemingly-indifferent, remarks had, up to that moment, hardly helped the occasion, obligingly killed the discussion at a mere 7.35.

*

Julian Huxley proposed the vote of thanks and Richard Sheppard, second-



The new American hotel in Bond Street, the Westbury, shown by night, right, was opened last week and is referred to by ASTRAGAL *on the preceding page. Top left is part of the restaurant, which seats only* 90. *Opening off the restaurant is the tea room, top right, which has a coarsely painted skyscape on the ceiling and a mural depicting Berkeley Square in* 1815, *by Mrs. Cragg, on the right. Above left, a single-, and right, a double-bedroom, showing two of the styles adopted. The seats in the right-hand picture pull out to become beds.*

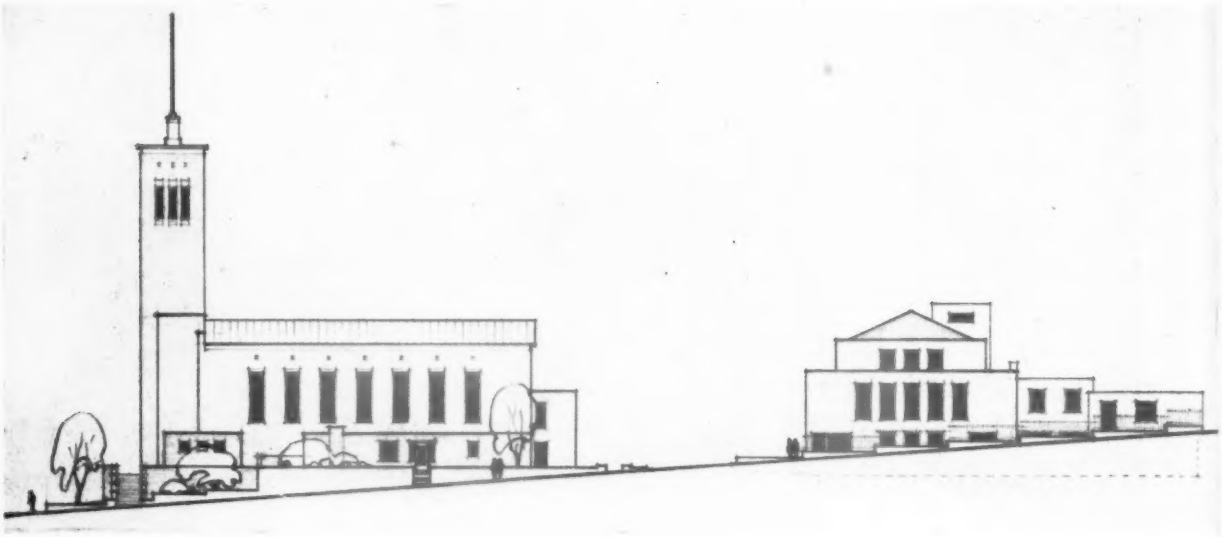
ing, was quick to cast doubts upon Bronowski's major point: "if we appreciate a thing, it is because we relive the heady freedom of making it. Beauty is the by-product of interest and pleasure in the choice of action." Alas, no one else, apparently, could compete, not even the earnest young man who prefaced his remarks with: "I am a scientist," in case, presumably, anyone thought he was a mere architect. Anyway, discussion or not, the RIBA deserve to be congratulated on their choice of speaker. It is refreshing to listen to a non-architect who would seem to know very much more than many architects about certain aspects of their own subject, and it is encouraging to find someone who still believes that an architect should be able to synthesize both art and science today as did Hooke and Wren in the seventeenth century.

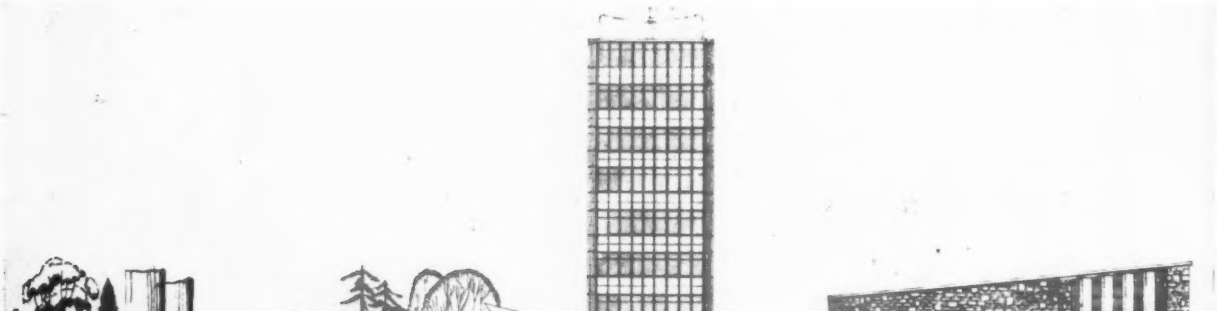
HIGH FINANCE

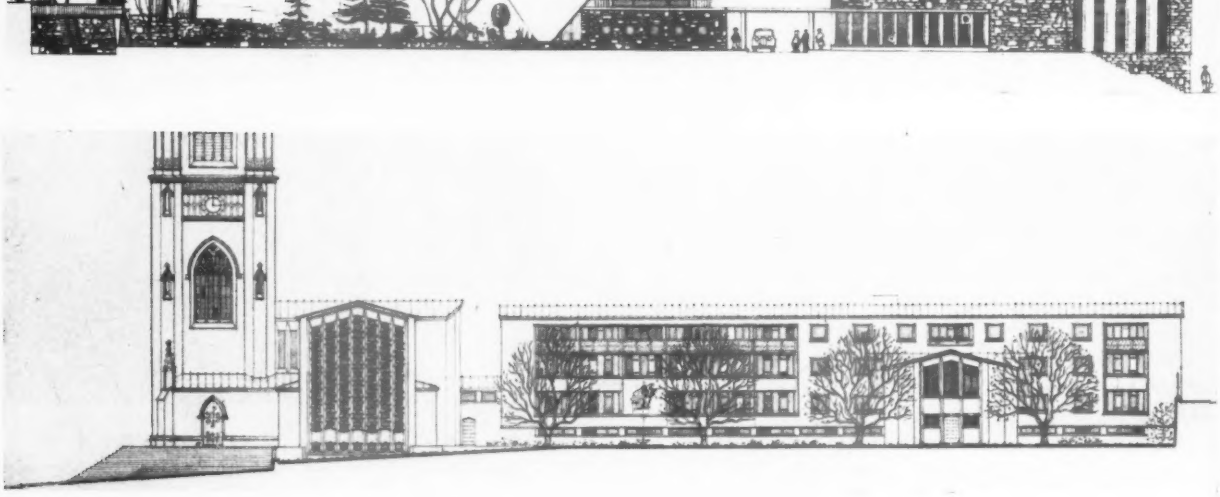
No doubt we are all influenced in sundry mysterious ways by fluctuations in the Bank Rate, but for most of us it is no more than higher interest on the overdraft. Hire-purchase restrictions of two or four years to pay for the TV or for a washing machine do not seem much of a hardship, but life will be made harder for some of the people who want to buy water heaters and such-like on long-term hire-purchase with no deposits at all. Essential equipment of this kind should not be restricted, I feel, for the gas and electricity companies are trying to provide vital necessities at rates which the poorest can afford.

ESTATELY HOMES EXHIBITED

In the years immediately after the war, most of the houses at the *Daily Mail* Ideal Home Exhibition were either sponsored by one of the Ministries or they were mere units in the "permanent non-traditional" programme. Whatever their shortcomings may have been, these houses were at least designed by architects, and they had a decent restraint about them. But the Olympian village began to look a bit different in 1954, and this year the newly-unleashed spec. builder is coming into his own again. With two exceptions, the houses







Contemporary Wouldn't Wash

These are the three prize-winning designs, chosen by Sir Giles Gilbert Scott from 112 entries, for a new church house and chapel for the Liverpool Diocesan Reorganization Committee. Although Sir Giles liked the centre design—"it is in the contemporary style, *but* has a number of attractive features" (our italics)—he placed it second, not only because it would need a lot of washing, but also because it would not create "the right atmosphere for its solemn ecclesiastical purpose." It wins £400 for its designers, S. W. Milburn and Partners. The first prize, of £800, goes to D. G. MacConville, author of the top design, which "though not exciting . . . perhaps a character too much sought after nowadays . . . is quiet and dignified, relying greatly on the beauty of its material—a 2¼-in. rustic brick of a golden brown colour." The third prize-winner (£200), Geoffrey P. Dawson, made use of an existing tower.

have most of the familiar wince-makers —leaded lights, odd dormers, half-timber with dowel pins to hang your umbrella on—in fact, all the clichés which architects detest and spec. builders dote on. Incidentally, if the writer of the leading article in last month's *House-Builder* will take a walk round the Ideal Home village he will encounter one of the pseudo-Tudor houses which he claims—in contradiction to a JOURNAL editorial note—do not exist today.

*

What about the remainder of this year's show? ASTRAGAL had a disappointing time. Nobody gave him a free sample of corn pads, and even the high-spot of his evening—an electric shave from a hair-raising blonde—did not help him to forget the sort of furniture he tried not to look at. Why is it that the cream of the furniture manufacturers and designers have given this year's show a miss? Is the public's Ideal too low to be propped up and saved from collapse?

THE YEAR BOOK AGAIN

The *Architect's Year Book** which is with us again—number 6, now—will not surprise its devotees any more than it shocked ASTRAGAL. It is laid out on the same plan as last year's, beginning with high-level stuff, æsthetics and so forth, and wearing its way down to practical brick and mortar at the end —or, this year, dry components and selected equipment.

*

ASTRAGAL supposes that the year book's readers are divided into two classes, those like himself, who start at the back with the technical articles, which are always excellent, and gradually brace up to the inevitable slab of proportion theory at the beginning —though this year the head of the queue is occupied by a discursive—but not diffuse—commentary from Max Fry. Presumably there are readers who begin among the reassuring and other-worldly abstractions and lose interest before they get to the selected buildings. One hopes that in this year's issue they will persevere at least as far as the very good articles by Ian McHarg and John Voelcker, on the development of open spaces between buildings, and Dutch developments in children's playgrounds, respectively.

ASTRAGAL

* Paul Elek. 42s.

POINTS FROM THIS ISSUE

The Editors

THE NEW ARBITER OF TASTE

TO the architect, rough-hewing his way, there is a town planner, as well as a divinity, shaping his ends. However sound it may be to have a planner controlling the development of town, and country there comes a point when control becomes unwarranted interference, a negative act, a brake on progress. Architects, judging from the recent discussion at the AA, referred to by ASTRAGAL last week, are at last waking up to the problem—their problem : at any rate to the extent of wondering whether planning officers should control elevations.

Architects are very fond of having things both ways. They want cheap assistants, but also fully qualified assistants. They want to be known as architects for designs, but to delegate responsibility for carrying them out. They accept the fact that the building of bad elevations should be stopped—without defining badness—and are hurt when a virtual layman refuses planning consent for one of their own designs. Of course, few envisaged—when the planning control ball was tossed lightly back and forth between ministers and professional advisors--that the ball would eventually lie in the hands of the (æsthetically) unqualified, and that by 1955 the number of architect-planners in charge of the development of towns and counties would be but a minute fraction of the whole. Indeed, even now, architects do not know which offends them more: to have their designs rejected by their peers or by a mere planning officer.

Now would be an opportune moment for the Town and Country Planning and Housing Committee of the RIBA to recommend to the Council a policy on this very important issue. It is to be regretted that no printed statement by the committee on this matter leaps to mind, because the problem is no new one, and an alert committee could have anticipated trouble. It is no real palliative to say that the architect can always appeal against a planning officer's decision, and that the MOHLG have rarely been known to uphold a planning objection on æsthetic grounds. The client cannot afford to wait while the planning appeal machinery, deliberately slow, churns out a decision. The whole issue should be reconsidered forthwith.

Planning officers are judging tomorrow's buildings by yesterday's standards. Having no creative visual policy, they are popping

glass cases over areas by insisting that new buildings conform to what exists. That is admirable—for a hundred years or so—for the terraces and squares of Bath, Edinburgh or Bloomsbury, but not, surely, for Pinner or Orpington. This is not planning, but arrested development. When the new buildings in a Georgian street are made to line up with their neighbours—use materials "in keeping" and so on, what act will break the chain of conformity to that which already exists?

The answer stems from Peter Smithson's comment at the recent AA's discussion: that "it is preposterous to have planning officers wasting time on negative work." They must be setting the stage for a new "principle of urbanism."

The planning officer's only hope for obtaining ordered development is to abandon the trivia of individual elevations and concentrate on comprehensive development. Their policy for central areas, for instance, should be to persuade all the owners of neighbouring properties bounded by a road system to combine, appoint a team of architects, and, in collaboration with the planner, not only iron out the incredible, uneconomic stupidities of rebuilding to be seen everywhere in central areas today, but also to create a new urbanity, a town of conscious contrasts, and not just to perpetuate pastiche. The great landlords, the enlightened property owners, are going or gone, and their estates are being broken up. The planner's job is to recapture —or, better still, improve upon—the conditions for the present-day architect which the eighteenth-century enlightened landlord provided. But it is not the planner's job to act as a judge of taste. His task is to provide opportunities. Our hope is that architects will then be equal to them.

ARCHITECTS AND TRADE UNIONS

In the last two issues Martyn Webb has put to an Editor his proposals for the steps the profession can take themselves to improve salaries. This week we publish a criticism of these proposals from a supporter of the trade union approach to the problem, who unfortunately has to remain anonymous and therefore signs himself "Stucco." Although at first reading the two viewpoints seem irreconcilable, we do not believe that the authors are so far apart in their views, in fact, as they would seem to appear. We invite readers to comment on these two proposals.

Martyn Webb opened this discussion with the admonitory statement that too much attention was being paid "to the question of *means* . . . rather than to *ends*." It is of course vital to know what you want before you start thinking on how to get it; but I believe that we, the general body of architects, know very well what we want and need, and that the major problem that confronts us today (apart from the aesthetic and technical) is how to set about it. The emphasis that is being given to means seems to me, therefore, both necessary and significant.

What are these *ends* which I have just implied most architects desire? Ideally and practically, I believe them to be: (i) good architecture; (ii) all buildings to be designed by architects; (iii) a responsible and respected status, commanding upon the community a recognition of the indispensability of the architect's services; and (iv) monetary reward commensurate with that standing. If these are our real objects, Mr. Webb's anxious arguments to convince us we are "professional men" are, I suggest, hardly relevant and somewhat otiose. The question, I submit, does not really merit the over-riding importance Mr. Webb has given to it. The term "profession," *pace* Mr. Webb and Messrs. Lewis & Maude has never been authoritatively defined. Are painters, sculptors, musicians, poets, novelists, actors, "professional men"? Few, if any of the practices listed by Mr. Webb as inherent in the "professions" prescribe them. Would they not all claim to be, first foremost and last, artists? What then is their standing in the social structure, and how does it compare with that of those who practice the mother of the arts? Suffice it for our purpose that we are bound by a strict code of conduct which may both hinder and help us in attaining the *ends* I have broadly defined.

Payments by fee or salary

If, as it is hoped, these are the ends which most faithfully reflect the ambitions of the profession (using the term, not as one of nicety, but as a convenient contextual synonym for practising architects), then the critical questions we have to ask are: (*a*) are any of the existing organizations at our service willing and capable of bringing them about? (*b*) if yes, which one or ones? (*c*) if not, is it within our command to create another which will be; and if so, what shall be its form? For the reasons later explained, I should have no hesitation in answering "Yes, the RIBA, and only the RIBA" to questions (*a*) and (*b*)—but only for the achievement of the first three *ends* stated above. In the attainment of the fourth, reward, it has partly failed, or, partially succeeded.

Unhappily, the means that we would employ to gain these ends—with the possible exception of (iii) status—will differ in varying degrees according to our concepts of our art, according to whether we practice in a private or in a public office, and according to whether we are paid by fee or by salary. Fortunately, with the first of these variants this article is not concerned; it is the second and third that so far have crucially affected, if not bedevilled, our thought on the question of means.

The power of the RIBA

Aesthetic and educational beliefs apart, it may be questioned whether the measures we would take to create good architecture and to ensure that only architects design buildings, would depend on whether we are private or official architects, principals or salaried. The point is largely academic; but it is as well to note—in support of the argument that our problem is one of *means* and not *ends*—that there are sections in the profession, extremist and small though they may be, who variously (*a*) hold that good architecture can be created only in conditions obtainable in private offices; (*b*) would restrict the work of official or private architects; and (*c*) would ensure a distribution of work to those who actually carry it out as distinct from those who actually "get" it. Disregarding these extremist views, the profession, with negligible exceptions have and will continue to place their trust on the RIBA for the fulfilment of our first two objects. And rightly so; for no trade union, no break-away or separate organization of private, official or salaried architects, no reorganization or filliping of the Allied Societies, can or could acquire the standing, the numerical and political strength, the

authority, and the means, of the Royal Institute— at least for the furtherance of these two ends. Its Royal Charter centred round its main object " the general advancement of Civil Architecture," its supreme and exclusive control over education; its promoting of the Registration Acts (inadequate though they be); its sole dominion—for all practical purposes—over the conduct of competitions; its established consultative relationship to the Government of the day; all signify its standing, its power—and its success—in this particular province.

The gaining of our third object—a responsible and respectable status, commanding upon the community a recognition of the indispensability of the architect's services—is dependent mostly upon the first two, but also to a large measure upon the—priggish airy-fairy expression—enlightenment of the public.

Exposure of ignorance threatened

It is idle to seek comparison with the doctor or the lawyer; or to expect the same awe-struck recognition of indispensability that the public willy-nilly accords to them. In the one case, such recognition is evoked by fear, fear of pain—and of death; and in the other . . . well . . . because the law pervades all our lives, and we ignore or defy it at our peril. But how many, or how few, of the public know or care whether the buildings they see, live, work and play in, have been designed by architects or by . . . ? This task, then, of establishing a high place in the body politic through recognition by the public is a formidable and very slow one. We must turn their flank—and in this manoeuvre, the transfer from the private to the public patronage of the architects is our ally—by convincing the Minister, the Councillor, the Chairman of the National Board, the Managing Director and all their counsellors, of our worth, either by visible and economic proofs, or by threatening to expose, in all the propaganda at our disposal, their commonplaceness and ignorance —they who as selected or elected leaders should know better than the led!

The writer has no doubt that for the accomplishment of this task, the RIBA is the best trained and equipped of all existing or contemplated organizations. It has the standing, it has the strength, it has the authority and it has the means to carry it out. Moreover, it follows naturally and logically on objects (i) and (ii).

A brief re-appraisal

Let us pause here and see whether we are agreed on three of our main objects and the means of securing them. (We must tackle the fourth and last unencumbered by any dragging relics from the preceding three.) I have asserted that our problem is one of *means* and not of *ends*; that the ends are clear and categorical, and that, therefore, the larger weight of thought given to the question of means is necessary; that in determining these ends it is immaterial whether or not we call ourselves " professional men."

On the question of means, I have argued that they differ in varying degrees according to whether we are in a private or public office, or are paid by fee or salary. I then briefly gave my reasons for believing that the RIBA is the best fitted body to carry out the policies necessary to the attainment of three of our stated objects. Whether in fact the Royal Institute makes full use of its plentiful actual and potential resources to carry out these policies is another matter. If it does not, the remedy lies with the general—*not* a sectional—body of members; for no institution can for long ignore or disregard their will, provided it is expressed persistently, constructively, and fearlessly.

The case of the private principal

And now for reward, the crux of the discussion. What, asks the Editor of Mr. Webb, is the type of organization best suited for improving the conditions of work, salaries and incomes of the architectural profession? (By incomes in that context I assume the Editor means the amount of earned fees retained by the principal in private practice after the payment of all overheads.) As I have already suggested, the type of organization best suited to increase the money you earn as an architect will and must differ according to whether you work in a private or in a public office, as a principal or as an assistant. Let us take the principal in private practice first. He does not look to or wants or needs any other organization for this purpose than the RIBA. His scale of fees is fixed by the Council of the Royal Institute; the Code imposes upon him the duty " to uphold and apply " this scale; it forbids him to " compete with another architect by means of a reduction of fees . . ."; and his conditions of engagement are prescribed in the " Scale of Charges." He is thus as jealously and fully protected as is any industrial worker by his trade union. When the cost-of-living rises sufficiently to be reflected in an increase in the wages of building operatives or in the cost of building materials, his percentage basis assures him a proportionate increase in his fees; which may or may not offset his own higher cost-of-living.

In the face of this evidence of the Royal Institute's will and successful means to ensure what it, acting as sole arbiter, considers a fair and reasonable reward for its *private* members, Mr. Webb's suggestion for the " handing over of the Scale of Charges to the local Allied Societies " could only have been made for the sake of novelty.

The salaried architect in private practice

Let us consider next what type of organization is, or would be, best suited to improve the lot of the salaried architect in private practice. Is the RIBA fitted for this task even if it had the will? The question is qualified because the almost automatic answer is that if it can, and successfully does, fix, safeguard and improve the reward of principals by means of the Code and the Scale of Charges, it could equally and as easily fix, safeguard and improve the reward of their assistants by similar means. I understand that this simple course was once put to and rejected by the RIBA Council. The main expressed objection would seem to be that whereas principals, on the whole, may be relied upon to " uphold and apply the Scale of Charges " and that it is comparatively simple to discipline them when they do not; their assistants, of whom there are very many more, could not be expected, particularly in lean times, " to uphold "—it would hardly be for them " to apply "—a Scale of Salaries, and that it would be extremely difficult to bring them to task when they failed to do so. Opinion will divide as to whether this is a specious or genuine objection. But what is certain is that if the idea has gone begging in Portland Place, it would have no hope of success in the form of a " sub-unit of the Scales of Charges Committee " of the Allied Societies—Mr. Webb's development of his novel suggestion. Rumour has it that in the report of the Salaried and Official Architects' Committee recommending the sponsorship of a trade union by the RIBA, there was a proposal for the formation of a joint negotiating committee, on the Whitley Council pattern, composed equally of principals and salaried assistants in private practice, to draw up and administer a scale of salaries and conditions of employment. Such a proposal, whether actually made or not, would appear to be practicable and capable of providing a quick, effective and neat piece of negotiating machinery for assistants in private practice. It could be so designed that only those who subscribed to the decisions reached by the joint committee would be formally bound by them; thus leaving the choice to members of both sides to come in or remain outside the " closed shop." In time it would be in the best interests of both to be inside. All that is needed to start it is a resolution of the RIBA Council.

The salaried architect in public office

We now come to our thorniest problem, that of the salaried architect in the public or semi-public office. Judging by the summary of the Salaried and Official Architects' Committee's report circulated by the RIBA to its members, the problem was thoroughly and exhaustively investigated by that Committee. The conclusion it reached was that in the existing conditions that regulate the pay of the class concerned only a trade union could have the will, the means and the power to effectively represent their interests. I have not seen the full reasoning that brought the Committee to this conclusion; but even on the condensed evidence presented in the summary, the conclusion appears logical and inescapable, even if the Council judged it impracticable. It is on this terrain of trade unionism that Mr. Webb's assertions must be frontally challenged. His first is that trade unionism and professionalism are incompatible; and the reasons he marshalls in support seem to me antiquated and contrary to the evidence before us. " Historically and politically," explains Mr. Webb, " trade unions have been fashioned to serve the needs of workers in their struggle to achieve better working conditions, higher wages and freedom from exploitation." Whether professional men, intellectual workers or what you will (incidentally there is a High Court willing that for the purpose of the Industrial Disputes Order, Town

Clerks (*i.e.*, lawyers) are "workers"), the group of architects we are discussing are waging precisely the same struggle, though they might halt before accusing their employers of exploitation. But the struggle is unconcerted, and they are hopelessly inadequately armed for it. Organize them into a trade union and they have the beginnings of a militant unit. Their biggest difficulty would be that other older, bigger and stronger militant units would bar their way to the front line.

Changes in the social structure

Professional men in their hundreds are already members of full-blooded or quasi trade unions: *vide* the respective memberships of NALGO, the IPCS, the British Association of Colliery Management and the Transport and Salaried Staffs Association. If the professional men who are members of these associations find nothing incompatible, indeed, judge it in their interests, to join these bodies, why should it be incompatible for a trade union to be formed solely of members of one profession?

Mr. Webb's further arguments against professional men resorting to trade unionism ignore, in my view, the fundamental changes that have taken place in the social structure during the last decade. To contradict but a few of his points; it is not necessary, as I think he implies, for a trade union, in order to be strong and effective, to be affiliated to the TUC, *e.g.*, NALGO; nor is the converse true, *e.g.*, the ABT. The strike may be the aggressive weapon of a trade union, and this may be the one best suited to the industrial worker; but these are also protective weapons in the armoury; *e.g.*, the power to refer certain disputes to arbitration; the protection from possible legal action for inducing breach of contract when members are individually or collectively advised to resign from their employment in furtherance of the union's policy; the availability of fund to compensate its members who suffer monetary loss as a result of adherence to the union's policy. These are some of the protective weapons which a trade union has readily at hand, but which any other association, including the one suggested by Mr. Webb, would find difficult, if not impossible to acquire, and frustratingly cumbersome to use.

And here I must correct the Editor: he asked Mr. Webb—"How can you explain . . . the RIBA's insistence that if the architectural profession was going to have anything, it must have a trade union." The RIBA has not insisted on anything of the sort; if it has insisted on anything at all, it is that it may have anything but a trade union; at least the letter announcing the Council's decision is open to that interpretation. And is it fair of Mr. Webb to imply that the Council's decision relied on "the snobbish element within the profession to resist contamination by trade unionism." The basis of its nugatory decision was, as I understand it, the well-grounded doubt that neither a brand new all-architect trade union nor any existing one could in the immediate future do the job that was expected of it.

The alternative before the profession

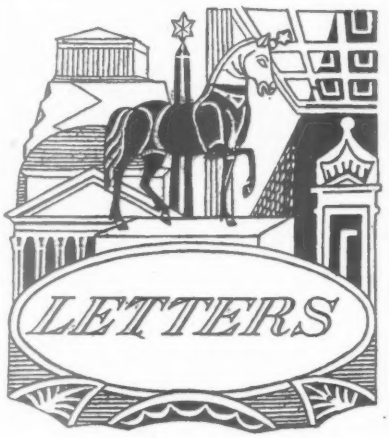
In Mr. Webb's opinion the RIBA's "NAY" to the formation of a trade union was correct, because of his bogey about "professional men"; according to mine, it was overcautious: an experiment might have been made if only to test its fears and its strength, and at the same time give a large number of its members what they asked for and what they had faith in.

But now, *quo vadis*? Let us take the road shown to us by Mr. Webb. A new professional association, which (1) must embrace both employer and employee; (2) must be responsible for fees as well as salaries; (3) must be free from taint, and have a nation-wide coverage, with some local autonomy and a firm hold of local events. If Mr. Webb had written this before 1834 (when the Institute of British Architects was founded) one would today acclaim him as a man of exceptional vision and surely as the founder or sponsor of the RIBA and its Allied Societies. The RIBA is already seized of all the attributes stipulated by him for the new professional association. The obstacles that have blocked its way, would be multiplied and magnified for his "new professional association." (Incidentally, to what genteel and innocuous functions would Mr. Webb confine Portland Place?) Surely he does not really believe that the body most likely to fulfil this rôle is the Allied Societies? The Allied Societies are in affiliation to the RIBA; their constitutions are subject to the approval of the RIBA Council; the memberships of many of them include non-architects; and they have always looked to the RIBA for direction, leadership and national representation of their interests. Moreover, could the RIBA vest them with more power than it itself commands? Whatever the Allied Societies could do in their suggested new guise, the RIBA can do better, and it is to be doubted whether the RIBA would ever acquiesce in such an ignominious passing of the buck.

Whither, then? Not with Mr. Webb, at least not for me. I should say that our wisest policy at this juncture might well be to mark time, to wait and see. Wait and see how many, if any, of the pro-trade-unionists join the ABT—or even BAG (neither will ever get such a chance as this one again). Wait and see what the Salaried and Official Architects' Committee produces from its second attempt—perhaps it will discover some new avenue, or turn up some hitherto hidden stone; they have gone over the ground pretty thoroughly, and if they report anything new it should be worth listening to! Wait and see if the RIBA can bring any telling influence to bear on all those "appropriate organizations" whom it has counselled its members in their own interests to join. Some new knowledge may come out of all this, and from knowledge, perhaps power will emerge. Time, of course, is not, financially, on our side; but is there a practical alternative equal to the task, just now? Not, I suggest, Mr. Webb's.

In the meanwhile, let us note that the profession is employed to its full capacity; that the salaried architect is in a sellers' market; that nearly all salary scales have been recently, or will shortly be, increased, and that what is mostly wrong with them is not their range, but their application. And to be quite irresponsible and inconsequential, I should like to leave you professional men, artists, technicians and intellectual workers, with this question: the Government of the day rules, but who wields the real power? Could it be the trade unions?

"STUCCO."



John W. Greenwood, A.R.I.B.A.

A. L. Tamkin, A.R.I.B.A.

D. A. G. Reid, B.Sc., A.M.I.C.E.,
Principal, Brixton School of Building

"*Associate*"

T. McEwan Porter, A.R.I.B.A.

J. G. Bodart

The New Way of Describing Buildings

SIR,—I found your presentation of the Barnet Secondary School (February 24) of great interest, and I would congratulate you on the very full description. Might I offer a few suggestions:—

(1) The details of construction and finishes would be far clearer if tabulated, rather than the present lay-out which is not very clear for rapid assessment.

(2) The cost of analysis does not give a total cost per sq. ft., although, of course, this can either be added up from the elements or worked back from total cost/total sq. ft.

(3) The list of sub-contractors, etc., on the same page and not tucked away at the back.

(4) Could the cost analysis be kept separate, preferably on a tear-out sheet, as the Information Sheets, so that a cost file could be built up—at present this can not be separated without spoiling the information on the reverse side of the paper.

I also greatly appreciate your series on costs, and I hope that this will be a permanent weekly feature, not just on and off for one year only. The more information that we can have on this subject the better. Your advertisers do not help very much as costs are very rarely given in their advertisements (or for that matter useful information either), and much time can be wasted

making enquiries for approx. costs, and then finding the cost impossible for the job in hand.

JOHN W. GREENWOOD

Herefordshire.

[We have Mr. Greenwood's first point in mind and when certain printing difficulties have been overcome we will adopt his suggestion. We are proposing to publish a total cost per square foot in the future. We would be interested to learn how other readers feel about Mr. Greenwood's third point. The introduction of a tear-out sheet for the cost analysis—the fourth point—would be extremely expensive. We would like to thank Mr. Greenwood very much for his helpful suggestions, all of which we will bear in mind, and we hope that other readers will add to them so that we can be sure of a continually improving standard of presentation.—ED.]

Why Worry About the Intermediate Exam

SIR,—First, I would like to say that I appreciate your endeavours to improve the status of the architectural profession, and trust that the position will improve as a result thereof.

However, I now write to you as I am intrigued by the advertisement inserted in the recent issue of your JOURNAL on behalf of the City of Manchester Housing Committee. I refer to the post of assistant architect: such architect is required to have passed the intermediate examination of the RIBA. Such a requirement is rather puzzling as the word "architect" is used only when the person concerned has been accepted by the ARCUK.

Why then worry about the intermediate RIBA exam?

A. L. TAMKIN.

Middlesex.

Office Story

SIR,—I followed your Guest Editors' "Office" story (AJ: January 27 and February 3) with the greatest interest. There are two points I should like to make.

(*a*) In the example you have chosen, the prospects are blighted at the outset by the building owner's demand for rapid progress. One gathers that Mr. Gross and the other members of his board have had no previous experience of commissioning a building; they would probably learn a good deal from experience during the period covered by your story.

During recent years, education for management has attracted a good deal of attention and the courses of study proposed have been designed to introduce future executives to the various problems associated with management. I cannot recall references in any of these syllabuses to the problems and procedure involved in the commissioning of building (apart from such studies as factory layout). It would appear, therefore, that you have indicated a weakness in management study syllabuses which could usefully be put right.

(*b*) Once the initial mistake has been made (by the building owner) the example loses much of its value as a study of building practice. It is sound practice in experimental studies of any sort to deal with one variable at a time. If, therefore, there is to be useful study of contracting practice, the other conditions of the subject must be at least reasonable. I hope, therefore, that you will be able to persuade your distinguished team of guest editors to produce another story from their case-book showing Mr. Basildon-Jones working efficiently for an exemplary client with such subsequent difficulties as Mr. Farrow is prepared to imagine.

D. A. G. REID,
Principal, School of Building.

Brixton.

Architects Treated Like Clerks

SIR,—The RIBA has advised us to join our appropriate trade union. Those of us in local government service would probably join NALGO, but those in private practice are not allowed to do so. A person leaving local government service for private practice would have to leave NALGO and join some other union.

Therefore, as a result of the RIBA's advice, architects will never be represented as a united body in any one union. Considering we pay £5 4s. per annum for registration and membership of the RIBA, one would expect the latter to offer its members the advantages it feels they will gain by joining a trade union and at the same time ensure a united profession.

Your article this week by Martyn Webb raises the question as to whether we are a profession or a trade. I submit, Sir, that those in private practice might possibly say they were in a profession but most of us in local government would doubtless answer that we were members of a trade, for the simple reason that a large number of local government authorities appear to regard their architects as some form of clerical assistant rather than a qualified specialist.

"ASSOCIATE."

Why Not TV for Building Operatives?

SIR,—With reference to the remarks made by Sir Richard Coppock in your issue dated February 17, I think you might be interested in the following extract from a letter I have received from a client of mine for whom we are building a house.

"No work done today. All the men in a shed—my wife took down magazines for them to read. Looks as though we shall have to supply a wireless and television as well."

T. MCEWAN PORTER.

Salisbury.

A Layman's View of the Profession

When Mary Applegate told Evening Standard *readers of a new house which had let her down badly,* ASTRAGAL *complained (February 17) about her reference to "the architect," because it seemed that her house was a typical spec. building. But* ASTRAGAL *had a word of thanks for Daphne (TV) Padell, who followed up Miss Applegate's article by writing in praise of architects. And now Daphne Padell's husband, J. D. Bodart, has returned* ASTRAGAL'S *kindness by telling us, shrewdly and frankly, why the layman is often suspicious of the architect. This letter is well worth your attention, particularly if the cap fits.*

SIR,—As you have given certain prominence in ASTRAGAL'S notes to my wife's article on architects in the *Evening Standard* (I am referring to Daphne Padell and not to Mary Applegate), I would like to add some comments. (AJ: February 17.)

Firstly, my wife's propaganda is not limited to this article. In 1953-54 she strongly upheld the architect's cause in a series of monthly TV programmes on our house; indeed, she has received a letter of thanks from the RIBA for her efforts.

Secondly, through these TV programmes, we have been in contact with quite a few people who belong to the "ignorant folk" category mentioned in your notes, and we find that in general the employment of an architect is not considered a waste of money, but rather as an expensive item; not simply expensive, but an item which cannot be budgeted for, inasmuch that the final cost of employing an architect is always much higher than estimated.

The RIBA booklet on the Scale of Charges does not help. *It seems* to have been compiled by a lawyer for the confusion of the client and for his final undoing!! I defy any layman to work out from it the exact cost of having an architect on the job.

The architect is a professional man, and as such the client gives him his confidence. He does not, therefore, try to work out the additional charges concealed in the tight print of the Scale of Charges booklet, but accepts the estimate. On the day of reckoning the client, faced with a larger bill, at first refuses to pay and argues, until advised by his solicitor that the architect is within his rights as set out in the booklet.

I know, within a three mile radius of my home, no less than three such cases, all hard-headed business men who were faced with a higher bill than estimated, and whose relations with their architects were or are now through solicitors. Each one of these men, who would read a hire purchase agreement through three times before signing it, relied on the professional estimate, and never thought of sending the booklet on the Scale of Charges to their lawyers to be vetted.

This not so infrequent occurrence is what, in my opinion, makes people shy of having an architect. When two years ago I announced to a group of friends that I intended to have an architect for my house, I was told, "Look out, old boy, it will cost you a damn sight more than you think." This remark was, of course, followed by hair-raising tales of other people's experiences.

Yes, architects are too safe from the law, I would like to see the day when no house can be built without an architect, *but* first the architect must have the general confidence of the public.

This could be achieved, I feel, by the following:—(*a*) A clearly set out Scale of Charges; (*b*) The abolition of rosy under-estimates!!!; (*c*) The fee to be a percentage of the commissioned cost of the house, and not of the final cost.

The last condition would stop the present position by which an architect can accept the commission to build for a given price, without any obligation. By the time the tenders from the builders are received, and if they are much above the commissioned figure, the client is far too committed to draw back; he has paid for his land and if he decides not to build, he still has to pay the architect for the work done to date. If, on the other hand, the architect redraws his plan and prepares new specifications in order to bring the cost down to the original figure, the client is charged for extra work. It is a case of tails I win, heads you lose!! Poor clients!! Every architect should be up to date with the trends in prices and costs, so that the client can rely on his figures, otherwise how can you blame the individual who prefers a "jerry-built" house with the advantage of a fixed price.

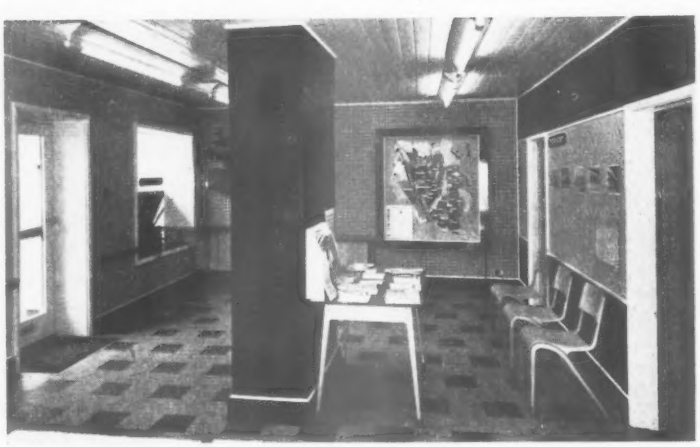
I hope you will give me the hospitality of your column, as these few thoughts are not just our own ideas, they seem to be fairly widespread, judging from the letters and conversations we have had with those who decry architects, through my wife's television programmes and ensuing publicity.

J. G. BODART.

Kent.

Information Office, Stevenage

The information and estate office in the High Street at Stevenage, seen above and right, was designed in the Chief Architect's Department, Stevenage Development Corporation (architect-in-charge, Owen N. Roberts). The office, which is contained within the shell of an eighteenth-century cottage, has two timber clad display bays on tarred brick plinths. The front wall is rendered dark green, the woodwork is painted white and the grey fascia has white lettering. The finishes used on the interior include red and grey thermoplastic floor tiles, and a boarded ceiling painted white.



BUILDINGS IN THE NEWS

County College, Liverpool

The Childwall County College, Liverpool, has been built for the City's Education Committee to the design and under the direction of Ronald Bradbury, City Architect and Director of Housing. The college, which cost £185,000, was completed and occupied late last year after various delays in the building operations, due to shortages of certain materials. The official opening took place in February. Work was begun in 1951, when steel was difficult to obtain, and a reinforced concrete frame was decided upon in place of a steel frame. The photograph on the left shows the three-storey teaching block. The general contractors were Tysons (Contractors) Ltd.

Houses at Crayford, Kent

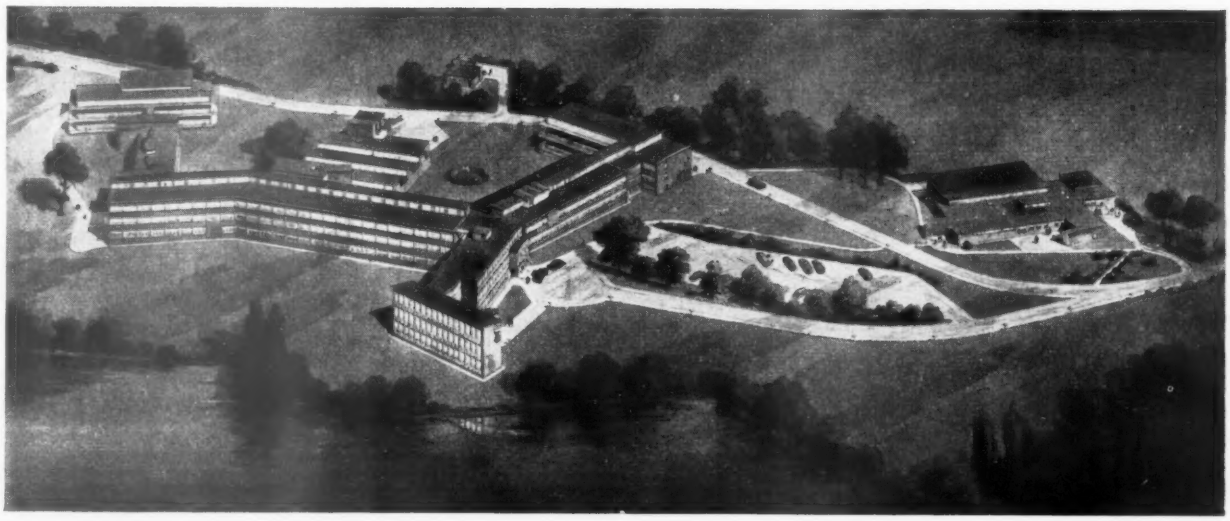
A housing association for the employees of Frederick Braby Ltd. has built 98 houses and 20 garages on an 8½-acre site near their factory. The architects were A. Hargreaves & Partners. There are four different types of 3-bedroom, and one type of 2- and 4-bedroom houses. Costs vary from £1,350 to £1,950. Each house has radiators in the dining room and two bedrooms, run from living-room back boilers.

Hospital Extension

An additional storey on the west wing of the Voluntary Hospital of St. John and St. Elizabeth, St. John's Wood, provides accommodation for eighteen children at a cost of £23,427. The architects, W. H. Watkins, Gray & Partners, provided the eight-bed ward shown below, which is flanked—to the south—by a sluice room, w.c. and lavatory, a six-cot ward and the playroom, right, and —to the north—by a bathroom, a w.c. and lavatory, a two-bed isolation ward, a treatment room, kitchen, sluice, duty room, bath and two single-bed wards. Windows conform to those on the older building. The playroom has an electrically-operated sliding roof, devised so as to provide sunshine and fresh air for children without any of the dangers associated with balconies.

Laboratories near Manchester

Below, proposed pharmaceutical laboratories, offices and canteen for ICI at south end of Radnor Mere, designed by Harry S. Fairhurst & Son.



ARCUK

The Council: 1955-1956

These are the members of the ARCUK Council for 1955-1956. (The newly appointed members are Dr. R. Bradbury, T. S. Cordiner, R. E. Enthoven, R. J. Hurst, and R. J. Potter.)

Appointed by the Council of the Royal Institute of British Architects.

H. Anderson, F.R.I.B.A.; D. H. Beaty-Pownall, F.R.I.B.A.; Dr. R. Bradbury, A.M.T.P.I., F.R.I.B.A.; J. T. Castle, A.M.T.P.I., A.R.I.B.A.; L. A. Chackett, F.R.I.C.S., F.R.I.B.A.; T. S. Cordiner, F.R.I.B.A.; Dr. F. F. C. Curtis, A.R.I.B.A.; R. E. Enthoven, F.R.I.B.A.; R. O. Foster, F.R.I.B.A.; P. G. Freeman, F.R.I.B.A.; J. K. Hicks, F.R.I.B.A.; R. J. Hurst, M.A.(CANTAB)., F.R.I.B.A.; H. L. Kelly, F.R.I.B.A.; C. Kennard, F.R.I.C.S., F.R.I.B.A.; H. Martin Lidbetter, F.R.I.B.A.; H. V. Lobb, F.R.I.B.A.; E. D. Lyons, A.R.I.B.A.; S. W. Milburn, F.R.I.B.A.; T. E. North, F.R.I.B.A.; J. T. W. Peat, F.R.I.B.A.; D. Poulton, F.R.I.B.A.; F. L. Preston, F.R.I.B.A.; A. L. Roberts, F.R.I.B.A.; W. A Rutter, F.R.I.B.A.; E. Seel, F.R.I.B.A.; R. H. Uren, F.R.I.B.A.; A. Neville Ward, A.R.I.B.A.

Appointed by the Council of the Incorporated Association of Architects & Surveyors.

A. P. Lambert, F.I.A.A. & S., F.R.I.C.S.; R. Mealings, F.I.A.A. & S., L.R.I.B.A.

Appointed by the Council of the Faculty of Architects and Surveyors.

N. J. Rushton, L.R.I.B.A.

Appointed by the Council of the Architectural Association (London).

J. M. Austin-Smith, A.R.I.B.A.; D. Clarke Hall, F.R.I.B.A.; J. Brandon Jones, A.R.I.B.A.; Gontran Goulden, T.D., A.R.I.B.A.

Appointed by the Council of the Institute of Builders.

Lt.-Col. I. L. Roney Dougal, B.A.

Appointed by the Council of the National Federation of Building Trades Employers.

D. E. Woodbine Parish, F.I.O.B.

Appointed by the Council of the National Federation of Building Trades Operatives.

Sir Richard Coppock.

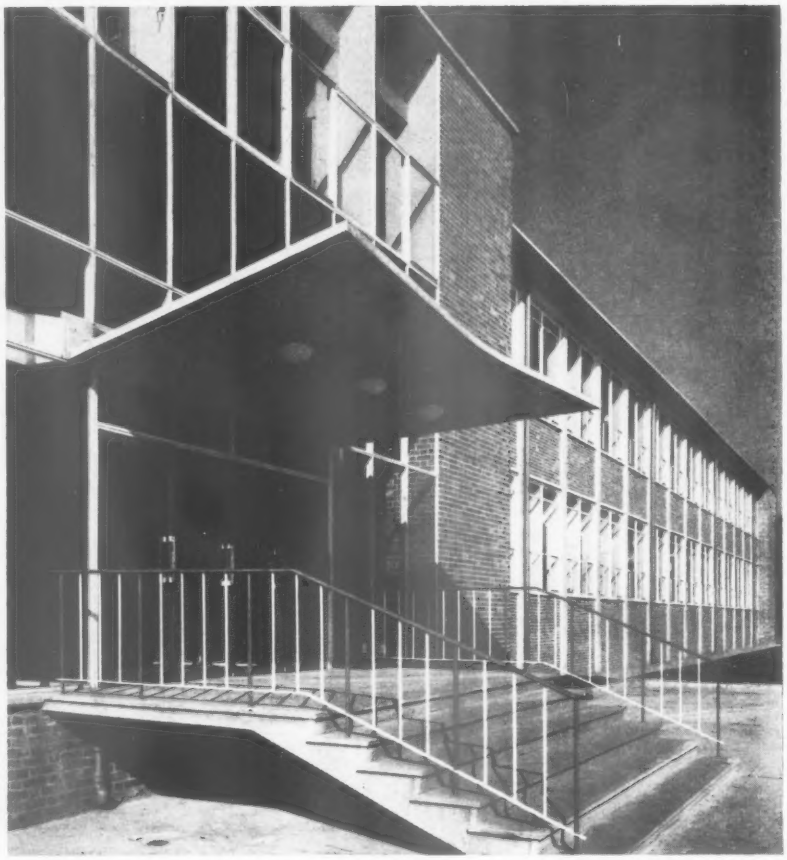
FMB

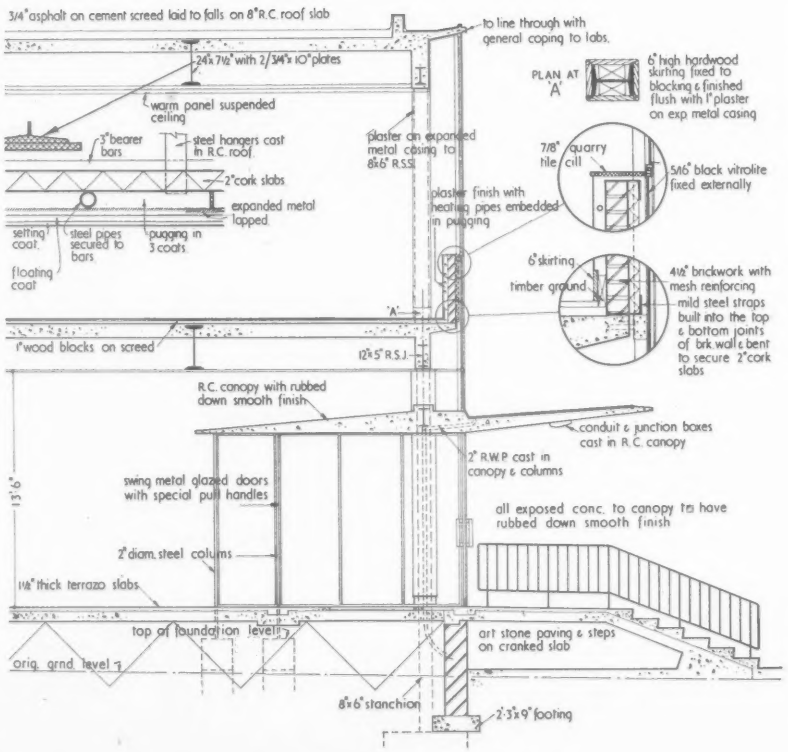
Why Building is Inefficient

"Architects only produce drawings after a building is up, or at least so late in the day that the builder is quite unable to keep his contracts to time."

That, said Sir Thomas Bennett, F.R.I.B.A., is what many building contractors would say if they were told that their industry was

LABORATORIES AND OFFICES AT

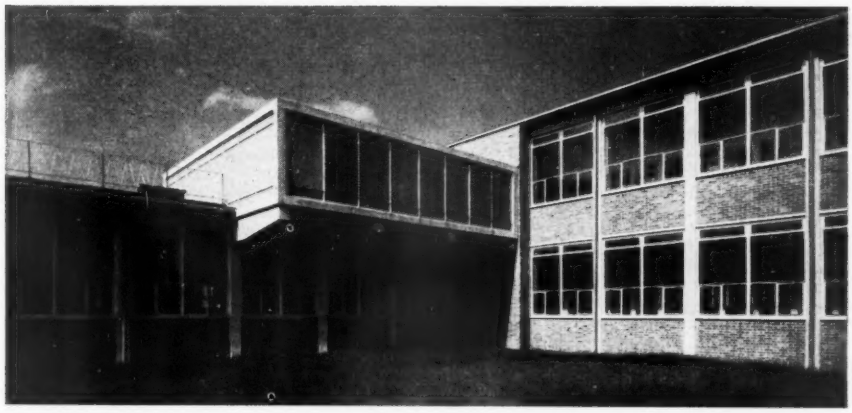


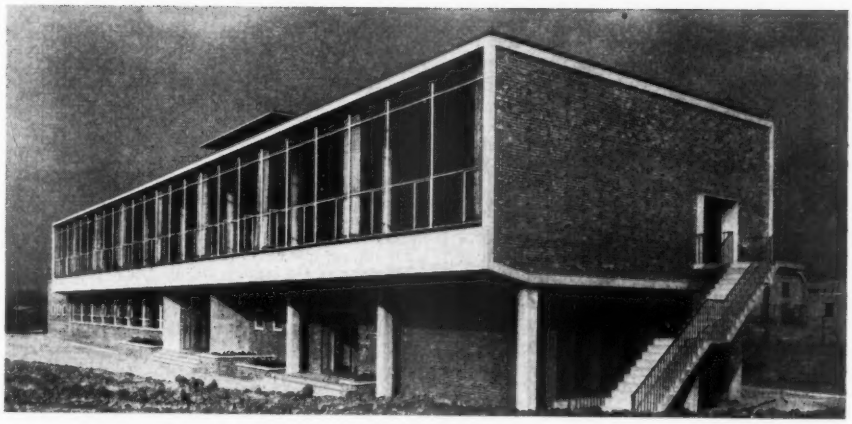


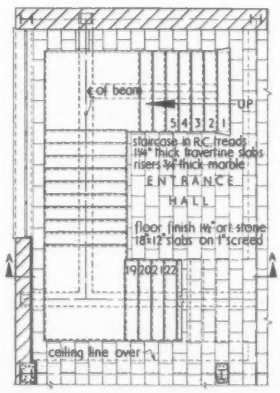
Section through main entrance with details [Scales : ⅛", ¾" and ¾" = 1'0"]

WYTHENSHAWE, MANCHESTER

The photograph on the opposite page shows the main entrance to the research laboratories and offices designed by Cruickshank and Seward for Ferranti Ltd. (acting as agents for the MOS). On the right is another view of the laboratory block, showing, centre, the ventilating plant fan chamber; centre, the canteen building from the south-west; bottom, the staircase in the main entrance hall. The buildings, which consist of laboratories, workshops and administrative offices for electrical research and development, are situated on an open site in Manchester's new Southern Industrial area. The laboratory section and workshops are placed on opposite sides of a central block containing heating and electrical plant. The buildings are steel framed, with external columns and beams cased in concrete. The infilling panels are of dark red rustic brickwork. The laboratory wings have portal type framing with a span of 40 ft. Heating is by low-temperature radiant panels embedded in the ceilings. The general contractors were R. Costain & Sons (Liverpool) Ltd. Sub-contractors, *page* 347.







Main entrance hall and staircase plan
[Scale : ⅛" = 1' 0"]

inefficient. And sometimes, said Sir Thomas—who was speaking to the Federation of Master Builders in London—the builders were right. "But you would probably be astonished," he continued, "at the number of clients who bring me large and important sites, with vague and uncertain requirements, and ask whether it is possible to put a contractor on the ground—with full plant and equipment—by Monday week.

"It is almost useless for the purist to say that a leading architect can firmly tell his client that he cannot commence building operation for nine months or a year, and that a builder cannot start work until he has a full set of drawings and a priced bill of quantities.

"We are great spenders of the public money. Even the purchase of the site involves substantial outlay, and it is not surprising, therefore, that even if the client is not so unreasonable as to demand possible construction within the matter of a few weeks or a month, he does constantly demand commencement at an earlier date than perfect organization would suggest.

"Today, there is the urgent need for the co-operation of all sections of the building industry, and some mutually constructive way in which the initial difficulties can be bridged."

MOHLG

Development Plan Revised

Five years after a local authority's development plan was approved by the Ministry, the authority is expected to submit a review of its plan to the Ministry. In this review, says the Minister of Housing and Local Government, each authority should give particular attention to any of the most difficult problems it has to deal with. It should also give attention to subjects which it was not able to tackle fully when it first submitted its plan.

The Minister is anxious to have particulars about overspill of population from one area to another, and he would like "exporting" and "receiving" authorities to send him information—in their review—which will enable development plans to be more closely linked.

CAMBRIDGE

Fine Arts Professorship

The Professorship of Fine Arts, Cambridge, is to be taken over in the autumn by Alan Clutton-Brock—critic and painter—from Professor Nikolaus Pevsner. The post is held for a period of three years.

HIGH BUILDING

Sergei Kadleigh's Views

It was, perhaps, only to be expected that Sergei Kadleigh's inaugural address (given on Tuesday) as Reader in Architecture at the Royal College of Art would be largely a defence of the high building principles expressed in his New Barbican scheme—(for the development of 40 acres in the City of London)—a scheme which has been rejected by the City of London's Corporation.

After giving a history of town planning and describing his New Barbican scheme, Mr. Kadleigh said: "The time will come when it will be no longer possible to ignore some major aspects of our problem; such things as the time spent in daily travelling, lack of adequate car parking facilities, traffic congestion, inadequacy of open spaces, lack of proper civil defence protection, and the mounting burden on communications. It will then be found that the present policies of "make and mend" are quite inadequate and a different conception altogether is necessary—a conception similar to the comprehensive development I have outlined. It is for such a moment that the architect should prepare today, so that when the time does come, sufficient work has been done already to make it possible for the result to be beautiful and inspiring, and not merely another monument to expediency.

"To prepare ahead and by so doing avoid the makeshift, has always been the privilege of the architect. Seldom has this quality been more necessary than it is today and seldom have the opportunities been greater.

"I should like to suggest a positive programme of research for architects. Firstly into all the material and technical requirements for "comprehensive development" on the scale of complete communities, bearing in mind that zoning is three-dimensional and that comprehensive means taking into account work, homes, food, communications, recreation, and defence. Secondly, into the incidence of such communities in our landscape, in relation to the broad national policy of decentralization of population, the pattern of transport and the nature and extent of the large open spaces created. Thirdly into the meaning of the concept of proportion and the discipline of symmetry so that when the time comes the results of all the above-mentioned research may perhaps be interpreted with art as well as invention, formulation, and craftsmanship.

"It seems to me that by attempting a programme such as this, we architects can prepare to meet our responsibilities and opportunities in the coming years. Years which are historically likely to mark a turning point in our civilization."

ACCOUNTANTS AND TREASURERS, ENGINEERS AND SURVEYORS, CHIEF EDUCATION OFFICERS AND ARCHITECTS

Population (thousands)	Old scales: Min. salary	Old scales: Increments	New scales: Min. salary	New scales: Increments
	£		£	
Under 5	450—600	3 × £50	517/10—690	3 × £57/10
5—10	600—750	3 × £50	690—862/10	3 × £57/10
10—15	600—850	3 × £50	690—977/10	3 × £57/10
15—20	750—1,000	3 × £50	862/10—1,150	3 × £57/10
20—30	800—1,100	3 × £50	920—1,255	3 × £55
30—45	900—1,300	4 × £50	1,035—1,465	4 × £55
45—60	1,050—1,450	4 × £50	1,202/10—1,622/10	4 × £52/10
60—75	1,250—1,650	4 × £50	1,412/10—1,832/10	4 × £52/10
75—100	1,350—1,850	5 × £50	1,517/10—2,042/10	5 × £51/10
100—150	1,550—2,050	5 × £50	1,727/10—2,250	5 × £51/10
150—250	1,750—2,250	2 × £100 1 × £50	1,937/10—2,450	2 × £100 1 × £55
250—400	2,000—2,500	2 × £100 1 × £50	2,200—2,700	2 × £100 1 × £50
400—600	2,100—2,700	3 × £100	2,300—2,900	3 × £100
Over 600	At the discretion of the local authority			

Revised salary scales (which took effect from January 1) for architects, engineers and surveyors in local authority offices. This table appeared in a recent issue of NALGO's official journal, Public Service.

Once again—in the third in our new series of buildings illustrated, which begins opposite—we give readers a cost breakdown, showing how the money spent on a building was shared out. We also print—on the same page (341) as the cost analysis—the comments of our Guest Editors (Costs) for 1955, who described a method of preparing cost analyses in the JOURNAL *for February 24. This week the Guest Editors show once again how comparisons between the costs of similar buildings can be useful. We remind readers that if they wish to get full value from our new method of building presentation they should cut out and file the pages which contain tabulated information and cost details. These pages can then be used for comparison later on, when we describe other buildings of a similar type. And we also remind readers of the request made by our Guest Editors on February 24. They asked architect-readers who are interested in having cost details of their buildings published to get in touch with them. The sooner architects start thinking in terms of comparative costs, the sooner they will be in a position to do what it should be their duty to do—to control costs.*

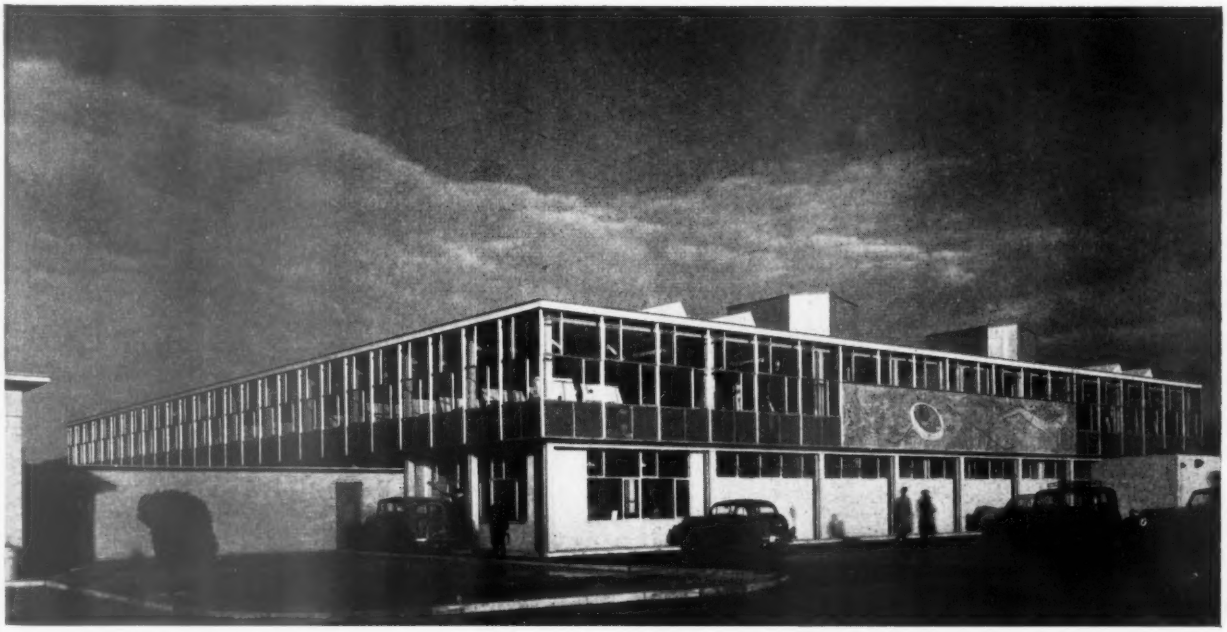
OFFICES

in WALLISDOWN ROAD, POOLE, DORSET,
designed by FARMER and DARK
the following were associated with the design, FRANKLAND DARK,
W. A. HENDERSON, E. G. HUTCHINSON, E. M. C. BUTCHER,
H. CLAMP, A. B. LESLIE and A. J. POTTS
consultants (reinforced concrete) WHEATLEY, BRYON and PARTNERS
(landscape) BRENDA COLVIN; quantity surveyors, E. C. HARRIS and PARTNERS

Sign near main entrance.

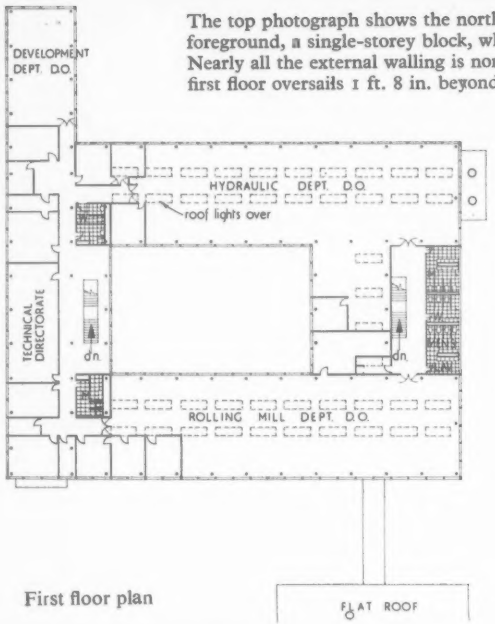
This office building has been designed for The Loewy Engineering Co., Ltd., designers and makers of rolling mills and hydraulic extrusion presses whose main works are elsewhere. Their principal requirement was accommodation for two large drawing offices, each separately organized. In addition to these a boardroom, technical directors' offices, administrative offices, storage accommodation, photographic department and canteen were required. The clients also asked that all office space should be enclosed by demountable partition units so that reorganization would be an easy matter. A factory and a housing estate for employees will be built later.

The office block from the south-east.

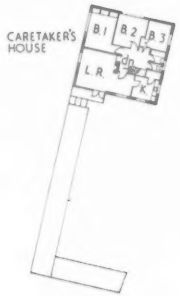


The top photograph shows the north-east corner of the office block and, in the foreground, a single-storey block, which contains part of the photographic department. Nearly all the external walling is non-load bearing. The aluminium glazing on the first floor oversails 1 ft. 8 in. beyond the column grid. The glass panels under the first floor window sills are blue-grey and the eaves fascia is of white acrylic sheet.

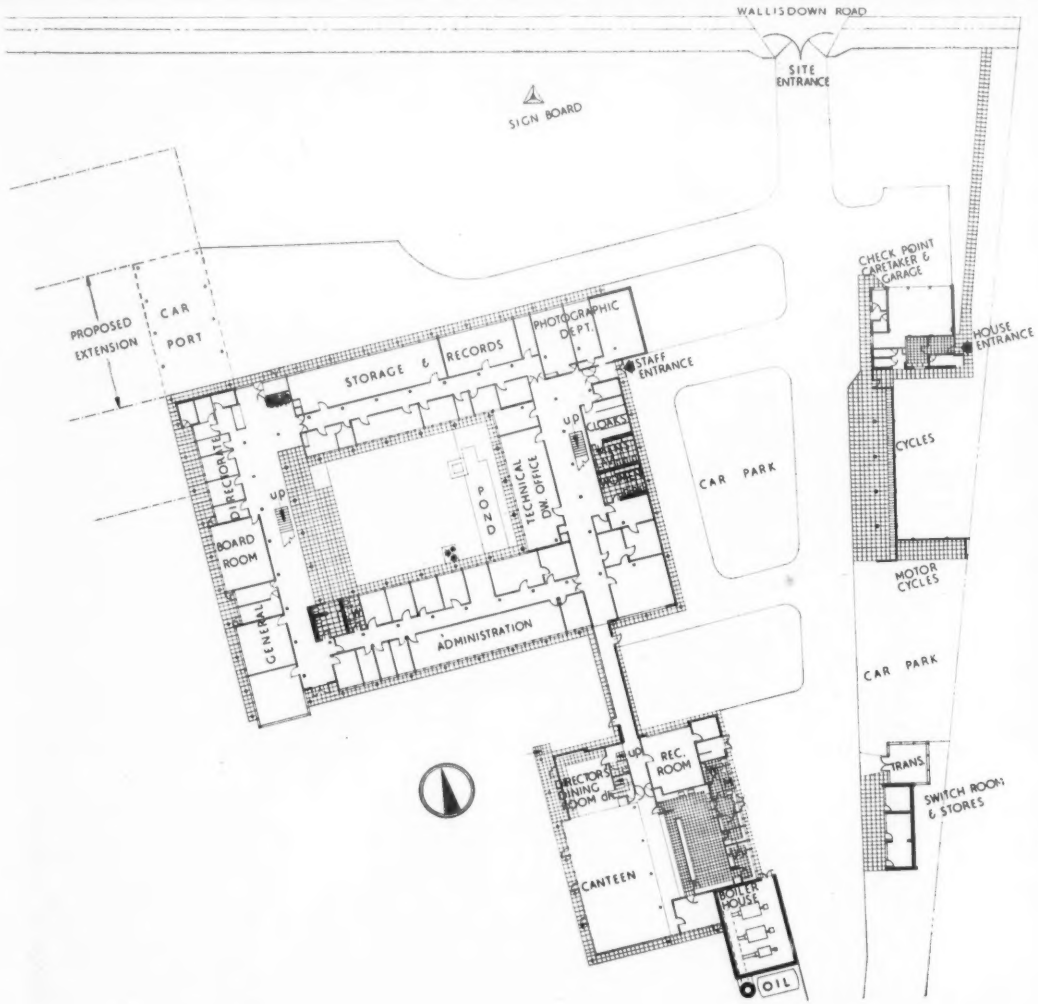
The photograph above left shows the north facade and—on the right—a projecting wing which contains an open car port on the ground floor and the development drawing office above it. This wing will form part of a proposed extension to the north-west (shown on the ground floor plan on the next page). With one exception, all the drawing offices, which occupy most of the floor space in the main block, occur on the first floor. The windows on the left in this picture light the hydraulic department drawing office, on the first floor, and the storage and records rooms on the ground floor. Below the high-level ground floor windows are 9½-in. cavity walls, an external skin of brickwork and internal skin of 3-in. foamed slag blocks. The photograph above right, shows the first floor development drawing office at night, from the north-west.

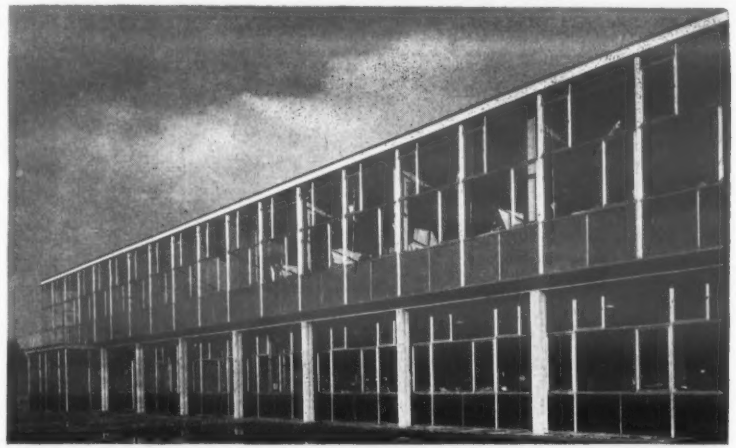


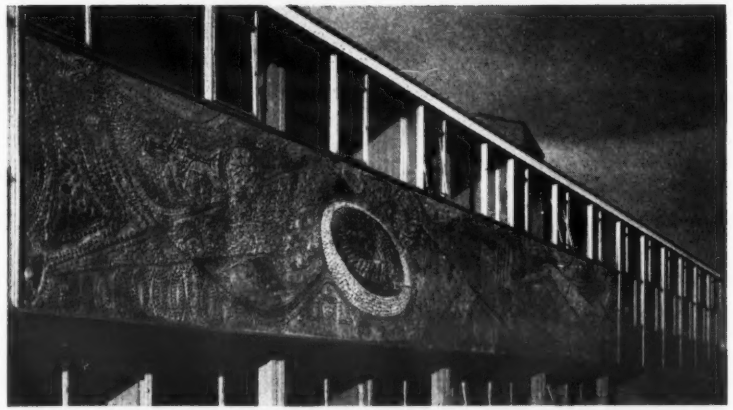
First floor plan



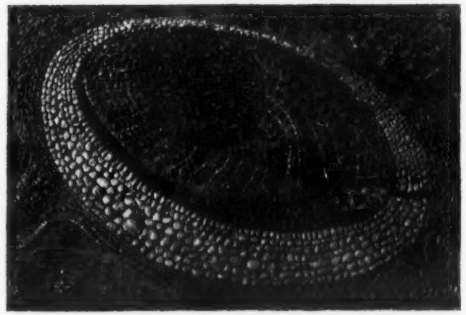
First floor plan



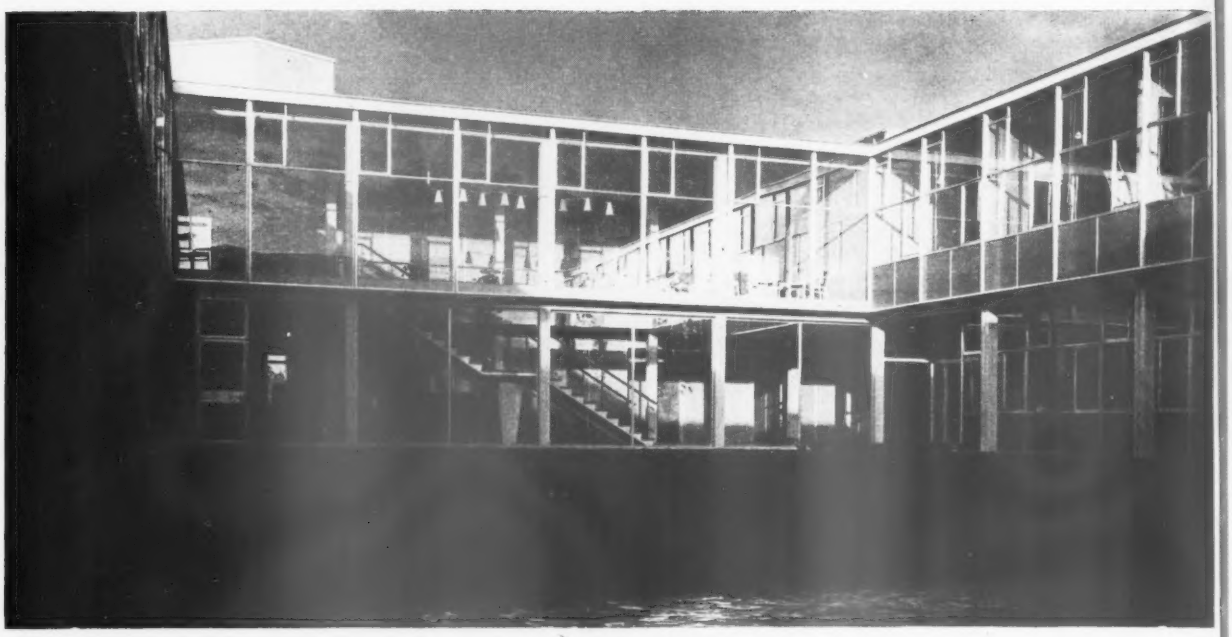




Left, Ground floor plan
[Scale : $\frac{1}{64}$" = 1' 0"]



For the next picture, top right, we move southwards and around the south-west corner of the offices. Here is the south facade, seen from the covered link between offices and canteen. The glass panels below ground floor window sills are coloured viola-purple (317 in the BCC Dictionary). The exposed reinforced concrete columns (described on page 339) and the exposed r.c. perimeter beam are painted in a mixture of white and archrome no. 20 (warm grey) in equal proportions; otherwise there are no external painted surfaces. Venetian blinds are provided to all windows on the south and west sides. The picture centre right, is a close-up of the centre of the east facade, already seen on page 333. This large relief panel, behind which are first floor lavatories, is composed of pebbles from Chesil Beach and aluminium sections of types produced by extrusion presses designed in the building. The panel, part of which is seen in close-up on the right, was made by students of the Bournemouth School of Art. The work was done in situ, the pebbles being set in screeding as work progressed.



Top photograph: before we go into the building we show a last picture of the exterior looking westwards across the internal courtyard, with the pond, in the foreground. Behind the fully glazed wall in the centre of the picture is the main entrance hall, staircase and first floor landing. Top left in this picture is one of the three tank rooms, the other two are visible in a picture on the previous page. The tank rooms, which are clad with fluted asbestos cement sheeting, each contain a 750 gallon galvanized cistern. Roofs are flat and constructed of 3-in. concrete slab, cast in situ, insulated with 2-in. wood wool and finished with two layers of 3-ply felt laid in bitumen. The surface is of white Derbyshire spar chippings.

Above left: Detail of a first floor external corner showing the staggering of the columns 1 ft. 8 in. inside the 3-ft. 4-in. planning grid. The glazing frames are aluminium. The lower panels are glazed with a sandwich panel made up of broad-reeded glass backed with a thin film of coloured resin-bonded glass fibre behind which is a $\frac{1}{2}$-in. thick panel of asbestos fibreboard bonded to the glass with $\frac{1}{8}$-in. cavity. The fascia is white acrylic sheet and the soffit ribbed asbestos. Apart from the exposed ground floor columns there are no painted external surfaces. The column shows clearly the method of construction with two 9-in. by 3-in. precast outer leaves which contain the main reinforcement and an 8-in. by 3-in. cast in situ inner core which produces a 3-in. by $\frac{1}{2}$-in. recess. This recess is also cast in each of the outer leaves. Conceived as a practical jointing detail it gives quality and elegance to the columns. (See Working Detail in this issue.)

Above: the doorkeeper's counter, just inside the main entrance on the north facade. The counter is a solid slate slab and the floor finish is of random marble slabs set in terrazzo. The picture above left shows the entrance hall and the main staircase, with part of the courtyard in the background, seen through floor to ceiling glazing of $\frac{3}{8}$-in. armourplate glass. The reinforced concrete treads of the staircase are cantilevered from a central spine and have red sheet rubber insets. The balustrading, which has plate glass panels, is illustrated as a Working Detail in this issue. On the left is the boardroom.

Most of the ceilings are of perforated insulation board tiles 24 in. × 12 in. and 12 in. × 12 in., arranged to form a 3-ft. square. 4-in. border strips of plain insulation board form a grid on 3-ft. 4-in. centres in two directions. All tungsten light fittings are located in the middle of the 12-in. × 12-in. tile in the centre of the ceiling panel, as shown above. There are also some 12-in. square recessed ceiling fittings which take the place of this tile. Right, this corridor link, glazed on the west side, connects offices and canteen.

Above: the canteen, which is housed in a separate block to the south of the main building. On the right is the kitchen servery and in the background is the directors' dining room, which can be separated from the main room by a sliding-folding screen. This room is at a higher level and can be used as a stage.
Below: one of the two main drawing offices showing the continuous window-walls, the north rooflights and the fluorescent light fittings of the type developed by BRS. Some of these fittings are hung at 45 deg., from left to right, to eliminate shadows from the draughtsman's hand. The colours used here are: a mixture of white and archrome no. 20 (a warm grey) in equal proportions for beams, no. 37 (blue) for the wood-wool monitor-tops and white for rooflight-cheeks and window-frames. The floor is of wood blocks on ¾-in. sand-cement screed. The rooflights are 13 ft. 4 in. long and 3 ft. 4 in. wide, spanning between secondary beams (see sketch on page 339 for beam and column construction). The cheek frames were cast in situ, with fixed glazing on the north.

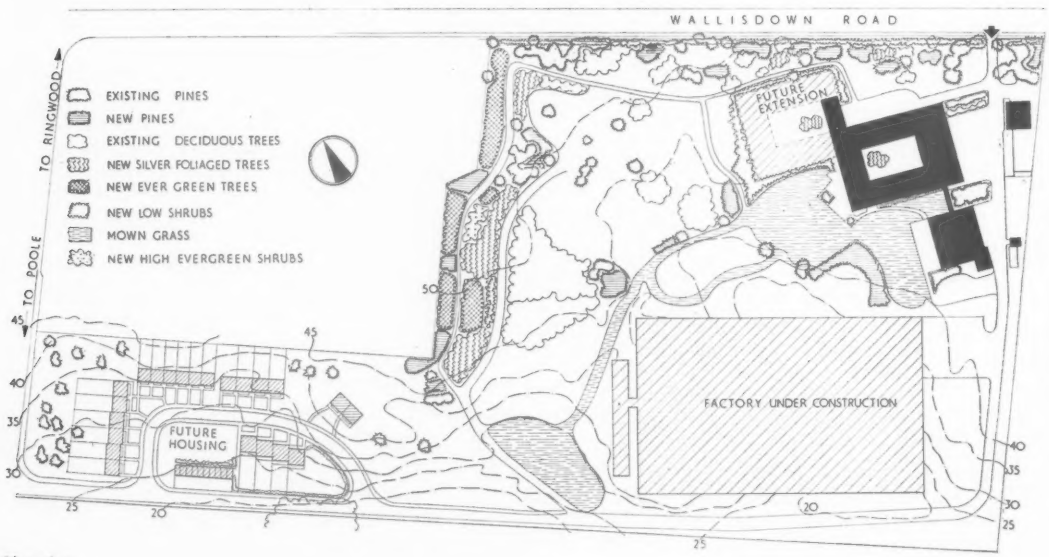
OFFICES AT POOLE

CLIENT'S BRIEF: his stated requirements

The client required a drawing office for 150 draughtsmen in two separate units, a technical drawing storage area serving both these units, offices for technical directors, a board room, general administrative offices, filing rooms, photographic and printing department, storage, etc. Ancillary buildings required were a caretaker's house with a garage for three official cars, transformer house, boiler house, staff canteen and recreation room, directors' dining room and kitchen. All partitions defining office space were to be of standard movable panels capable of easy re-arrangement (the internal planning has, in fact, been re-arranged three times during the course of building). The structure and planning relationships were also to be such that later extensions to the building would be simple. An additional requirement was that the minimum of exterior maintenance was to be necessary and that all exterior colour was to be integral with the materials used. The hydraulics and rolling mills drawing offices are two separate organizations within the company with completely separate personnel and directors. They were therefore to be planned as parallel units. The possibility of reorganization within these units and of general office space had to be taken into account.

SITE: topography, surroundings, access and planting

The site is natural heath land sloping away to the south. It commands a view across a shallow valley but the view is of no particular interest. Geologically the site forms part of the Bagshot Beds, a mixture of gravel and sandy clay giving rise to foundation and drainage problems. To the east, and across the valley to the south, the site is bordered by local authority housing. To the west there are WD depot buildings and general small industrial development. A private road enters the site from the Wallisdown Road, which forms the north boundary and joins the Poole-Ringwood Road. A belt of pine trees exists along the Wallisdown Road frontage and there are a few small groups of pines on the west side of the site. Further tree and shrub planting has been carried out on the west boundary to screen the WD depot. The centre courtyard has been grassed and planted, but so far the planting plan for the immediate surroundings of the building has not been carried out. The area of the site before development was approximately 20 acres, including the factory site upon which work has just started.



Site plan

PLAN: general appreciation

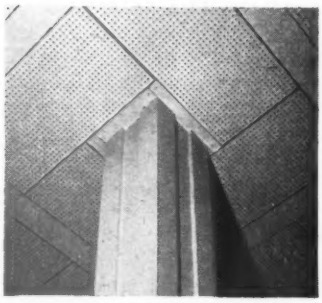
The courtyard plan was the direct outcome of the space requirements of the two large and separate drawing offices linked by common services and administrative offices; the need for adequate cross-lighting and ventilation to the drawing offices; and the desire to reduce circulation. A 3 ft. 4 in. planning grid was chosen, as it provided an economical space dimension and a width of demountable partition panel which could be easily handled. The placing of both drawing offices on the first floor ensured the clear spans required free from internal columns, continuous window walls allowing high daylight factors, and roof space in which rooflights could be placed as required to reinforce the general level of daylight illumination. The first floor oversails the ground floor, which contains the administrative offices and storage, records and photographic department, resulting in colonnaded elevations to the ground floor, while the first floor columns are contained within the envelope of external glazed walls. A projecting wing to the north provides a first floor drawing office for the Development Department. It is on free-standing ground floor columns and forms a covered car port for the main entrance. It also forms the nucleus of a possible extension to the west.

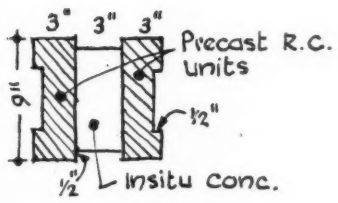
MAIN CONSTRUCTION: general appreciation

It was decided that the maximum amount of structural reinforced concrete would be site precast as near as possible to its final erection position, as it would thus be possible to obtain good control over quality, fine tolerances, speed in erection and reduction in cost. The design of a continuous slab and column structure allowed all walls and partitions to be non-loadbearing. In order to use a standard demountable partition it was decided to have a common floor to ceiling dimension throughout the building and also to stagger columns 1 ft. 8 in. off the 3 ft. 4 in. planning grid.

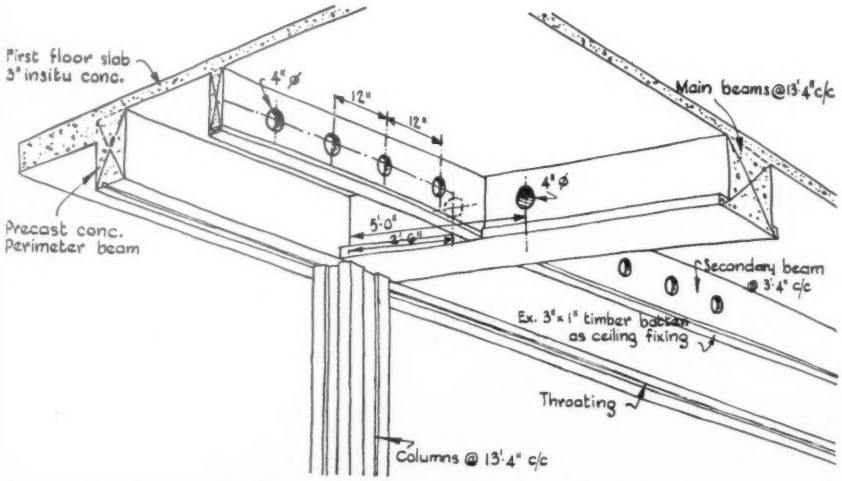
MAIN CONSTRUCTION

LOAD BEARING ELEMENT: *a.* Standard r.c. column 9 in. by 9 in. erected in three parts. Two sections 9 in. by 3 in. with projecting stirrups and containing the main reinforcement of this column are precast on the ground and erected with a 3-in. gap between them. The final section 8 in. by 3 in. is poured in situ forming a half inch joint rebate on each side. See detail and photograph below. *b.* Standard r.c. beams site precast to the underside of roof and floor slab and monolithically connected to columns by overlapping reinforcement and in situ concrete. *c.* r.c. slabs cast in situ. *Location: a, b, c.* Throughout structure. *Beam spans:* At first floor level the primary beams span up to 20 ft. The secondary beams at 3 ft. 4 in. centres span 13 ft. 4 in. between primaries. Both have a common depth of 14¾ in. At roof level primaries span up to 36 ft. 8 in. with a depth of 24 in. Secondary beams have 4-in. diameter holes precast on the neutral axis at 12-in. centres for the passage of services. Where services had to pass in the opposite direction special holes were cast in the primary beams as required. *Column Grid:* Columns are spaced at 13 ft. 4 in. around the perimeter up to 20 ft. across the building for floors and up to 36 ft. 8 in. for roofs. *Reasons:* The method of precasting columns enabled loads to be applied immediately after the casting of the core. In erection the two leaves are connected together with a spacer and hoisted over the starter bars, which protrude from the foundation bases (or ground floor columns for first floor columns).

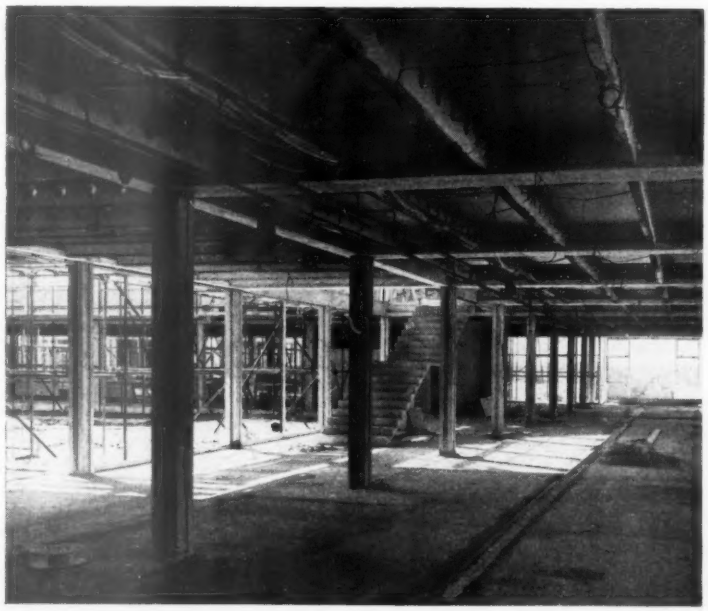




Above: plan of column
Left: junction of column and ceiling



Above: details of primary and secondary beams. Below: progress photograph of structure.



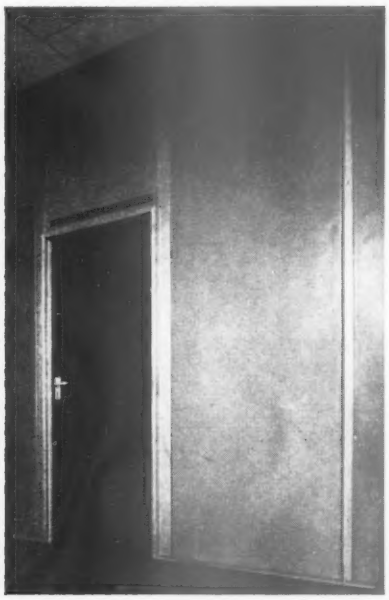
FOUNDATION TYPES: Mass concrete bases with stub columns up to ground floor level. *Location:* Throughout. *Sub-soil:* Sandy gravel or clay and sand with a bearing capacity of 1·5—2 tons per square foot. *Depth:* Generally 3 ft. 6 in. below finished floor level but up to 9 ft. deep in bad places.

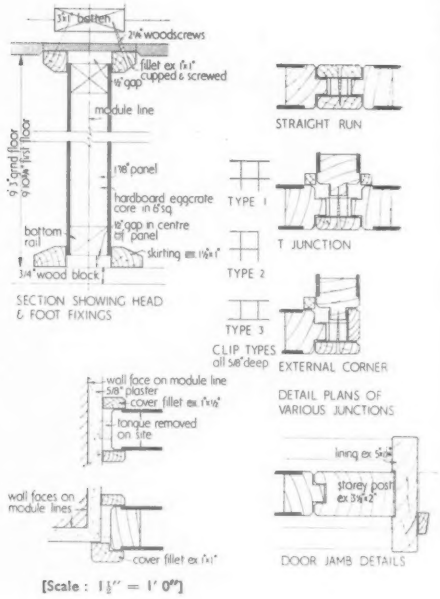
OUTER WALL TYPES: *a.* 9½-in. cavity. *b.* Aluminium frames and mullions. *Location: a.* Around all fixed units of accommodation. *b.* All external walling except where brick is used. *Materials: a.* 4½-in. facing bricks, 2-in. cavity, 3-in. foamed slag blocks. *b.* Frames glazed with clear glazing, hermetically sealed double glazing, or, below 2 ft. 8 in. sill height, panels of broad-reeded glass, backed with coloured resin-bonded glass fibre and asbestos fibre sheet, bonded on with ¼-in. cavity. *Finishes: a.* Plastered internally, fair-faced externally. *b.* Aluminium polished, asbestos fibre panels painted on inside. *Reasons: a.* Good fixing conditions for sanitary and other wall fixings in toilets, dark rooms, stores, etc. Required by local byelaws for sanitary accommodation. *b.* Maximum daylight required in all drawing and administrative office accommodation. Exposed aspects needed greater insulation.

ROOF TYPES: Flat roof. *Location:* Generally. *Materials:* 3-in. concrete slab cast in situ; 2-in. wood wool; two layers 3-ply felt laid in bitumen. *Finishes:* White Derbyshire spar chippings.

FLOOR STRUCTURE TYPE: 3-in. concrete slab, cast in situ, spanning between precast secondary beams at 3-ft. 4-in. centres. *Locations:* First floor. *Materials:* Reinforced concrete. *Finishes:* ¾-in. sand-cement screed with either wood block or in situ polyvinyl chloride flooring. *Reasons:* Roof and floor slabs act as top flanges of T-beams thus formed by primary and secondary beams.

INTERNAL WALL TYPE: *a.* Solid construction. *b.* Demountable partition units 10 ft. high × 3 ft. 4 in. wide. *Location: a.* Around toilets *b.* All office partitions. *Materials: a.* 4½-in. brick. *b.* 2-in. thick cellular partition unit faced both sides with hardboard and bonded to "egg-crate" core of hardboard strips. Fixed top and bottom with timber cornice and skirting, and vertically with recessed clips to which timber cover strips are screwed flush with partition face. Door linings are screwed to storey height jambs. See details and photograph overleaf. *Finishes: a.* Plastered both sides. *b.* Hardboard





Door in demountable internal partitioning described on previous page and shown in details on right

and timber glazed with two coats of clear phenolic emulsion which upgrades the hardboard to Class 1 flame spread. *Reasons: a.* Bye-law requirement. *b.* Easily demountable for re-erection in other positions on the 3-ft. 4-in. planning grid.

CEILING TYPES : *a.* Insulation board. *b.* Perforated insulation board tiles. *Location: a.* Toilets and some circulation. *b.* All offices and main circulation. *Materials: a.* ½-in. fibreboard. *b.* 2-ft. × 1-ft. and 1-ft. × 1-ft. tiles fixed to grounds on underside of beams to form 3-ft. square panels framed by 4-in. wide strips of insulation board forming a grillage at 3-ft. 4-in. centres in both directions. *Finishes: a.* White emulsion paint. *b.* White finish ex-works. *Reasons: a.* Sound absorption not important; cost reasonable. *b.* Used where maximum sound absorption required. The ceilings provide the greater part of the sound absorption in the building.

ARTIFICIAL LIGHTING

SOURCE AND FITTING TYPES : *a.* Fluorescent tubes suspended from ceiling to design developed by BRS. *b.* Tungsten plastic fittings of two types developed by MOE for schools. *Location: a.* Drawing offices. *b.* Administrative offices and circulation. *Illumination level: a.* One 80-watt tube used per 35 sq. ft., giving an even illumination of 30 ft.-candles on the working plane. *b.* 25 ft.-candles. *Quality: a.* Warm white light. *Comments: a.* Tubes hung at 45° from left to right on plan in relation to drawing boards in order to reduce shadows. Luminaire frame is white with vertical louvres yellow (AR 15). *Wiring and switching types:* TRS and PVC throughout. Microgap ceiling switches in all offices to allow reorganization of partitions. Microgap wall switches elsewhere on solid walls. *Power supply type:* 3-phase 450/230 volts A.C. Single phase each floor of office block and canteen. One main distribution board in office block and one in canteen. Total load 108 kW.

NATURAL LIGHTING

WALL GLAZING: *a.* Drawn sheet. *b.* ⅜-in. armourplate glass. *c.* ¾-in. double glazing hermetically sealed. *Location: a.* General. *b.* East wall of main entrance hall. *c.* Fixed lights on exposed elevations. *Reasons: a.* External walls generally glazed from ceiling down to 2 ft. 8 in. above finished floor level with glazed sandwich slab below this line. *b.* Uninterrupted glazing from ceiling level down to floor. *c.* Daylighting in drawing offices was designed to a factor of 7 per cent.

ROOF GLAZING TYPE: Concrete cheeks cast in situ with wood wool top monitor. *Location:* Drawing offices. *Reasons:* Required to maintain even distribution of daylighting over working area. Monitor fixed glazed on north face only. Wood wool painted blue (Archrome 37) and cheeks white.

THERMAL INSULATION

TYPES: 2-in. wood wool with slurry and felt with suspended ceiling of ½-in. insulation board below. *Location:* All roofs. *U-value:* 0·178. This U-value is for the roof structure from underside of ceiling to external face of roof.

HEATING AND VENTILATION

HEAT EXCHANGER TYPES: Heating convector of propeller type. *b.* Pressed steel radiators. *c.* Ceiling unit heater with roof fresh-air inlet and concave baffle below ceiling. *Location: a.* Circulation areas. *b.* Offices etc. under windows. *c.* Canteen. *Criteria temp. a.* 60 deg. *b.* 70 deg. *c.* 70 deg. *Airchanges: a.* Two *b.* One to two. *c.* Two (six in kitchen) *Reasons: b.* Partitions and floors to be kept clear of heater units.

BOILER TYPES: C.I. sectional. Two boilers of 1,624,000 B.Th.U. output each. *Heat load:* 2,664,000 B.Th.U. (surplus for later factory use). *Fuel types:* Oil. *Stoking methods:* Automatic. *Reason:* The heating system is divided into several circuits all independently regulated by thermostatically controlled electrically operated valves, while the boilers are also automatically controlled by means of photo-electric cells regulating the flow of oil fuel to the burners.

WATER HEATER TYPES: C.I. sectional boiler of 323,000 B.Th.U. output with two calorifiers of 150 gall. each. *Location:* Boiler house for canteen supply only. *Fuel types:* Oil. *Stoking:* Automatic.

HOT WATER STORAGE TYPES: Electric water heaters. *Location:* Toilets. *Capacity:* 20 gallons each. *Comments:* Some floor, some wall types.

PIPES AND JOINTING: Steel tubes threaded BS fittings.

COLD WATER STORAGE: 3 tank rooms. *Location* Roof. *Materials:* Galvanized cisterns. *Capacity:* 750 gallons each. *Comments:* Storage based on a provision of 15 gall. per person per day.

FIRE

STRUCTURAL PRECAUTIONS: Code of Practice requirements for rc. *Grade of protection:* One hour. *Apparatus:* Free standing hand extinguishers, hydrants in road. *Means of Escape:* Four ways of leaving office block, two staircases, one at each side of building.

COLOUR

PAINT TYPES: *a.* Emulsion. *b.* Heat-resisting oil-paint. *c.* Gloss oil paint. *Location: a.* 2 coats plaster walls, ceilings and columns. *b.* Radiators, pipes, etc. *c.* Woodwork generally *Colour treatment and reasons:* The Archrome range of colours was used internally. Strong colour stimulation was avoided in office spaces where generally restful schemes were adopted. Stronger contrasts of value were used in circulation areas and gayer colours of high chroma in the canteen block.

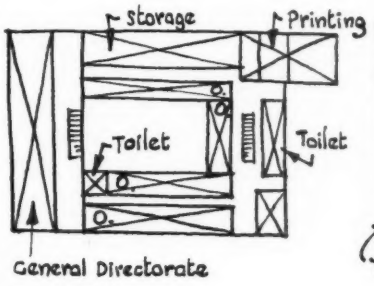
TIME SCHEDULE

Drawings commenced November 1952. Contract signed, March 1953. Work commenced, March 21, 1953. Work completed, December 7 1954. Type of contract: Lump sum. R.I.B.A. form of contract. *Comments:* as this was a prototype building, drawings took longer than with traditional construction, owing to research and the difficulty of obtaining information quickly.

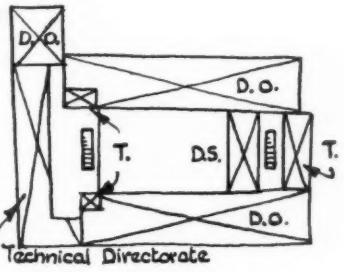
PLANNING RELATIONSHIPS

MAIN PLANNING ELEMENTS: Two large drawing offices, each for 75 draughtsmen. One smaller drawing office for 20 men. Drawing record storage. Correspondence record storage. Three photo-printing and blue-printing rooms. Administrative offices. Technical directors' offices, conference rooms and boardroom. Canteen for a staff of 165 at one sitting. Senior staff dining room for 20. Recreation room.

PLANNING RELATIONSHIPS: Main drawing offices are designed as parallel units with equal access to technical directors, and drawing office storage on first floor. All record storage, accounts etc. are on the ground floor.



Ground floor
O. General administrative offices
D.O. Drawing offices



First floor
D.S. Drawing office storage
T. Toilet

SOIL, WASTE AND LIFTS

TYPE OF SYSTEM:: Separate systems for soil and storm water. *Materials:* Cast iron in building, S.G.W. outside. *Comments:* 6-in. diameter pipes were used for rainwater disposal internally.

LIFT TYPE: Hand-operated book lifts for carrying drawings.

COST ANALYSIS

Tender cost of superstructure (office block only)	£88,868
Tender cost of foundations (office block only)	£2,528
Tender cost of ancillary buildings	£46,061
Gross total cost of job	£137,457
Floor area (sq. ft.)	40,566
Cost of office block per sq. ft. of floor area (excluding preliminaries, insurances and contingencies)	45s. 0½d.
Cost per ft. cube (office block only)	4s. 8d.
Tender date	March 1953

ELEMENT	cost per sq. ft. in pence
Preliminaries and insurances	15·50
Contingencies	30·00
Work below ground (including floor slab)	24·75
Columns, beams, first floor slab, roof slab, staircase	125·00
Woodwool slabs and felt on roof	14·75
Rooflights	17·00
External walling: brick and glazed aluminium framing	125·75
Internal partitions: brick and timber, including doors, finishes and decoration	40·00

ELEMENT	cost per sq. ft. in pence
Floor finishes	48·00
Ceilings	15·50
Built-in fittings	8·50
Decorations	10·00
Ironmongery	3·00
Plumbing (external)	1·00
Plumbing (internal)	14·00
Sanitary fittings	4·50
Heating and hot water system	60·00
Electrical installation	16·00
Drainage	10·00
Pond, lawn, and paving to internal courtyard	3·00

COST ANALYSIS: Guest Editors' Comments

This week we refer back to our second article (February 3) "The Office Building" story—in which the cost analysis of yet another single-storey office building was quoted. We use this in relation to the Poole offices to show the kind of comparisons which, in practice, it would be useful to make. For instance in the "general appreciation" of the main structure (page 338) it is stated that site precast reinforced concrete was chosen because among other things it was hoped to reduce costs. It is possible to assess the results of this aim by a grouping of elements as follows:—

OFFICE BUILDING STORY: Cost of structure per sq. ft. floor area 27s. 8d. (work below ground, external walls and facings, internal partitions, roof construction and rooflights, windows, glazier, internal and external doors).

OFFICES AT POOLE: Cost of structure per sq. ft. floor area 28s. 11¼d. (elements as above plus frame, upper storeys and staircase).

This suggests that to the extent of 1s. 3¼d. the type of structure chosen for the Poole offices did not in fact reduce costs, but reliable conclusions about these figures should be drawn only in the light of all the factors involved in the design and construction of both jobs. This comparison is made only to show the motions one should go through, and the comparisons will become valid only when more information and a greater stock of cost analyses of office buildings has been prepared. Cost analysis can also help to show the differing cost of an element due to different structural solutions, for instance, the effect of multi-storey development on foundation costs. For Poole, work below ground floor level was 2s. 0½d. per sq. ft. floor area, in the single-storey block quoted in our Office Building story it was 7s. 1d. This difference is too large to be due entirely to two-storey construction, and for its full explanation one would need the analysis of another single-storey building with full information on construction and site conditions. Another point we notice is that at Poole the cost of the electrical installations (1s. 4d.) is remarkably low—particularly since the lighting is fluorescent (usually more expensive in capital cost than tungsten lighting) and the drawing office illumination level is probably fairly high. But one wants to know more specifically what the costs include in this, and other comparable buildings to assess the economy.

Below is an account of the Symposium on high flats held at the RIBA on February 15. The cost problem—our Guest Editors' subject for the year—was mentioned by most of the speakers and for this reason we give prominence to the paper on this subject by Dr. J. C. Weston of BRS.

A SYMPOSIUM ON HIGH FLATS

Twelve papers were read; those in the morning session dealt with the town planning and sociological aspects of building high; those in the afternoon dealt with constructional technique and costs. In the absence of the Minister of Housing (Duncan Sandys) the meeting was opened by Dame Evelyn Sharp, Deputy Secretary of MOHLG. At the end a critical summary of the papers read was given by J. H. Forshaw, Dr. J. L. Martin, Architect to the London County Council, was in the chair.

While the case for high density residential development appears to be very strong on grounds of land use, heating, amenity and the quality of the civic scene, it is constantly weakened by the puzzling disparity between two-storey and multi-storey building costs. The last speaker at the RIBA meeting, *Dr. J. C. Weston*, of BRS, mentioned that this cost disparity does not seem to occur in continental countries and then showed a series of slides giving the results of a cost survey in this country. The most significant thing here was not only the high prices but the wide range of prices being paid for flats. On a floor area basis, excluding access space (lifts, staircases, corridors) they vary from 55 shillings to 80 shillings per square foot. Taking two-storey houses at about 32 shillings, this makes the more costly flats about two and a half times as dear. Other comparisons, allowing for the smaller size of flats—and including the access space—still showed that houses are not much more than half the cost of flats.

The wide range of costs corresponds with a wide range of planning efficiency. For instance the plan area given to access space varies from 10 per cent. to 25 per cent. of the total. External walling is, in the worst cases, equal to the floor area enclosed, and in the best cases it is 30 per cent. less than this area. These variations can be attributed only in part to the varying standards of flat building in different regions. They also suggest that architects need some method of analysing cost distribution in blocks of flats.

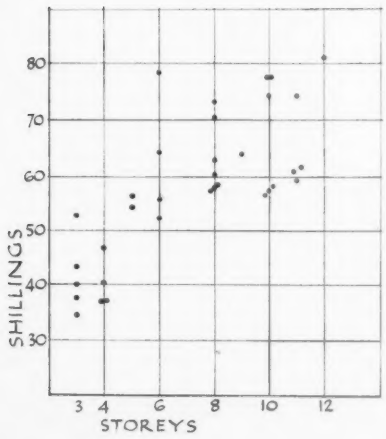
There were two particularly significant points in Dr. Weston's paper. First: there is one block in the London area (he said) costing 43 shillings per square foot—only slightly above the price of local two-storey houses. And second: the price of lifts does not account for the high cost of high flats.

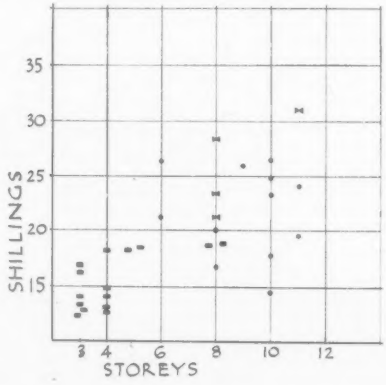
Although the BRS studies have not progressed far enough for recommendations to be made, it begins to look as if the cost disparity between houses and flats is not inevitable. *Dr Weston said that BRS would welcome more cost information. And we would remind readers of the proposal made by the* JOURNAL'S *Guest Editors (February 24) for a scheme of publishing readers' cost information. If you have a cost problem in flat designing, please write to us.*

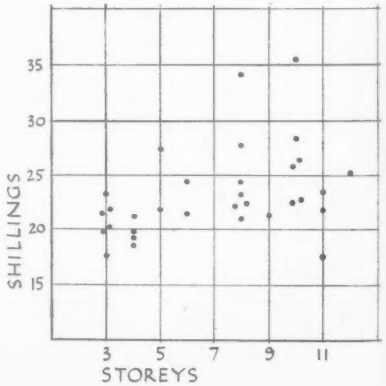
H. Whitfield Lewis, principal housing architect to the LCC, gave the first paper of the Symposium—in the form of a report on progress and experience since the LCC first embarked on its "mixed development" policy in 1950. This has involved sites first in the Roehampton area—(a 100 persons per acre zone), with trees and natural slopes; and second—in Hackney, Bermondsey and Camberwell—a 136 persons per acre zone of squalid Victorian streets. Two achievements of this policy stand out among many—the square eleven-storey tower block with four flats per floor; and the narrow-frontage maisonette.

The more conventional approach might have been to develop with five- or six-storey blocks, but the LCC began its pioneer site (Ackroyden Estate) with eleven-storey point blocks having three flats per floor. These provide some 56 per cent. of the accommodation on the site. Four per cent. is in two-storey houses and the remainder in three- and five-storey blocks of flats. Despite the higher cost of tall flats the scheme as a whole cost about the same as uniform five- and six-storey development.

Graphs shown by Dr. Weston, giving prices of blocks of flats. Prices are based on tenders and exclude land and external works. "Gross" areas include, and "net" areas exclude, areas of staircase, lifts, etc. Left, prices per ft. sup. floor area (net). Note that there is a more consistent increase in price up to 5 storeys than above it. Centre, price per ft. sup. (gross), of superstructure excluding finishes and fittings. (The "H," circle and rectangle indicate, steel frame, concrete frame and l.-b. brick respectively). Right, price of finishings and fittings (excluding lifts). Notice the wide variation in price between blocks of similar height.







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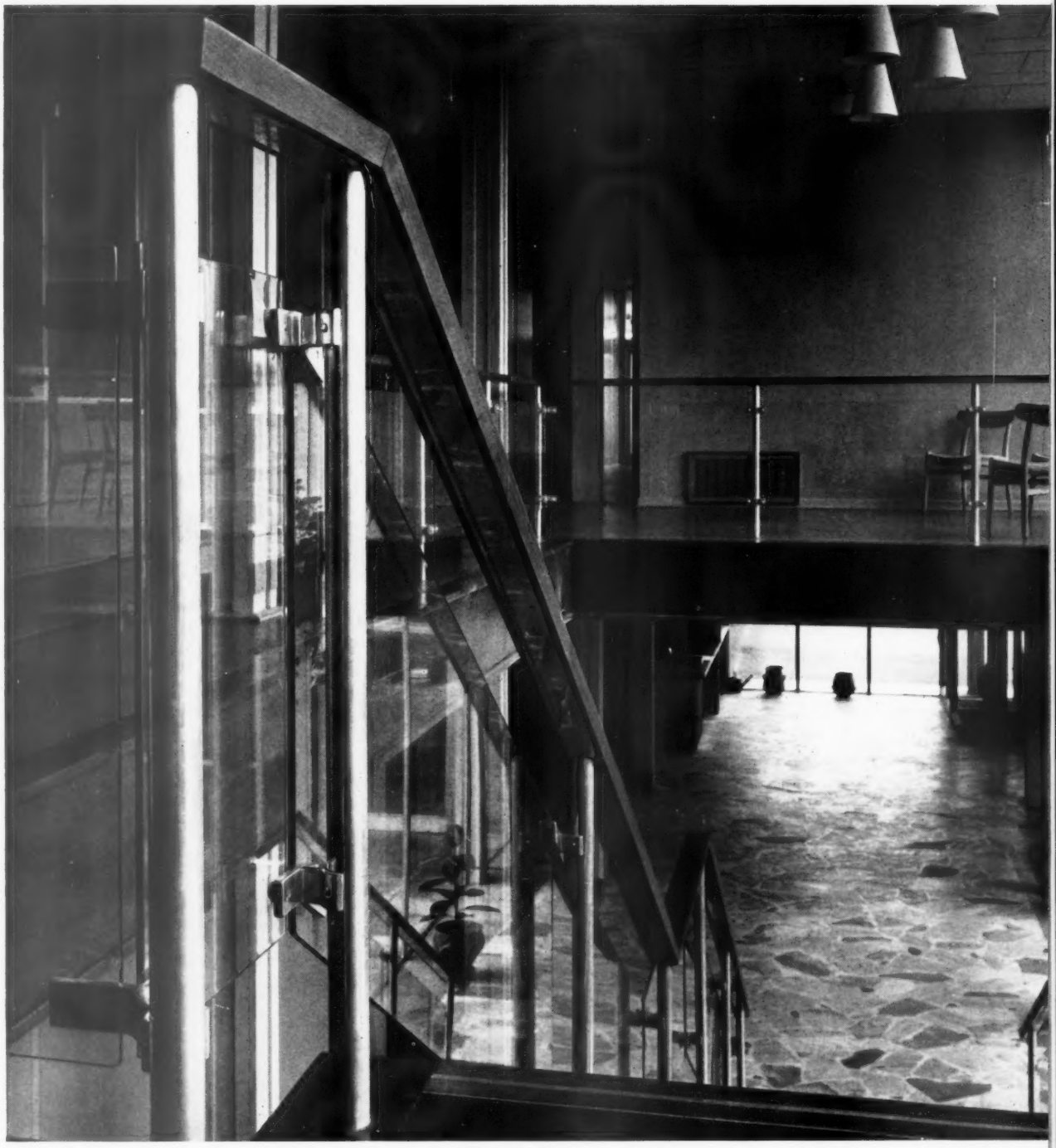
WORKING DETAIL

BALUSTRADE: OFFICES AT POOLE

Farmer and Dark, architects

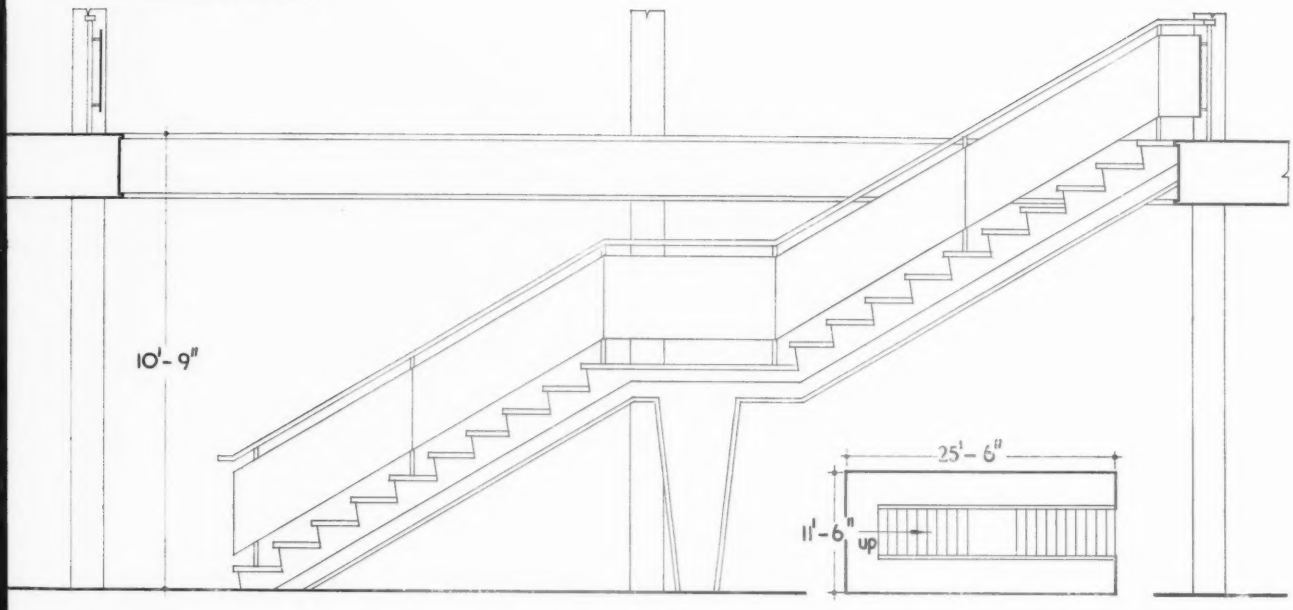


One particular problem this balustrade set out to solve was how to prevent the rail from working loose with wear, a defect all too common on this type of design. The usual cause of failure is the tendency of the tubular standards to work against and thus wear down the surface of the tread. To obviate this here a brass thimble of the same diameter as the standard, and on which therefore the standard can bear, has been wedge fitted into the wood tread. As regards the fabrication of the balustrade, it is worth noting that the standards were offered up to the threaded ragbolts and trued before the grout had set.

WORKING DETAIL

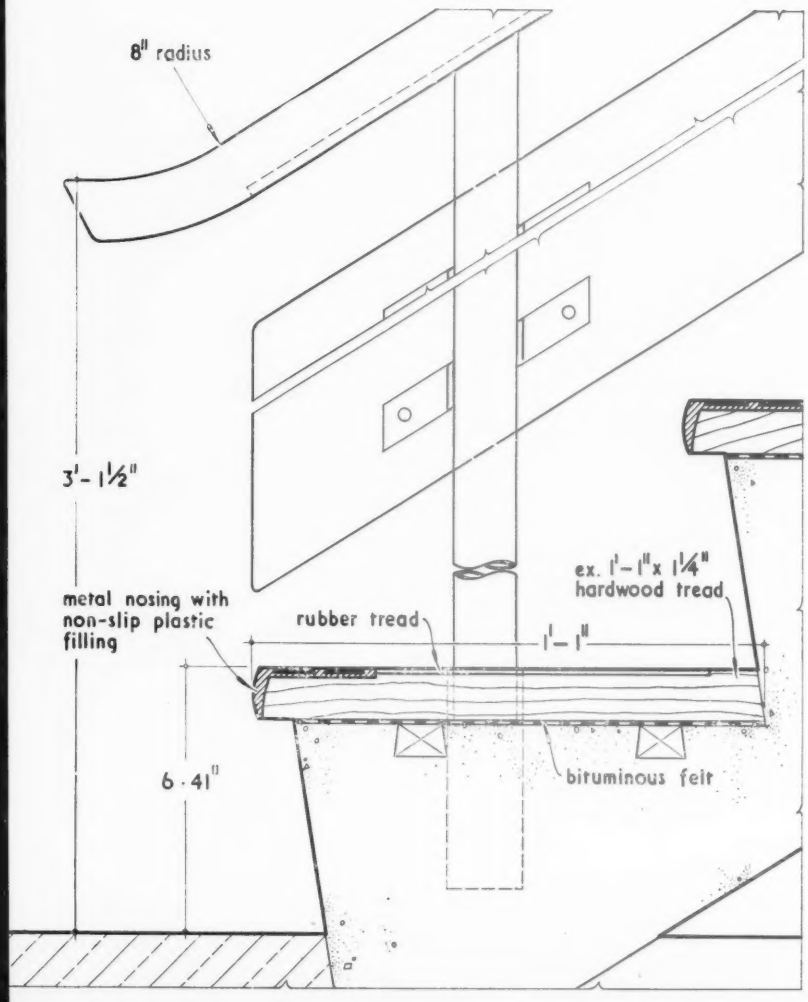
BALUSTRADE: OFFICES AT POOLE

Farmer and Dark, architects

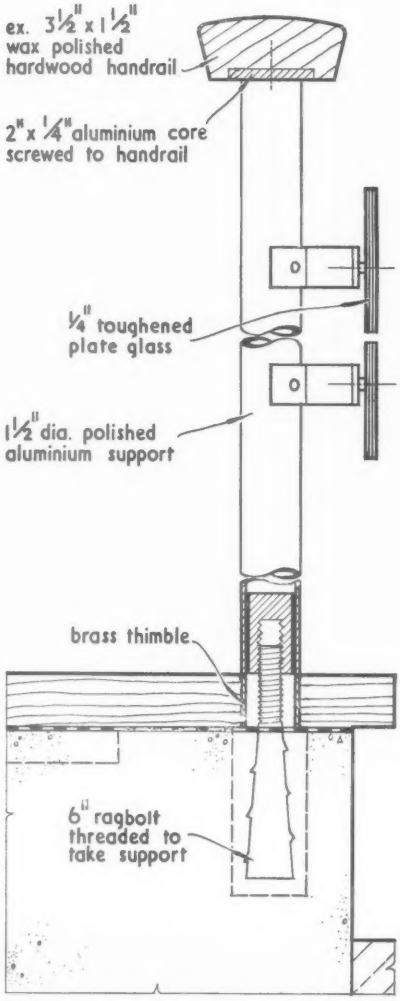


SIDE ELEVATION OF STAIRCASE. scale 1/4" = 1'-0"

KEY PLAN. scale 1/16" = 1'-0"



LONGITUDINAL SECTION THROUGH STAIRCASE. scale 1/4 full size

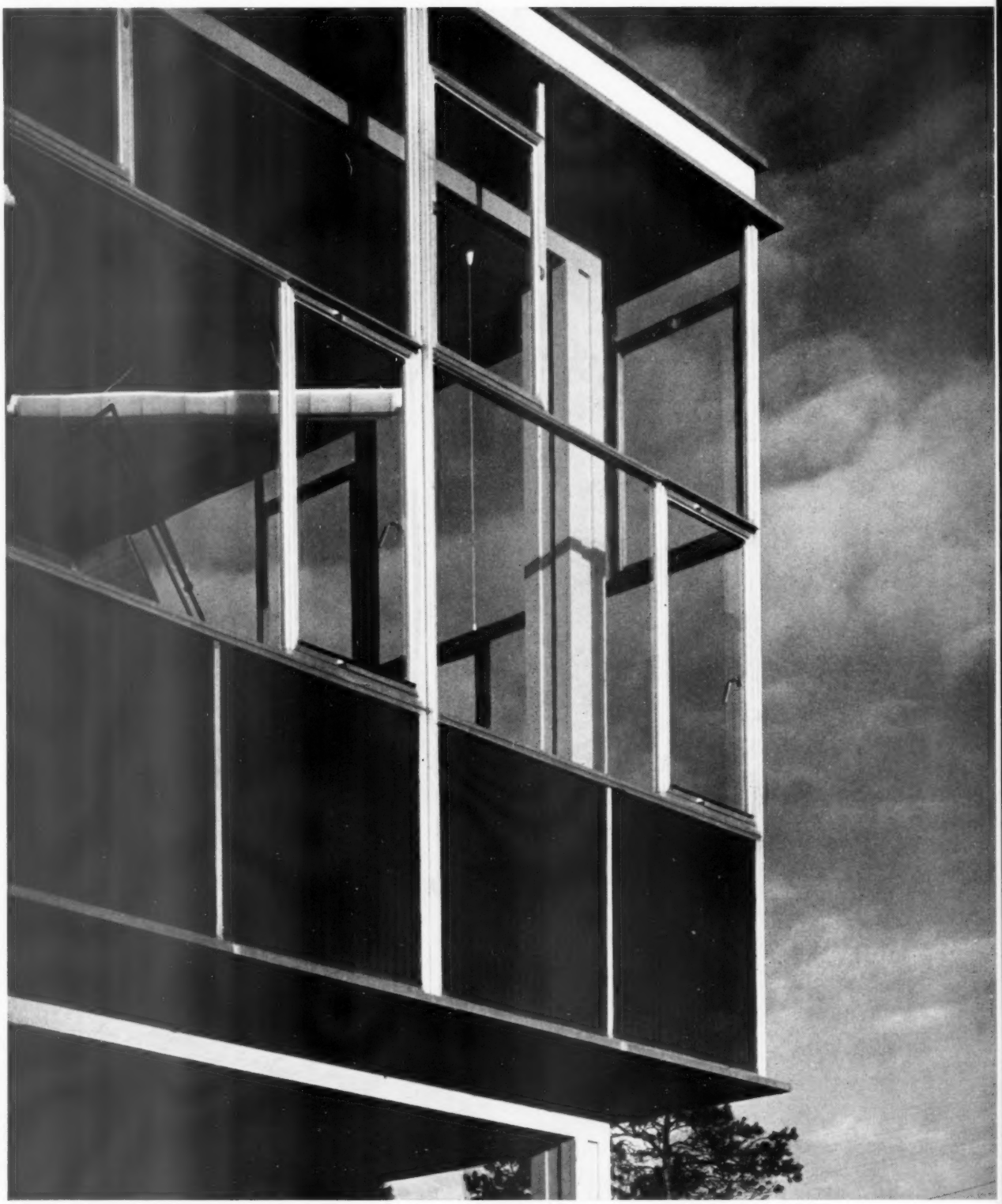


SECTION THROUGH BALUSTRADE.

WORKING DETAIL

GLAZED WALL: OFFICES AT POOLE

Farmer and Dark, architects

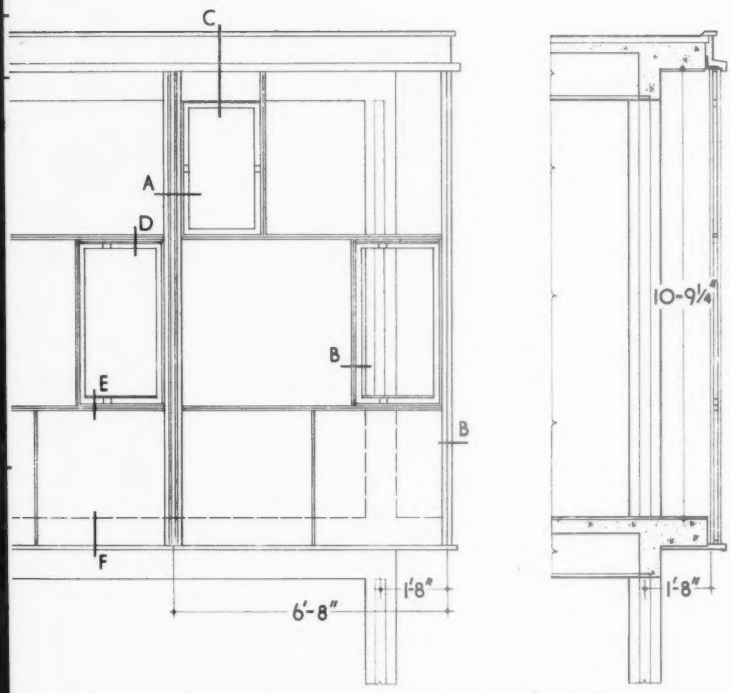


The glazed wall is supported at the head by a m.s. angle which is cast in with the concrete of the fascia. Each mullion is then offered up to and screwed into this angle and is secured at the base by means of a lug grouted into pockets in the first floor slab. The north facing facade (i.e., that which was facing away from the camera in the photograph) is glazed with concealed cavity double glazing.

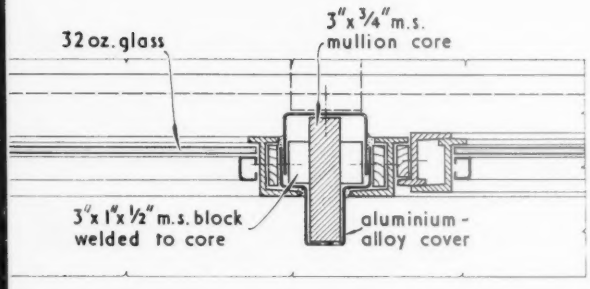
WORKING DETAIL

GLAZED WALL: OFFICES AT POOLE

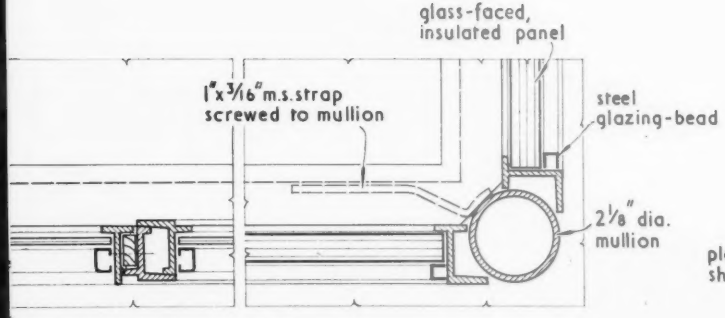
Farmer and Dark, architects



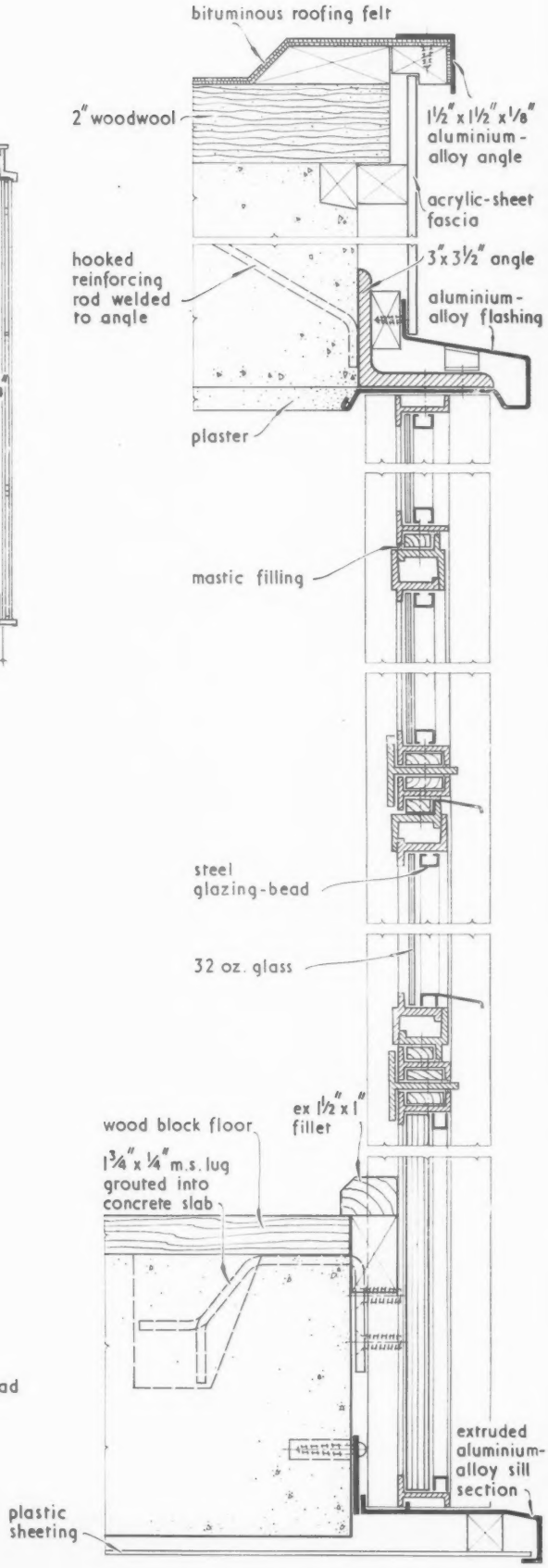
KEY ELEVATION AND SECTION. scale ¼" = 1'-0"



HORIZONTAL SECTION AT A.



HORIZONTAL SECTION B-B.
scale ¼ full size



VERTICAL SECTION THRO' C,D,E AND F.
scale ¼ full size

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Saint Nicholas Houses, Manhattan. A slide shown by Dr. Bradbury, characteristic of high density housing in New York.

On the next site the LCC trod more boldly, omitting the three- and five-storey blocks, developing an eleven-storey block with *four* flats per floor and internal bathrooms, and increasing the accommodation in two-storey houses to 10 per cent. The buildings were also arranged closely enough to allow group heating at a cost of ten shillings a week to the tenant. This scheme—the Alton estate on the Portsmouth Road—is now well on the way to completion.

The LCC's next step, on its third major site (between Roehampton Lane and Richmond Park), was to use a maisonette that had been developed for the 136 persons per acre zone, in eleven-storey slab blocks. These blocks, which stride the crest of the site, house 20 per cent. of the accommodation. Square tower blocks give 35 per cent., four-storey maisonettes 35 per cent. and two-storey again 10 per cent. The total site area is 100 acres.

The maisonette seems to be a promising form on many counts, and a 12 ft. frontage type with an internal bathroom has been worked out for the 136 persons per acre zone. It allows bedrooms on both sides of the block, yet gives the constructional economy of balcony access. It allows an unprecedented number of dwellings in a given frontage, requires only short floor spans, and presents a minimum surface area for heat loss. Being nervous of the daylighting of so narrow and deep a plan, the LCC built a mock-up, and this (fully and elegantly furnished) received unconditional approval. Sites at Bentham Road, Hackney, Eugenia Road, Bermondsey, and Picton Street, Camberwell are being partly developed with maisonettes of this type—the plans of which have a Unité d'Habitation look about them. Picton Street is the scheme in which a nominated contractor is a member of the design team, but information on this very important experiment has yet to be released.

The next speaker at the RIBA meeting was *Dr. Ronald Bradbury*, who gave an account of American high-building ideas and practices. It seems that in New York the insurance companies are the principal housing developers. They clear a " run down " central area city block and build six- to fourteen-storey blocks at densities averaging 225 persons per acre. Densities over there are indeed much higher than ours, the extreme case quoted being 497 persons per acre, which gave 22 per cent. site coverage! The rather institutional-looking blocks are put close together round the perimeter of the site, and an open space in the centre is equipped (one cannot say landscaped) with flower beds, grass, fountains, seats and playgrounds. This one great open space gives a false idea of the real density of building. " Through " traffic is not allowed in the site, and the speed of local traffic is strictly controlled, presumably by the special police who patrol to frustrate juvenile vandalism. Flats are often cruciform or star-shaped on plan, with as many as eight flats (back to back) per floor, served by two lifts—which skip alternate floors. Internal bathrooms are, it seems, in the minority. Group heating, often from commercially-bought steam, is customary. The Americans seem to find refuse disposal as much a problem as we do. The incinerator chute is often used but is a considerable fire risk and can only take certain kinds of refuse. Dr. Bradbury, and the deputation from Liverpool Corporation with which he visited the States were overwhelmed by the scale of the housing they saw, which included the immense Parkchester scheme—housing 45,000 people on 27·4 acres.

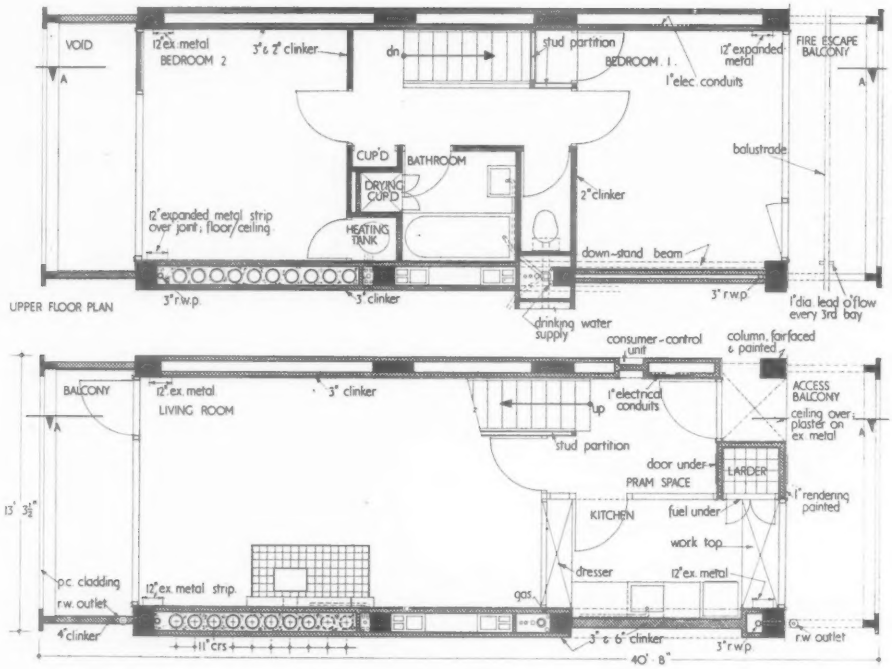
Dr. Bradbury's talk was followed by one from *Frederick Gibberd* who was concerned mainly with appearances. *Margaret Willis*, an LCC sociologist, next reported to the gathering on high flat tenants' reactions. It seems that people who live high up like it and would in fact like to live even higher. They like the cleaner air, quietness, privacy, sunshine, space and of course the " view." This, said Miss Willis—referring to a survey—is the majority opinion of those living above the sixth floor—especially the men. Below this level only a small proportion want to go higher, partly because pensioners, medical cases and those who are allergic to heights or have families of young children are given lower floor flats. The second to fourth floor seem to be the favourite locations because they are close enough to the ground for tenants to use the stairs yet far enough from it for them to escape the noise of children and of tradesmen.

Children, of course, have to be taken into consideration in this question of high building and it appears that seven years is—relative to the height of the flat—the critical age. Above seven, *constant* parental supervision is not necessary, below seven there is the awkwardness of prams and the danger of toddlers falling downstairs or over the balconies. For these the third or fourth floor is the reasonable limit.

Opinions on heating, quoted by Miss Willis, are very interesting. Among tenants enjoying central heating, 77 per cent. prefer it to coal fires. Among those with gas fires only 20 per cent. prefer gas to coal fires. There is some objection to the fixed charge on the rent for central heating but the majority think the money worth it, especially those with few " family commitments."

On the whole tenants seem to appreciate the quiet and privacy of high flats—yet there is also evidence of their desire to be able to see some activity—passing traffic or people.

The morning session at the RIBA was concluded by *R. A. Jensen* and *A. G. Sheppard Fidler*, who put more or less opposing points of view. Where Mr. Jensen questioned the density limits to which we work and implied that far more higher blocks should be built, Mr. Fidler thought that high cost and all the " extra " costs of tall building should restrict its develpoment. Yet both seemed to agree on the need for re-creation of real urban life. Mr. Fidler gave the functions of a high block as: reduction of overspill, accommodation of households not needing gardens, and, to make " open " planning at high density possible. He cited the rental difference of 8s. 9d. between houses and flats and the extra costs of maintenance, management, estate drives, refuse systems, booster pumps and so forth which must be added to this, all tending to restrict high building. Mr. Jensen on the other hand



Floor plans of the narrow-frontage maisonettes with internal bathrooms being built by the LCC at Bentham Road and other sites in the 136 person per acre zone. These dwellings were referred to by H. J. Whitfield Lewis and A. W. Cleeve Barr.

compared the "all-in" cost per dwelling in the new towns (£3,700 approximately) with the "all-in" cost in a Metropolitan borough of a twelve- to fifteen-storey block (£3,000-£3,500 per dwelling) in order to "dispose of the claim" that higher densities mean higher cost. He was at variance with other speakers on this question.

In the afternoon session of the Symposium, the first paper was given by *K. R. Lack*, who spoke about "Fire Protection in High Flats." He was followed by *A. W. Cleeve Barr* who talked mainly about the effect of services on detailed design. Perhaps the two most interesting developments he reported are shunt flues and internal ventilation. In certain of the LCC high density schemes central heating has not been possible—partly because of the addition it makes on the rent. Hence solid fuel stoves are used, but accommodation of the flues becomes a difficult problem at ten or eleven storeys. The shunt flue, which is being installed experimentally is a common flue with branches of two-storey height from each stove, offering a much simpler solution. They have been used extensively and successfully on the continent.

The reason for the internal placing of bathrooms and w.c.s was, said Mr. Barr, the economy in planning and structure which they permitted. The extra cost of ventilation plant ducts and so forth ranged from £15 to £24 per flat. There are two main vertical ducts—one for the bathrooms and w.c.s the other for the drying cabinets, each connected through a 15 ft. branch—a similar arrangement to the shunt flue. Indeed, it may be possible to omit the fans and rely on natural ventilation and the LCC and BRS are co-operating to experiment with this idea on one of the housing schemes.

Mr. Barr said that the Garchey system of refuse disposal had much to commend it, but at the Portsmouth Road scheme it had been found to add some £66 per flat. For soil and waste plumbing the LCC is using single-stack with w.c.s only vented; one of the Picton Street blocks has a stack fitted up for test—in an experiment to discover whether venting can be omitted altogether. A difficulty about water supply in high blocks, said Mr. Barr, is the need for booster pumps to maintain pressure. Mr. Barr concluded his paper with some comments on problems of weather protection high up from the ground.

The next two papers read at the afternoon session of the RIBA were by *Felix Samuely* and *Peter Dunican* (of Ove Arup and Partners); both discussed the structural aspect of high flats in general terms. (Mr. Dunican's paper was read in his absence by Geoffrey Wood.) Both speakers seemed to favour maisonettes and the cross-wall approach, and both seemed to think that concrete was likely to be more economic than steel except for extremely high buildings. Mr. Samuely made a gentle dig at the architects about the shaping and expense of pilotis, and Mr. Dunican emphasized the importance of pre-contract collaboration.

The audience was next given a lively account of the building of the LCC flats at Trinity Road, Wandsworth, by *C. D. Mitchell* of Wates Ltd. (Fully described in the JOURNAL of February 3). After Dr. Weston had read the paper we referred to at the beginning of this summary, *J. H. Forshaw* gave a critical report of the Symposium. He emphasized the value of maisonettes, deplored the small proportion of houses on high density sites, and referring to R. A. Jensen's paper, suggested that our present density limits might well be reviewed. But cost was the main pre-occupation of his summary. He outlined the possibility of a "twin tower" block—11 storeys, 8 flats per floor, 2 lifts and 3 staircases—which, compared with tower blocks now being built could offer a saving of about £113 per flat. He also suggested that the price of flats in blocks of *more* than ten storeys would tend to decrease rather than increase. In referring to the efficiency of the Trinity Road site organization and to Peter Dunican's paper, he gave qualified approval of the ideal of pre-contract collaboration between contractor, architects and consultants.

TECHNICAL SECTION

The Ministry of Health has issued a circular on old people's residential accommodation.* This outlines the general principles to be observed, and sets out in some detail the standards required for a home for between fifty and sixty residents. Much of the useful information given will be unfamiliar to architects who have not done this kind of work. It includes details about floor areas and the number of single-, two- and four-bedded rooms needed, and it refers to points of detailed planning—such as the need for baths to be accessible on both sides, for w.c.s to have room for a chair alongside the pan and for sills to be low so that bed-ridden patients can look out of windows. The type plan which accompanies the circular is unsatisfactory. Institutionalism is the one architectural quality which old people most dislike. It is, therefore, unfortunate that the plan shows over 200 ft. run of corridor on each floor, which means that there is close on 8 ft. run per old person. As the corridors are 5 ft. wide this means that there is about 40 sq. ft. of corridor to about 80 sq. ft. of bedroom space per person, which seems exceedingly poor planning. The standards set down may well be admirable, but we are still looking for the architectural skill to work them into a successful building.

* MOH Circular 3/55: "Residential Accommodation for Old People. Homes for the More Infirm." Obtainable from HMSO. Price 9d.

This week's special feature

25 WATER SUPPLY AND SANITATION
pitch-fibre pipes for drainage

The number preceding the week's special article or survey indicates the appropriate subject heading of the Information Centre to which the article or survey belongs. The complete list of these headings is printed from time-to-time. To each survey is appended a list of recently-published and relevant Information Centre items. Further and earlier information can be found by referring to the index published free each year.

One of the most difficult trades on the building site to speed and cheapen is that of the drain layer. For this reason any technical development affecting this trade which promises improvements in either of these respects deserves careful attention. One such development is the use of pitch-fibre pipes, a product which has been in use for drainage in America for some 50 years but which has only recently been manufactured over here. This week Dargan Bullivant, who has had experience of using these pipes with MOE, reports on their properties and discusses the technique of handling them.

The use of pitch-fibre for drain pipes is not in itself anything new. The manufacture of these pipes for both sewers and gas mains first became a commercial proposition in America as long ago as 1893. A U.S. Federal Standard Specification for these pipes was published in 1939, and by 1951 the original manufacturer, the Orangeburg Company, claimed to have laid over a hundred million feet.

Manufacture began over here in August, 1953, and last spring pitch-fibre pipes were laid by the MOE Development Group at Green Farm Comprehensive School, Wyken, Coventry, and by the MOW Chief Sanitary Engineer's Department at Aldermaston.

This work was carried out with the co-operation of the respective contractors Messrs. Gilbert-Ash and Messrs. E. A. Bance and Son. Both jobs were studied and timed by the Building Operations Research Unit of DSIR.

The object of this article is to describe the manufacture of pitch-fibre pipes, to discuss

American testimony to their qualities and to present the fruit of experience gained in laying them.

THE MATERIAL AND ITS MANUFACTURE

Manufacture

Pitch-fibre pipes are made by mixing cellulose fibres into a pulp stock which is carefully washed and automatically regulated for consistency. This pulp stock is then pumped in the form of a fibre and water slurry to a pipe-forming machine where the fibres are deposited on a mandrel in layers and formed into pipe of constant thickness without joints. (See Fig. 1.) The damp fibre tube, still on the mandrel, is then dried in ovens, and emerges pale grey with considerable strength and very light. The fibre structure is homogeneous at this stage and cannot be laminated. The tubes are inspected for straightness and true bore and then impregnated with coal tar pitch under vacuum. The finished pipe has a glistening black surface with a smooth internal bore and consists of about 75 per cent. pitch and 25 per cent. fibre by weight.

Samples are tested for:
crushing, bending, impact, effect of temperature change and exudation of pitch.

Material standards

The National Plumbing Code of U.S. and National Building Code of Canada require pitch-fibre pipes to comply with the Commercial Standard CS 116-54. Preparatory work for a British Standard is being undertaken now, but until this can be completed the American code will remain the only standard for comparison. This code can be criticized on some points, such as tests for properties not needed in a drainage pipe. For instance, a crushing test is called for, whereas a radial pressure test would simulate underground loads more closely. There is also a boiling water test, although drains never carry boiling water.

The pitch-fibre pipes now made in this country by Key Engineering Company have been tested by the Building Research Station and found to conform in all respects with the requirements of the American Standard CS 116.

Pipes and joints

The pipes are supplied in 5 ft. 6 in. lengths with a 2 deg. machine cut taper on each end. Sleeves of the same material are provided with an internal taper and jointing is effected by placing the tapered end into the sleeve and driving it up tight. The tapers allow ¼ in. for driving before the pipes butt together inside the sleeve. It is a very simple joint to make and remains tight.

The material is easily cut with a coarse toothed saw (see Fig. 2) and a hand tooling lathe (see Fig. 4) is available for purchase or hire for cutting tapers on site, an operation which takes about 3 to 4 minutes for 4 in. and 5 to 6 minutes for 6 in.

The cut ends of pipe can be satisfactorily jointed to stoneware or cast iron sockets with a cement and sand (1:1) and tarred

Fig. 1. The pulp stock is pumped to the pipe-forming machine where the fibres are deposited on to a mandrel in layers and formed into a pipe of constant thickness.

Fig. 2 (top). Cutting a 4-in. pipe with a saw. Fig. 3 (right). Centring the hand lathe to cut a taper on site. The pipes are delivered tapered but can be cut to length and retapered on site. Fig. 4 (bottom). Cutting a tapered end on site with a hand lathe.

Architects:
Alec F. French & Partners, F./L.R.I.B.A., Bristol, Plymouth and Doncaster.

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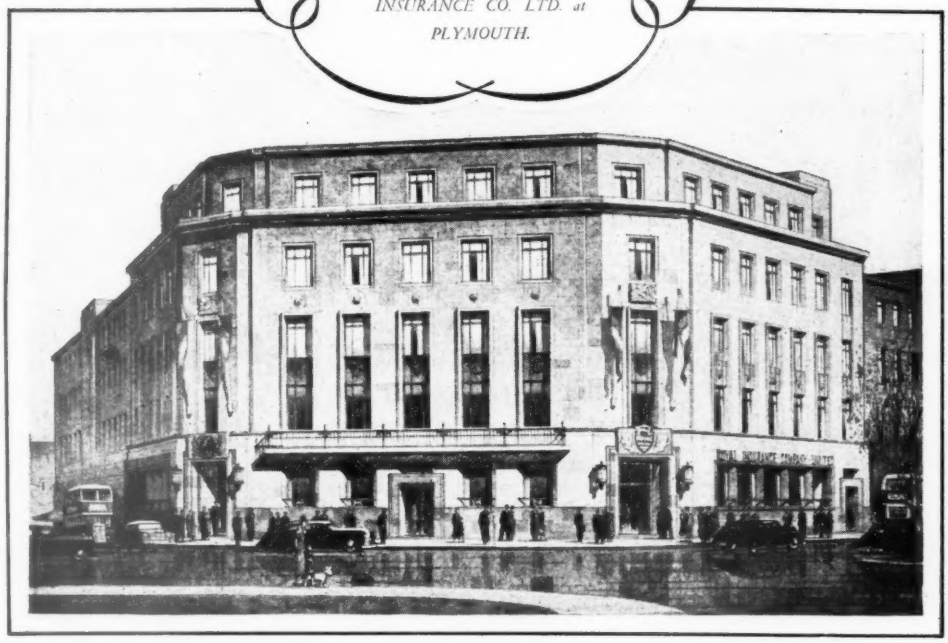

At St. Andrew's Roundabout, Plymouth. This five-storey building is steel framed and the walls of the main facade are of Portland Stone, relieved by ornamental aluminium and stone panels. Elevations to the court-yard are in brick, rendered to match the stonework. Floors are hollow tile.

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yarn joint. Dry sand will adhere to the pipe end after warming it with a blow lamp, and this will further improve the cement joint. This, however, is unnecessary if the joint is well made.

Characteristics

Due to the fibrous nature of the material it combines strength with lightness. A 4-in. pipe weighs approximately 2·3 lb. per ft., about one quarter of the weight of stoneware, and has a crushing strength of 1,100 lb. per ft. This lightness makes it easy to handle: one man can carry several 5-ft. 6-in. pipes at one time. Before production commenced in this country, millions of feet of pipe were imported from America for electrical purposes and breakages were negligible.

The material is also tough and flexible, but although the pipe is not brittle and does not break into pieces if it is struck, it can be pierced with a pick and the taper ends can be dented about as easily as stoneware can be broken. Damaged ends can be cut off and retapered on site, thereby reducing any wastage. The lightness of the pipes seems to encourage careful site handling. Stacking is very compact, as the pipes have no projecting sockets.

Pipe sizes and fittings available

Pipes and channels are available in 2 in., 3 in., 3½ in., 4 in., 5 in. and 6 in. sizes. Bends can be obtained of 3 ft. and 6 ft. radius for 4-in. pipe and of 6 ft. for 6-in. pipe, oblique junctions 45 deg. and 60 deg. (see Fig. 9) and adaptors can be obtained for connecting to stoneware and cast iron spigots. A double collar fitting can be used for jointing two plain pipe ends with a cement joint. The purpose of this fitting is to join two lengths of pipe already in the ground when the normal joint could not be used (e.g., making a joint to an existing drain).

AMERICAN EXPERIENCE OF THE USE OF PITCH-FIBRE

Turning to American practice, it is interesting to notice that the Americans generally lay the pipes direct on the earth bottom without a concrete bed, and often with as little as 6 in. to 9 in. between the top of a pipe and the surface of a road carrying heavy traffic. The American standard calls for a crushing strength equivalent to more than 30 ft. of earth without allowing any side support.

Reports of the durability of these pipes seem to be satisfactory. In 1948 nineteen foul drains which had been in service for periods varying from 2½ to 42 years were examined, and no disintegration due to domestic sewage effluents was found: even the oldest sewers, made in materials inferior to the modern product, were reported in a satisfactory condition.

Effect of hot liquids

It has been found that hot liquids of 120 deg-130 deg. F., flowing continuously for several years, caused no serious deterioration.

Effect of corrosive liquids

American Standard CS 116-54 includes under uses industrial waste drainage, but each case should be examined separately. A number of industrial sewers examined in America have shown no deterioration. Two examples are of interest: six miles of pipe carrying salt water were found to to be satisfactory after nine years; a drainage line from an engraving shop, taking nitric acid, muriatic acid, acetic acid, chloride of iron, benzol, alcohol, and turpentine, was still satisfactory after 18 months.

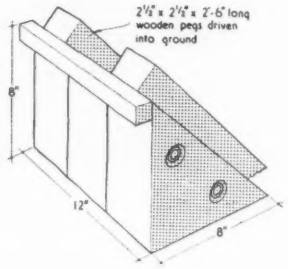
LAYING PRACTICE

Trenching

As the action of laying and jointing is essentially a simpler and uni-directional movement compared with caulking socketed pipes, a narrower trench should be possible. A width of 18 in. at the bottom is probably sufficient up to a depth of 4 ft. 6 in. and possibly up to 6 ft. if the top is slightly wider. The bottom should be boned true to grade and hand trimmed after mechanical excavation. If the subsoil is stiff or uneven, a bed of sand about 12 in. wide by 1 in. thick will be useful. A larger amount is no help as it will only bulk up and form a soft foundation.

Pipelaying

Before laying, the pipes should be set out along the trench bank with sleeves between. It is important to have a firm backstop that will not move at the start, as more time can be spent providing supports than laying pipes. The type of backstop recommended is illustrated in Fig. 5. This backstop should be placed at the end of the pipe line by driving two 2-ft. 6-in. × 2½-in. × 2½-in. wooden pegs into the ground. Then a pipe with a sleeve on each tapered end should be placed in the trench with one sleeve against the backstop. A further pipe with a sleeve on the forward end is entered into the sleeve on the end of the first pipe and a wooden dolly placed in front of the third sleeve. The whole is then driven together with light



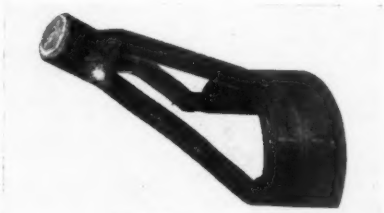
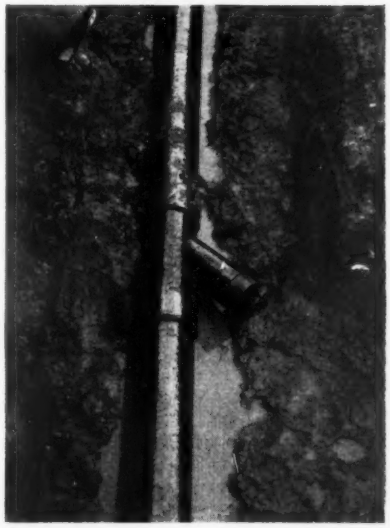


Fig. 5 (above). Backstop. Fig. 6 (below). Prototype dolly for tightening sleeves.

Fig. 7 (above). The joint is driven up on a block of wood placed across the last sleeve. Note: The 2 ft. 6 in. trench is more than wide enough. Fig. 8 (below). Backfilling in sections to hold pipe in place. Note: Laying in very wet conditions. Fig. 9 (bottom). Pitch-fibre oblique junction 4 in. to 6 in.



B.B.C. TELEVISION CENTRE, LONDON, W.12.

(Above) The West Façade of the Scenery Block.

(Right) "Royal Flush" Swing Doors in the Television Library.

Architect: Graham Dawbarn, Esq., C.B.E., M.A., F.R.I.B.A. (Norman & Dawbarn), in association with M. T. Tudsbery, Esq., C.B.E., F.C.G.I., M.I.C.E., Consulting Civil Engineer to the B.B.C.

Contractors: Messrs. Higgs and Hill Limited.

blows. See Fig. 7.

The pipes should be laid to a line placed in the trench and pegs driven crosswise at an angle into the trench bottom every 15 feet to prevent the pipe line from bending horizontally or vertically under the hammer blows. The weight of hammer used should be 4 lb. for 4 in. and 7 lb. for 6 in.

The pipe tapers and sleeves should be wiped before jointing.

By continued driving of pipes and couplings and pegging in this way, a 4-in. drain, not including fittings and junctions, can be laid at a rate of 400 ft. per hour by ordinary pipe layers with little practice, but a skilled team could easily lay at faster speeds.

Boning the pipes to grade can be made easier if folding wedges are available at the trench to assist in raising or lowering sections of the pipe, as this is nearly always necessary to overcome small pockets or lumps; otherwise time is lost by making the adjustment with soil. Care should be taken to pack under the pipes before the grade has been set so as not to displace vertically.

As no cement joints are involved, the pipe lines can be tested immediately and back filled the same day, instead of having to wait for the cement to set, with the possibility of trench deterioration. The proportion of leaking joints with pitch-fibre is very small, but if one occurs all that may be necessary is to tighten the sleeve with the tool shown in figure 6. One cause of a faulty joint is driving up the joint too hard which may split the sleeve. This is easy to spot at the time, but if missed it will have to be cut off with a cold chisel and replaced.

It should be noted that:

1. A coupling must always be placed against the backstop.
2. The dolly must always be placed against a coupling.
3. The hammer must only hit the dolly and must do so squarely.
4. Every coupling should be wiped clear of grit and dirt before a pipe is entered into it.
5. It is only necessary to drive joints up firmly and it is not essential that they should be driven up to the shoulder of the pipe. This will be approx. a ¼-in. drive.
6. Pipes should be entered into couplings in their correct alignment and not at an angle.
7. The operator must not continue hammering the dolly against the sleeve once all joints are firmly driven up.
8. Backfilling: the backstop must be removed before the backfilling commences but the side pegs maintaining the alignment of the pipe should be left in position to prevent movement during backfilling.

Backfilling

Normal backfilling practice can be employed, and stones should be kept free from contact with the pipe. Selected excavated material should be rammed or stamped by foot firmly between the sides of the pipe and the sides of the trench up to the crown of the pipes. It may be necessary to do this thoroughly for 18 in. of every 5 ft. 6 in. of pipe (see Fig. 8), and fill in between with further rammed earth. A small amount of sand may be used to fill the interstices if the earth is stiff. Thereafter a stone-free fill should be placed by hand for a depth of 9 to 12 in. over the pipe and this should not be rammed. Back-filling can then proceed by mechanical means.

SPECIFICATION

Drainage practice has become so common that it is unusual to specify the operations in detail, and a lot is left to those on the site to work out and to construct to satisfy the local authority tests. With a new material, it is important to specify what is done more closely, and to examine the value of practice with similar materials.

The following Specification should cover laying in stiff clay soils.

(1) Excavate trench for 4-in. diameter P.I.F. pipe and include for getting out, levelling and ramming bottom to regular and even falls, planking and strutting, and backfill in the following way: hand pack selected excavated material on either side of the pipe and up to the crown and pack by hand punning in a direction away from the pipe, then cover the crown of the pipe with a layer of sand. Backfilling is then to proceed in accordance with Code of Practice, Building Drainage, CP.301:1950, Clause 508 (IV and V).

(2) Lay down centre of trench bottom bed of sand 1 in. deep and 12 in wide, and hand pack well under pipe on either side.

(3) Lay 4-in. diameter P.I.F. pipe in the 5 ft. 6 in. lengths on bed of sand. Place the P.I.F. sleeve on tapered end of pipe and place the opposite tapered end into the sleeve of the previously laid pipe. Drive up joint until shoulder of the tapers just meets the end face of the sleeve. The driving should be done by sledge hammer against a 12-in. × 18-in. × 2-in. block of wood placed against the sleeve of the pipe to be driven.

CONCLUSIONS

It is too early to state categorically the economies and technical improvements to which the use of pitch-fibre pipes gives rise. But evidence to date is at least sufficient to suggest the directions in which these might be expected.

The first kind of economy relates to pipe size and gradient. The circumstance that the pipes are manufactured in so many sizes may encourage architects to consider whether, for instance, we always need to use a 4-in. pipe for an isolated sink or for one or two basins with 1½-in. waste pipes. Would not a 3-in. drain give better possibility of achieving the self-cleansing velocity with such small flows? Do we need to increase from 4 in. to 6 in. when a 5-in. pipe is available?

Turning to the question of gradient, it is interesting to notice that American pitch fibre piping is rated as having a higher flow capacity than American clayware. But a more important consideration here is the self-centring dry joint which obviates the risk of a bad joint due to an offset pipe, often the cause of stoppages in spigot and socket jointed pipes. This point is of some importance if note is taken of the conclusion concerning gradients in the Report of the Joint Committee on Field Research into Drainage Problems (May 1954), which was "that conventional gradients, 1 in 10 times the diameter, may be considerably reduced provided a good standard of workmanship in laying and jointing is maintained."

Savings in time are potentially spectacular, since it has been found easily possible to lay pitch fibre pipes at a rate 8 to 10 times as fast as stoneware, but savings of this order over the whole operation cannot be realized until equivalent savings can be made in excavating and backfilling. Since a narrower trench of 18 in. width is all that is required, the answer may be to use an 18-in. revolving bucket trencher.

The fact that pitch fibre pipes can be laid at temperatures below freezing point and (as can be seen in Fig. 8) in very wet trenches should remove two causes for delay in orthodox drain laying.

As architects know only too well, it is one thing to achieve a saving in cost and quite another to achieve a saving in price. It may be difficult at first to obtain competitive rates for laying pitch-fibre pipes until the material is more widely known. One procedure is to negotiate a price on the basis of a laying rate observed or timed on the site for a "dummy" run. There is little information on the cost of drains laid, but the following price build up is taken from a recent job where both materials were used. Orders more than £150 and free carriage are assumed.

Table showing comparative costs per yard of stoneware and pitch-fibre pipes.

4 in. diameter	Stoneware "Best" (per yd.)	Pitch Fibre (per yd)	Breakdown of Pitch Fibre figure, given per foot run
(1) 3 in. concrete bed and haunch	6s. 4d.	—	1s. 11d. ft. pipe 2d. ft. profit
(2) Sand bed 12 : 1	—	4d.	2d. ft. lay
(3) Supply, lay and joint ..	8s. 3d.	6s. 9d.	
6 in. diameter			
(1) As above	7s. 11d.	—	3s. 8d. ft. pipe 4d. ft. profit
(2) „ „	—	6d.	3d. ft. lay
(3) „ „	11s. 9d.	12s. 9d.	

28 MISCELLANEOUS
new school playing fields

In the leader to the Technical Section for February 24 we welcomed the publication of MOE Bulletin No. 10 on New School Playing Fields.* *This week we have asked two acknowledged experts to review it for us: Peter Shepheard the architect and Martin Sutton, a director of Sutton and Sons Ltd., the seedsmen. While both pay a very handsome tribute to the Bulletin as a whole, Peter Shepheard—who gives a brief résumé of what the Bulletin contains—remarks that not enough attention is given to the visual side of landscaping; while Martin Sutton cites a few detailed points where the advice in the Bulletin is, at least, controversial.*

* Obtainable from HMSO. Price 3s. 6d.

PETER SHEPHEARD WRITES :

The Building Bulletins which the Ministry of Education has issued from time to time about the building of schools are well known for their admirable summaries of existing information and future trends, and they have been a powerful instrument in the improvement of school design which the Ministry has done so much to foster. Bulletin No. 10: *New School Playing Fields* fully maintains the high standard. Indeed, since most of the information it contains is not by any means readily available elsewhere in half so concise a form, it would be difficult to imagine a more useful or timely publication, and no praise is too high for the extremely practical and clear way in which it is written.

The bulletin aims to provide a concise guide to the design, construction and maintenance of playing fields for new secondary schools. Much of the information in it is, of course, applicable to many other kinds of landscape, and its summary of information will be found useful by architects and landscape architects who are engaged on things other than school playing fields.

The introduction emphasizes the important relation between capital and maintenance costs, and although the authors have refrained from giving actual examples of cost because of the present lack of information, they keep in sight from beginning to end the essential economy of all the operations involved.

The first chapter on the educational requirements not only contains tables showing the areas required for all purposes, but gives a good description of the precise way in which the areas are used. This is followed by a chapter on definitions of technical terms, in which I was surprised to find a word I have never heard before—braird—which I imagine you might hear an ancient Scottish farmer use for the first appearance of a crop above ground and which looks strange amongst the other everyday technical terms.

The third chapter is about the choice of sites, and will concern the authority or the county architect rather than the private architect building a school, who usually has no say in the matter.

Chapter 4 deals with the layout and construction of new playing fields. Proper emphasis is put upon making plans at the earliest possible stage, and the chapter goes on to detail all the operations involved in laying out and constructing playing fields.

LANDSCAPING

The section on layout contains a number of sample plans showing how playing fields are related to the school building, and a very complete set of tables and diagrams showing the sizes and orientations for all pitches for all kinds of games and school athletics. If this section has a fault, it is perhaps that it lays not quite enough emphasis on the contribution that can be made to the general beauty of a school setting by the landscape architect. The section on trees, for example, contains perfectly sound advice and one welcomes its attitude towards ineffective trees like the ornamental cherries and its hint that some evergreens would be useful. In school layouts, however, many trees often have to be removed to make way for playing fields, and there is a tendency for too little replanting of shelter belts and groups to be done. I would therefore have liked to see a strong emphasis on the value of trees in providing the sort of setting for our modern schools that is found in some of the ancient sites, such as Winchester and Eton.

The remainder of this chapter treats of the direct conversion of grass fields and the construction of new ones, describing all the operations of conserving top soil, grading and levelling, and a note on the use of controlled tipping. There are sections on the preparation of seed beds and the use of fertilizers, the establishment of new grass by seed or turf, the drainage of land by ditches and pipe or mole drains (an excellent section this, with plans, and notes on the maintenance of such systems), the establishment of special turf areas for cricket and tennis, etc., with a note on the bitumen process. The chapter ends with a section on hard porous pitches, including non-turf cricket pitches.

Chapter 5 deals with specifications and bills of quantities, and points out the importance of such work being done to a proper bill of quantities.

THE PRICE OF NEGLECT

Chapter 6 is about maintenance and begins with the words, "The urge to create is stronger than the urge to maintain"—a fact which is borne home to the landscape architect with every job he does. It is pointed out how much damage can be done to a well-constructed playing field by neglect. Some years' neglect of a building may mean a high bill for repairs, but two or three years' neglect of a playing field may mean ploughing it up and starting again. This chapter not only describes the processes involved in maintenance, but suggests systems which local authorities might follow for carrying them out.

The bulletin ends with eight appendices. The first contains tables of areas, the second deals with the recognition of soil texture by handling, the third with seed mixtures on grass, the fourth and fifth with the method of sampling seed, soil and turf, the sixth with the time taken for various agricultural operations and the seventh sketches out specimen clauses for a playing fields specification. This, I think, although useful, may be a little dangerous, because the specification is by no means complete, and would be inadequate if used without a great deal of amplification. Appendix 8 deals with the details of two typical maintenance schemes with their costs and Appendix 9 gives a short bibliography.

WHAT ABOUT THE LANDSCAPE ARCHITECT?

Altogether, this bulletin is a most impressive piece of work. If it has a fault, it is in not making quite clear who should be responsible for the design and construction of playing fields. The amplification of the material and the detail into which it goes seems to suggest that the architect of the building is probably the man responsible, and indeed, in the sample specification the contractor is referred to the architect. It would, however, be risky for an architect to undertake to design the

complete landscape layout for a school—even after reading this full and excellent work. I should like to have seen it made a little clearer that a properly qualified landscape architect is, in the long run, the only person who can solve both the practical and aesthetic problems involved.

MARTIN SUTTON WRITES :

Recent years have shown an enormous increase in the importance of recreational facilities for schools, and the inadequacy of many existing sports grounds has become more and more apparent. It is heartening to know that the School Premises Regulations, 1954, have taken this matter firmly in hand and set out minimum standard requirements with which all primary and secondary schools must comply. The Bulletin under review tackles the job of supplying basic information on the ways and means of carrying out these requirements. As it modestly states in paragraph 2, it " attempts to give guidance on ways of providing the required facilities for outdoor games so as to obtain the best possible educational value from the prescribed areas, with economy in capital and maintenance costs." There is no doubt at all that the Bulletin achieves its object admirably, both as regards the methods to be adopted and consideration for the ratepayer's pocket!

A careful study of the publication should provide a pretty complete education in the planning, laying out and maintenance of sports grounds from the most unpretentious to those covering several acres—on paper at any rate. To the practical groundsman it will serve as an invaluable source of reference to which he can turn.

As is to be expected in an official publication of this type, the lay-out is concise and clear, with sections and paragraphs headed and numbered. Reference to any specific subject is extremely easy, and it is evident that a competent, analytical mind is behind the work. This necessarily impersonal approach stamps the Bulletin clearly as a reference work rather than reading matter to be browsed through and enjoyed. One thing is very evident, however: every fact presented is accurate; it has probably been checked and re-checked and one feels that the instructions given can be carried out with every confidence. This must of necessity be so, as the document will doubtless become the source of reference in any case where difficulty or dispute arises.

GRASSES

Having made these remarks concerning the nature and presentation of the matter, it is obviously rather difficult to suggest points for criticism. In fact it is almost impossible to disagree with the bulk of the information given. One or two small points, however, may be raised upon which the reviewer holds somewhat different opinions. The use of Bent grass (*Agrostis*) in cricket wicket mixtures, for instance, seems to be regarded as essential, but this is not by any means the case. There are certain disadvantages in the use of Bent grass for this purpose, especially on the lighter soils. Apart from being shallow rooting, *Agrostis* tends to develop overground stems which can prove very troublesome. This is particularly the case with German Mixed Bent, which contains some of the coarser aggressive types as well as the finer ones, and would not appear to be a desirable ingredient for cricket squares under any circumstances. Crested Dogstail, on the other hand, which it is suggested should be excluded from first-class squares, is an ideal grass for the purpose because of its strong root system, its permanent nature, and its capacity for standing up to very rough treatment.

FERTILIZING AND ROLLING

Another matter for disagreement is the recommendation to apply a nitrogenous fertilizer such as sulphate of ammonia or nitro-chalk in mid-summer to grass sown in the spring—even taking into account the caution " Dry periods should be avoided." If seed has been sown on a properly prepared and fertilized seed-bed, such dressings should not be needed during the first season, and there is a definite risk of damage to the young sward.

These points are, of course, relatively insignificant, and only represent differences of opinion; it is difficult to be dogmatic on the subject of turf culture. One subject upon which more information might have been given is the question of rolling—always a controversial one. Little guidance is provided as to what constitutes " light " and " heavy " rolling, and the warning that " rolling must not be overdone " does seem to demand some more definite qualification.

BITUMEN TREATMENT OF TURF

The inclusion of a paragraph on the bitumen treatment of turf is of especial interest to the present writer as he was closely associated with the development of this type of treatment during the war. The experimental work then carried out indicated that the process might have wide applications for sports purposes in peace time, but in fact its usefulness has been very limited owing mainly to high costs. The advantages of the treatment outlined in the Bulletin can be vouched for, and one other point is the protection afforded against birds whose depredations can seriously upset a sowing of grass seeds. (In passing, it may be suggested that this point about birds ought to be taken into account when considering the rather low seeding rates recommended for sowing down sports grounds!)

THE IMPORTANCE OF MAINTENANCE

The subject of "Maintenance" is extremely well covered. A comparison is made between constructing a building and laying out a playing field. If the former is left to deteriorate for a few years after completion the harm can be repaired at the owner's convenience; but the playing field will allow of no such delay, for irreparable harm may be done. It is good to note that turf nurseries are advocated for providing a supply of material for patching worn areas, extensions, etc. So often this important point is overlooked and imported turf of a totally unsuitable type is used, sometimes at considerable expense.

IS LEAD ARSENATE SAFE ?

The use of lead arsenate for the control of worms seems to be a somewhat questionable recommendation where school playing fields are concerned. There always exists a certain amount of doubt regarding the safety of such materials where children are to play games. Many education authorities have banned the use of lead arsenate for many years; it will be interesting to see whether they revise their ideas after studying this Bulletin.

The publication runs to nearly 90 pages, and contains clear diagrams showing typical plans for playing fields of varying sizes, drainage systems, correct marking out of grounds for all types of sports, structure of running tracks, jumping pits, etc. Every page is packed with valuable information.

Buildings Illustrated

Research Laboratories and Workshops for Ferranti Ltd., at Wythenshawe, Manchester. (Pages 330-331.) Architects: Cruickshank & Seward, F.R.I.B.A.; Quantity Surveyors: Ernest R. Babbs & Sons; Consulting Engineers: Hoare, Lea & Partners; General Contractor: R. Costain & Sons (Liverpool) Ltd.; sub-contractors: structural steelwork, Henry Smith (Constructional Engineers) Ltd.; reinforced concrete floors, flat roofs, staircases, etc., Matthews & Mumby Ltd.; metal windows, Doodson & Bain Ltd.; roof glazing, Mellowes Ltd.; heating and ventilation, Brightside Foundry & Engineering Co. Ltd.; electrical installation, T. Clarke & Co. Ltd.; wood block floors, Hollis Bros. Ltd.; granolithic floors, The Johnson Flooring Co. Ltd.; terrazzo paving, Conways Ltd.; wall and floor tiling, Beaumonts (Manchester) Ltd.; metal partitions, Roneo Ltd.; rolling shutters, Mather & Platt Ltd.; goods lift, Etchells, Congdon & Muir Ltd.; asphalt roof covering, The Limmer & Trinidad Lake Asphalt Co. Ltd.; balustrades and handrails, Brookes & Co. (1925) Ltd.; reconstructed stone, Girlings Ferro-Concrete Co. Ltd.; kitchen equipment, General Electric Co. Ltd.; fire equipment, Charles Winn & Co. Ltd.; facing bricks, Blockleys Ltd.; paint, Donald MacPherson & Co. Ltd.; sanitary fittings, Shanks & Co. Ltd.; metal roof decking, The Ruberoid Co. Ltd.; lightning conductors, John Faulkner & Sons Ltd.; ironmongery, James Gibbons, Ltd.

Offices at Poole, Dorset, for the Loewy Engineering Co. Ltd. (Pages 333-341.) Architects: Farmer & Dark, F/F.R.I.B.A., the following were associated with the design, Frankland Dark, F.R.I.B.A., and W. A. Henderson, A.R.I.B.A., E. G. Hutchinson, and E. M. C. Butcher A.R.I.B.A., H. Clamp, A.R.I.B.A., A. B. Leslie, A.R.I.B.A., A. J. Potts, A.R.I.B.A. Consultants, (reinforced concrete, Wheatley, Bryon and Partners and Z. Pick (landscape) Brenda Colvin. Quantity Surveyors, E. C. Harris & Partners. General Contractors: Whitelock & Co. Ltd.; Subcontractors: flooring, The Adamite Co. Ltd.; Venetian blinds, J. Avery & Co. Ltd.; balustrading, postal box baffle plates, The Birmingham Guild Ltd.; gas connections, Bournemouth Gas Undertaking, roller shutters, G. Brady & Co. Ltd.; roof decking (cycle shed), William Briggs & Sons Ltd.; planting, J. Cheal & Sons, Ltd.; M.S. staircase balustrade, Clark, Hunt & Co. Ltd.; heating and hot water services, James Combe & Son Ltd.; r. c. structure, William Cowlin & Son Ltd., and Wheatley Bryon & Partners; canteen equipment, Falkirk Iron Co. Ltd.; W.I. wire bins, Farrow & Jackson Ltd.; Resinoid flooring, Haskel Robertson & Co. Ltd.; lightproof blinds, Albert J. Shingleton Ltd.; electrical wiring, installation, Southern Electricity Board; electric clock system, Synchronome Co. Ltd.; hand power lifts, Waygood-Otis Ltd.; window frames, roof lights, glazing, Williams & Williams Ltd.; wood flooring, Vigers Ltd.; Wilton carpet, Vineys of Abingdon; emulsion paints, Vitretex (England) Ltd.; oil paints, International Paints Ltd.; sanitary fittings, Adamsez Ltd.; louvres, F. H. Biddle Ltd.; gates, Boulton & Paul Ltd.; enquiry desk cill, flower box, slate slabs, Bow Slate & Enamel Co. Ltd.; louvred vents, balustrading and hand rails, Clark Hunt & Co. Ltd.; Broadcrete columns, Concrete Utilities Ltd.; electrical fittings, Courtney Pope (Electrical) Ltd.; fluorescent fittings, louvred panel, Ekco-Ensign Electric Ltd.; marble paving, Fenning & Co. Ltd.; lightning conductor, W. J. Furse, Ltd.; electrical fittings, fluorescent lanterns, General Electric Co. Ltd.; stainless steel grip handles, James Gibbons Ltd.; lightning fittings, Hartley Electromotives Ltd.; Purbeck stone, W. J. Haysom; roof lights, Hills (West Bromwich) Ltd.; electrical fittings, Hume, Atkins & Co. Ltd.; fibre underfloor ducts, telephone pedestals, Key Engineering Co. Ltd.; loft ladder, Loft Ladders Ltd.; electrical fittings, The Merchant Adventurers Ltd.; ironmongery, Mountford Bros. Ltd.; glass domes, Seddon & Sons (St. Helens) Ltd.; coat hangers and framework, James Sieber Equipment Co. Ltd.; electric toilet incinerators, Stitsons Sanitary Fittings Ltd.; special chimney bricks, Swanage Brick & Tile Co. Ltd.; electrical fittings, Troughton & Young (Lighting) Ltd.; mats, Tyre Products Ltd.; extract units, weather cowls, Vent-Axia Ltd.; soap dispensers, Waddington & Duval Ltd.; partition units, Yelverton Dawbarn Bros Ltd.; Vitroslab, Plyglass Ltd.

Announcements

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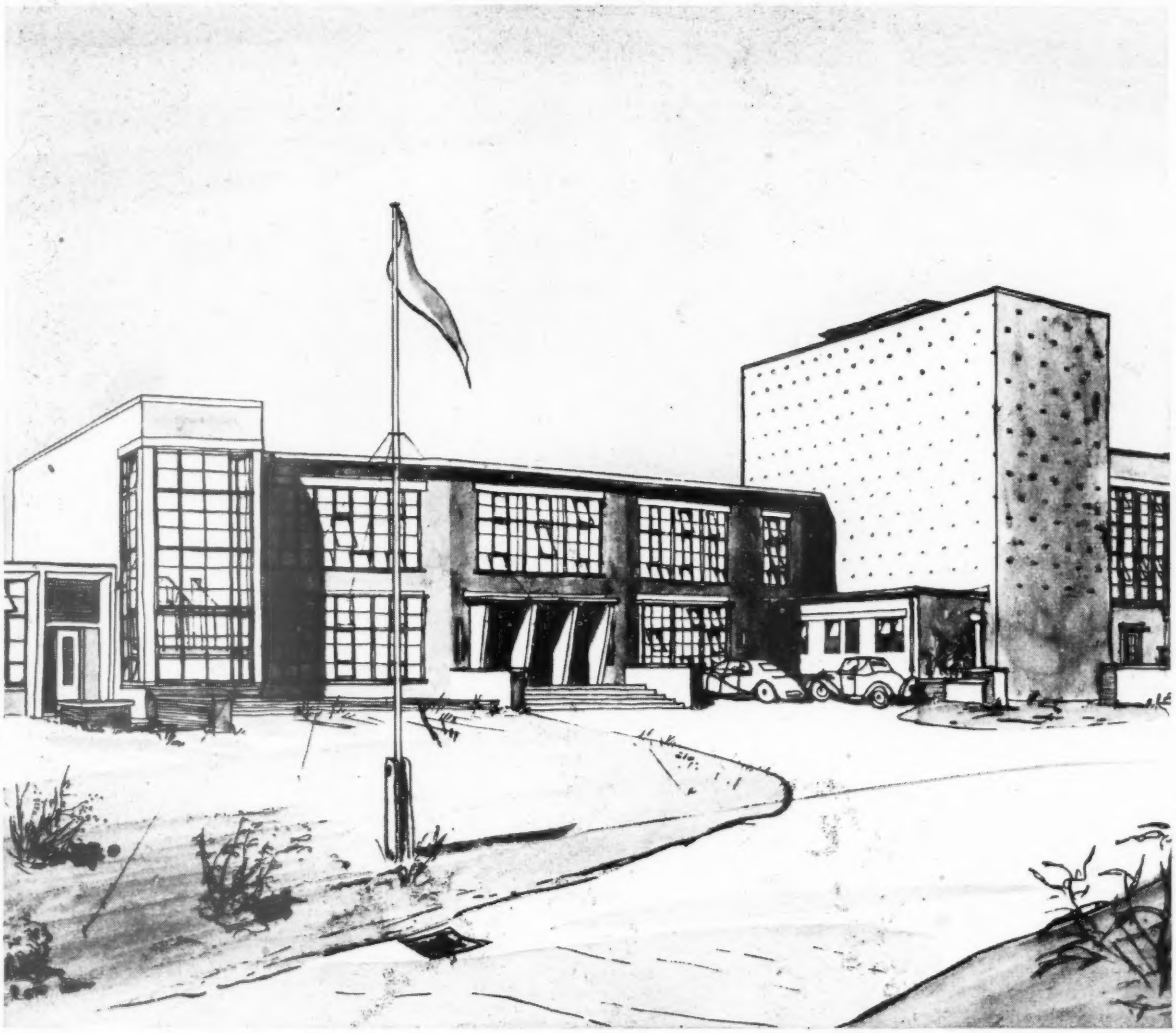
Mr. John Voelcker, A.R.I.B.A., A.A.DIP., is now practising at Little Loddenden, Staplehurst, Tonbridge, Kent. Telephone: Staplehurst 248.

Mr. John Bickerdike, D.A., A.R.I.B.A., is now practising at 88, George Street, Portman Square, W.1. Telephone: HUNter 0775.

Correction

The Ilkeston Kirk Hallam County Infants' School, illustrated on page 262 of the JOURNAL for February 24 was designed, not by Norman and Dawbarn, but by F. Hamer Crossley, Derby County Architect; F. K. Hicklin, Assistant County Architect (schools); Bernard C. Adams, Architect-in-charge (development); F. Alderson, Assistant Architect. The quantity surveyors were A. E. Thornton-Firkin and Partners.



Haverfordwest Modern School is a mixed school with accommodation for 750 pupils. It was designed by Lt.-Col. Walter Barrett, M.B.E., A.R.I.B.A., architect to the Pembrokeshire County Council.

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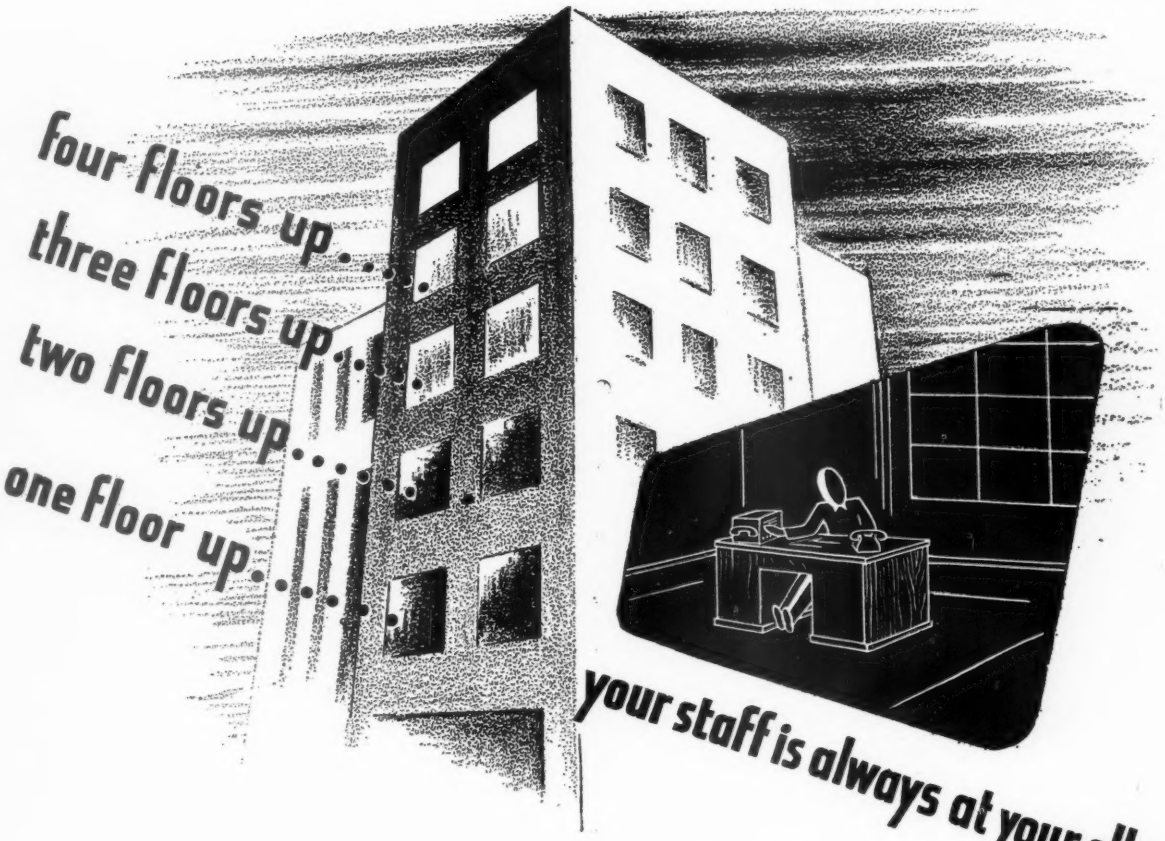

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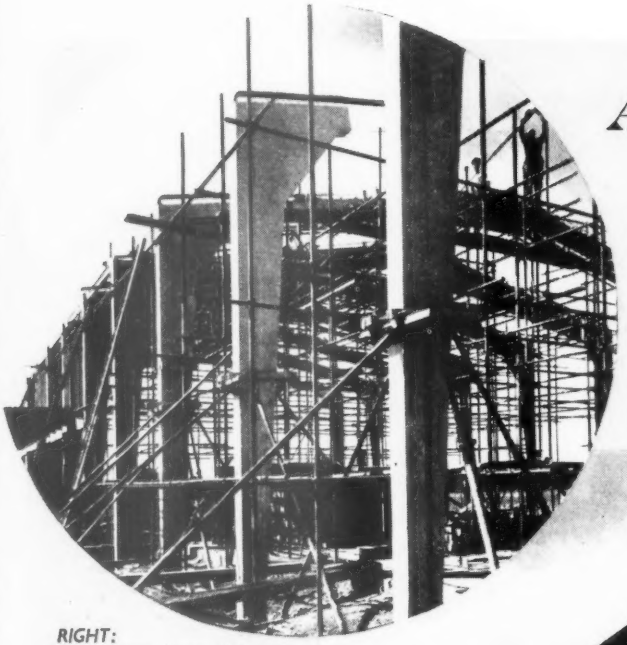

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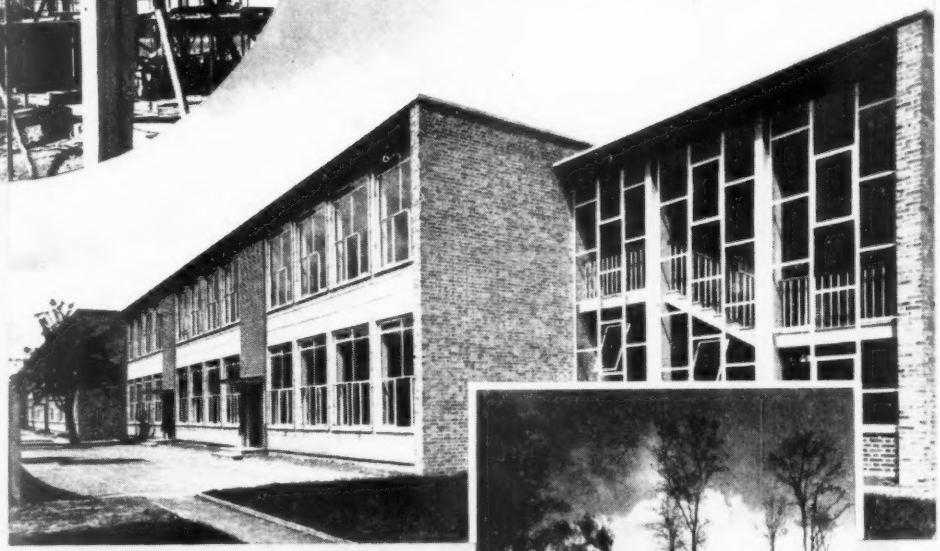
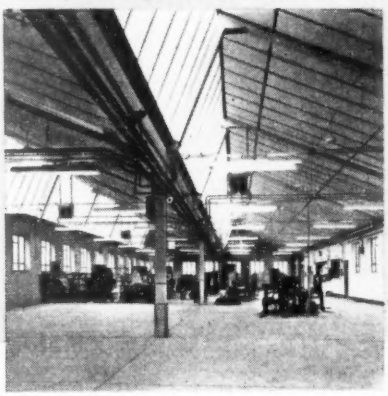
Assistant Chief Architect: A. I. R. Crick, A.R.I.B.A.

RIGHT:
Sir Thomas Abney Primary School (L.C.C.)
Architect:
Robert H. Matthew, C.B.E., A.R.I.B.A.
former Architect to the London County Council.
Schools Architect :
Sydney Howard, L.R.I.B.A.



ABOVE: Simple pitched roof construction
BELOW: North light roofing



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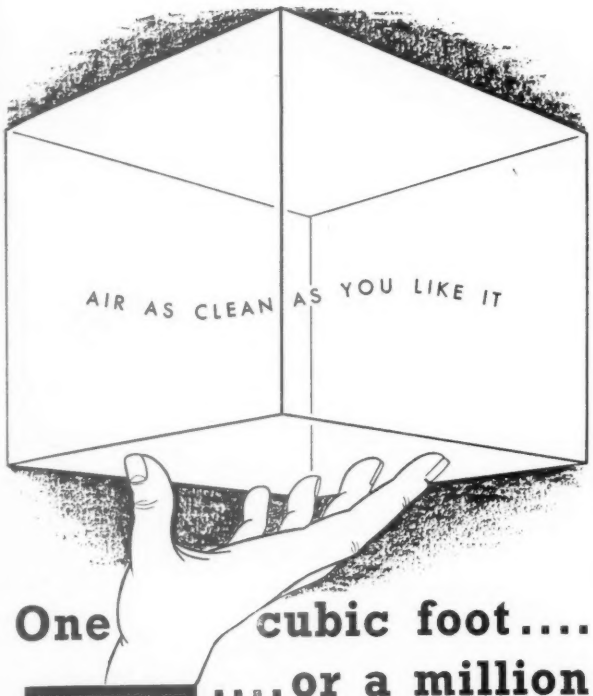

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Replies to Box Numbers should be addressed care of "The Architects' Journal," at the address given above.

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ROBERT LYLE,
Town Clerk.

City Chambers,
Dundee.
23rd February, 1955. 8832

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(*c*) ONE ARCHITECTURAL ASSISTANT on A.P.T. II £560-£640.

(*d*) ONE ARCHITECTURAL ASSISTANT on A.P.T. I—II, £500—£640.

Applicants for (*a*) should be members of the R.I.B.A., applicants for (*b*) and (*c*) should have passed the R.I.B.A. Intermediate examination, and applicants for (*d*) should preferably be students R.I.B.A.

Commencing salary will be according to qualifications and experience.

The appointments are in the County Architect's Department, County Hall, Aberayron.

Application forms can be obtained from the County Architect and these must be returned to the undersigned not later than 19th March, 1955.

J. E. R. CARSON,
Clerk of the Cardiganshire County Council.

Swyddfa'r
Sir, Aberystwyth, Cards. 8772

HOLLAND (LINCOLNSHIRE) COUNTY COUNCIL.
COUNTY ARCHITECT'S DEPARTMENT.

Applications are invited for the undermentioned appointments.

QUANTITY SURVEYOR—A.P.T. Grade V, £750—£900 per annum. Qualifications required: F.I.C.S. Quantity Surveying Sub-division.

QUANTITY SURVEYOR'S ASSISTANTS (3)—A.P.T. Grade II-III, £560—£725 per annum. Qualifications required: F.I.C.S. Intermediate Quantity Surveying Sub-division.

Forms of application and conditions of service from the undersigned. Closing date, 21st March, 1955.

H. A. H. WALTER,
Clerk of the County Council.

County Hall,
Boston, Lincs. 8777

CORPORATION OF GLASGOW.
ARCHITECTURAL AND PLANNING DEPARTMENT.
ASSISTANT ARCHITECTS.
PLANNING ASSISTANTS.
ASSISTANT QUANTITY SURVEYORS.
ASSISTANT CIVIL ENGINEERS.
ASSISTANT HEATING AND VENTILATING ENGINEERS.

Applications are invited from suitably qualified persons, salary on a scale £532 10s.—£892 10s. with placing according to age, qualifications and experience. The posts are superannuable subject to Medical Examination. Forms of Application may be obtained from the Principal Administrative Officer, 20, Trongate, Glasgow, C.1.

A. G. JURY,
City Architect and Planning Officer. 8780

WEST SUFFOLK COUNTY COUNCIL.

QUANTITY SURVEYOR (in control of Quantity Section). N.J.C. service conditions. Salary £750 × £30—£900 (A.P.T. Grade V). Post pensionable; medical examination. Applicants to be Associates of the Royal Institution of Chartered Surveyors (Quantities Division).

Application forms, obtainable from the County Architect, Westgate House, 13, Westgate Street, Bury St. Edmunds, to be returned by 21st March, 1955. 8801

BOROUGH OF PUDSEY.
APPOINTMENT OF ARCHITECTURAL ASSISTANT.

Applications are invited for the appointment of ARCHITECTURAL ASSISTANT in the Borough Surveyor's Department, at a salary in accordance with Grade II of the A.P.T. Division of the National Scheme of Conditions of Service.

Candidates should have had experience in the Design of Houses and Estate Layouts, Supervision of Contracts of Building, Setting out and Measurement of Work, and keeping of Records.

The appointment will be subject to the provisions of the Local Government Superannuation Acts, 1937—1953; to the National Scheme of Conditions of Service, and to the successful applicant passing satisfactorily a medical examination.

The Council will consider providing suitable housing accommodation, if necessary, for the successful applicant.

Applications, stating age, present appointment, qualifications and previous experience, together with the names of two referees, must be delivered to the Borough Surveyor, Town Hall, Pudsey, endorsed "Architectural Assistant," not later than 9 a.m. on Saturday, 19th March, 1955.

Canvassing, either directly or indirectly, will be a disqualification.

W. R. CRUSE,
Town Clerk.

Town Hall, Pudsey. 8932

MIDDLESEX COUNTY COUNCIL.
COUNTY ARCHITECT'S DEPARTMENT.

ASSISTANT ARCHITECT, Grade III (£600 to £725 p.a. plus London weighting) required. Appointment to grade minimum, established, subject to medical assessment and prescribed conditions. Should be Registered Architect. Application forms (stamped addressed f'scap. env.) from County Architect, 1, Queen Anne's Gate Buildings, Dartmouth Street, S.W.1., returnable by 21st March (quote Q.45 AJ). Canvassing disqualifies. 8933

CAMBRIDGESHIRE COUNTY COUNCIL.

Applications are invited for two appointments of ARCHITECTURAL ASSISTANT, Grade A.P.T. II (£560—£640), in the department of the County Architect.

Applicants should have passed the Royal Institute of British Architects' Intermediate Examination, or its equivalent at one of the recognised Schools of Architecture, and have worked in an Architect's office for a period of two years. They should have had a good knowledge of construction and details, and be able to prepare drawings from preliminary sketches.

Applications, stating age, qualifications and experience, accompanied by one recent testimonial and the names and addresses of two referees, should be sent to the Clerk of the County Council, Shire Hall, Cambridge, not later than 23rd March, 1955.

The appointment will be subject to one month's notice on either side, and to the provisions of the Local Government Superannuation Acts of 1937 and 1953.

The selected candidates will be required to pass a medical examination.

CHARLES PHYTHIAN,
Clerk of the County Council.

Shire Hall, Cambridge.
1st March, 1955. 8931

COVENTRY CORPORATION

require:—

(*a*) 8 Qualified ASSISTANT ARCHITECTS

(*b*) 1 Qualified ASSISTANT PLANNER

to serve in Department of newly appointed City Architect and Planning Officer (Mr. A. G. Ling, B.A., A.R.I.B.A., M.T.P.I.).

Salary New Grade for Special Classes, £650—£775 plus £26 (men) or £19.10s. (women) local award in approved circumstances on salaries up to £750.

For post (*b*) Associate T.P.I. with practical experience development control work essential. Additional architectural qualification an advantage.

Housing accommodation may be available.

Application form and conditions from Acting City Architect and Planning Officer, Bull Yard, Coventry, returnable 31st March. 8948

CITY OF WAKEFIELD.
CITY ENGINEER'S DEPARTMENT.
ARCHITECTURAL ASSISTANT,
SPECIAL GRADE.

Applications are invited for the permanent appointment of an Architectural Assistant on the Special Grade (£650 × 25 to £775 commencing at £650).

Applicants must be A.R.I.B.A. and have had good experience on Housing, Schools and General Municipal work.

Housing accommodation will be provided if necessary.

Applications stating age with full particulars of experience and previous appointments to be sent with the names of two referees to me by the 23rd. March, 1955.

W. S. DES FORGES, *Town Clerk.*
Town Hall, Wakefield. 8971

CITY OF BIRMINGHAM.
CITY ARCHITECT'S DEPARTMENT.

Applications are invited for the appointments of SENIOR ASSISTANT ARCHITECTS as Group Leaders in the Housing Design Section, which is responsible for a large housing programme in suburban and central redevelopment areas, including multi-storey flats in both traditional and new-traditional construction, garages and large shopping centres. The appointments will be within Grade A.P.T. VI (£825—£1,000 per annum), commencing at a salary according to experience.

Applicants must be Associate Members of the R.I.B.A., or hold an equivalent qualification.

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

Applications, stating age, present position and salary, qualifications and experience, together with the names of two persons to whom reference can be made, should reach the undersigned not later than 18th March, 1955.

Canvassing disqualifies.

A. G. SHEPPARD FIDLER,
City Architect.
Civic Centre, Birmingham, 1. 8930

LONDON COUNTY COUNCIL.
ARCHITECT'S DEPARTMENT.

Vacancies for ARCHITECTS, Grade III (up to £892 10s.), and ARCHITECTURAL ASSISTANTS (up to £739 10s.), in Schools, Housing, and General Divisions.

Particulars and application forms from Architect (AR/BK/A/2), County Hall, S.E.1. (1058) 2205

AIR MINISTRY Works Designs Branch requires in London and Provinces (with liability for overseas service) ARCHITECTURAL ASSISTANTS experienced in planning/preparation of working drawings and details for permanent and semi-permanent buildings. Salaries up to £810 P.A. for men and £690 for women. Starting pay dependent upon age, qualifications and experience. Extra duty allowance or overtime payable. Posts non-pensionable with long term possibilities. Natural born British subjects only. Write stating age, qualifications, employment details including type of work done to Ministry of Labour, 256, Walworth Road, London, S.E.17, quoting Order 81/AA. 8506

SUDAN GOVERNMENT.

The Ministry of Education invites applications from suitably qualified candidates for the posts of LECTURERS or ASSISTANT LECTURERS in the following Departments in the Khartoum Technical Institute:—

(*a*) Building (1010)
(*b*) Engineering (1012)
(*c*) Commerce (1011)

Qualifications for (*a*) and (*b*) are a degree in Civil or Mechanical Engineering or equivalent, or qualified teaching experience in a Technical College. Teaching experience in a similar appointment would be an advantage. Qualifications for (*c*) are a degree in Economics or Commerce or equivalent qualification in Accountancy.

Applicants must be able to read, write and speak Arabic or English up to a standard which will enable them to carry out the duties of the post.

Candidates who are successful for (*a*) and (*b*) will be required to teach their subjects up to Ordinary National Certificate standard and for (*c*) they will be required to teach their subjects, Accountancy or Economics, up to professional standards.

Appointment will be on Short Term Contract for a period of up to three years. Salary scale ranges from £E.1075 to £E.1675 per annum. Point of entry into this scale will be determined by age, qualifications and experience. A Cost of Living Allowance which is reviewed quarterly is payable. Outfit Allowance of £E.50 is payable on appointment.

Further particulars and application form will be sent on receipt of a postcard only addressed to The Sudan Agent in London, Sudan House, Cleveland Row, St. James's, London, S.W.1. Please quote the Department concerned and the number printed alongside together with name and address in *block letters.* 8969

BRITISH STANDARDS INSTITUTION.

TECHNICAL OFFICER is required by the British Standards Institution to act as SECRETARY TO COMMITTEES preparing standards for BUILDING materials and construction. Architectural or surveying experience and aptitude for committee work are essential.

Salary of the posts of this grade is at present £650 to £1,000; starting salary dependent on qualifications and experience. The positions are pensionable. Apply in writing to the Establishment Officer, B.S.I., 2, Park Street, W.1. 8915

WAR OFFICE.

Vacancies exist for ARCHITECTURAL ASSISTANTS in the Architectural branch of the Directorate of Fortification and Works, Chessington, Surrey.

Candidates must have at least three years' architectural training, experience in an architect's office, and be of Intermediate R.I.B.A. standard.

A varied programme of design is undertaken, including married quarters, barracks, hospitals, schools, clubs, layouts of estates and cantonments, for Home and Overseas.

Applicants must be British of British parentage.

Salary range is £432 (at 21)—£680 plus overtime. Starting pay according to age, qualifications, and experience, with annual increases subject to satisfactory service. Prospects of promotion and establishment. Canteen facilities.

State age, full details and experience to Secretary of State for War, War Office (C.5.A), R. 503, Northumberland House, W.C.2. 8968

SUDAN GOVERNMENT.

The Ministry of Education invites applications for the posts of ASSISTANTS in the Departments of Engineering, Building, and Arts and Crafts in the Khartoum Technical Institute.

Successful candidates will be responsible for the practical instruction of students in the Institute workshops. If necessary they will be called upon to teach certain classroom subjects.

Vacancies exist in the following trades:—

(*a*) Fitting (1013)
(*b*) Machinist/Turner (1013)
(*c*) Motor Vehicle Maintenance (1013)
(*d*) Blacksmithing (1013)
(*e*) Welding (1013)
(*f*) Carpentry and Joinery (1010)
(*g*) Bricklaying (1010)
(*h*) Painting and Decorating (1010)
(*i*) Printing (typography and process work) (1009)

Candidates must have served a full apprenticeship (or recognised equivalent) and possess theoretical qualifications of a standard not less than Final Technological Certificate City and Guilds. They must be not less than 25 years of age. Teaching experience in a similar post would be an advantage but is not essential. Applicants must be able to read, write and speak Arabic or English up to a standard which will enable them to carry out the duties of the post.

Appointment will be on Short Term Contract, with bonus, for a period of up to three years. Salary scale ranges from £E.800 to £E.1350 per annum. Point of entry into this scale will be determined by age, qualifications and experience. A Cost of Living Allowance which is reviewed quarterly is payable. Outfit Allowance of £E.50 is payable on appointment.

Further particulars and application form will be sent on receipt of a postcard only addressed to The Sudan Agent in London, Sudan House, Cleveland Row, St. James's, London, S.W.1. Please quote the trade concerned and the number printed alongside together with name and address in *block letters.* 8970

NORTHUMBERLAND COUNTY COUNCIL.
COUNTY PLANNING DEPARTMENT.

Applications are invited for the appointment of a SENIOR ASSISTANT ARCHITECT/PLANNER at a salary in accordance with A.P.T. Grade IV of the National Joint Council Scales (£675—£825 p.a.). The actual commencing point will depend upon qualifications and experience.

The successful candidate will be in charge of the Architectural Design Section of the department and must have experience in dealing with re-development schemes, housing layouts, and architectural control. This appointment involves considerable responsibility and provides a wide scope for an architect who is interested in the related architectural/planning problems of a County Planning Authority. The final qualification of the A.R.I.B.A., is an essential requirement and possession of the A.M.T.P.I. qualification would be an advantage.

Applications on forms obtainable from the undersigned should be completed and returned not later than the 24th March, 1955.

J. B. ROSS, A.R.I.C.S.,
County Planning Officer,
County Hall,
Newcastle-upon-Tyne, 1. 8981

INVERNESS COUNTY COUNCIL.
COUNTY ARCHITECT'S DEPARTMENT.

Applications are invited for the undernoted appointments:—

Two ARCHITECTURAL ASSISTANTS on salary scale A.P.T. V — £665—£715 per annum.
One ARCHITECTURAL ASSISTANT on salary scale A.P.T. I — £515—£560 per annum.

with placing according to experience and qualifications.

Candidates for the senior appointments must be Associate Members of the Royal Institute of British Architects and preferably should have experience in Local Authority housing and educational work.

Housing accommodation may be made available, if required, in respect of the two senior appointments.

Applications, stating age, particulars of professional training, experience and qualifications, together with the names of three persons to whom reference may be made, should be lodged with the undersigned not later than 14 days after the publication of this advertisement.

R. WALLACE.
County Clerk.
County Buildings,
Ardross Street, Inverness. 8972

PADDINGTON BOROUGH COUNCIL require QUANTITY SURVEYOR'S ASSISTANT A.P.T. Grade I (£530—£610 inclusive) (£10 p.a. less if under age 26). Candidates should have experience in preparation of estimates, taking-off, working up, abstracting, billing, site measurement and working up to final account stage. Inter R.I.C.S. or equivalent preferred. Write age, experience, qualifications, names of three referees, to the undersigned by 30th March, 1955 (Quoting A.207).

W. H. BENTLEY,
Town Clerk.
Town Hall,
Paddington Green, W.2. 8973

COUNTY BOROUGH OF CROYDON.
ARCHITECTURAL SECTION.

Applications are invited for the appointment of an ARCHITECTURAL ASSISTANT with housing or general experience. Salary A.P.T. I £500 × £20 — £580 per annum plus London Weighting. Applications (on forms from the Borough Engineer, Town Hall, Croydon) must be submitted to him by the 22nd March, 1955.

E. TABERNER, *Town Clerk.*
8957

COUNTY COUNCIL OF THE COUNTY OF LANARK.
PROPERTY DEPARTMENT.

Applications are invited for ARCHITECTURAL ASSISTANTS. J.I.C. A.P.T. Grades of salary. Placing according to qualifications and experience. Must have thorough knowledge of all architectural work with practical experience in design and preparation of working drawings for erection of schools, public buildings and police houses, etc.

Posts superannuable. Medical examination. No canvassing.

Applications stating age, qualifications and experience together with the names and addresses of three referees to be sent to W. R. Watt, County Architect, 34, Albert Street, Motherwell.

WM. C. BROWNLIE.
County Clerk.
8952

RAWMARSH URBAN DISTRICT COUNCIL.
HOUSING ARCHITECT.

Applications are invited for the position of Housing Architect on the staff of the Surveyor at a salary within Grade IV of the A.P.T. Division of the National Joint Council for Local Authorities Staffs, commencing at £765 and rising by two increments of £30 each to £825.

Applicants must be Associates R.I.B.A. with experience in housing estate development.

A house will be made available if required.

The appointment is subject to the provisions of the Local Government Superannuation Acts, and to the passing of a medical examination.

Applications, stating age and qualifications, details of experience together with copies of two recent testimonials must be delivered to the undersigned not later than Wednesday, 23rd March, 1955.

G. F. CLEGG,
Clerk to the Council.
Council Offices,
Parkgate,
Nr. Rotherham. 8951

CITY AND COUNTY OF BRISTOL.
CITY ARCHITECT'S DEPARTMENT.

Applications invited for following staff appointments:

(*a*) SENIOR ASSISTANT ARCHITECTS — Grade III. (£600 × 25 to £725 p.a.)
(*b*) ASSISTANT ARCHITECTS—Grade I. (£500 × 20 to £580 p.a.)
(*c*) ASSISTANT QUANTITY SURVEYOR — Grade I (£500 × 20 to £580 p.a.)
(*d*) JUNIOR ASSISTANT QUANTITY SURVEYOR—General Division (£275 at age 20.)

Applicants for (*a*) must be Associate Members of R.I.B.A. or equivalent, or qualified in accordance with para. 28 of National Conditions of Service, and have experience in design, construction, and contract administration. For appointment (*b*) applicants should have passed R.I.B.A. Intermediate Examination or equivalent, or qualified in accordance with para. 28, and have good experience including preparation of working drawings, details, etc. For appointment (*c*) applicants should have passed R.I.C.S. Intermediate Examination or equivalent, or qualified in accordance with para. 28 and have suitable experience. For appointment (*d*) applicants must be not less than 20 years of age, and have suitable education and experience. Duties include squaring, abstracting, and billing, and generally to work under supervision of Assistant Surveyor.

Housing accommodation available, if necessary, at economic rent.

Further particulars and application forms obtainable from me. Applicants must state post for which they are applying. Completed application forms by 21st March. J. NELSON MEREDITH, F.R.I.B.A., City Architect, The Council House, College Green, Bristol, 1. 8946

EAST ANGLIAN REGIONAL HOSPITAL BOARD.

ASSISTANT ARCHITECT. Candidates must be Associate Members of R.I.B.A. and Registered Architects. Good general experience in design, construction and specification writing essential. Knowledge of hospital work desirable. Salary £625—£890 per annum. Additional increments within the scale based on experience and age may be granted to suitable applicants. Applications stating age, qualifications, experience and full details of present position, with names of three referees, to Secretary of Board, 117, Chesterton Road, Cambridge, by 25th March, 1955. 8975

BOROUGH OF WIDNES.
BOROUGH ARCHITECT'S DEPARTMENT.
Applications are invited for the appointment of:—ARCHITECTURAL ASSISTANT Grade A.P.T. IV (£675—£825). Commencing salary £675.
Applicants must be registered architects, preferably Associate members of the R.I.B.A. Experience with a Local Authority will be an advantage.
Housing accommodation will be provided if needed.
The appointment will be subject to the National Scheme of Conditions of service as adopted by the Council, to the Local Government Superannuation Acts, and to the successful candidate passing a medical examination. Applications, stating full particulars of age, experience and qualifications, present and previous employment (with dates) together with the names and addresses of two referees, to be sent to the Borough Architect, Brendan House, Widnes Road, Widnes, not later than 10 a.m. Friday, 18th March. Canvassing directly or indirectly will disqualify.
FRANK HOWARTH,
Town Hall, *Town Clerk.*
Widnes.
2nd March, 1955. 8945

LONDON ELECTRICITY BOARD.
STRUCTURAL ASSISTANTS & STRUCTURAL DRAUGHTSMEN.
Applications are invited for the above positions in the Construction Branch of the Chief Engineer's Department in Central London.
Applicants for the positions of STRUCTURAL ASSISTANTS in the Civil Engineer's Section should have experience in the design and detailing of either reinforced concrete or steelwork structures. Applicants for the positions of STRUCTURAL DRAUGHTSMEN should have a knowledge of building constructional requirements and some knowledge in detailing reinforced concrete or steel structures.
The posts are graded under Schedule "D," National Joint Board agreement as Grade 5—£672 to £777 and Grade 6—£535 10s. 0d. to £661 10s. 0d. per annum respectively, inclusive of London Allowance. Commencing salaries will be dependent upon qualifications and experience.
Application forms obtainable from Personnel Officer, 46/7, New Broad Street, London, E.C.2, to be returned completed by 24th March, 1955. Please enclose addressed envelope and quote ref.: V/1919/A on all correspondence. 8905

NATIONAL COAL BOARD—
SOUTH-WESTERN DIVISION.
Applications are invited for the following appointments in the Divisional Chief Architect's Department, Cardiff, for work on industrial and welfare buildings, housing and office accommodation:—
(*a*) QUANTITY SURVEYORS, Grade II.
Salary:—£600 × £25 — £650 × £30 — £900.
Applicants should be A.R.I.C.S. (Quantities Section) with not less than one year's subsequent practical experience and should be thoroughly experienced in the preparation of estimates, bills of quantities, measurement and settlement of final accounts.
(*b*) ARCHITECTURAL AND QUANTITY SURVEYING ASSISTANTS (Grade I).
Salary:—Males £525 × £25 — £650.
Females £420 × £20 — £520.
Applicants should have passed the Intermediate Examination of the R.I.B.A. or R.I.C.S. and have had not less than 3 years' subsequent practical office experience; or those who have passed the appropriate Final Examination but have had less than one year's subsequent practical experience.
(*c*) ARCHITECTURAL ASSISTANT, Grade II.
Salary:—Males £440 × £20 — £540.
Females £352 × £16 — £432.
Applicants should have passed the Intermediate Examination of the R.I.B.A. and have had less than three years' subsequent practical experience.
(*d*) MEASURING SURVEYOR.
Salary range £500 — £600.
Applicants should have considerable experience in site measuring and preparation of variation accounts.
Point of entry into the above scales will be according to qualifications and experience. The appointments are subject to the provisions of the Board's Superannuation Scheme.
Applications in writing, stating age, education, qualifications, experience, previous and present appointments, present salary, the names and addresses of two referees and the desired appointment to Secretariat (E), National Coal Board, South-Western Division, Cambrian Buildings, Mount Stuart Square, Cardiff, not later than 14 days after the publication of this advertisement. 8955

LANCASHIRE COUNTY COUNCIL—
PLANNING DEPARTMENT.
PLANNING ASSISTANTS, A.P.T. Grade I (£500—£580), II (£560—£640) or Special Scale (£650—£775), required in Architectural Section at Preston. Candidates should be studying for, or possess, a qualification in architecture, surveying or engineering; planning experience desirable but not essential. Salary grade dependent upon qualifications and experience. Duties include the preparation of layouts of residential areas and the redevelopment of central areas. Applications giving qualifications, present appointment, experience, age, and two referees to County Planning Officer, East Cliff County Offices, Preston, by 19th March, 1955. 8902

STAFFORDSHIRE COUNTY COUNCIL.
COUNTY PLANNING AND DEVELOPMENT DEPARTMENT.
APPOINTMENT OF SENIOR PLANNING ASSISTANT.
Applications are invited for the appointment of a SENIOR PLANNING ASSISTANT in the County Planning Department on Grouped A.P.T. Grades IV—V (£675—£900) the commencing salary and grading to be in accordance with qualifications and experience.
The person appointed will be mainly engaged on the preparation and carrying into effect of housing and other estate development proposals.
Applicants should be qualified in Architecture or Engineering and Membership of the Town Planning Institute would also be an advantage.
Applicants should give details of age, education and training, present appointment and experience, and should include copies of two recent testimonials. Applications, in which relationship to any member or senior officer of the County Council must be disclosed, should be sent to D. W. Riley, County Planning and Development Officer, 41a, Eastgate Street, Stafford, not later than Thursday, the 17th March, 1955.
T. H. EVANS,
Clerk of the County Council.
8906

BOROUGH OF SCUNTHORPE.
APPOINTMENT OF ASSISTANT ARCHITECT.
Applications are invited for the following appointment in the department of the Borough Surveyor (Mr. Cyril Cooper, M.I.C.E.) at a salary within the range of the Grade quoted.
ASSISTANT ARCHITECT, Grade A.P.T. II (£560—£640 per annum).
Candidates should have passed the Intermediate Examination of the R.I.B.A. or its equivalent at a recognised School of Architecture.
Housing accommodation will be provided if necessary.
Applications, suitably endorsed, giving details of training, qualifications and experience, together with the names of two referees, should reach the undersigned not later than Monday, 21st March, 1955.
W. P. ERRINGTON,
Town Clerk.
Municipal Offices,
34, High Street, Scunthorpe.
23rd February, 1955. 8907

STEVENAGE DEVELOPMENT CORPORATION.
CHIEF ARCHITECT'S DEPARTMENT.
Applications are invited for post as ASSISTANT ARCHITECT on Corporation salary grade A.P.T. IX (£840 × £40—£960). Applicants should be fully qualified architects with experience of large scale building contracts.
Housing accommodation will be available eventually in appropriate cases.
Applications giving details of experience and names of two referees should be sent to the Chief Administrative Officer, Aston House, Nr. Stevenage, Herts., not later than Saturday, March 26, 1955. 8934

BOROUGH OF SCARBOROUGH.
BOROUGH AND WATER ENGINEER'S DEPARTMENT.
ARCHITECTURAL ASSISTANT.
Applications are invited, from appropriately qualified candidates, for a post of ARCHITECTURAL ASSISTANT. Salary, Special Scale, £650—£775 per annum.
The appointment is subject to the provisions of the Local Government Superannuation Act 1937—1953, and to the passing of a medical examination, and will be terminable by one month's notice on either side. The Council may assist in the provision of housing accommodation.
Applications, in envelopes endorsed "Architectural Assistant," stating age, present and previous appointments, training, qualifications and experience, together with the names of two referees, must be delivered to the undersigned not later than the 21st March, 1955.
H. V. OVERFIELD, M.I.C.E.,
Borough and Water Engineer.
Town Hall, Scarborough.
March, 1955. 8938

COUNTY BOROUGH OF CARLISLE.
Applications are invited for the following posts in the City Surveyor's Department:—
(*a*) SENIOR ASSISTANT ARCHITECT, A.P.T IV (£675—£825).
(*b*) ASSISTANT QUANTITY SURVEYOR A.P.T. III (£600—£725).
(*c*) BUILDING SURVEYOR, A.P.T. III (£600—£725).
Appointment (*a*) is an additional post to cater for an augmented Educational Building Programme. Candidates should be A.R.I.B.A.
Appointment (*b*) is also additional to deal with the increased work of the Department which includes Housing, Schools and General municipal work. The successful candidate will be engaged on taking off, site measurement, etc., and will be required to possess the appropriate academic qualifications.
Appointment (*c*) is a new post and is primarily intended to relieve the Architects of minor building work, e.g., alterations, additions, etc. Candidates should possess appropriate R.I.C.S. (Building) or equivalent qualification.
Forms may be obtained from and are returnable to the City Surveyor, 18, Fisher Street. Closing date: 22nd March, 1955.
H. D. A. ROBERTSON,
Town Clerk.
8936

KUALA LUMPUR MUNICIPAL COUNCIL,
MALAYA.
Applications are invited for the post of ASSISTANT PLANNING OFFICER in the Kuala Lumpur Municipality on 3 years contract.
Candidates should preferably be about 30 to 35 years of age and must possess the following qualifications: A.M.T.P.I. and/or A.M.I.Mun.E.
They should have a sound knowledge of town planning practice, procedure and law, experience of Committee work, interviewing prospective developers and co-ordination of development proposals with Government Departments. General Municipal Engineering experience in addition would be an advantage.
Kuala Lumpur is an expanding town of some 300.000 population and the work will involve the control of development in accordance with an Approved Town Plan, the preparation of outline schemes for the layout of land ready for development.
The basic salary will be within the range of $528× 36—852/912 × 36—1.200 per mensem ($ = 2s. 4d.)
A variable cost of living allowance is payable and at present rates the gross salary per mensem would be:—
Single officer: from $680 to $1.240.
Married officer: from $774 to $1,430.
Married Officer with child: from $774 to $1,505.
An expatriation allowance varying from $140 to $480 p.m. will be payable when applicable.
The commencing salary will be according to age, qualifications and experience. The following are examples for a suitably qualified and experienced man:—

Age.	Basic Salary $ p.m.	Total Salary Including Allowances. £ p.a. Bachelor	Married.	Married with Family.
30	780	1.512	1.869	1.995
35	984	1.792	2,170	2,380

A transport allowance will be paid.
Free passages for the successful candidate, his wife and not more than three children under 10 years will be provided. Quarters furnished with heavy furniture may be available at nominal rental or a housing allowance in lieu will be paid.
The successful applicant will be eligible for a gratuity at the end of the 3 years contract calculated as follows:—

Basic Salary.	Gratuity.
$912 per mensem or over	£70 per quarter.
$852 per mensem or below	£50 ,,

Home leave will be allowed at the rate of 5 days per month of resident service after completion of 3 years.
Applications in DUPLICATE giving full personal and technical information with copies of 3 recent testimonials in Duplicate to Messrs. Allen & Williams (Agents to the Council) 1, Victoria Street, London, S.W.1. before Thursday, 24th March, 1955. 8937

NORTHWICH URBAN DISTRICT COUNCIL.
TEMPORARY ARCHITECTURAL ASSISTANT.
Applications are invited for the appointment of TEMPORARY ARCHITECTURAL ASSISTANT at a salary in accordance with Grade II of the A.P.T. Division of the National Scales (commencing at £560 per annum and rising to £640).
The appointment will be subject to the Scheme of Conditions of Service, the Local Government Superannuation Acts, to a month's notice on either side and to the successful applicant passing satisfactorily a medical examination.
Applications, giving details of age, qualifications and addresses of two referees, should be received by the undersigned by 9 a.m. on Monday, 14th March, 1955.
Canvassing will disqualify and applicants must disclose in writing whether they are related to any member or senior officer of the Northwich Urban District Council.
HAROLD GRANTHAM,
The Council House, *Clerk of the Council*
Northwich, Cheshire.
28th February, 1955. 8903

HERTFORDSHIRE COUNTY COUNCIL.
COUNTY ARCHITECT'S DEPARTMENT.
Applications invited for the appointment of SENIOR ASSISTANT ARCHITECTS, Grade IV (£675—£825). Previous Local Government experience not essential.
Applications, with names of two referees, to County Architect, County Hall, Hertford, Herts., not later than first post, 19th March, 1955. 8909

CITY ENGINEER, NOTTINGHAM.
ARCHITECTURAL ASSISTANT.
Applications are invited for the position of Architectural Assistant, City Engineer's Department. Salary in Grade APT I, *i.e.*, £500 to £580 per annum. Applicants should be quick draughtsmen, capable of undertaking alterations and minor new works. Applications on forms to be obtained from City Engineer, Guildhall, Nottingham, returnable by 1st April, 1955. 8976

LONDON COUNTY COUNCIL.
ARCHITECT'S DEPARTMENT.
ASSISTANTS required for work on schemes for the conversion and rehabilitation of existing property. Candidates should have good practical experience and be able to prepare surveys, working drawings and specifications. Salary up to £739.10.0d. according to experience. Particulars and application forms, returnable by 18th March, from Architect (AR/EK/H/2), The County Hall, London, S.E.1. (275) 8940

BOROUGH OF BLYTH.
BOROUGH ENGINEER'S DEPARTMENT.
Junior ARCHITECTURAL ASSISTANT required. Salary Grade I (£500/£580). Further particulars from Borough Engineer, Municipal Buildings, Blyth, Northumberland. Closing date 25th March, 1955.

EDWIN W. CARTER,
Town Clerk.
8974

NORFOLK COUNTY COUNCIL.
ASSISTANT QUANTITY SURVEYOR, salary A.P.T. Grade III (£600 × £25—£725 per annum); experience of taking off and working up, checking final accounts, essential.
ARCHITECTURAL ASSISTANT, A.P.T. Grade III (£600—£725 per annum); sound knowledge design and construction.
N.J.C. Service conditions, posts pensionable; medical examination. Applications, stating age, details of training, experience, past and present appointments and salary with names of three referees to County Architect, 27, Thorpe Road, Norwich, by 22nd March 1955. 8935

LONDON COUNTY COUNCIL.
ARCHITECT'S DEPARTMENT.
Vacancies for ARCHITECTURAL and SURVEYING ASSISTANTS (up to £739 10s.) in the Maintenance and Improvements Division. Particulars and application forms, returnable by 24th March, 1955, from The Architect (AR/EK/M/2.), The County Hall, S.E.1. (49) 8929

COUNTY BOROUGH OF SOUTHEND-ON-SEA.
BOROUGH ARCHITECT'S DEPARTMENT.
Applications are invited for the following established posts:
ASSISTANT ARCHITECTS—
(*a*) Assistant Architect (£650 × £25—£775).
(*b*) Assistant Architect (£675 × £30—£825).
(*c*) Architectural Assistant (female) (£560 × £20—£640).
(Applicants should be Associate Members of the Royal Institute of British Architects for appointments (*a*) and (*b*).)
ASSISTANT QUANTITY SURVEYORS—
(*a*) Assistant Quantity Surveyors (£650 × £25—£775).
(*b*) Assistant Quantity Surveyors (£675 × £30—£825).
(Applicants should be Associate Members of the Royal Institute of Chartered Surveyors.)
The appointments will be subject to the provisions of the Local Government Superannuation Act 1937 and the N.J.C. Scheme of Conditions of Service. Medical examination.
Applications stating age, qualifications and experience, with the names of two persons to whom reference can be made, should be submitted to the Borough Architect, 30, Alexandra Street, Southend-on-Sea, forthwith.
ARCHIBALD GLEN, *Town Clerk.*
8871

Architectural Appointments Vacant

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

The engagement of persons answering these advertisements must be made through a Local Office of the Ministry of Labour or a Scheduled Employment Agency if the applicant is a man aged 18-64 inclusive or a woman aged 18-59 inclusive unless he or she or the employment is excepted from the provisions of the Notification of Vacancies Order, 1952.

BUILDING SURVEYING ASSISTANT (about R.I.C.S. Final Standard) with at least two years' practical experience required by City firm of Chartered Surveyors & Architects. 3925

SENIOR ASSISTANT ARCHITECTS required with experience of work on commercial and industrial buildings. Salaries up to £915 per annum for suitably qualified applicants.
ASSISTANT ARCHITECTS also required, capable of preparing working drawings and details from preliminary sketches. Salaries up to £745 per annum.
Applications stating age, experience, qualifications and salary required to G. S. Hay, A.R.I.B.A., Chief Architect, Co-operative Wholesale Society Ltd., 1, Balloon Street, Manchester. 4919

ARCHITECTURAL ASSISTANT: Intermediate approaching final. Commercial and industrial work; large-scale contracts. Watson, Johnson, Stokes, Victoria Square, Birmingham. 4895

ASSISTANT required in busy practice in West End, in early twenties, about Intermediate R.I.B.A. standard. Excellent opportunities for gaining all-round experience. Box 5092.

RONALD WARD & PARTNERS require several ARCHITECTURAL ASSISTANTS. Apply 29, Chesham Place, Belgrave Square, S.W.1, or telephone Belgravia 3361. 7023

CECIL Howitt & Partners, Architects, St. Andrew's House, Mansfield Road, Nottingham, require JUNIOR ARCHITECTURAL ASSISTANTS, preferably Inter. R.I.B.A. standard. Please apply in writing, giving full details and stating salary required. 4705

QUALIFIED ARCHITECTURAL ASSISTANT required immediately for firm of Architects in North London. Reply, stating age, qualifications, and experience and salary required, to Box 8919.

A WELL-KNOWN Midland Motor Manufacturer requires an ARCHITECTURAL TRAINEE who has completed his Intermediate R.I.B.A. for work of interesting and responsible nature. He will be given opportunity to design complete garage premises. Reply, stating age and all relevant details, to Box 8728.

ARCHITECT (qualified) required to take charge of small drawing office of well-known company exporting factory-made structures throughout the world. Preference given to man interested in tropical architecture and capable of producing attractive presentation sketches. Excellent prospects. Please state experience and salary required, to Box 8912.

ARCHITECTURAL ASSISTANT required (Inter. standard) in S.W. London. State age, experience and salary required, to Box 8913, or telephone KEN 6221/2187.

ARCHITECTURAL ASSISTANTS (male) required for busy London practice. Intermediate and Final standard. Apply in writing, stating experience and salary required to Milner & Craze, 120, Crawford Street, W.1. 8917

ELIE MAYORCAS requires immediately QUALIFIED ARCHITECTURAL ASSISTANT, with some office experience, for interesting contemporary projects. Salary up to £600 per annum, according to ability. Apply in writing, giving details, to 13, David Mews, Baker Street, W.1. 8916

ARCHITECTURAL ASSISTANT/BUILDING SURVEYOR, up to 32 years of age, required by Multiple Company in Northampton. Able to prepare specifications/drawings for shop developments and maintenance. Permanent position. Pension scheme. Commencing salary £550—£600 p.a Apply Box 8924.

THE Milk Marketing Board require an ARCHITECT'S ASSISTANT, preferably qualified, to be employed mainly on new office buildings and conversions. Applicants should be able to undertake responsibility for the whole job from sketch plan to completion, including writing of specifications, site supervision and checking of accounts. Commencing salary will be between £700 and £750 per annum, according to qualifications. Applications, giving full details including age and previous experience, should be addressed in writing to the Establishment Officer, Milk Marketing Board, Thames Ditton, Surrey. 8926

INTERMEDIATE and Post-R.I.B.A. standard ASSISTANTS required urgently in London office specialising in commercial buildings of contemporary design. Good salaries, five-day week. Holidays this year. Lewis Solomon Son & Joseph. Holborn 5108 or 7082. 8920

R.I.B.A. INTERMEDIATE and SENIOR ASSISTANTS required in office dealing with Factories and Commercial buildings in London. Write or telephone Eric Firmin & Partners, 10, Manchester Square, W.C.1. Welbeck 4339. 8921

DRAUGHTSMAN required urgently for Architectural Planning and Workshop Drawings, timber frame construction, domestic housing, village halls, etc.; knowledge of quantities advantage, though not essential. Applications in first instance by letter with examples of work, stating experience, salary required and date available. W. H. Colt, Bethersden, Nr. Ashford, Kent. 8922

SIR LINDSAY PARKINSON & CO. LTD. now have vacancy in their London Housing Department for a JUNIOR ARCHITECTURAL DRAUGHTSMAN. Applications should be made in writing to 171, Shaftesbury Avenue, London, W.C.2. 8918

PITE, SON & FAIRWEATHER invite applications from ASSISTANT ARCHITECTS for appointments in their office in connection with interesting work on hospitals, schools and housing. Reply by letter to 6, Queen Anne's Gate giving full particulars of qualifications, experience and salary required. 8980

THE NUFFIELD FOUNDATION.
APPLICATIONS are invited for the post of ARCHITECTURAL ASSISTANT on the staff of the Foundation's Division for Architectural Studies. Candidates should be of Intermediate standard and have had some experience of work on contemporary buildings. The selected candidate will be appointed at a commencing salary within the scale £350—£550, increasing yearly increments of £25, according to age and qualifications. He will be particularly concerned with working drawings for a number of experimental buildings, including hospitals, research laboratories and farm buildings.
Applications giving age, qualifications, experience and the names of two referees should be sent to the Director of the Division for Architectural Studies, The Nuffield Foundation, Nuffield Lodge, Regent's Park, London, N.W.1, not later than the 21st March, 1955. 8959

ARCHITECTURAL ASSISTANT, Intermediate Standard or equivalent, required in Branch Office at Shrewsbury, Shropshire. Opportunity to work closely with Area Architect on work of wide variety and contemporary nature. Apply with details of experience, age and salary required, to Angus McDonald & Partners, Chartered Architects, 1, Unity Street, Bristol, 1. 8953

JUNIOR ARCHITECTURAL ASSISTANT. State experience and salary required. Arthur W. Whydale, L.R.I.B.A., Architect, Tannery Drift, Royston, Herts. 8925

ARCHITECTURAL ASSISTANT required for immediate vacancy. Practical experience and constructional design ability essential. Salary up to £750 p.a., according to age and experience. Applications by 18th March, giving full details to Read and McDermott, F.R.I.B.A., 18, High Street, Maidstone. 8923

"THE ARCHITECT'S JOURNAL" requires a DRAUGHTSMAN, to assist in the preparation of drawings for Working Details and Information Sheets. Good draughtsmanship, a knowledge of building construction, and a keen interest in the above type of work are necessary. Write to the Editor (Information Sheets), 9, Queen Anne's Gate, S.W.1, stating age, architectural training, and experience. 901

IMPERIAL CHEMICAL INDUSTRIES LIMITED, Plastics Division, requires an ARCHITECTURAL ASSISTANT in the Engineering Department at Welwyn Garden City. Applicants should have passed the Intermediate examination of the Royal Institute of British Architects and it would be to advantage if they had spent a few years in an Architect's office. Five-day, 39-hour week. Write for application form to The Staff Manager, I.C.I. Ltd., Plastics Division, Black Fan Road, Welwyn Garden City, Herts. 8954

ARCHITECT'S ASSISTANT required by small Westminster Office. Must be about Intermediate standard R.I.B.A. Able to prepare working drawings and have some knowledge of surveying. Write, stating salary required. Box 8758.

APPLICATIONS are invited for the post of RESEARCH and DEVELOPMENT ASSISTANT to investigate, institute and direct research into new building methods and materials. Applicants should hold recognised professional qualifications and preferably have experience in structural engineering. Write giving full particulars of experience, etc., to Personnel Dept., Taylor Woodrow Homes Ltd., Ruislip Road, Southall, Middlesex. 8956

ARCHITECT required by manufacturers of timber houses for home and export. Applicants should have had at least five years' post-graduate experience, including some experience of prefabricated structures. Duties to include the preparation of designs and supervision of a Small Drawing Office. Applications giving full details to Works Director, W. J. Simms, Sons & Cooke Limited, Haydn Road, Sherwood, Nottingham. 8950

SENIOR ARCHITECTURAL ASSISTANT is required with good practical experience for a responsible position in a small city office with mixed practice. Write, stating qualifications, practical experience, age and salary required, to Box 8947.

INTERMEDIATE Standard ASSISTANTS required by Central London Office with large varied practice. Good salary to applicants interested in modern structural design. Write, stating experience and salary required to T. P. Bennett & Son, 43, Bloomsbury Square, W.C.1. 8949

SENIOR ASSISTANT ARCHITECTS and ASSISTANT ARCHITECTS of Final A.R.I.B.A. and Inter R.I.B.A. standard, respectively, required for busy N.W. London office engaged on interesting and varied works of contemporary character, including office and industrial schemes, multi-storey flats and maisonettes, Private and Local Authority housing. Superannuation scheme and five-day week. Applications stating age, experience, qualifications and salary expected, to Sidney Greenwood, A.R.I.B.A., 33, Bunns Lane, Mill Hill, London, N.W.7. 8944

SENIOR ASSISTANT required for Architect's small office in Welbeck Street. Interesting work, mainly housing. Thorough knowledge and experience of working drawings, specification writing, site supervision, etc., essential. Salary by arrangement. Apply to Box 8943.

2 ASSISTANTS, Inter. standard, with office experience. Salary £400—£600, according to qualification. Interesting work on housing, flats, schools, etc. William Crabtree, 8, Robert Adam Street, W.1. 'Phone Welbeck 8918. 8942

SENIOR ASSISTANT required; salary according to ability. Five-day week. 'Phone London Wall 3825 or write Gordon & Gordon, Finsbury House, Blomfield Street, E.C.2. 8967

ARCHITECTURAL ASSISTANT required, Intermediate standard, for busy West End practice. Opportunity for young man wishing to obtain good general experience and use of initiative. Salary according to experience. Apply Eric H. Davie, A.R.I.B.A., A.M.T.P.I., Staff Architect, Hillier, Parker, May and Rowden, 77, Grosvenor Street, W.1. 8966

ARCHITECT'S ASSISTANT required in small Central London Office. Up to or over Intermediate standard. Surveys, working drawings, details, etc. Office experience necessary. Write Box 8965.

CLIFFORD TEE & GALE, F/F.R.I.B.A., require ASSISTANT in their Birmingham Office for work on Testing Establishments and other interesting projects. Please apply to 43, Frederick Road, Birmingham, 15. (Edgbaston 3676). Five-day week. 8958

ARCHITECTS' Co-Partnership require unmarried qualified ASSISTANT for their Lagos office. Maximum tour 14 months. Flat provided. Minimum salary £850. Write to 44, Charlotte Street, W.1. 8964

PLYMOUTH Architects require ASSISTANT capable of preparing working drawings and details of industrial and domestic work and also of supervising some jobs. Salary according to age and experience. Details to Box 8963.

JUNIOR BUILDING SURVEYING ASSISTANT required in Chartered Surveyor's Office in Berkshire. Reply, stating age and whether any previous drawing office experience to Box 8962.

ARCHITECTURAL ASSISTANT required of Junior or Final R.I.B.A. standard. Must be first class draughtsman, able to take charge of jobs if necessary. Full knowledge of details and specifications important. Varied and busy practice in country area. Reply, stating salary required and when free, to T. R. Bateman, A.R.I.B.A., 21, Vine Street, Evesham. 8961

ARCHITECTURAL ASSISTANTS, SENIOR and JUNIOR, required for busy private offices in Gravesend and Rochester, Kent. Reply stating age, experience, salary, etc., to George E. Clay & Partners, AA.R.I.B.A., 198, Parrock Street, Gravesend, Kent. 8896

ARCHITECTURAL ASSISTANTS required for :—
MOMBASA : Salary about £900 per annum.
NAIROBI : Salary £750 per annum.
Apply R. S. Cobb, F.R.I.B.A., Mill End, Kidlington, Oxon. 8897

ARCHITECTURAL ASSISTANT, intermediate to final standard, required for preparation of working drawings and details from Architect's sketches. Good working conditions, canteen and sports facilities. Apply in writing, giving age and details of experience, to the Personnel Officer, Albert E. Reed & Co., Ltd., Aylesford Paper Mills, Larkfield, Nr. Maidstone, Kent. 8898

ARCHITECTURAL STAFF required—One SENIOR and one JUNIOR—Small but busy London practice with high standards and continuity of work. Five-day week. Salary by arrangement, plus bonus on results achieved. Write Box 8899.

ARCHITECTURAL ASSISTANT required for appointment to the permanent staff at the Westminster office of an Educational Trust. Apply, stating experience, age and salary required, to the Secretary. Box 8900.

ARCHITECTURAL ASSISTANTS required immediately in Architect's Dept., at Head Office. Varied and interesting work with good opportunities for advancement. Permanent appointments with salaries from £600 to £800 per annum, according to qualifications and experience. Applicants should write, giving brief particulars of qualifications and experience, to Chief Architect, George Wimpey & Co. Limited, 27, Hammersmith Grove, London, W.6. (Envelopes to be marked "Architectural Vacancies.") 8904

ARCHITECT (SENIOR) required for busy South Coast practice. Interesting work of a varied nature. Salary according to ability. Apply Ernest J. Thomas, Jolly & Grant, Coronation House, King's Terrace, Portsmouth. 8895

ARCHITECTURAL ASSISTANT required by North Eastern Brewery. Salary up to £450 per annum, according to experience. Housing Allowance if rent-free house not provided; pension scheme and bonus system. Apply Box 8894.

ARCHITECT'S JUNIOR ASSISTANT : Starting at £10 per week; required in leading Birmingham Office with interesting and varied work and superannuation scheme. Ability to drive a car an asset. Box 8893.

ARCHITECTURAL staff vacancies exist for TRACERS and JUNIOR and SENIOR ASSISTANTS. Varied and interesting work in hand. Congenial working conditions. Every encouragement given to capable men to accept responsibility and work on own initiative. Full particulars to Naylor, Sale & Widdows, St. Mary's Chambers, St. Mary's Gate, Derby. 8892

BRONEK KATZ AND R. VAUGHAN have vacancies for one SENIOR and one JUNIOR ASSISTANT. 17, Great Cumberland Place, W.1. AMBassador 3740. 8891

OPPORTUNITIES offered for ARCHITECTURAL ASSISTANTS aged between 20 and 30 in the Staff Architects' offices in London, Leeds, Birmingham and Bristol of a large national institution. Gratuities and rises on passing technical examinations and progressive salary scale according to age and qualification. Permanent pensionable positions attainable by selected applicants after preliminary trial. Apply in writing with full particulars of age, education, training and experience, and if available for interview in one of the places named. Applicants should be of British nationality and have completed their National Service. Box 8890.

ARCHITECTURAL ASSISTANTS required, for contemporary office. Reply, stating qualifications, experience and salary required. C. H. Elsom, F.R.I.B.A., 44, Catherine Place, S.W.1. VICtoria 4304. 8887

SENIOR ASSISTANT ARCHITECTS required for progressive firm of Architects in Yorkshire. Commencing salary £1,200, but only first-rate qualified men with considerable experience should apply. Work is varied, but experience in Commercial, Industrial or Technical Educational buildings an advantage. Superannuation scheme in operation. Prospects unlimited. Apply J. G. L. Poulson, 29, Ropergate, Pontefract. 8901

ARCHITECTURAL ASSISTANTS wanted : 1 SENIOR and 1 JUNIOR; salary according to experience. Applicants should apply by letter, stating age, qualifications and experience, to Halliday & Agate, FF.R.I.B.A., 14, John Dalton Street, Manchester, 2. 8886

APPLICATIONS are invited for the post of ASSISTANT ARCHITECT with Richard Brown, Architects, Crown Street Chambers, Darlington. Salary £600—£750, according to age and experience. 8885

ARCHITECTURAL ASSISTANT required by Midland firm for responsible position in combined architectural and engineering office. Good salary and prospects for applicant interested in modern methods of construction and prefabrication in all classes of buildings. Apply in writing giving full details of experience and salary required, to Box 8910.

ARCHITECTURAL DRAUGHTSMAN wanted for Edinburgh office. Reply, stating experience and salary expected to Box 2949, Robertson & Scott, 42, Charlotte Square, Edinburgh, 2. 8908

ARCHITECTURAL ASSISTANTS required, above intermediate standard, preferably night school trained Apply in writing, giving FULL particulars :—R. H. Gallannaugh, L.R.I.B.A., 12, Grafton Street, London, W.1. 8883

RILEY & GLANFIELD seek MALE ASSISTANT of experience for factory, Church, domestic and public house work. Ability to assume responsibility for design and supervision. Good draughtsmanship essential. Salary to be agreed. CHA 7328. 8483

JUNIOR and intermediate ARCHITECTURAL ASSISTANTS required. Applicants with knowledge of commercial work, including offices and stores, etc. London experience an advantage. Box 8481.

SENIOR and INTERMEDIATE ARCHITECTURAL ASSISTANTS required. 5-day week. Write or telephone, giving full particulars, including age and salary, to Hasker & Hall, Architects, 13, Welbeck Street, W.1. (WELbeck 4061). 8507

ASSISTANTS required for firm of Architects in Portland Place area, the following qualifications being essential :—
(a) Should be about Intermediate standard;
(b) Excellent drafting ability;
(c) Several years' office experience;
(d) Sound knowledge of construction;
(e) Keen interest in modern architecture.
Box 8564.

ARCHITECTS.—SENIOR ARCHITECTURAL ASSISTANTS required immediately for a wide variety of work. Salary range £700—£975 per annum. Superannuation scheme.
Application should be made in writing to :—Kenneth F. Masson, A.R.I.B.A., Chief Architect, S.C.W.S. Ltd., 119, Paisley Road, Glasgow C.5. 8565

ARCHITECTURAL DRAUGHTSMAN required by multiple shop company, interesting and varied work, involves a certain amount of travelling, 5-day week, staff canteen, pension scheme, write stating age, qualifications, salary required, to Box 8529.

ARCHITECT'S ASSISTANTS required (1 Senior and 2 Juniors) for West End Office. Write, stating full particulars and salary required, to Box 8725.

ARCHITECTURAL ASSISTANT required, capable, usual office experience, specifications, land and property surveys. Age, experience, salary to Gilbert & Hobson, 69a, Castle Street, Farnham, Surrey. 8732

ARCHITECTURAL ASSISTANTS required; varied work; salaries £700 to £750. Write, stating age, training, experience, present salary; all interview expenses paid. G. de C. Fraser Son, & Gearey, chartered Architects, 27, Dale Street, Liverpool. 8719

ARCHITECTURAL ASSISTANT up to inter. R.I.B.A. standard. Applications stating age, experience, qualifications and salary required to Robert W. Ingram, R.I.A.B.A., Dip. Arch. (Leics.), Staff Architect, 77, Uxbridge Road, Ealing, W.5. 8718

ARCHITECTURAL ASSISTANT required in City firm of architects and surveyors. Intermediate R.I.B.A. standard. Good draughtsman essential, preferably with some experience of contemporary design of interiors and shops. Write stating particulars of previous experience and salary required to : Vigers & Company, 4, Frederick's Place, Old Jewry, E.C.2. 8622

ONE SENIOR and two Intermediate R.I.B.A. standard ARCHITECTURAL ASSISTANTS, with office experience required in small private office. Write stating experience and salary required to S. W. Wendes, 29a, Lugley Street, Newport, I.O.W. 8654

ARCHITECTURAL ASSISTANT or BUILDING DRAUGHTSMAN age up to 35, required for work on industrial buildings. Preference given to candidates with Inter R.I.B.A. but this not essential, although O.N.C. in building is the minimum acceptable qualification. Applicants should have experience in foundation work, drainage and factory buildings. Permanent position and attractive salary. Assistance with housing given if necessary. Write in confidence to Personnel Manager, Michelin Tyre Co. Ltd., Stoke-on-Trent, Staffs.; giving all relevant information. 8659

REQUIRED for Architects' office, Central London area, young qualified ASSISTANTS interested in design and construction. Write, stating experience and salary required. Box 2325.

CLIFFORD TEE & GALE, F/F.R.I.B.A., require SENIOR and JUNIOR ASSISTANTS in their Westminster Office on Research Laboratories and other interesting projects. Please apply to 5, Buckingham Palace Gardens, S.W.1. (Sloane 2296). Five-day week 8660

NORMAN AND DAWBARN require ARCHITECTURAL ASSISTANTS at or about R.I.B.A. Intermediate standard with from three to six years' office experience at salaries in the range £400—£650, according to experience. Applications stating age and details of career should be made in writing to 5, Gower Street, London, W.C.1. 8663

ASSISTANTS required for extensive general practice. One with substantial experience and one junior. Martindale and Jackson, F/A.R.I.B.A., Cathedral Chambers, Castle Street, Carlisle. 8667

ARCHITECTURAL ASSISTANT required with minimum qualification of Intermediate R.I.B.A. Preference will be given to applicants having several years of general experience in the design of industrial buildings and housing. Write, stating age and full particulars, to :—Staff Officer, Handley Page Ltd., Cricklewood, London, N.W.2. 8823

W. H. WATKINS, GRAY, FF.R.I.B.A., & PARTNERS require ARCHITECTURAL ASSISTANTS of Intermediate standard for Bristol Office. Applicants should preferably have passed R.I.B.A. Intermediate and be studying for Final. Must be good draughtsmen and have good practical experience. Contributory pension scheme in operation. Apply in writing, giving age, experience and salary required, to 1, Clare Street, Bristol, 1. 8821

ARCHITECT'S ASSISTANT of Inter. Standard required immediately at Chelmsford Office. Must be neat and accurate draughtsman with office experience. Varied and interesting work mainly agricultural and housing. 5-day week. Apply giving full particulars of age, experience, and salary required, to The Architect, Messrs. Strutt & Parker, Coval Hall, Chelmsford, Essex. 8822

NORFOLK Architect requires ASSISTANT Intermediate standard; competent Surveyor; car driver. Reply, with particulars of experience and salary required, to Box 8809.

ARCHITECT'S ASSISTANT for small West End office. Must be clean, neat draughtsman, with contemporary outlook, varied work, housing, industrial and commercial. Opportunity for advancement for keen young man. Salary to start £550—£600 p.a. Write giving full particulars to Box 8815.

WANTED in Oxfordshire office, ARCHITECTURAL ASSISTANT, male or female, approx. Inter. standard. One who has some knowledge of, and is interested in, traditional and restoration work. Good prospects and scope for the right applicant, who must be keen and conscientious. Apply stating salary required. Box 8820.

ARCHITECTURAL DRAUGHTSMEN with good basic experience, and ARCHITECTURAL ASSISTANTS of Intermediate standard, required for practice with excellent scope for varied experience and advancement and use of own initiative. Apply in first instance in own handwriting with full particulars of education, recent experience, salary required, and stating when available. Applications should be addressed to : H. Anthony Clark, F. C. Roberts & Partners, Chartered Architects, 41, Regent Street, Wrexham. 8827

D. C. DENTON-SMITH & PARTNERS, Chartered Architects, Surveyors, require additional experienced ARCHITECTURAL ASSISTANTS at 40, Regent Street, Cambridge, and 5, Lynn Road, Ely. Excellent opportunities in varied practice covering a very wide area. Salaries, by arrangement, according to capabilities. Written applications, giving full details, may be sent to either of the above addresses. Box 8838.

ARCHITECTURAL ASSISTANT required in small general practice. Intermediate to Final standard, with some office experience. David A. Wilkie, 45, Chancery Lane, W.C.2. Holborn 1550. 8844

MOST urgently required in City office with a wide and comprehensive range of commissions, two experienced ARCHITECTURAL DRAUGHTSMEN. Salary range £403—£689, depending on experience. Box 8845.

QUALIFIED ARCHITECTURAL ASSISTANT for busy general practice. Salary up to £600 p.a. according to experience. Apply H. N. Jepson & Partners, Midland Bank Chambers, Nuneaton. 8516

ARCHITECTURAL ASSISTANT, Inter. or Final standard, required in Architect's London Office, for interesting contemporary work. Salary £500—£600 p.a. according to ability. Telephone EUSton 8175. 8846

ARCHITECTURAL ASSISTANT required immediately for office in Cotswold area. Five-day week. Applications, stating age, experience and salary required, to Eric Cole & Partners, FF.R.I.B.A., Dyer Street House, Cirencester, Glos. 8847

TWO ARCHITECT'S ASSISTANTS required for private office in London, E.C., with widely varied practice. One must be Associate R.I.B.A., and preferably with not less than three years' practical office experience. The other must have passed Intermediate R.I.B.A. Reply giving age, full particulars of qualifications and experience, and stating salary required. Box 8833.

SENIOR ASSISTANT required, able to prepare working and detail drawings and supervise works; must be good draughtsman; experience in cinema work would be an advantage. State salary and experience. Box 8691.

EDINBURGH Office of David Carr & Stuart Matthew requires SENIOR and JUNIOR ASSISTANTS. Seniors must have considerable experience in running contracts, general design, planning and construction. Juniors should have good practical office experience and/or school qualifications. For interview write, giving brief particulars and salary required, to above firm at 14, Lynedoch Place, Edinburgh. 8714

ARCHITECTURAL ASSISTANT of not less than Intermediate standard, required for interesting contemporary work of varied nature. Please write or telephone for appointment.—Leonard J. Multon, F.R.I.B.A., 6, Greenfield Crescent, Edgbaston, Birmingham. EDGBASTON 4188. 8633

ARCHITECTURAL ASSISTANT required in the West End Offices of Percy Bilton Ltd. Salary about £500—£600 according to experience. Work would entail preparation of drawings, details and specifications for wide range of buildings including houses, flats and offices. Write giving experience and other useful information to Staff Architect, Percy Bilton Ltd., 113, Park Street, W.1. 8292

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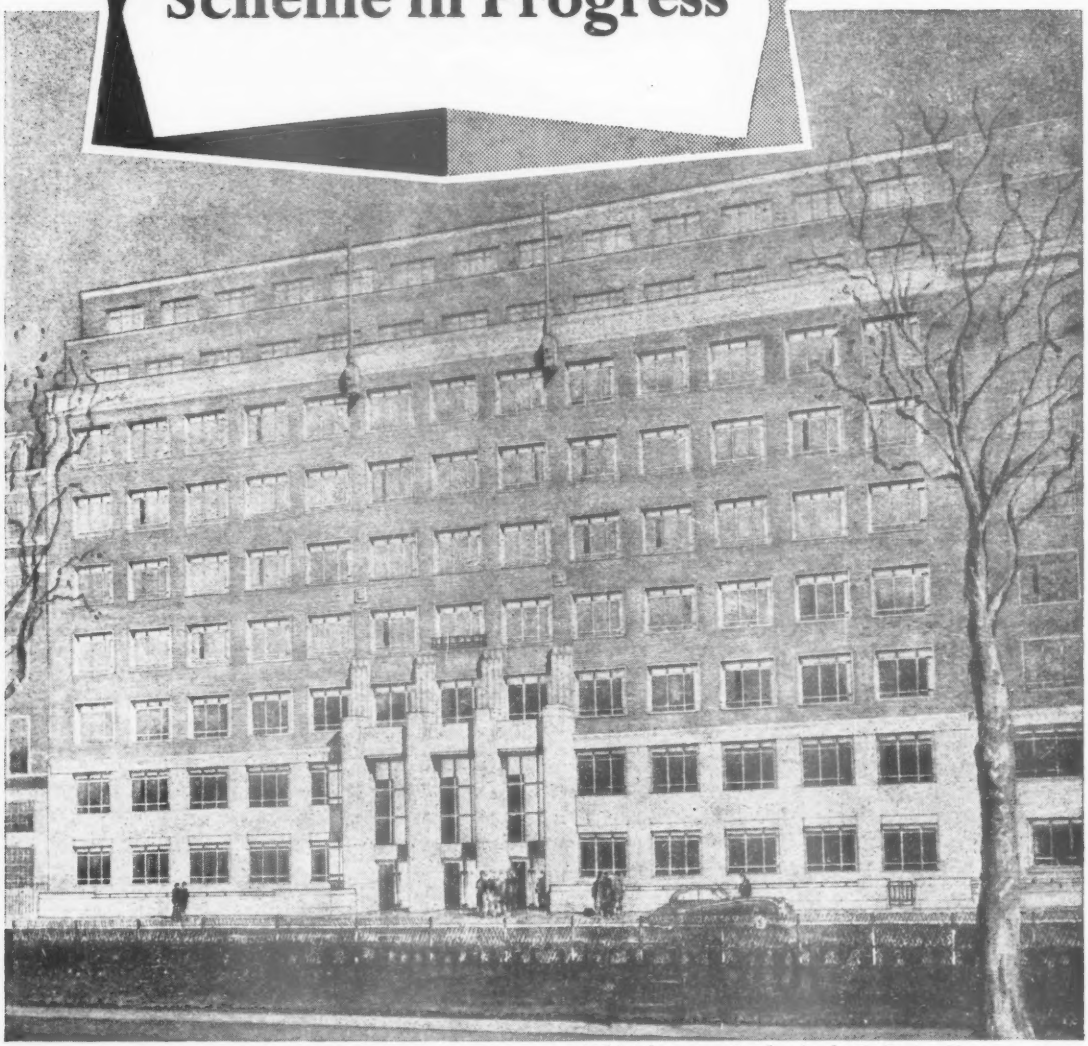

Architect's perspective drawing by R. C. Arnold F.R.I.B.A.

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