THE ARCHITECTS' JOURNAL

standard contents

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

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Details of Planning, Construction, Finishes and Costs
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Architectural Appointments Wanted and Vacant

No. 3255] [Vol. 126

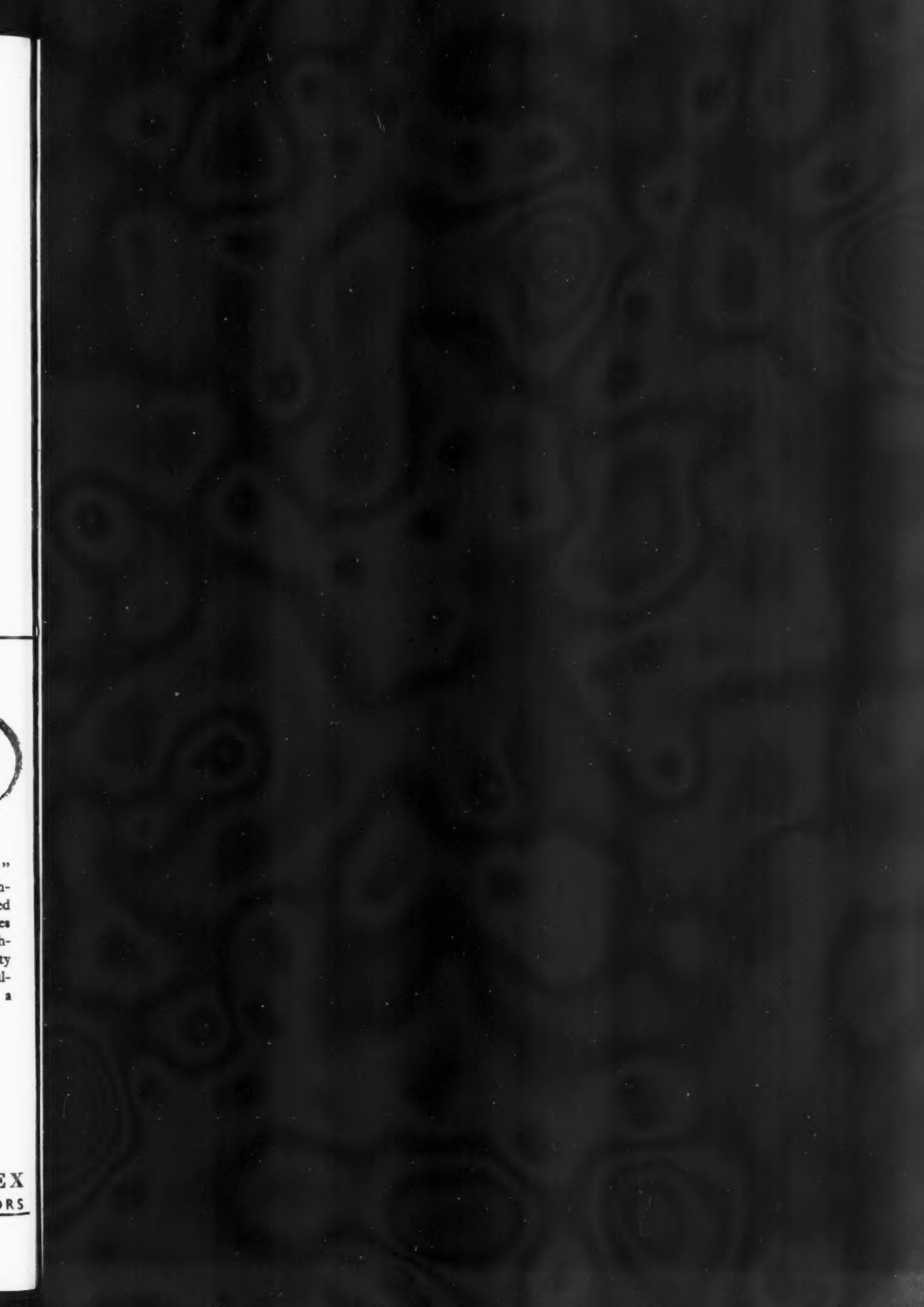
THE ARCHITECTURAL PRESS
11 and 13, Queen Anne's Gate, Westminster, S.W.1. 'Phone: Whitehall 0611

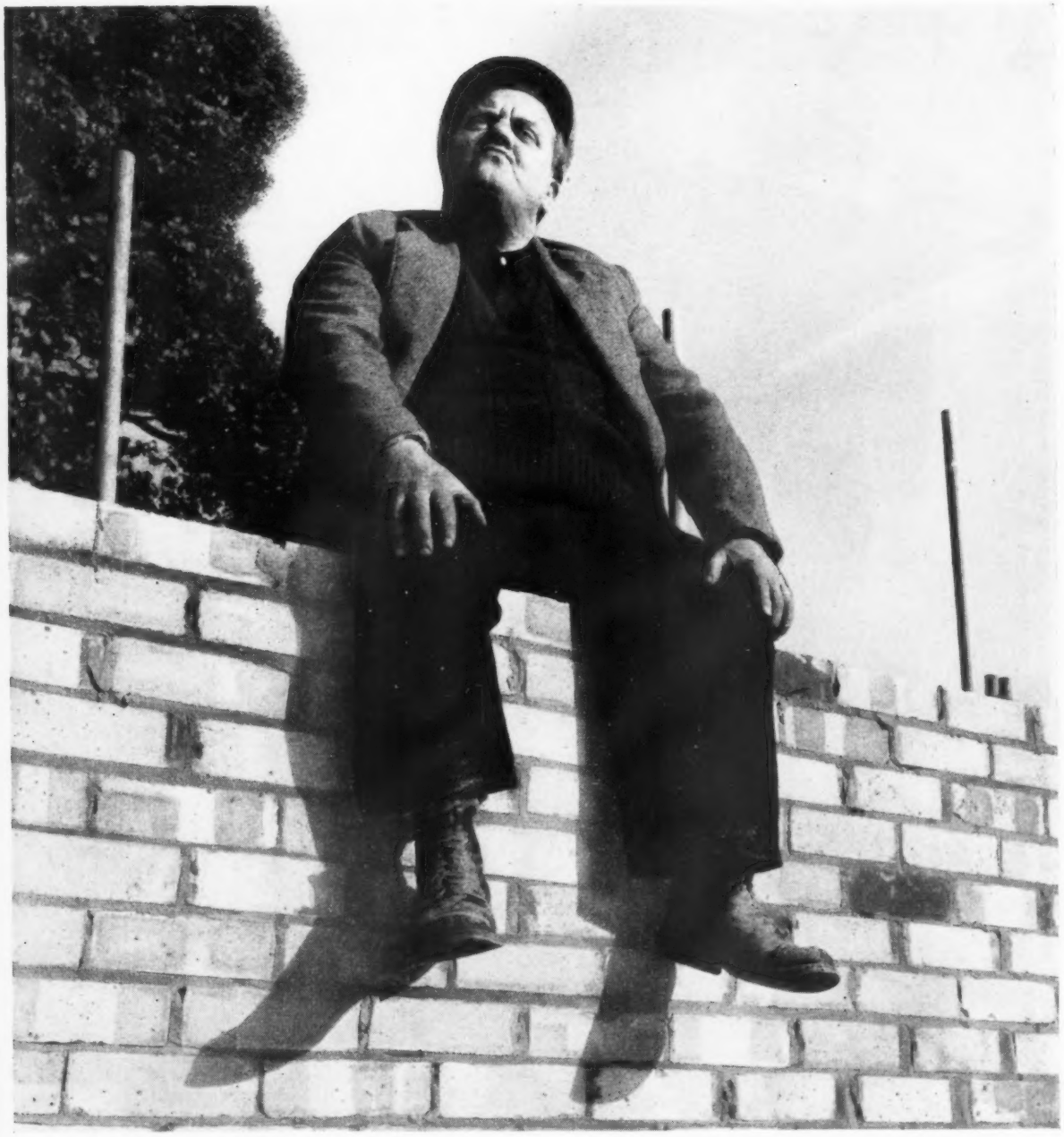
Price 1s. 0d.

Registered as a Newspaper.

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

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





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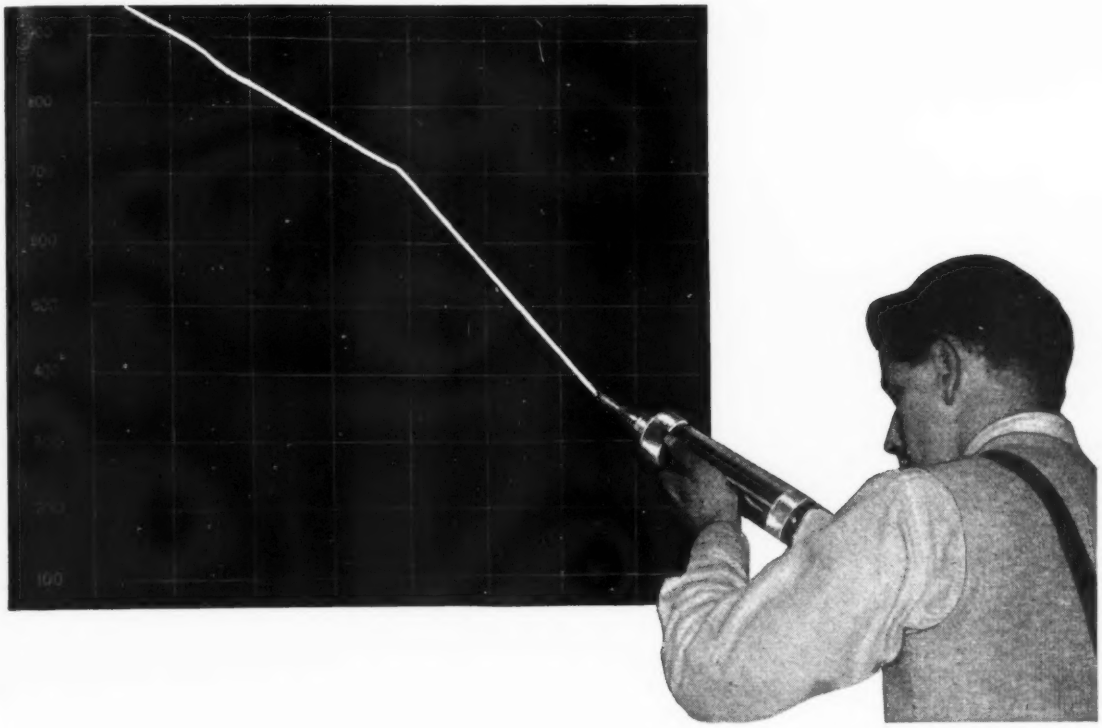

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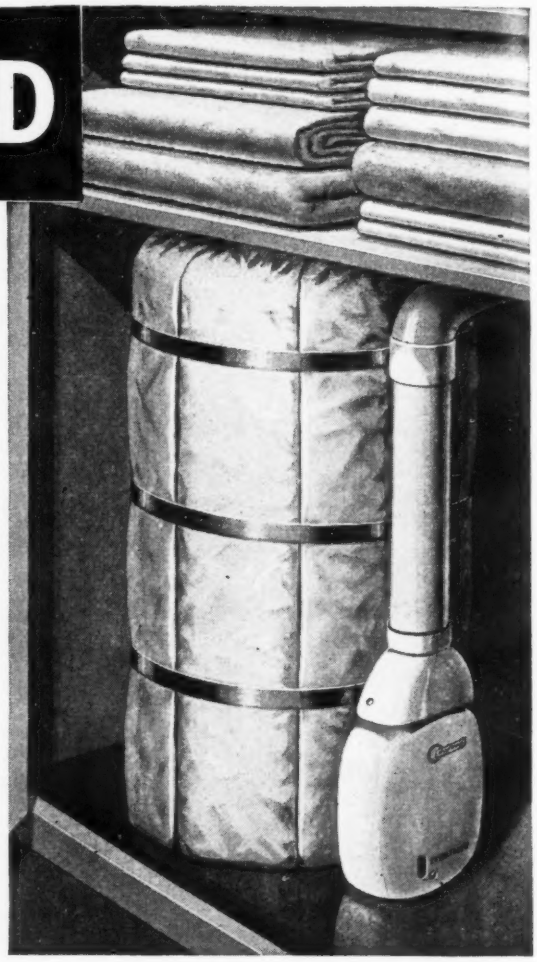

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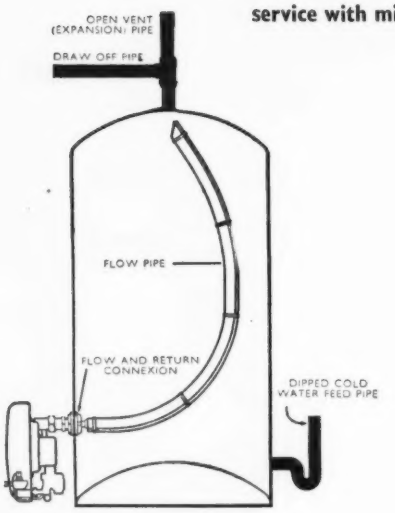

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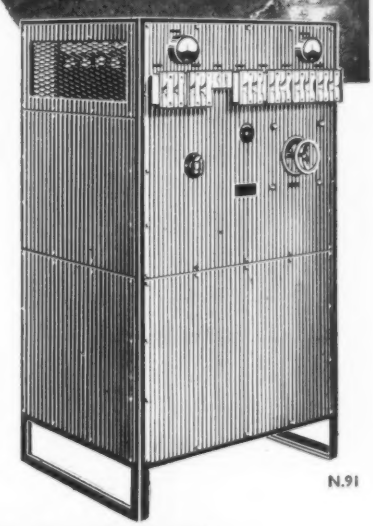

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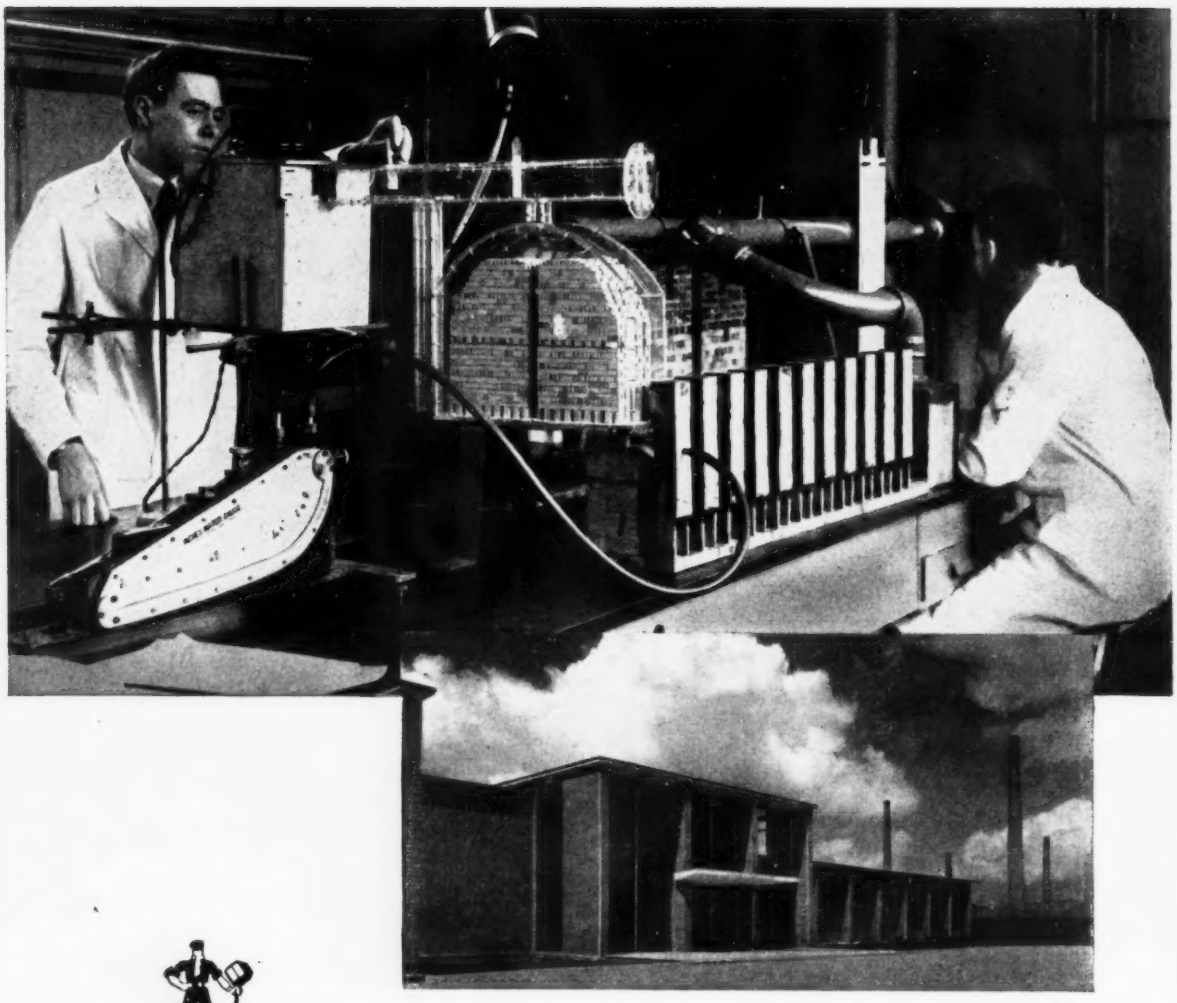

PHORPRES

In the laboratories of the London Brick Company, data needed for the future design of kilns has been secured by the use of small scale models to determine the behaviour of gases during firing.

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Saint Margaret's, Westminster, is the Parish Church of the House of Commons. The present church—the third to be built upon this site since Saxon times—was completed in 1523, and no parish church in London is more rich in historical associations. It is really a large church, but so dwarfed by Westminster Abbey alongside that visitors are often surprised to discover that it comfortably seats a thousand people. Throughout the spacious and beautiful interior of St. Margaret's a comfortable temperature is maintained by means of a No. 38 L.S. Whitehall Sectional Heating Boiler, with automatic stoker, and forty Pall Mall and Hospital Pattern Cast Iron Radiators. This is another example of how Crane heating equipment can be unobtrusively installed in an ancient and beautiful building without spoiling the character of the interior in any way.

Once again, heating by Crane

HEATING ENGINEERS: Troughton & Young (Heating) Ltd., Knightsbridge, London, S.W.3. Under the direction of the Consulting Architect of St. Margaret's, E. C. Butler, Esq., L.R.I.B.A. (Messrs. W. A. Forsyth & Partners).

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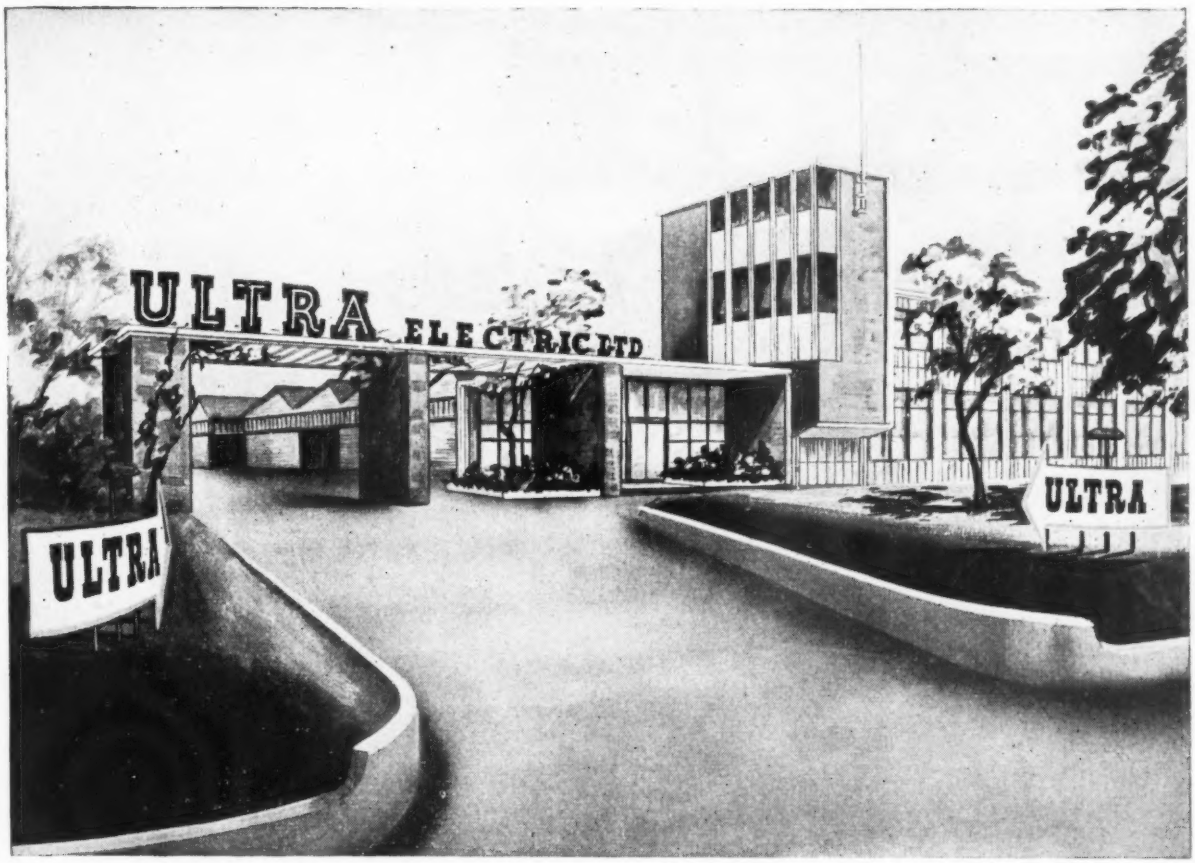

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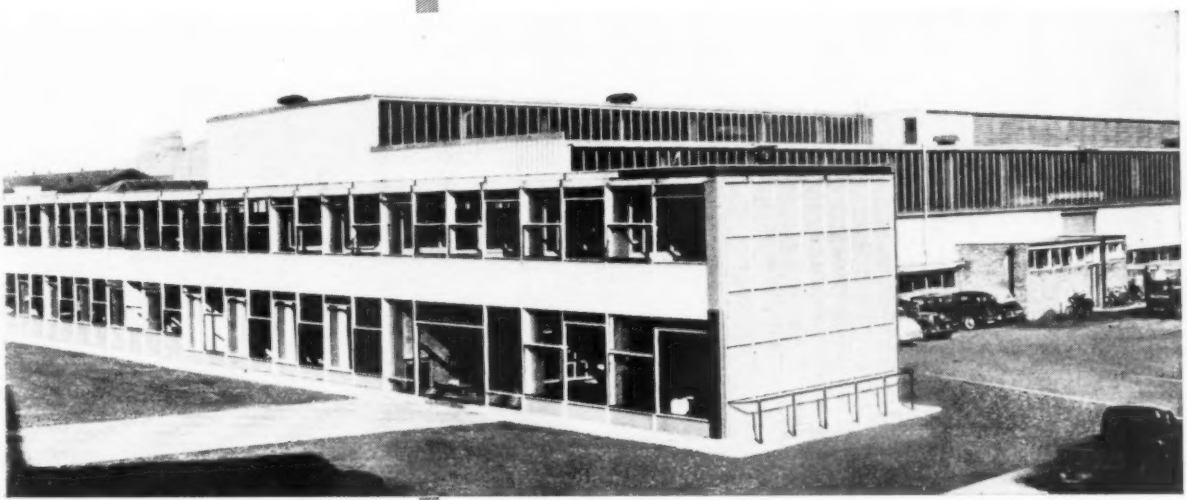

The new Research Centre recently completed at Lincoln for Ruston & Hornsby Ltd., is probably one of the finest of its kind in Europe.

These modern and well-equipped buildings are of flat-roof construction, and the roofing, of course, is Robertson Q-DECK. The vertical areas of the Air Filter Gallery are clad with Robertson Q-Panel.

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**** If you would like copies of The Architects' Journal Library of Information Sheets describing Robertson Q-DECK and Q-PANEL we shall be pleased to send you on request, a copy of each.***

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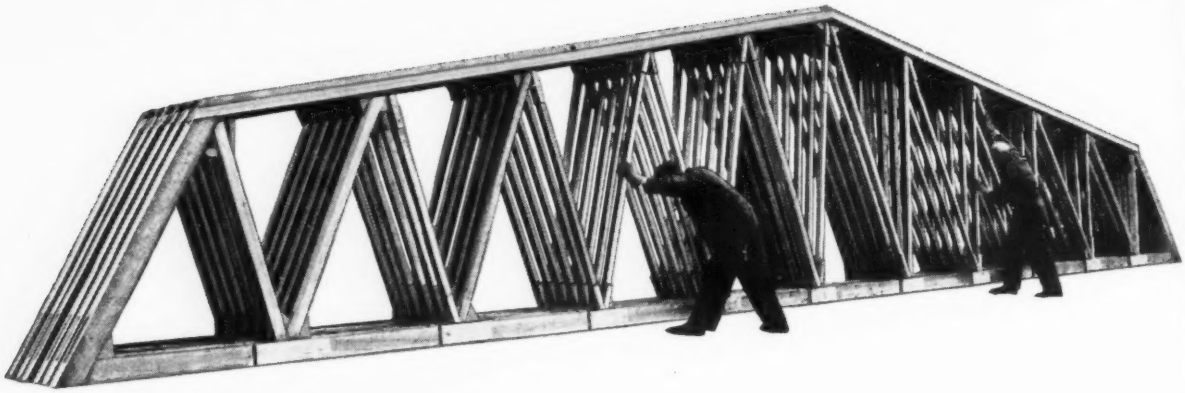

Full steam ahead

Resistance to steam and to other hazards of industrial processes may well call for timber structures, and timber structures today mean *glued* structures.

Synthetic resin adhesives have eliminated the weaknesses associated in the past with glued joints and a modern resin-bonded truss is amazingly strong and rigid for its weight—and *durable*, too, under the most severe conditions of exposure.

The lattice trusses shown above form the roof structure of the new Courtaulds finishing plant at Bocking, Essex, designed by Ove Arup and Partners. These trusses are of 45ft span and 9ft height and were constructed by Rainham Timber Engineering Co. Ltd. A high degree of resistance to chemicals and steam was essential and gluing was, therefore, carried out with Aerodux 185 resorcinol-formaldehyde adhesive to ensure bonds of unequalled durability, unaffected even by boiling water and by changes in moisture content of the wood.

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Aerodux 185 *resorcinol resin glue*

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AP 336

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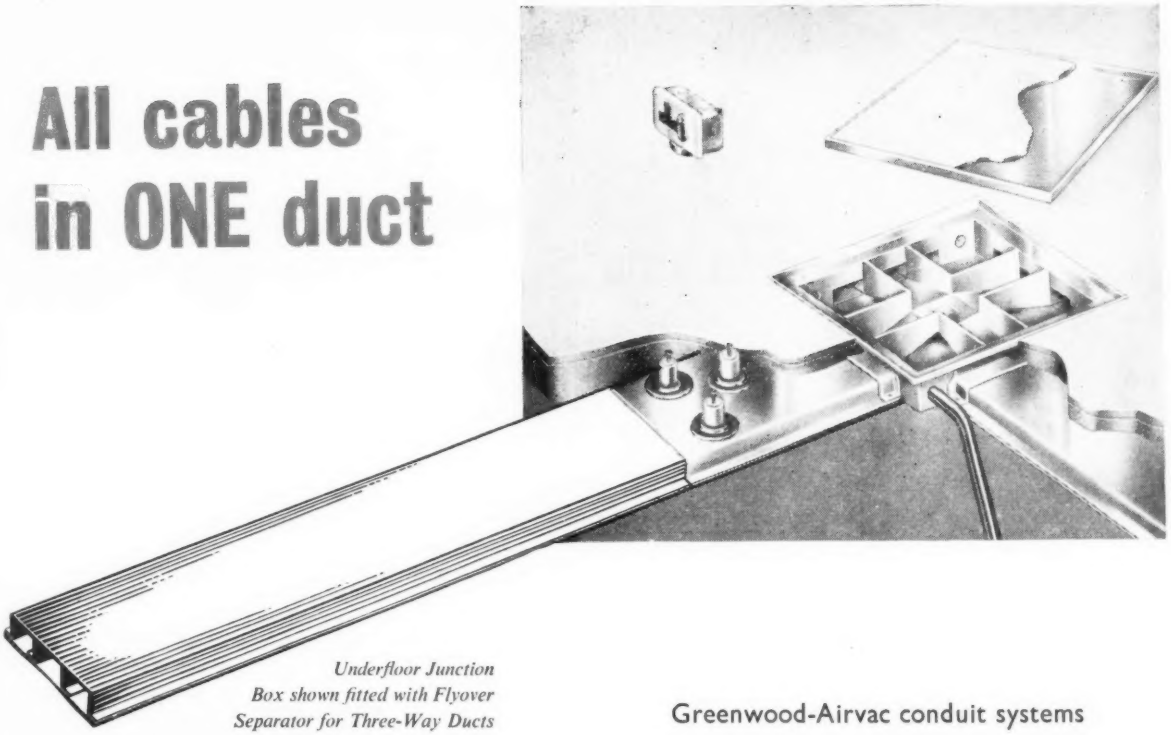

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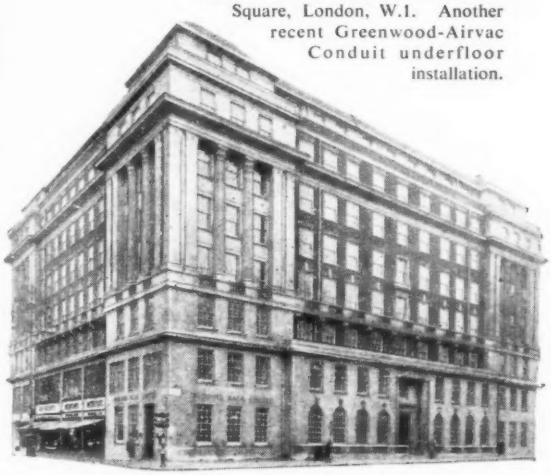
Unilever Ltd., Hesketh House, Portman Square, London, W.1. Another recent Greenwood-Airvac Conduit underfloor installation.



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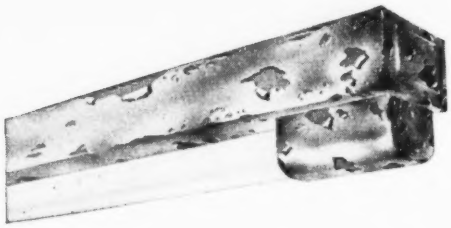
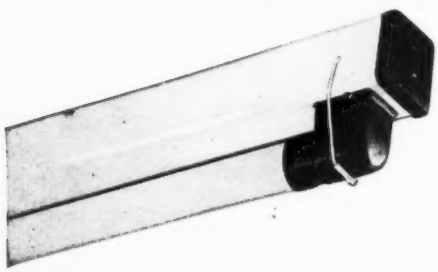


an end to this

Corrosion . . . dampness . . . acid vapours . . . dust-laden atmospheres all are enemies of durability and economy: yet some or all of them are part of every plating shop, laundry, laboratory, dockyard or cotton mill. They are unavoidable on railways, in dye works, on so many places essential to our industry and economy. Corrosion is the enemy of all lighting installations; it costs money



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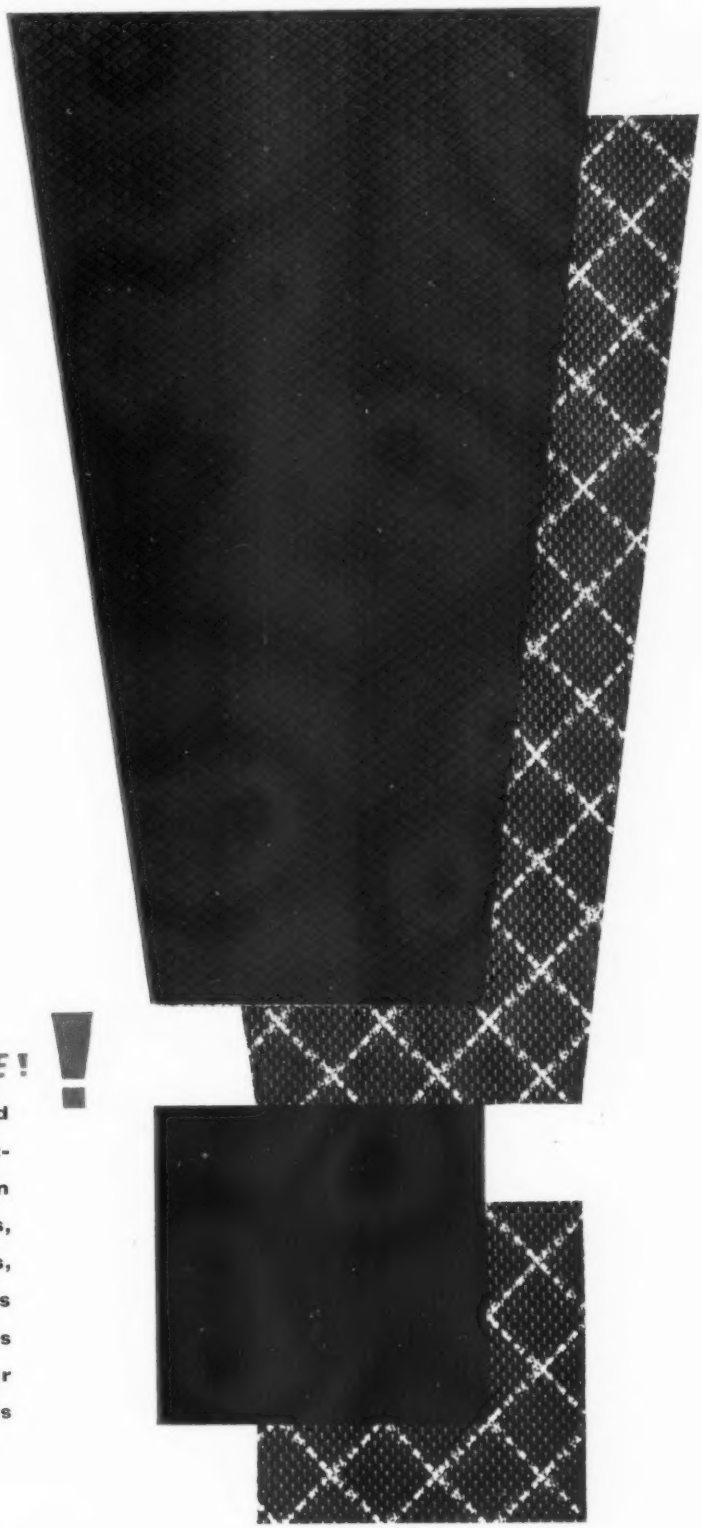

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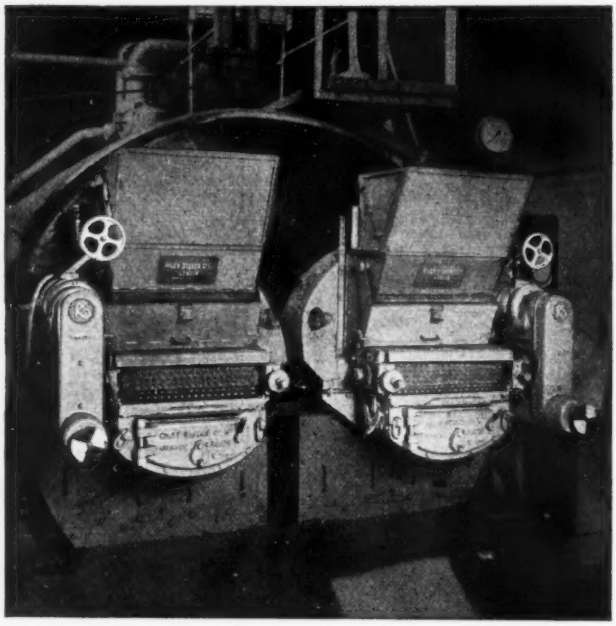

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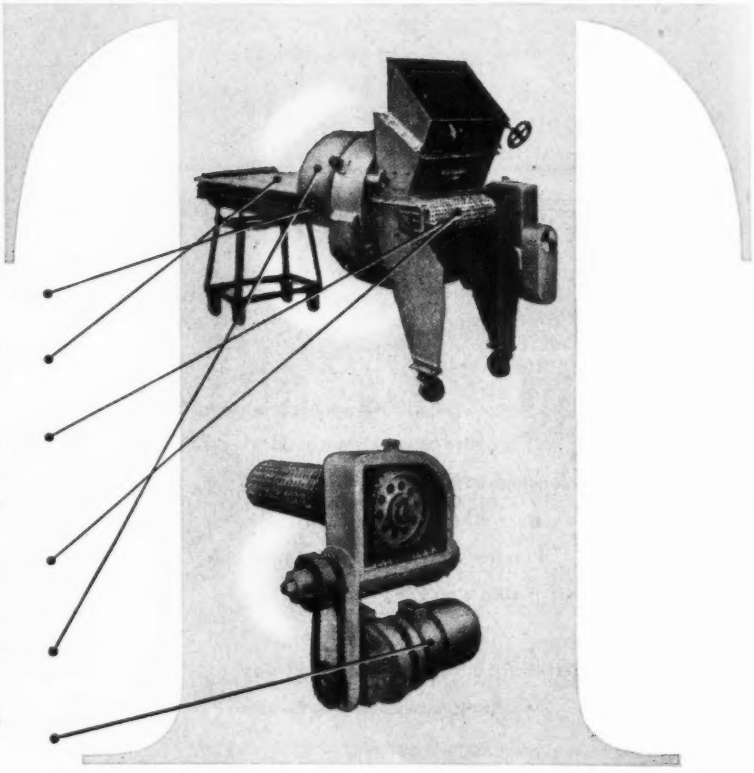

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one of the many reasons why

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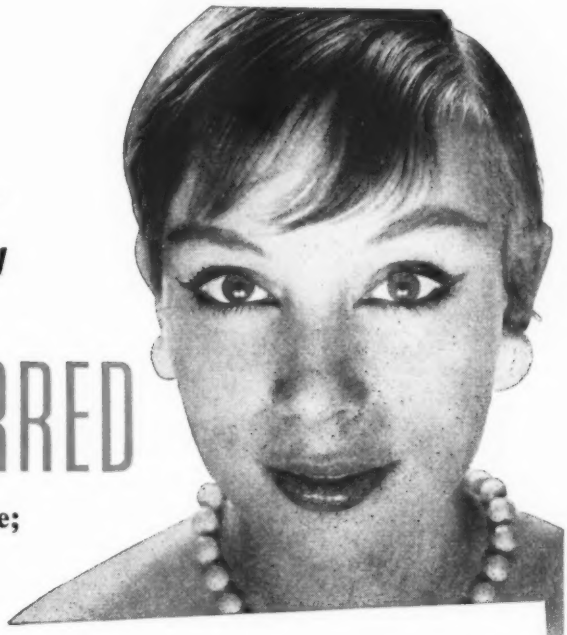

A long life of unblemished beauty in spite of abuse; a wide range of modern colours, woodgrains, linens, and other decorative designs; the fact that new production methods make it possible to produce Panax at a low price level... these are some of the many reasons why Panax is preferred.

Panax can be seen in

- Homes and Hotels
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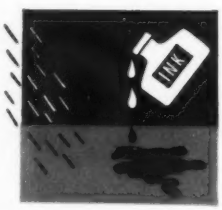


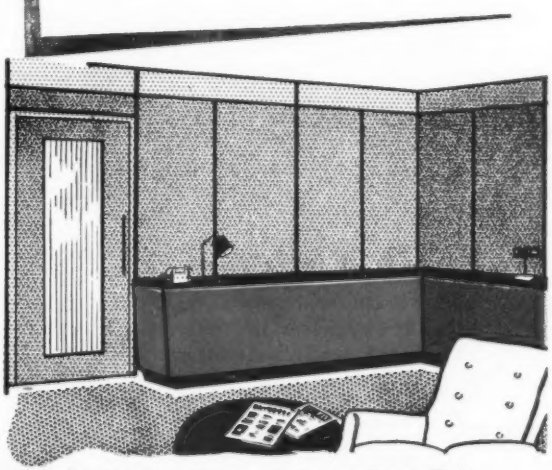
Will not stain

Resistant to heat

Wipes clean instantly

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

PANAX is used extensively for wall panelling, counter and table tops, shop fittings, laboratory and factory benches, and on furniture. It is easy to cut and easy to fix. The standard sheet size is 8′ x 4′, thickness $\frac{1}{16}$″. With satin finish.



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

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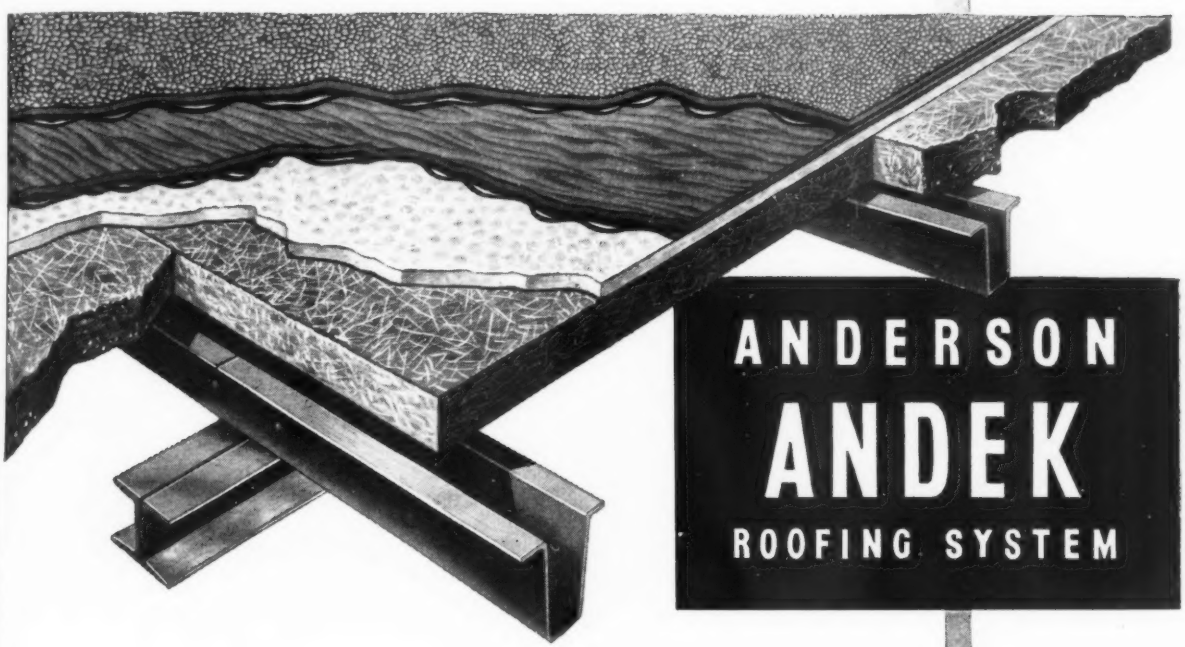
THERE IS MORE ANDEK SOLD THAN ANY OTHER WOOD WOOL SYSTEM



Now, galvanised bars eliminate corrosion...

ANDEK is a complete roof comprising steel bar sections, fully protected against corrosion, insulating building slabs and waterproofing by an Anderson built-up roofing system with a gravel or mineral surface finish.
Full slab bearing and anchorage gives increased loading resistance and ensures a continuity of insulation minimising condensation. The choice in depth and gauge of bar sections gives flexibility of design to meet all conditions and longer spans can be achieved. ANDEK is equally suitable for flat or sloping roofs, and the bar sections can be used to span between trusses, eliminating purlins. The soffit of ANDEK has a pleasing appearance and can, where desired, be given a plaster or other decorative effect.

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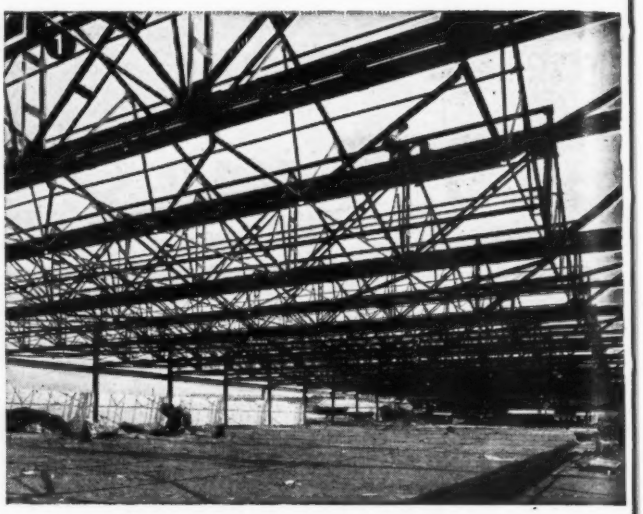
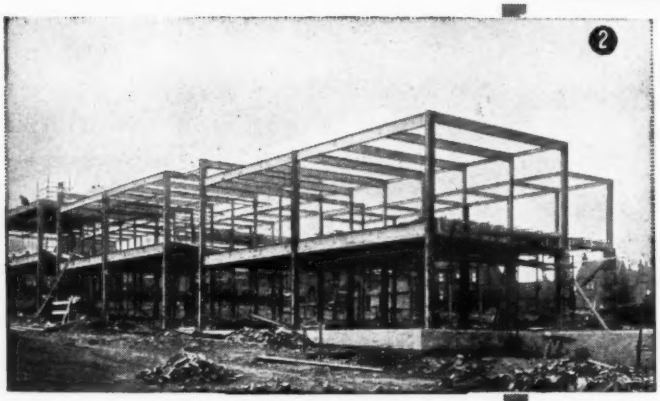
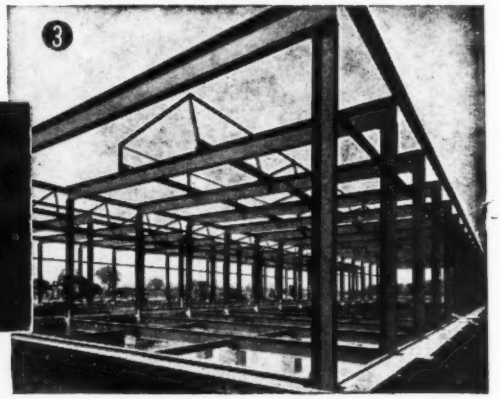




1. New factory building for Messrs. William Cooke & Co. Ltd. of Rotherham. 300 ft. x 120 ft. span.
2. The County Primary School, Crosland Moor, Huddersfield.
3. College of Further Education, Grimsby, in course of erection. Stage 1.
4. The completed College. Stage 1.



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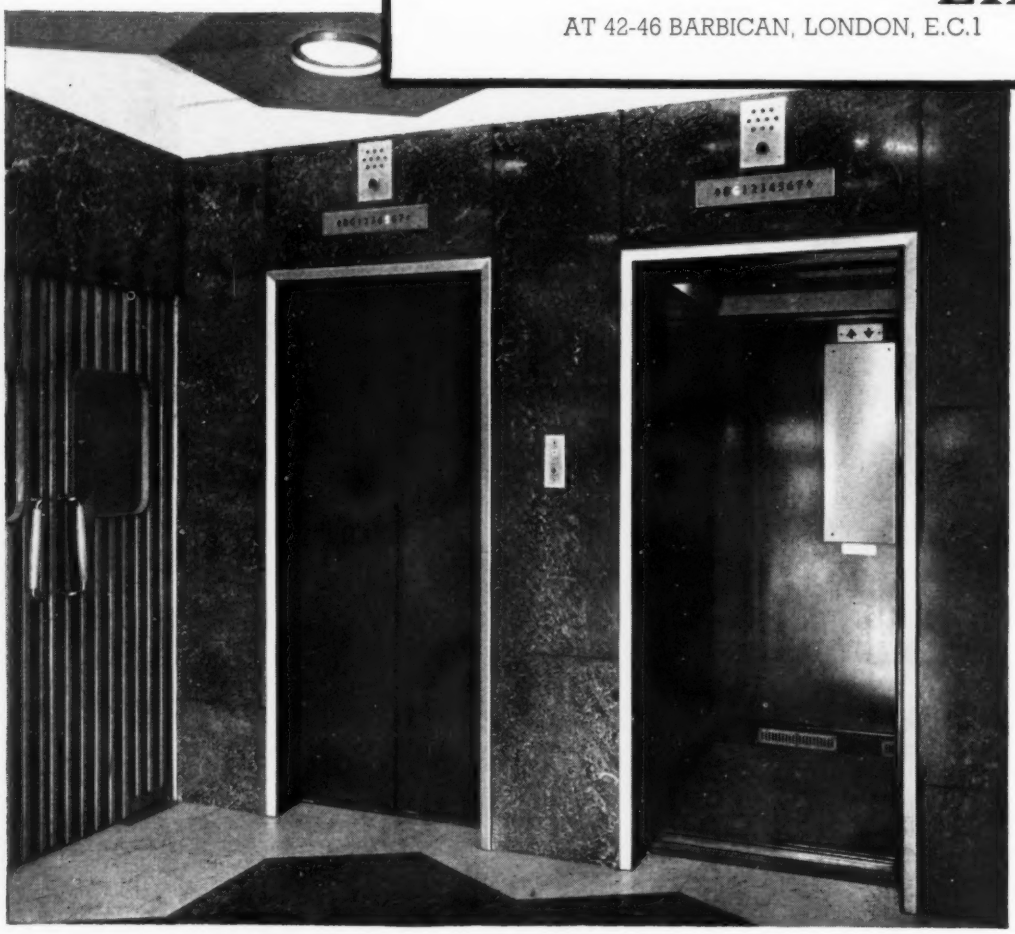

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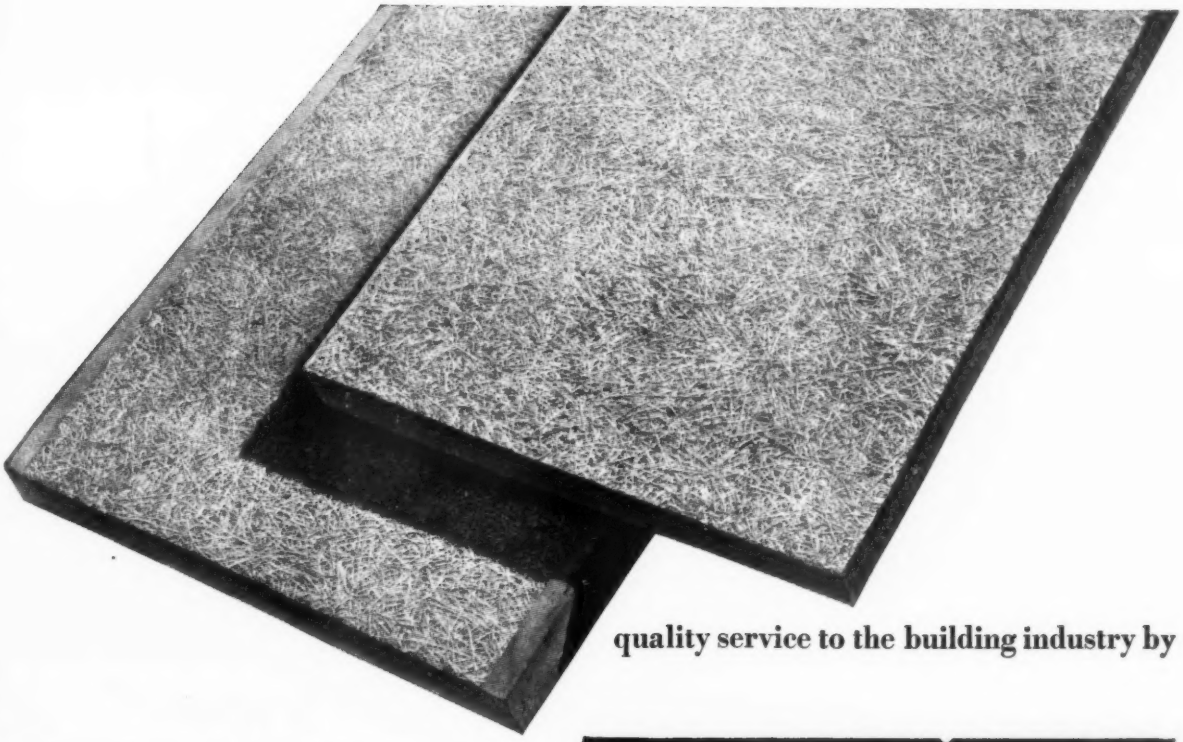

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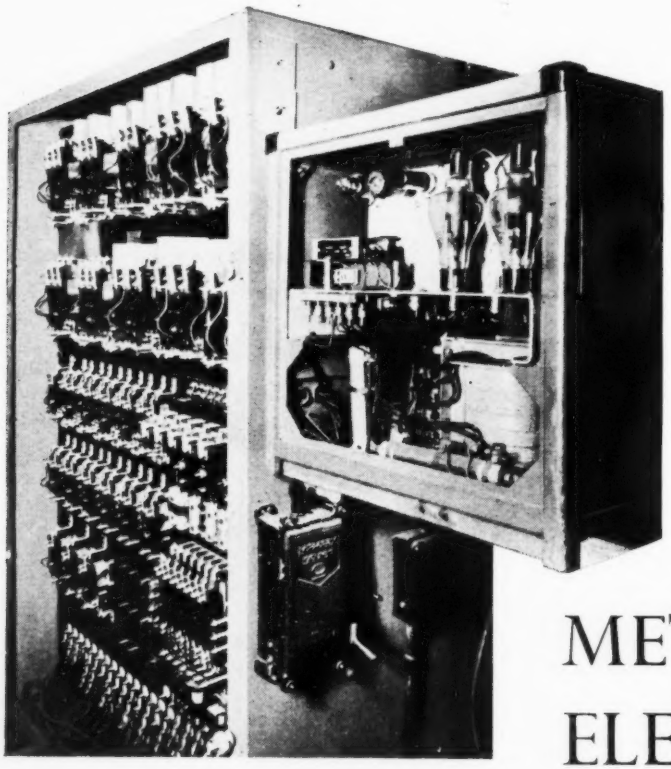

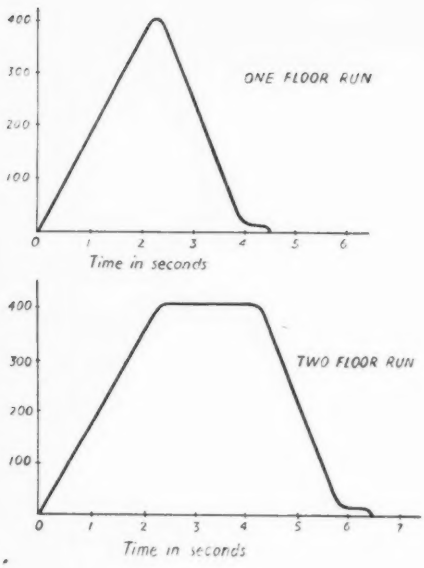

The main lift controller and electronic control equipment, which can be sited in any convenient position. Right: *Factual speed time curves for this electronically controlled lift.* Below: *Drum mechanism, embodying cams and followers of the control gear, photographed across the lift shaft.*

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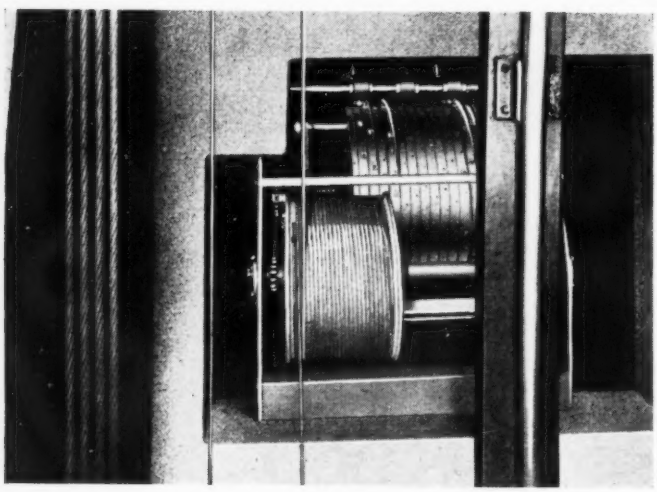

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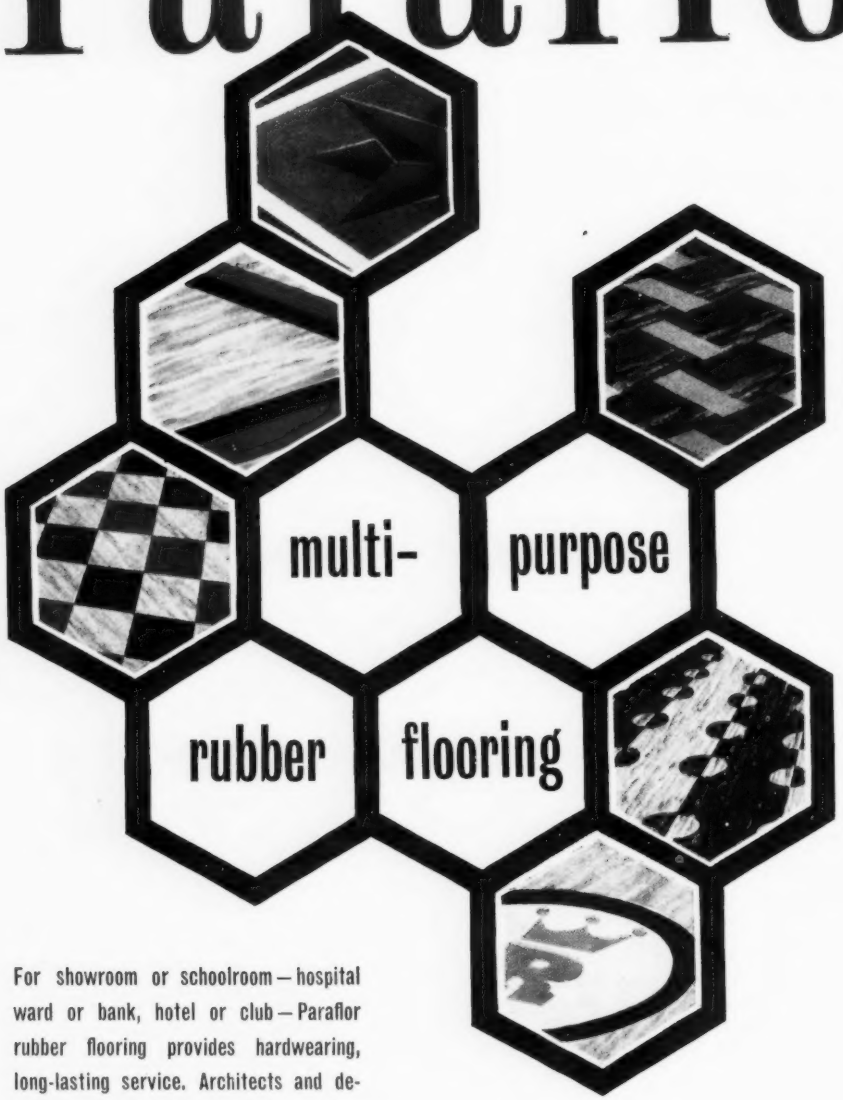

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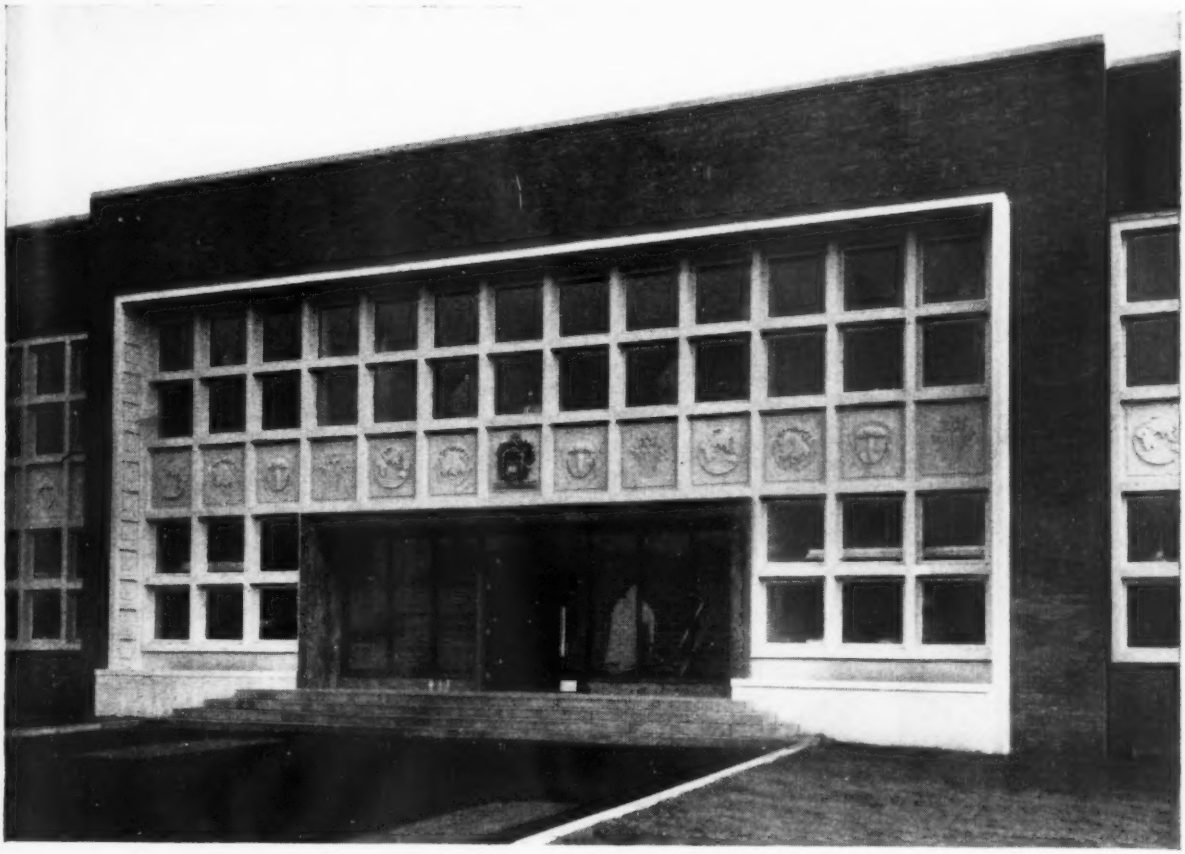
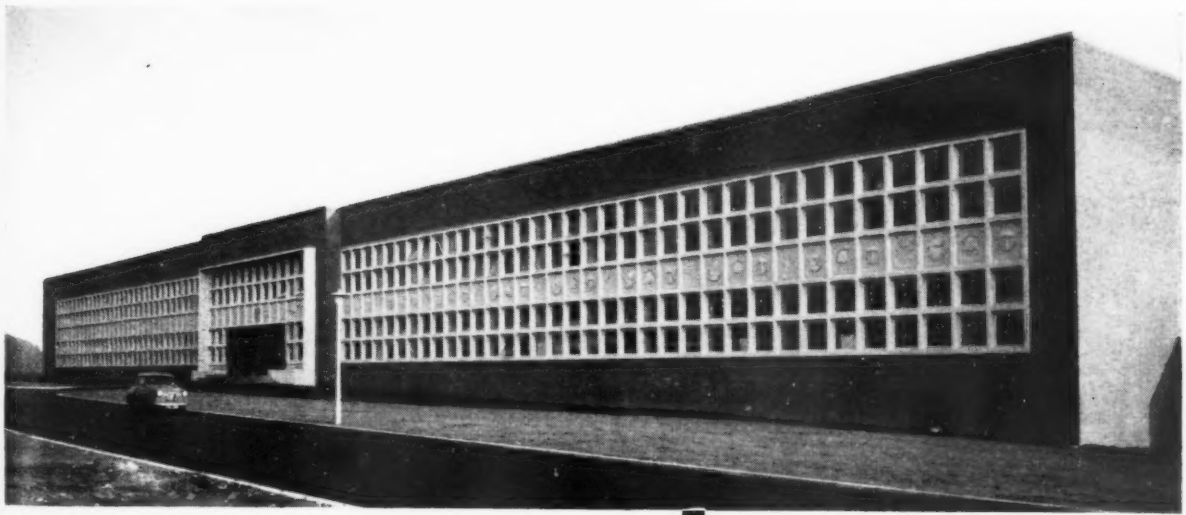
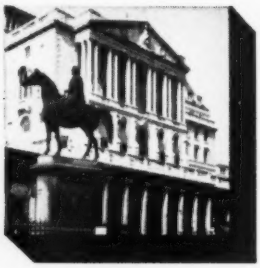
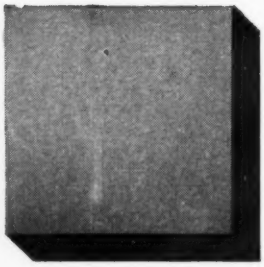
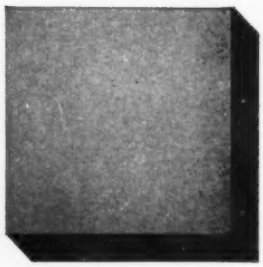


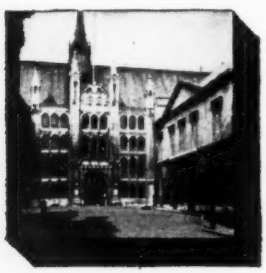
University College of Swansea—Natural Sciences Building *Architects: Sir Percy Thomas & Son, PP.R.I.B.A., A.R.I.B.A.*

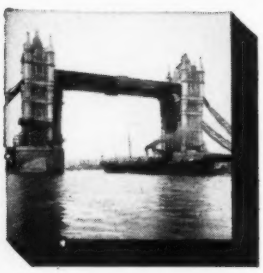




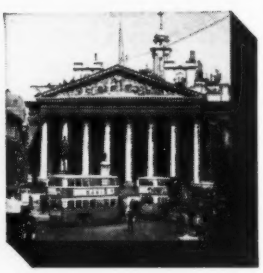








3,608,821 SQ. YDS.
OF ACCOTILE FLOORING



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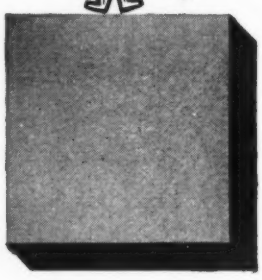

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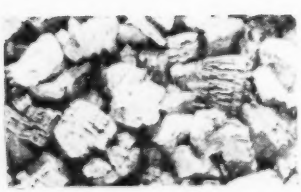

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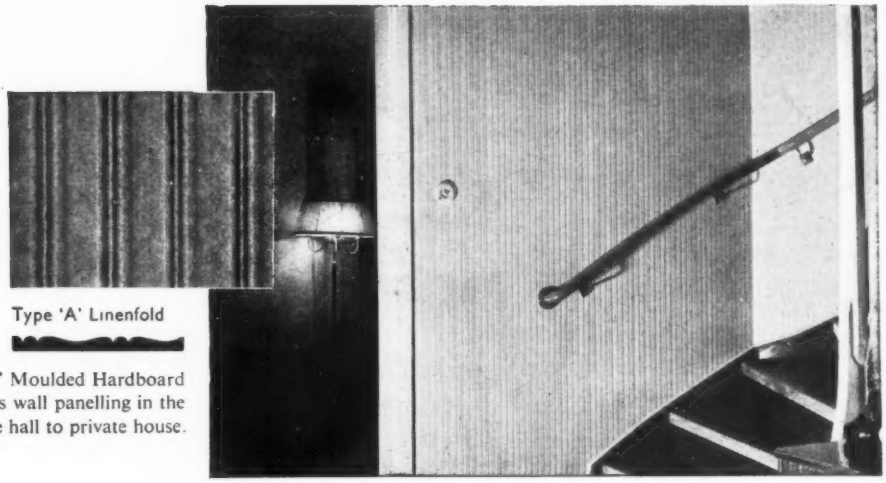

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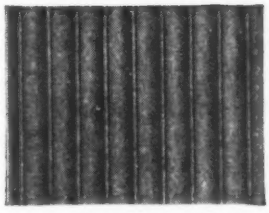
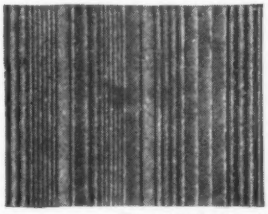
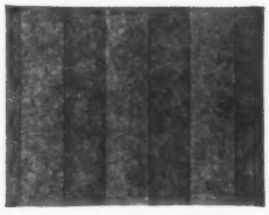


Type 'B' Reed & Bead

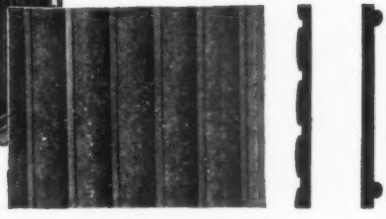
Type 'A' Hardboard used in the Lounge Bar of the Llanrumney Hall Hotel, Cardiff. Owners: Wm. Hancock & Co. Ltd. Architect: G. L. H. Rogers, L.R.I.B.A.



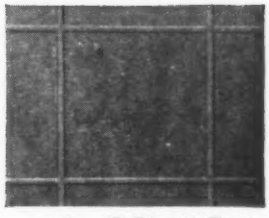
Type 'C' Striated



Type 'D' Slatted



Type 'E' Close Slatted



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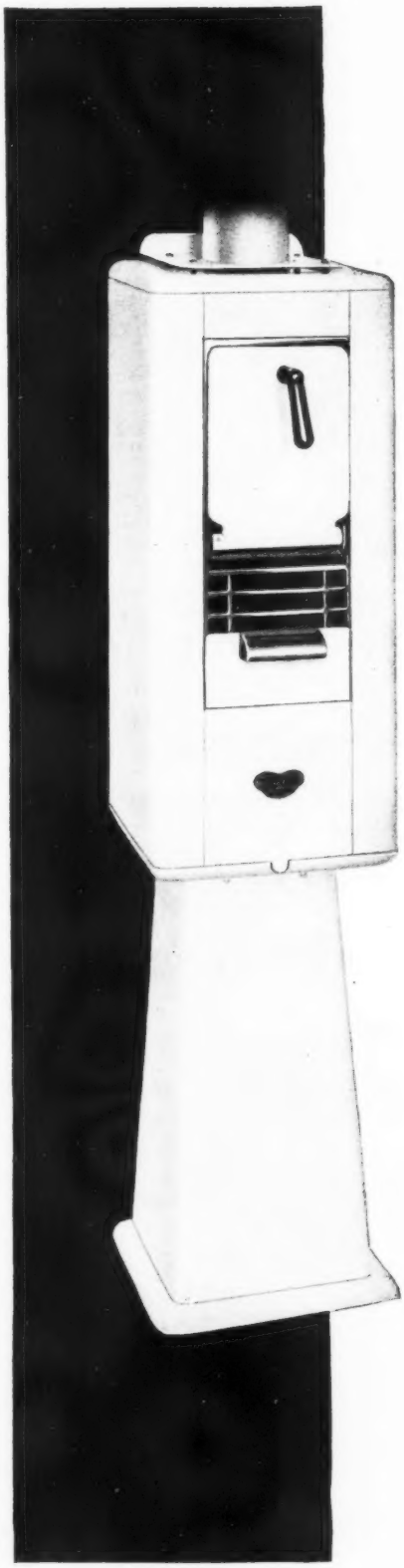

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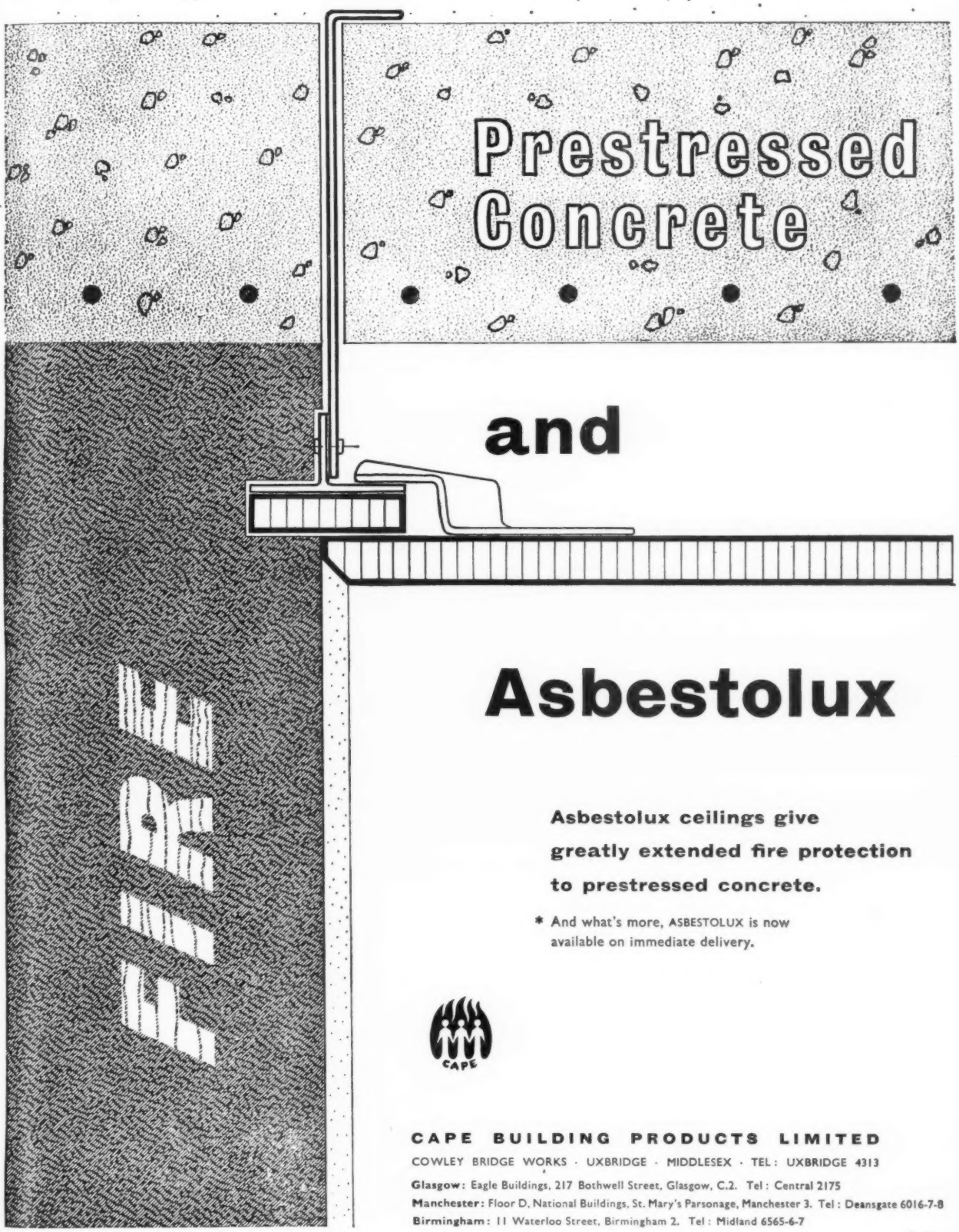

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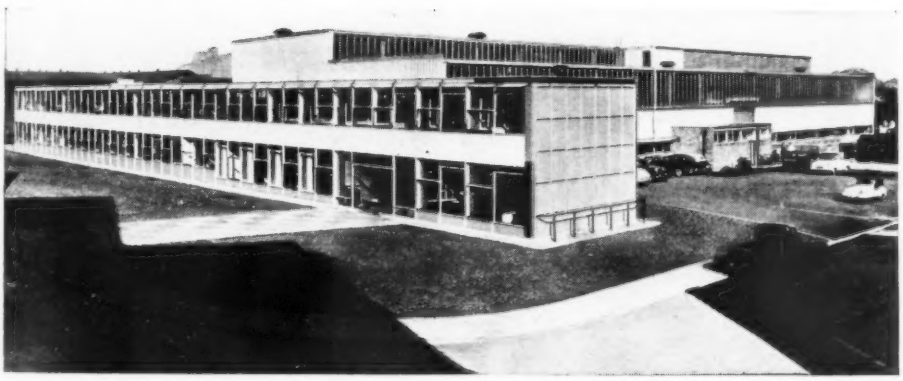
planned lighting



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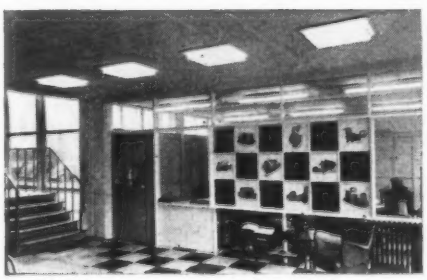

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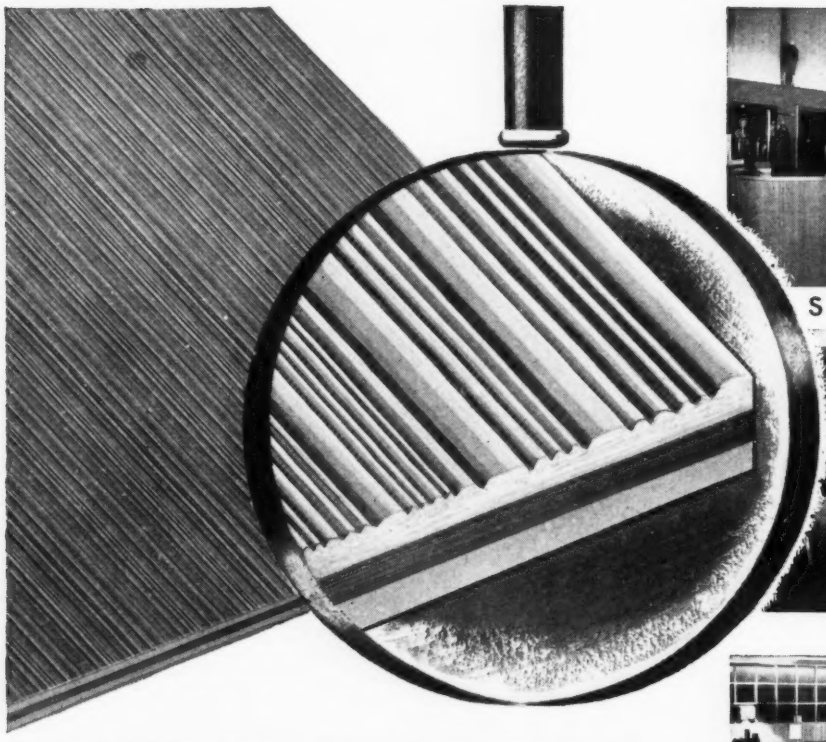

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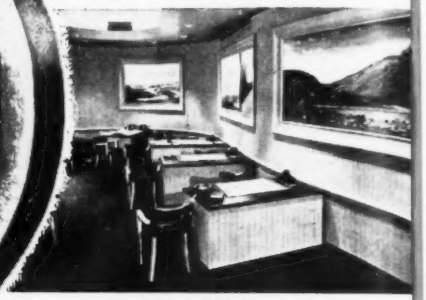

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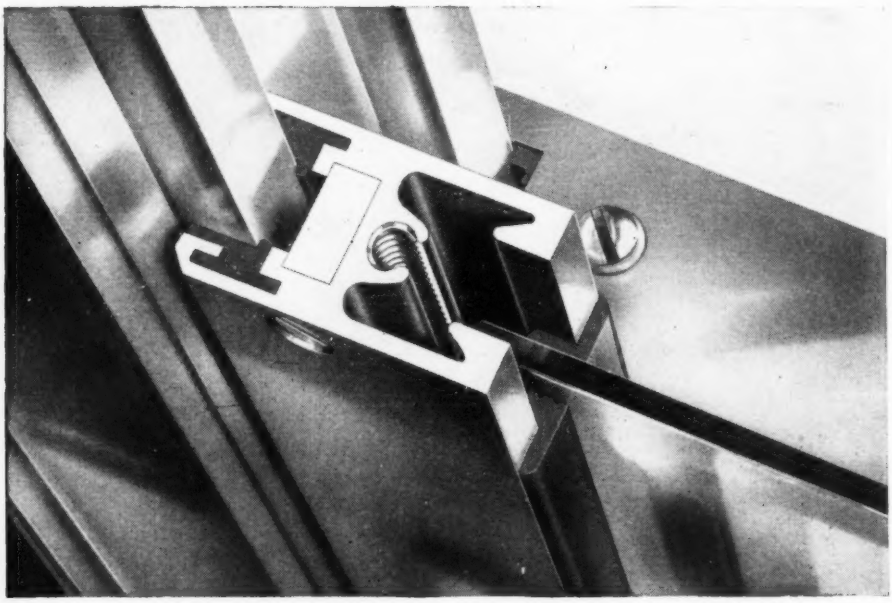

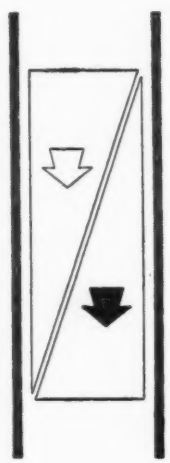

Pressure on top wedge (white arrow) binds wedges together in channel, locks device in position. Pressure on bottom wedge (black arrow) permits free downward movement. The converse is true for upward movement. This is the principle on which the 'Alomega' suspension works. The wedges are accommodated in the jambs of the moving sash, and the whole mechanism is completely enclosed.

Wedge-and-wedge suspension in place of sashlines-and-weights

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TYPE 34, 3′ 8⅜″ x 2′ 8½″	TYPE 44, 3′ 8⅜″ x 3′ 5½″
TYPE 15, 4′ 8¾″ x 1′ 2½″	TYPE 25, 4′ 8¾″ x 1′ 11½″
TYPE 35, 4′ 8¾″ x 2′ 8½″	TYPE 45, 4′ 8¾″ x 3′ 5½″
TYPE 16, 5′ 8¾″ x 1′ 2½″	TYPE 26, 5′ 8¾″ x 1′ 11½″
TYPE 36, 5′ 8¾″ x 2′ 8½″	TYPE 46, 5′ 8¾″ x 3′ 5½″

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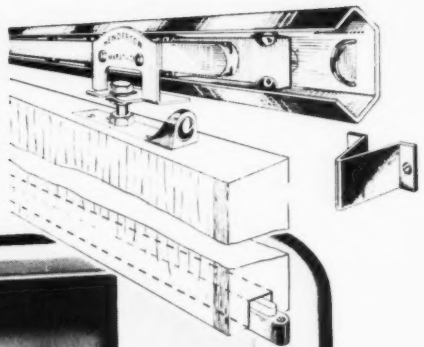

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THE ARCHITECTS' JOURNAL

No. 3255 Vol. 126 July 18, 1957

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NOT QUITE ARCHITECTURE

OXFORD CONFERENCE DIARY

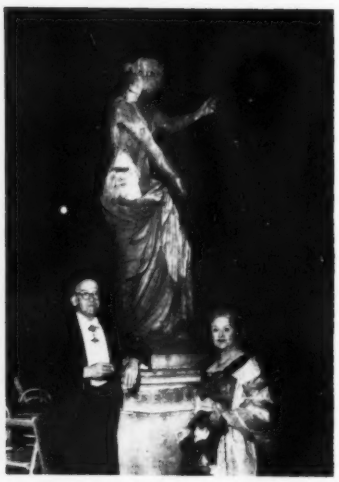
Wednesday, July 10, 10 p.m. Architects maddened by wine cup in Canterbury Quad, St. John's College, stole in sensuous search of moonlit madrigals in college gardens. 10.15 p.m. Harp and flute. Meanwhile bad light had spoiled play for job-hunting private architects (name badges of potential local-authority victims were unreadable). 10.30 p.m. Repeat of madrigals. 10.31 p.m. Repeat of wine cup. 10.45 p.m. More harp and flute. "Gluck," said a cultured city architect. "Don't drink it then," said eager little wife. 11 p.m. Oxford's hotels swamped by demands of hundreds of architects no longer thirsting for beauty.

*

Thursday, 9.45 a.m. "Finance, Design and Durability" at Playhouse Theatre: reported elsewhere. 3 p.m. Durability test at Trinity College garden party. To be proved, how long could 900 architects, wives and daughters foregather under one piece of soggy canvas? Rain spoiled play for private architects, who were unable to circulate freely in packed tent. Unconfirmed report says two were seen *talking to each other.* Official denial that rain percolated into tea urns.

*

7.45 p.m. Another durability test: Kenneth Cross, RIBA president, gave marathon performance to conference dinner guests.



Above: the Long Library at Blenheim Palace. Extreme left: the band and the first Duke of Marlborough. Left: C. H. Aslin, P.P.R.I.B.A., and Mrs. Aslin.

Account of recent world tour remarkable for wealth of detail. "Singapore was frightfully hot . . . We moved freely with the Chinese element . . . Must tell you how my bags went astray . . . Free drinks on the aeroplane . . . Arrived at Adelaide at 6 o'clock and thought it a good idea to go to bed . . . A waitress came to me after breakfast and said, 'Mr. Cross' (she had seen my name in the papers): 'Mr. Cross,' she said, 'I think we ought to have more houses.' This, I thought, was an encouraging sign." The President's world tour was so thoroughly reported that some guests were unable to sit it out. Mr. Steward Smith, president of the local association, made friends for life among those who stayed behind when he referred innocently to the adventures of Phileas Fogg. The occasion was also memorable for Professor Basil Spence's forlorn hope (in a good speech) that Oxford could be "the great leader of design and the great patron of architecture," and for witty remarks made by Sir John Wolfenden, vice-chancellor of Reading University. "Architecture," said Sir John, "is first of all a programme to enclose a certain amount of vacant space in an agreeable way—a considerable effort of the imagination."

*

Friday, 9.45 a.m. If a conference is a programme to enclose a certain amount of vacant time in an agreeable way, then this was no conference. But I trespass. The discussion on "Finance, Design and Durability," again held at the Playhouse, is reported in blissfully-condensed form elsewhere. 9 p.m. 1,300 architects, relations and friends gathered in a house which once caused a rift between architect and client. (The estimates were thrown out because of the continual bad weather, the difficulty of getting local materials and the removal of a subsidy from the Treasury.) The client was Sarah, Duchess of Marlborough, and the house was Blenheim Palace. The Ball that closed the conference in this great house was a triumph for the organizers—the Berks, Bucks and Oxon Architectural Association. As we hung our coats reverently in Sir Winston Churchill's birthplace, sipped champagne by the Siege of Bouchain, or dug (if I may say so) the hot clarinet under the tin organ pipes in the Long Library, we thought we were to sample that phenomenon known as "Gracious Living." But too soon came the need to investigate the food and the plumbing! The first was magnificent, plentiful and hard to get; the second was sparse and popular, and the terraces were floodlit. But what did we care?—there was positively no wine cup.

*

Saturday, 11.30 a.m. Architects seen entering a dim passage in the Cornmarket where a versatile firm deals with superfluous hair, moles, warts and feet. Much disappointed to find colleagues sitting above this establishment controlling superfluous feet with black coffee.

K. J. R.

The Oxford Conference platform. Left to right, John Eastwick-Field and Cleeve Barr, who gave two of the conference papers; E. Steward Smith, President of the Berks Bucks and Oxon Architectural Association; T. R. S. Boase, Vice-Chancellor of Oxford University; Kenneth Cross, President of the RIBA; C. D. Spragg, Secretary; Thomas Mitchell and J. L. Womersley, who gave the other two papers. The papers are summarized on page 92.

The Editors

MORE WORK FOR THE RIBA?

DESPITE its title,* the operative word at the Oxford British Architects Conference was MAINTENANCE and the dominating conclusion from the discussions was the need for systematic collection and exchange of information about it. Most of the speakers from the floor rose to air particular problems: bituminous flat roof coverings came under very heavy fire; the over-elaboration of costly safety devices in British lifts was contrasted with continental practice; the freedom of water undertakings to impose regulations was criticized and our taxation system was blamed for the penalties it imposes on the low-maintenance cost building. Many speakers mentioned the curious problems of glass curtain walling and produced conflicting opinions about the weathering properties of aluminium. Only one speaker called outright for a return to traditional methods.

But the real need, felt by everyone, was for information and guidance on the subject. More than one speaker, having heard someone else, got up to say that he had encountered the same problem and to ask whether we could not avoid the waste of the same lesson having to be learned over and over again. Others rose to appeal for guidance on what economic standards they or their clients should work to.

If the RIBA is to act on this conference, their task is clearly indicated. Perhaps the best suggestion was that the Allied Societies should begin to collect maintenance data from members, for the RIBA to pool and publish. But this again raises the problem besetting many RIBA Committees: who is to do the actual work? The answer to this is encouraging: The RIBA is advertising for an architect to be secretary to the Science Committee who will also be technical editor of the *RIBA Journal*. His plate will be full, but his chances boundless.

One footnote to the conference: For the first time a study group was held after lunch on the first day. All four speakers were present and about 40 or 50 delegates turned up. Discussion proved to be extraordinarily fruitful, but most valuable of all was the simple procedure agreed for the next day's three-hour meeting, which, in the event largely avoided the old difficulty of some aspects being neglected and others worked to death. Let us hope that next year the idea is extended.

* Finance, Design and Durability of Buildings.

RIBA Oxford Conference Papers

Finance, design and durability of buildings

We print below a report of the papers presented to the Oxford Conference by Thomas Mitchell, J. C. Womersley, Cleeve Barr and John Eastwick-Field on Thursday, July 11. Space precludes their reproduction in full, so we have selected those parts of each paper which either give new technical or cost information, or which present a point of view that seems to us fruitful. At the Conference each speaker read a short summary of his own paper. Following the papers we give a condensed account of the discussion.

Thomas Mitchell

Outlining the problem

Taxation

The taxation system in this country in many ways encourages cheap capital cost in new building and a deliberate acceptance of relatively high maintenance cost, particularly in the case of successful industrial and commercial concerns, because maintenance costs are an allowable charge against profits for taxation, whereas capital costs are not, except in the case of industrial buildings, which receive for taxation an initial allowance of 10 per cent. and an annual allowance of 2 per cent. of the initial expenditure, and agricultural buildings, which receive an allowance of 10 per cent. annually for ten years. The result is that the cheapest possible initial cost is pursued relentlessly in spite of the fact that the cost of servicing the capital invested by industry in building is sometimes small compared with other charges—labour, material and equipment.

In buildings outside the commercial category the cheapest initial cost is equally sought after for reasons which also arise from the fiscal policies of successive governments.

Building for universities, technical colleges, schools, hospitals, the armed forces, and many other categories all have to be paid for largely by taxation. Nobody wants higher taxation, yet we need more and more of many of these types of buildings: and so there is a constant pressure to build more cheaply.

House rents are paid for with the income that is left after taxation, and in this field one might expect to find the search for cheapness at its keenest, although since the upkeep of houses has to be paid for out of the same pocket, it would not be surprising to find equal keenness to design in such a way as to keep down maintenance costs, some striving to strike a balance. We may well find that even in this field cheap capital cost takes precedence over any but certain very well established maintenance considerations. Is this a sound overall policy?

Maintenance work

The building industry has a total labour force of 1,186,000. Of these, 327,000, equivalent to 27.5 per cent. of the total, are devoted to maintenance. Therefore there are 859,000 left for new construction.

We should not erect buildings in such a way as to use up in subsequent years a large building labour force to maintain them, and by so doing deprive ourselves of new construction. The new buildings so lost could contribute directly to raising the standard of living: but the maintenance work merely preserves the existing situation.

The Architect's brief

Should the brief from the client give some indication of acceptable maintenance costs? From published figures local authorities know for housing where the money they spend on maintenance goes, and no doubt many do also for other types of buildings. Has this affected their briefing? Should it? Clients are generally fairly clear about the accommodation they want, and are often very definite about wanting it as cheaply as possible. Yet there are many other matters on which architects require instructions.

Classes of durability

Now let us examine three commonly used phrases:

(*a*) The cheapest possible building.

(*b*) The 'temporary' building.

(*c*) The 'limited life' building.

We have all heard phrase (*a*) from our clients many times: in their minds, very often, intelligent though they may be, the phrase means exactly what it says. They are prepared to accept the cheapest possible price for a building of the physical dimensions required. Generally they are equally prepared to grumble afterwards if it does not perform as expected. The cheapest possible house, school, office, hospital, in literal terms, would simply involve depriving ourselves of the conveniences, comforts and amenities of today. There are no such structures. What we do commonly is to decide, sometimes arbitrarily, which of these conveniences, comforts and amenities we can afford.

The 'temporary' building is an equally nebulous phrase. Post-war prefabricated houses were considered temporary. How temporary were or are they in fact? Why were they considered temporary? Was it because the materials were:

(*a*) New in their application to houses?

(*b*) New entirely in building, and hence untried?

(*c*) Known that they would not prove sufficiently robust against user damage?

(*d*) Considered that their external appearance would gradually deteriorate to the point where it would be unacceptable?

I must leave others to pursue this.

The 'limited life' building conception might appear to differ little from the 'temporary' building, but that has not been the case so far as architects' thinking is concerned. It is a phrase which became current between the 1914 and 1939 wars and it has had a good deal of influence.

In the United States buildings are only reckoned to have a useful life of 30 or 40 years, and are then pulled down completely to make way for new buildings to suit new purposes. However, most of the American construction was built in no less permanent a manner than any similar buildings erected in this country during the same period. The American buildings had been financed in such a way that the original capital had been redeemed, and once that was done in a country with a buoyant economy, in some cases pulling down and rebuilding offered fresh and increased opportunity for profit, especially when land values had risen, or, where changing need occurred, it was simply cheaper than alteration.

Without going into any financial calculations at all it would be agreed that a building, designed to last 40 years, if such a thing were possible, could not be built for half the cost of a similar building designed to last 80 years, and that in the second 40 years of the life of the 80-year building the renewal of parts incapable of being made to last 80 years—such as boilers—would be much less than the cost of a new 40-year-old building.

Further, as far as commercial building is concerned, renewals in the 80-year building, excluding any element of improvement, would be allowable for taxation relief. In many types of buildings flexibility to enable alteration for changing requirements is a much more practical aim economically. The idea, however, seems to have had some influence on a very important national building programme—that of schools.

The Board of Education publication *Suggestions for the Planning of new Buildings for Secondary Schools*, 1937, ch. IX said: '. . . it is not economical to build schools of a more substantial character

than is necessary to resist the weather and the hard wear to which they are subjected, or so solidly that they cannot be adapted to meet the possible changes in the requirements of Education'.

The Board wanted buildings which would not last as long as older schools, yet it seemed reluctant to pay any less for them unless the savings would pay for any additional maintenance costs arising from lesser durability. It seemed to want to encourage architects to use novel materials and methods of construction, and had freed school buildings from local bye-laws for that purpose. And it wanted adaptability, which normally means higher initial cost. This gave architects what, for the time, was a remarkable freedom in design. Post-war shortages of building labour and materials gave them a further incentive to explore new building systems so as to utilize tradesmen and material, not up till then normally employed on building, to prefabricate components which could be erected quickly.

Durability

There is a Code of Practice on Durability. The British Standards Institution say it is not a best seller. It is an admirably concise document, somewhat like a dehydrated vegetable. As in many documents, the greater substance is in the appendices, which give an invaluable check list for the causes of deterioration of buildings and their installations. I suppose it is ten years since the drafting of this Code began. It will be interesting to see whether the Conference will reveal sufficient advance in knowledge to justify a revision of Chapter IX. On this point we are frittering away our chances of accumulating knowledge of real value by failure to establish a continuing and comprehensive national study of durability. Mr. Hope Bagenal has made a plea for this.

Calculated economic life of components

W. J. Reiners gives a formula to determine the economic life of short-lived materials compared with traditional materials of theoretically unlimited life:—

$$L = \frac{\log C_1}{\log (C_1 - C_2)} \Big/ \log (1 + R)$$

where L = economic life of the short-lived material;

C_1 = initial cost of traditional material of unlimited life;

C_2 = initial and replacement cost of the new material (assumed less than C_1);

R = rate of interest.

According to this formula, if the rate of interest is taken as 5 per cent., if a new material showed a saving of 10 per cent. in initial cost its economic life would be 47 years, for 25 per cent. saving 28½ years, and for 50 per cent. saving 14 years. It may be premature to ask manufacturers to add this information to their data sheets.

Mechanization of maintenance

In buildings, even with current design, major repair and replacement can sometimes be carried out with at least the same degree of mechanization as the original job although removal of the perished material or components may often be much more labour consuming. We must, therefore, try to eliminate what I have called jobbing maintenance and to design so that replacement can be carried out as easily as possible, with maximum mechanization and with the minimum amount of site labour. The pattern of labour in the building industry will probably force the pace of this process. The pay, status, and working conditions of building labour are likely to continue to improve. This will make the labour content of maintenance work more costly, and will reduce the difference in winter working conditions between new building and work on existing buildings. The latter is sometimes said to be one inducement for older men to turn to maintenance work during the winter months, another being that it gives them a greater opportunity to exercise craft skill.

Even under present conditions, however, it would seem that what most men of all ages want is a high pay packet from overtime or bonus or piecework rates, and the pressure for this is often greatest before Christmas. On this score alone some builders report difficulty in attracting suitable men for jobbing maintenance work.

Further, it will become increasingly difficult to get the type of craft skill needed for this sort of work. Training in the building industry must be primarily for new construction, and that means training for increasing mechanization and diminution of the labour content in erection. In all trades a new type of operative will tend to emerge.

Unit replacement

There is some scope in buildings for the technique of replacing complete units rather than individual components, just in the same way that with motor cars the major overhaul of engines in local garages has given way to the fitting of factory reconditioned engines. The packaged boiler unit for buildings is a step in this direction.

Accessibility for maintenance

This leads to the consideration of accessibility for maintenance. Internal accessibility, particularly in relation to services, is well enough understood, but not always practised. Much more thought is needed to give us buildings which are not festooned with pipes and wires, but in which these pipes and wires can be renewed when necessary without tearing down parts of the fabric or finishings. Few of us can say we have found an answer for every occasion. External accessibility does not always receive the thought it deserves, perhaps because it can raise such awkward problems. Very notable attention has been paid to it in some important buildings in recent years: generally, however, I suppose few architects could say that they subjected every building on their drawing boards to a scrutiny on this score, and made sure that every part which might require attention could be reached by means commensurate with the cost of repair or replacement of the part affected.

Probably a great majority of buildings have lurking somewhere on the outside a potential £5 maintenance job which requires £50 worth of scaffolding or tackle to reach it, or a piece of painting whose renewal cost is out of all proportion to its æsthetic contribution. We must try to get rid of these. The discipline to design which this involves will often be irksome. We shall find ourselves faced not only with decisions involving the weighing up of capital cost, and ingenuity in construction, but also with important appearance problems.

J. L. Womersley

Structures

The relationship of capital and maintenance costs

In seeking to throw light on this problem one is very soon faced with the fact that there is a singular dearth of scientifically collated data in regard to maintenance costs. Few property owning bodies have apparently found it desirable to analyse maintenance items as a whole in such a manner as to form a reliable guide to the design of future buildings. Local authority housing seems to be an exception, however, as the Institute of Municipal Treasurers and Accountants periodically publish detailed information on maintenance costs in relation thereto. From this and from other information collected from local authorities direct by the Building Research Station, Mr. W. J. Reiners, on behalf of the Station, has written a valuable paper on "Maintenance Costs and Economic Design."*

Two tables in Mr. Reiners' paper are of particular significance. Table 2 brings out the important fact that, so far as housing is concerned, maintenance of the structure is the lowest of all the capitalised maintenance items in terms of a percentage of its own initial cost, being only 5 per cent. as compared with 33 per cent. for heating, cooking and lighting and 100 per cent. for external painting.

Whilst the absence of corresponding figures for different types of buildings is unfortunate —it should be quite possible to compile

* *The Chartered Surveyor*. September, 1956.

Table 1: Equivalent Capital Cost of £1 Maintenance Cost per annum

	Rate of interest		
Duration of life	*4½ per cent.*	*5 per cent.*	*6 per cent.*
	£	£	£
20 years	13·0	12·5	11·5
40 years	18·4	17·2	15·0
60 years	20·6	18·9	16·2
999 years	22·2	20·0	16·7

Table 2: Components of Maintenance and Initial Cost in Local Authority Housing

	Maintenance cost				*Maintenance as percentage of initial cost*
	Annual	*Capitalized**	*Initial cost*	*Total cost*	
	£	£	£	£	
Water service	1·90	42	50	92	84
Sanitary fittings	0·50	11	50	61	22
Heating, cooking, lighting	1·50	33	100	133	33
Internal structure and finishes	1·50	33	500	533	7
Main structure	1·15	26	500	526	5
External services and site works	0·90	20	100	120	20
External painting	3·55	80	80	160	100
	£11·00	£245	£1380	£1625	

* Conversion factor 22·2 (see Table I).

Table 3

Job	*Brief specification*	*Price per yard super of cladding (as at April, 1957)*
		£ s. d.
1. Comprehensive School, London 4 storeys	Panels between structural frame formed with precast concrete posts and steel angle ties; hardwood windows with metal opening lights; 32-oz. glass; below sill 4½-in. brick wall in facings and 3-in. clay blocks plastered and painted internally	4 19 0
2. Technical College, Yorkshire 4-storey block	Panels between structural frame formed with precast concrete posts and hardwood framing; hardwood double hung sashes; 32-oz. glass; below sill clear glass backed with 3-in. concrete block colour-rendered on one side and plastered and painted internally	6 4 0
3. Technical College, South Wales 4-storey block	Panels between structural frame with precast concrete posts and steel angle ties; hardwood windows with hardwood opening lights; 32-oz. glass; below sill precast concrete slabs and 3-in. clay blocks plastered and painted internally	7 1 0
4. Technical College, Yorkshire 10-storey block	Aluminium curtain walling, half 32-oz., half ¼-in. polished plate; below sill wired glass backed with 3-in. concrete blocks colour-rendered one side and plaster on "Newtonite" and paint the other	10 18 4
5. Airport	Steel mullions and top and bottom rails, infilling timber frame with fixed glazing and opening lights in metal	11 15 0

Per Messrs. Yorke, Rosenberg and Mardall.

Table 4

Job	*Brief specification*	*Price per yard super*
		£ s. d.
1. Office block, London	9,030 ft. super of walling, comprising aluminium framing, steel sashes and "Vitroslab" infilling	9 4 6
2. Office block, London	10,140 ft. super of walling, comprising steel framing and sashes and "Vitrolite" infilling	11 5 0
3. Seamen's Home	25,565 ft. super of walling, comprising steel framing and sashes, with 15 per cent. insulated "Decoplast" infilling and 85 per cent. "Vitroslab" infilling	10 16 0
4. Laboratory	8,950 ft. super of walling, comprising aluminium framing and sashes and insulated "Holoplast" infilling	11 14 0

Note: Job No. 1 is a standard manufacturer's framing with only minor modifications. The remaining jobs are purpose-made.

Per Messrs. Gollins, Melvin, Ward and Partners.

Table 5

(A) Pitched roofs, 21 ft. span	*Cost as a percentage above basic*
(*a*) Basic construction T.D.A. roof trusses to 35° pitch at 6-ft. centres, 9-in. × 3-in. purlins, 3-in. × 2-in. rafters, 7-in. × 2-in. ridge, 4-in. × 3-in. plate, 5-in. × 2-in. ceiling joists covered with 1-in. fibre-glass. Roof covered with hand-made sand-faced pantiles on battens and felt, with 9-in. projecting eaves, boarded on soffit	Basic
(*b*) T.D.A. roof trusses to 20° pitch at 2-ft. centres covered with three-layer built-up bituminous roofing on 2-in. straw slabs, in lieu of basic traditional construction	+17%
(*c*) T.D.A. roof trusses to 20° pitch at 6-ft. centres, rafters, purlins, and 22-gauge patent aluminium roofing and battens, with 1-in. fibre-glass over ceiling joists instead of basic traditional construction	+30%
(*d*) As item (*c*) but 1-in. boarding in lieu of battens and covered with 14-gauge zinc roofing instead of aluminium	+37%
(*e*) As item (*c*) but 1-in boarding in lieu of battens and covered with 24-gauge copper roofing instead of aluminium	+75%
(B) Flat roofs, 21 ft. span	
Roof designed to take 20 lb. per sq. ft. superimposed load and point load of 220 lb. on any one place: (*a*) 8 in. × 2 in. timber joists at 24-in. centres, No. 2, 8 in. × 6 in. steel beams, 2-in. wood-wool and 2-in. minimum vermiculite screed laid to falls, painted plywood fascia, three-layer built-up bituminous roofing finished with mineral chippings	+28%
(*b*) In-situ reinforced concrete roof slab spanning between reinforced concrete beams and with upstand all round to form fascia, 2-in. minimum vermiculite screed laid to falls, three-layer built-up roofing as Item (*a*)	+29%
(*c*) As Item (*b*) but finished with ¾-in. mastic asphalt to B.S.988	+37%
(*d*) Patent steel decking spanning 12-ft. between 8-in. × 6-in. steel beams and covered with 1-in. insulation board, three-layer built-up bituminous roofing as Item (*a*)	+65%
(*e*) As (*d*) but patent asbestos cavity decking covered with ½-in. insulation board and three-layer built-up bituminous roofing as Item (*a*)	+71%
(*f*) As Item (*d*) but patent aluminium decking	+95%

Data supplied by Stillman and Eastwick-Field, Architects, and Harry Trinick and Partners, Quantity Surveyors, from ARCHITECTS' JOURNAL of October 25, 1956, and January 24, 1957.

figures for schools, for example—the significance of the housing figures for other buildings having a similar type of structure should not be overlooked.

Light-weight claddings

Even the traditionalist today has to admit that economic circumstances preclude him from using load-bearing walls for the majority of buildings over four storeys high. Thus if he wishes to reproduce the "holes in the wall" type of fenestration he has to do so by clothing his steel or concrete frame with large areas of stone or brick which, though much thinner than if they were load-bearing, are nevertheless quite heavy. The steel frame has to support them and the foundations have to carry the lot.

Tables 3 and 4 on the left give some recent prices received for various types of cladding and show that brick infilling is about half the cost of many of the other materials. Nevertheless, despite the present cost disparity, there is little doubt that the manufacture and use of dry factory-made panels will continue.

Roofs

There is a wealth of experience to show that for buildings which can be adequately planned in simple rectangular shapes of moderate span, the most satisfactory roof is the pitched roof of slate or tile. It is the cheapest of the 'permanent' roofs in both capital and maintenance cost. This indicates that the profession is not nearly so sensitive to cost as it thinks it is and that it must analyse its reasons for selecting other types of roof far more carefully than it has been doing in the recent past. Table 5 which follows gives the percentage increase in the cost of roofing a simple rectangular building by means of various types of sheet materials over and above the cost of a well-insulated roof of hand-made sand-faced pantiles.

A. W. Cleeve-Barr

The services

The services, as we know them, are still comparatively new elements in building, and, in regard to materials and to technologies even, they are still developing rapidly, in common with the electrical, chemical and mechanical engineering industries to which they are closely related. By new, I mean that most services are products almost of the last century—if we disregard the rudimentary forms of heating and drainage in use in ancient times—and, as for still developing, one has only to think of radio-diffusion, television, refrigeration, built-in vacuums, refuse comminutors (or insinkerators?) to wonder what is coming next. This 'marvel of the age' aura with which engineers, and the public, like to invest their playthings reflects an attitude of mind which never sees the services as *part* of a building.

Table 6: **Percentage of Capital Cost represented by the Services in Typical Building Types (excluding site works other than drainage)**

Services	*Small house*	*4-storey maisonettes*	*11-storey maisonettes*	*Schools primary and secondary*	*11-storey office blocks*	*Hospital ward units*	*Research laboratories*
	per cent.	per cent.	per cent.	per cent.	per cent. (*f*) (*g*)	per cent.	per cent.
Heating	4·1(*a*)	3·0 (*a*)	13 (*b*)	10 (*p*)	7 13	7 (*e*)	13 to 23 (*c*)
Hot water	2·2	3·3					
Mechanical ventilation	—	—	1·0	0·1	—	—	
Cold water	0·8	2·2	2·3 (*h*)	1·7			
Sanitary fittings	3·6	5·3	4·0	1·8	5 5	7	15 (*d*)
Sanitary plumbing	1·1			0·3			
External plumbing	2·3						
Gas	1·0	0·5	0·4	0·1	— —	—	—
Electrics	3·3	3·7	3·0	4·5	7 8	6	8
Lifts	—	—	3·3 (*j*)	—	5 7	—	—
Miscellaneous	2·0 (*m*)	1·0 (*l*)	3·0 (*k*)	—	— —	—	—
Drainage	3·6	1·0	1·0	2·5	1 1	2	4
Tota	24·0	20·0	31·0	21·0 (*n*)	25 34	22	40 to 50

Notes: (*a*) Open fires and flues. (*b*) Central heating; proportion is 6 per cent. if fires and flues only. (*c*) Higher figure including full central heating plenum and ventilation system, fumes extracts, constant temperature rooms, etc. (*d*) Cold water, compressed air, chemical plumbing, etc., also includes 9 per cent. for laboratory fittings. (*e*) Includes percentage central boiler-house. (*f*) A block with average standards. (*g*) A deep block with full air-conditioning and mechanical ventilation and very high standards. (*h*) Internal bathrooms and w.c's. (*j*) Assuming 80 dwellings per two lifts. (*k*) Laundry 2 per cent.; refuse chutes 0·7 per cent. (*l*) Refuse chutes. (*m*) Fuel store, dustbin and enclosure. (*n*) From published analyses there seems to be no great difference between primary and secondary schools. In both classes the total proportion of services varies from 17 to 25 per cent. (*p*) Ministry of Education Bulletin No. 13 gives a range in actual installations of from 5 to 15 per cent. of total cost.

The following is a short list, by subjects, of most of the services, some of which are not mentioned in the above table. This does not include factory or works processes, petrol and oil supplies, etc.:

Heating
Hot water
Ventilation
Air conditioning
Steam
Compressed air, etc.

Water supply
Sanitary plumbing
Rain water
Fire mains
Drainage

Electric lighting
Electric power
Lifts
Lightning protection
Conveyors
Telephones
Radio and television
Alarm systems
Other telecommunications

Gas
Refrigeration
Sprinklers
Refuse disposal
Incinerators

Table 6 shows a list of the most usual services in buildings and, in parallel columns, the percentages of capital costs which these services represent in various typical building types. It will be seen that the total proportion of capital expenditure represented by the services varies from around 20 per cent. in low-storeyed residential and educational buildings to as much as 50 per cent. in some kinds of laboratories. These figures include, so far as I could isolate them, only the cost of the service installations themselves.

It will be seen at a glance how few of these services were available in buildings fifty to a hundred years ago. When people decry, in a general way, the continuous rise in the cost of building, it should not be forgotten that the character of buildings in themselves is continually changing. It is the services which are responsible for by far the largest percentage increase in the cost of buildings. The question is, are we now spending too much on the services relative to the amenities they provide? Now that we have at last begun to talk about cost planning at the design stage—and a few even to practise it—are we spending too much on boiler-houses and plumbing, and too little, for example, on finishes which are all too easy to strike out at the last moment? I have a hunch that we are. I cannot prove it.

There is a strong prima facie case from the Ministry's own figures that many heating installations in schools have not received the same cost pruning as other elements. The wide range in capital costs, from 5 to 15 per cent. of the total cost of the building (Table 6), for school heating designed to prescribed and common standards, is unlikely to be accounted for entirely by differences in plan shape, structural form, U-values and so on. This is borne out by the fact that in such schools as have been directly cost-planned by the Ministry or by local authorities in association with the Ministry—where the engineer has been given a target to work within—the costs of the heating and hot-water services have been brought within the lower half of the national range, without sacrificing standards or controls. It would be interesting to know in more detail how this has been achieved.

Integration of services with structure accessibility

As important as economy in the specialist installation itself, is the problem of its integration with the design of the structure. So far as access is concerned I am convinced that all too much money is wasted on elaborate provisions which are rarely used, and that if money has to be saved initially we can save it here and risk having to spend it to dig things up when a failure occurs. Having said that, let me hasten to add two points. First, obviously one has to use common sense in this matter and access must be provided wherever it is likely to be frequently required (even once every five years is frequent). Secondly, where access is not provided, positive precautions against damp, corrosion, leaks, expansion and sources of trouble must be taken.

In long, spread-out, horizontal buildings—some schools, hospitals, offices and other building types—the traditional basement crawl-way for heating pipes is frequently a waste of money. Not only does it add enormously to the cost of building but it adds considerably to site difficulties and to the time taken in construction. It also often fails in its purpose either due to difficulties in damp-proofing and ventilation, or because the floor above it has to be taken up anyway if major repairs have to be undertaken. Two architects have told me how, by re-designing heating systems for schools with surface boiler-houses in lieu of sunken ones, and by substituting overhead pipe runs with false ceilings, in lieu of floor ducts, they have saved over 1 per cent. (over £1,000 in a £100,000 school) on the total cost of the building. Below ground ducts of all kinds, accessible or otherwise, appear to be a frequent source of maintenance trouble. Elaborate precautions made for the replacement of heating systems (as of electrical and other services) are unwarranted, if it is likely that the operational life of the building, as well as of the installation, will have largely changed in, say, 30 years' time—and, looking back, this has so often been the case in buildings of the last generation.

Wiring and accessories

Big advances have been made in recent years in electrical wiring and in the design of many accessories. For many years electrical wiring generally has been regarded as a material with a short life, say 20 to 25 years maximum, on account of its rubber insulation which in time becomes brittle and certainly perishes rapidly in damp or very hot conditions. To permit complete renewal of the installation, electrical wiring is therefore normally run in accessible voids (timber floors, or false ceilings) or in metal conduit (in masonry walls or concrete floors). The development of mineral-insulated, copper-sheathed wiring, which is flexible, strong and as permanent as any building structure, has been a great step forward. This is now competitive in price with wiring in heavy-gauge screwed conduit, and in some cases even with light-gauge brazed conduit. Electrical conduit in concrete floors has frequently been a great nuisance during construction, interrupting the sequence of trades, never shown on drawings and following no known course, and all too often filling up with water or condensation and causing corrosion.

I have been apprehensive that in a few years' time post-war houses and flats will need to be re-wired to cope with the ever-

increasing load. My authority makes provision for 10 kilowatts per dwelling, and I am told that this should cover all foreseeable needs, even say a considerable extension of electrical water-heating or space-heating, since the diversity factor is very large.

Advances in the design of accessories include better looking and more durable switches, with fewer moving parts, fused plugs and 13 amp. switched socket outlets with insulating shields which cover the live sockets when the plug is withdrawn. Unfortunately these design improvements have not yet spread to pendant twin-flexes nor to lampholders. My authority approves four makes—of the kind which is interlocking so that the whole thing does not come apart in the hands when a shade or bulb is replaced—but even so they still have 'Bakelite' rings and sockets (brass-lined). Is this the sort of thing that the RIBA representatives at the BSI could make a really big fuss about?

Lifts

On the subject of lifts, these are relatively such expensive pieces of equipment, both to install and maintain, that a first consideration is to site them so that the maximum economic advantage is obtained from their use, consistent with maintaining the necessary standard of amenity. In multi-storey housing, for example, the standard 100 feet per minute lift installation costs of the order of £2,500 for a five-storey block, £3,000 for a ten-storey block, plus at least 100 per cent. addition for the enclosing shaft, foundations, motor room, and so on. One has only to divide these figures by the potential number of dwellings served per lift to realise their significance. The cost per flat in a five-storey staircase-access block (ten dwellings) is, say, £500. In a five-storey balcony-access block (say thirty dwellings) the cost will be only £166. The difference, some £333, represents roughly the difference in cost between these two conventional types of dwelling.

On the other hand, one must add a warning against taking this particular kind of economy in planning too far, and note that above six storeys in height the Ministry has always and still does recommend the provision of two lifts as a necessary amenity because of the considerable percentage of time during which each lift is out of use for servicing.

On a typical housing estate the lifts are serviced once a fortnight, and in addition breakdowns occur which average at least once in six weeks per lift. This in spite of the fact that over the past ten years the whole subject has been exhaustively studied by engineers to render lifts as fool-proof and maintenance-free as possible. The cost of maintenance (excluding current consumption) is around £55 per year per lift, and some 50 per cent of this is due to misuse. There is something about unattended lifts which seems to bring out the very worst responses from suffering humanity. I only mention the matter here as an extreme example of avoidable maintenance, which, apart from doubling the annual maintenance expenditure, is itself a reason for duplicating the initial service, and therefore of doubling the capital cost in blocks over six storeys in height.

Water services and sanitary plumbing

I have already referred to the problem of burying pipes and to the fact that not only can a building be made to look a lot tidier, but that useful capital economies can be achieved if removable access covers are restricted to a minimum. Provided that precautions are taken against freezing, and against corrosion, there would seem to be no good reason why copper pipes for cold water supplies, once tested, should not be covered up and expected to last out the life of the building. Protection against corrosion is, however, vital and a most important factor is to avoid damp.

Drainage

The Report of the 1954 Joint Committee* on this subject is interesting: 'A more scientific approach to design is leading to an increase in the numbers of connections which can be made to 4 in. and 6 in. pipes; figures as high as 20 houses to one 4 in. pipe laid at 1 in 70 and 64 houses to one 6 in. pipe being given. At the same time economy is being effected by the use of flatter gradients than those obtained by "rule of thumb" method . . . It is recognised that the planning of manholes needs careful consideration, and that their numbers can be reduced without impairing working efficiency, rodding-eyes being frequently adequate for normal maintenance. The use of intercepting traps (except in special circumstances) is becoming generally less, and some 70 per cent. of local authorities do not use them in new work . . . blockages (are) more frequent where interceptors are used, and do not increase in number merely as a result of using flatter gradients . . .'

The same report reveals that the main causes of blockages in drains, the removal of which costs the local authorities some £500,000 a year, are: sanitary towels (37 per cent), newspaper (23 per cent), rags (11 per cent)—not to mention roller-skates, bottles and bones. At the present time incinerators with flues costing many hundreds of pounds are being installed in blocks of flats which have no open fires, for the disposal of sanitary towels—whereas in America, I understand, the only kinds of towels available are soluble types, which can be disposed of through the ordinary drainage system. The author mentions this problem only because it is one of a number of instances in which low standards of social behaviour are directly responsible for avoidable expenditure in building. Pitch-fibre pipes offer considerable capital economies, plus the advantages of very rapid laying and of enabling drains to be laid and tested and the trenches backfilled the same day. Unfortunately, the cost of junctions and fittings in pitch-fibre, which are still at an early stage of development, is prohibitively expensive. Using a combination of pitch-fibre for long runs and stoneware for branches and fittings, at least a 5 per cent. saving can be achieved in the drainage costs of a typical school.

*Obtainable from the Institute of Public Health Engineers.

Refuse disposal

This is a service which, as a result of the inability of municipalities generally to spend more money on it, and of the failure of architects and engineers to produce a better but more economic alternative, is a disgrace. The dry chute system in blocks of flats, and dustbins in high-density terrace housing, with once-weekly dust-cart collection, are really unworthy of the standards of design, and hygiene, and engineering skill which go into all other aspects of residential building. A few progressive authorities have adopted the water-borne Garchey system for multi-storey flats, at an additional capital cost of the order of £80 a dwelling (1s. 9d. per week at present interest rates), but what the saving is in terms of dust-cart collection I do not know. The point is for how many years hence are we to go on with the dust-cart system; what work is going on and how as architects can we help to develop cheaper but more hygienic methods of converting household refuse into waste, for disposal simply through the ordinary drains or by other means?

Architect-engineer collaboration

Instance after instance has been quoted to me, in relation to the work of the best London consultants' offices, where at design stage the consultant has had only the haziest notion of the space to be occupied by the services, of the depths and widths of ventilation trunking, of the sizes of pipes, or of radiant panels, or how much space the various services will occupy at bends, crossing over each other or passing from a hollow floor space to a vertical duct. I quote from one such instance. 'The consultant first said, when asked, that 2 in. clear depth below beams was quite enough—so I allowed him 6 in. When detailing had proceeded some way this was proved insufficient and he asked for 8 in. as an absolute limit—so I allowed him 12 in. The final chapters have still to be written.'

Again, mechanical and electrical engineers seem to find it extraordinarily difficult to understand the problems of architecture and building. As a friend of mine said recently after a bitter experience: "Detailing, as the architect understands it, is not in the consultant's vocabulary." Most consultant services are largely covered by $\frac{1}{8}$ in. scale diagrammatic drawings up to contract stage, and thereafter by sub-contractors' drawings or by working things out on the site. All too often, in spite of the utmost pressure by the architect, large-scale details are never prepared, and work goes on from hand to mouth—"verbal drawings."

J. Eastwick-Field

Finishes

The expenditure by the MOW in a typical year on all aspects of maintenance of buildings in their charge is £13½ million. Builders' maintenance, including cleaning, amounts to £8½ million, of which £2 million is spent on repainting. The Eastern Region of the British Railways spends a total of £1,500,000 on general building maintenance, of which £350,000 is accounted for by painting, that is about one-fifth.

When Wilkins designed St. George's Hospital at Hyde Park Corner in 1827 and faced it with stucco, he will not have foreseen that by 1957 it would be costing its owners an average of £1,500 annually to keep the outside in good decorative repair.

In the Report of the Committee of Enquiry into the cost of House Maintenance we find (Table 7) that painting accounts for about twice the cost of any other item of maintenance, and that the index for the increase in cost of materials between 1939 and 1953 is higher for those associated with decoration than with any other trade except carpenter and joiner.

To show the variation in cost due to the amount of painting to be done, I quote average costs given to me for exterior redecorations over the past seven years related to the number of flats at various properties:

Pinner ... 48 flats. £14 0*s.* 0*d.* per flat
Muswell Hill ... 27 flats. £4 0*s.* 0*d.* per flat
Kensington ... 87 flats. £8 0*s.* 0*d.* per flat
Shepherd's Bush 70 flats. £5 0*s.* 0*d.* per flat
Brighton:
Astra House 61 flats. £8 5*s.* 0*d.* per flat
Brighton ... 123 flats. £27 0*s.* 0*d.* per flat. (Here the whole of the exterior walls also had to be painted.)
Hove ... 31 flats. £16 0*s.* 0*d.* per flat.

To show the variation in the periods between painting, I quote figures collected by J. Stillman in 1952 from a number of authorities responsible for the redecoration of schools:

County	*Internally*	*Externally*
North Riding of Yorkshire	5 years	4 years
...	8 years	4 years
Surrey ...	8 years	4 years
Middlesex ...	7 years	5 years
Hertfordshire	6 years distemper	6 years
L.C.C. ...	12 years paintwork (washed after 6 years)	

I imagine it is unlikely that there will be any startling improvement in durability of paint, but since cement paint is reputed to last as long as oil paint in such places as it is appropriate, it would seem to offer considerable savings. Comparative costs for redecoration in oil and cement paints, including average preparation, are:

Two coats oil paint ... 5*s.* 8*d.* yd. super
Two coats cement paint 1*s.* 9*d.* yd. super
Scaffold for each ... 4*s.* yd. super

Stove enamelling, which has been tried on metal windows, for instance, and on some curtain wall panels, can only give a longer initial life and eventually needs repainting.

Aluminium and hardwood windows

The corrosion of aluminium is not serious like the rusting of steel, but the metal does not remain in its pristine state without constant cleaning. At one public building 'maintenance free' aluminium costs over £1,000 annually to keep clean, as much, in fact, as the cost of cleaning the glass. Anodising delays the formation of the *natural* oxide film and makes it more regular, but needless to say it puts the cost up. The extra on a figure of, say, £52 11*s.* 3*d.* for five windows in mill finish would be £7 17*s.* 6*d.*, showing an increase of about 15 per cent.

Before leaving the subject of metal windows, I must refer to the resistance to corrosion which has been shown by unpainted galvanized steel windows. If one considers their appearance acceptable, and they prove to have the life that experience of them in some of the sea coast forts would indicate, they would save much maintenance. They are at present being tried for this reason by the British Railways. We must all have wondered at some time or other whether hardwood windows would not really be more economical than painted softwood. Tender figures for the windows in a factory/office block were recently obtained for comparison, the sections being exactly the same for hardwood and softwood, and they are quoted below:

Softwood (primed and painted two undercoats and one finishing coat) £2,441 13*s.* 0*d.*
Hardwood (oiled):
Agba ... £2,073 6*s.* 0*d.*
African Mahogany ... £2,192 7*s.* 6*d.*
Teak ... ... £2,875 13*s.* 6*d.*

It would seem that hardwood can sometimes be cheaper in *first* cost than painted softwood, but the more usual experience is that whilst it is initially more expensive, one is left wondering, other things being equal, whether the saving on maintenance would justify the extra. Here is a hypothetical example:

A window 2 ft. × 3 ft. in 2 in. moulded sash in 1 square:
6 ft. super at 8*s.* 5*d.* ft. su. for *hardwood* (oak) = 50*s.* 6*d.*

Table 7 showing Typical Sub-division of House Maintenance Costs in 1939 and 1953

Trade group	1939 *sub-division of cost*				1953 *indices* (1939=100)		1953 *sub-division of cost*			
	Labour (including on-costs)	*Materials*	*Total labour and materials cost*	*Trade totals as percentage of total cost*	*Labour*	*Materials*	*Labour (including on-costs)*	*Materials*	*Total labour and materials cost*	*Trade totals as percentage of total cost*
(1)	(2) £	(3) £	(4) £	(5) per cent.	(6)	(7)	(8) £	(9) £	(10) £	(11)
Painter, decorator and paperhanger	31·4	11·6	43	43	318	300	99·8	34·8	134·6*	42·6
Plumber, gasfitter and smith	16·4	7·6	24	24	318	290	52·1	22·0	74·1	23·5
General labourer, bricklayer, paviour, roofer, plasterer and fencer	13·2	3·8	17	17	318	260	42·0	9·9	51·9	16·4
Carpenter and joiner	10·5	3·5	14	14	318	460	33·4	16·1	49·5	15·7
Electrician	1·5	0·5	2	2	318	250	4·7	1·2	5·9	1·8
Total	£73	£27	£100	100	318	311	£232	£84	£316	100
Percentage of total cost	73	27	100				73·4	26·6	10	

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* At May, 1957, this figure would be equivalent to £150·8.

Table 8

Type of finish	*Initial cost per sq. yd.*	*Ministry of Works*			*Factories Act*, 1937		
		Frequency		*Maintenance cost per sq. yd. per annum*	*Frequency*		*Maintenace cost per sq. yd. per annum*
		Redecoration	*Wash*		*Redecoration*	*Wash*	
		Years	Years		Years	Months	
Oil paint	5s. 6d. (primer and 3 coats)	8	3 and 6	6¼d. (2 coats)	7 years	14	10d.
Emulsion paint	2s. 1½d. (2 coats)	8	3 and 6	5¼d. (2 coats)	7 years	14	9d.
Washable distemper	1s. 3d. (2 coats)	4	Nil	4½d. (2 coats)	14 months	Nil	1s. 3½d.
Limewhite	7d. (1 coat)	4	Nil	2½d. (1 coat)	14 months	Nil	8½d.

6 ft. super at 2*s.* 8*d.* ft. su. for *softwood*	= 16*s.*
1st painting (inside and outside) at 8*s.* (including preliminaries and overheads)	= 8*s.*
1st, 2nd, 3rd and 4th repainting at 6*s.* 8*d.* (prepare and paint two coats)	= 26*s.* 8*d.*
	50*s.* 8*d.*

Cleaning

Washing limestone costs about 9*s.* per yd. super, of which scaffolding accounts for no less than 4*s.* yd. If cradles are used instead of scaffolding their hire and erection cost about 1*s.* 3*d.* yd.; but if cradle fixings and track were provided a further reduction in the charge could be made. It would seem to be well worth while to provide fixings in view of the fact that in industrial cities the frequency of cleaning is likely to be at about five-year intervals for stone and brick buildings.

The Building Research Station is conducting investigations into the long-term durability of a number of selected buildings put up in the last 20-30 years and in their reports have shown that the difficulty of access has often led to damage which might otherwise have been discovered, and to the omission of redecoration because of the high cost involved of erecting scaffolding. If the means of reaching the building were made easier there would obviously be a saving not only on washing but also on painting and on incidental repairs.

The particular work being done by the Building Research Station to which I have referred is, in my opinion, of very great interest and importance and the results ought to be made known as soon as possible.

Window cleaning

Charges for window cleaning are assessed for each building individually and are governed not only by the area but also by the difficulties and the risks involved in doing the work. Window cleaning can involve large expenditure and in buildings such as the Festival Hall costs over £1,000 annually. School windows are usually cleaned once a term, but glass curtain-walled buildings may need cleaning six times a year. It is the view of the window cleaning companies and, I believe, of the authorities concerned with the legal implications, that architects and window designers will need in future to be more conscious of the window cleaner's lot and to try to make it easier and safer and incidentally, therefore, cheaper. I think the problems of window cleaning affect the design of a building and the cost of its upkeep enough to make it worth while quoting the answers to some questions I asked a leading firm of window cleaners:

1. To what height is it practicable to clean from ladders and what is required to lean the ladders against?

A reasonable height is 25-30 ft., although it is possible to work up to 45-50 ft. There are many disadvantages to this method. Often it is necessary to have one man 'footing' the ladder; three- or four-part ladders require special operatives—and this increases cost. Strong winds are a danger. A firm surface is necessary for the ladder to rest against. With curtain walls there is a great risk of glass being broken as the ladder is difficult to control at that height. Architects and occupiers do not always favour the use of ladders because after a few cleans the face of the building is scored where the ladder slides up and down.

2. Do the standard extended hinge casements really make it possible to clean from inside or not? This type of hinge is not as simple as it may at first appear. In the majority of cases the reveal does not allow sufficient gap for a man's arm and after cleaning three or four windows his forearm is badly scratched. Frequently the fanlight or fixed portion of this type of window necessitates the man having to stand outside.

3. Is it of great advantage to be able to clean from inside in, say, a tall office building, or if, for instance, the building is curtain walled, requiring cleaning all over, is it more economical to clean from cradles? Cleaning cost is often reduced when it is possible to clean from inside; but usually the space required for the man to perform his duties is too valuable; furniture has to be shifted, or if it is not moved there is a risk of accidents. When cleaning curtain walls from inside the man generally has to stand on the frame and reach as far as possible to clean the fixed portion, and most transoms are not strong enough or large enough to accommodate him.

The vitrolite or other materials under windows must be cleaned by cradle or bosun's chair. The majority of customers do not require these to be cleaned as frequently as the clear glass. It would be as well if architects became more conscious of the desirability of fixing cradle runners to the roofs of their buildings.

5. Are there regulations governing any aspect of window cleaning? LCC Bye-laws and individual firms' own rules. LCC Bye-laws insist on the cleaner using a rope and belt at any height exceeding 6 ft. over a public highway, but there is rarely anything for him to fix the rope to. Safety eyebolts should always be fitted.

Internal finishes

One building owner thought it financially an economic proposition to spend £30,000 on installing a clean air plant in a building in an industrial city, costing £200,000, thus reducing cleaning costs (which may normally be reckoned at 1*s.* 6*d.* to 2*s.* per sq. ft. floor area per year), and increasing the rental.

There is much to be said in favour of using linoleum and of plastic cloth as wall finishes. There are linoleum dadoes 20 years old and still in good order: and it is the experience of the British Railways that plastic cloth which can be scrubbed without damage is proving satisfactory.

The Conference opens

T. R. S. BOASE, the Vice-Chancellor of Oxford University, welcomed the members of the conference not only with pleasure but also, he said, with trepidation. Architecture, he explained, was a constant source of pre-occupation to everyone associated with Oxford University, either the preservation of old architecture or the creation of new: old or new, they were always doing something wrong (laughter). Oxford, a museum both of old buildings and of methods of restoration, had been closely watched by the world at large from the days of Morris and "anti-scrape" to John Betjeman and the *Architectural Review*. Oxford was also in constant need of new buildings, but the plans had to go through such antiquated, if extremely democratic, forms of university government up to the Planning Committee and the Fine Art Commission that it was extremely difficult to know how these new buildings ever got started. In its university expansion the 19th century did fairly well: now there was another great period of expansion, and he only wished the 20th century, when we looked back on it, would be found to have something to its credit as well. "On that" he said "we shall all depend on you."

KENNETH M. B. CROSS, the president, then addressed the conference, and expressed in his turn the members' great joy at being in Oxford: it would be difficult to find any other place in the British Isles where within the limit of half a square mile there could be found such a wealth of architectural achievement—except, of course, in Cambridge (laughter).

The contrast between the all-time record of 931 who were attending the conference this year (supplemented by the guests who were coming to the Ball at Blenheim) and the 268 who attended the last Oxford conference in 1924 was symptomatic of the great expansion of the Royal Institute since those far-off days. There was also a contrast in the papers: today we dealt with rather more pedestrian subjects. In 1924 the chief paper dealt with the history of Oxford, and today we were dealing with economics, the four papers being really a continuation of the discussion at Harrogate in 1955 and Norwich in 1956. The conference, he finally reminded the members, was not primarily concerned with the preservation of ancient buildings (although they had the greatest sympathy for the calamitous situation in Oxford) but with the economics of building maintenance and its impact on the work of architects today.

After Eric Steward Smith, the President of the Berks, Bucks and Oxon. Architectural Association had thanked Mr. Cross for his address, the four principal speakers summarized their papers and illustrated them with lantern slides. The conference was then thrown open for discussion.

Conference discussion

First day

HUBERT BENNETT gave the conference figures on the average maintenance expenditure on public buildings, including schools, of a local authority. The annual maintenance was approximately 1 per cent. of the capital cost. One-third of that could be put into general repairs, but two-thirds went on renovations and decorations. That was rather an alarming figure when they considered their approach to design. One local authority found in 1955-56 that the cost per yard super for internal decoration—3-coat work—was 5s. 11½d.

One way of reducing the cost of this work, Mr. Bennett indicated, was to do more decorating in the winter. One small painting contractor who employed 40 men in August only retained 10, his best tradesmen, during the winter. If the contractor was paying a wages bill of £100 a week from November to March to retain his men, might it not be in clients' interests to have redecoration done then, and not in the summer? Tenders for three large contracts from some 75 firms between November and March, 1955-56, showed very surprising results, ranging from 2s. to 8s. 0½d. per yard super for painting. These works were carried out at 3s. 11d. If they could get the education authorities away from the necessity of painting buildings during the recess—and he knew there were accommodation difficulties—they could get very large savings for their clients. For one local authority alone the painting work was reduced by some £50,000.

The other one-third, Mr. Bennett suggested, if not being done by a maintenance organization could be undertaken by negotiation with the building industry. Many architects had a large number of buildings to maintain. It should be possible for them to obtain more favourable unit prices by negotiating with the local builders' federation. As an experiment it was found—and these figures might not apply all over the country—that by negotiation the overheads and profits of the small contractors might drop from something like 49 per cent. to 39 per cent.

Miss JOCELYN F. ADBURGHAM referred to a slide that had been shown of a blistered bituminous felt roof on a bus garage, and expressed astonishment that in this enlightened century we should expose material of that character to the elements. She believed it was the practice on the continent to have tanking and to keep 9 or 12 inches of water always in place on roofs of that character. Her grandfather had built a mill in Derby with a flat roof which acted as a rain-water reservoir and protected the asphalte from the sun. It seemed to her that the architect in charge of that bus garage must be having very serious sleepless nights.

Greetings from the architects of British Columbia were brought by JOHN H. WADE, who expressed appreciation of the visit to Canada by the president and secretary, and astonishment to see British architects using wood, Canada's native material, so freely and almost loosely. "It is a material fraught with difficulty," he said, "and we ourselves wish we could use the materials that are so readily available to you" (applause).

He asked members never to varnish new external woodwork: the cost to their clients was far beyond the estimate of Mr. Eastwick-Field. There were available in Canada various paint and creosote stains for woodwork, particularly western red cedar, which had great durability and other attractive attributes which would make them acceptable over here.

LESLIE K. WATSON referred to the alleged lack of knowledge about the use of aluminium outside for a long period. Cambridge University Library, he said, was built about 25 years ago and had the first unpainted aluminium windows, which were anodized. He saw them three years ago, and they were as good then as when they were put up.

A proposal that the conference should pass a resolution, asking for a reversal of taxation policy, was made by J. E. TYRELL, Gosport. Taxation, he urged, should encourage higher capital costs where it could be proved that they would result in lower maintenance costs. Thomas Mitchell, replying, doubted whether a resolution from the conference would influence the Chancellor of the Exchequer; withdrawing allowances for maintenance was impracticable, and the answer must lie in the education of the clients.

At the informal reception on Wednesday evening, in the library at St. John's. Below left (left to right), Mrs. M. P. Cahill (Aycliffe Development Corporation), M. D. Murray (deputy city architect, Oxford), and Mrs. Murray, G. R. Bruce (Cardiganshire County Council), and Mrs. Bruce. Bottom left (left to right), Mrs. Wilson and Leslie Hugh Wilson (chief architect, Cumbernauld), G. A. Goldstraw (chief architect, Aycliffe), and J. S. Rank (borough architect, Stockport). Below, harp and flute in the gardens of St. John's.

Top left, garden party at Trinity, in the rain. The second umbrella from the right belongs to John Stillman. Extreme left, taking refuge in the tent: Mrs. Lyons, Eric Lyons and Herbert Tayler. Left (left to right), J. W. Adamson (city housing architect, Belfast), H. Nevile Player (borough architect, Widnes), John Burton (borough architect, Bournemouth), K. Martin Baxter (borough architect, Bolton) and D. K. McGowan (Birmingham). Above (left to right), Miss Spence, Professor Basil Spence, Mrs. Spence and Peter Shepheard.

Study Group

After lunch on Thursday, a study group was held at Balliol College. This was announced at the end of the morning's meeting, when volunteers for it were invited. In the event some 40 people turned up to what proved to be a very keen and fruitful continuation of the morning's meeting, with all speakers present. It was urged that BRS should publish what work they have done on maintenance; John Eastwick-Field, who had read it said that it was extremely objective and could cause offence to no one. Other points made included the need for published information on maintenance costs, expressed in elemental form, and for some committee work to arrive at reasonable standards of practice for such things as water storage in schools. There was wide agreement on the need for systematic collection of information so that the same lessons did not have to be learned over and over again. Arthur Ling proposed that at future conferences there should be study groups before the conference to prepare information for the discussion—a proposal that was strongly supported by those present.

Conference discussion

Second day

On the second day, the four sections of the papers were taken in reverse order (beginning with Finishes), each platform speaker opening with a very brief résumé of the main points from his paper.

Finishes

The discussion from the floor was opened by W. A. ALLEN, BRS, who asked whether architects realized sufficiently that the knowledge of how their buildings behaved was one of the most vital foundations on which to build their principles of design and construction. He did not know to what extent the profession was studying these problems, or collecting the "vital statistics" that were necessary. The local authorities and the ministries ought to be giving a lead in this, not only for themselves but for the whole profession, for the only way to deal with knowledge of these things was to record it. Turning to the problem of extending the life of paint, he said that architects had asked for sharp arrisses, but did they realise that paint was bound to be thin over them? Some arithmetic (which was admittedly shaky) done at BRS showed that if pencil round arrisses were used the life of paint might be extended by one or two years, and £5 million a year saved. He drew attention also to the need for thermally constant behaviour behind the surface of the structure if pattern staining was not to show through. And how many of the curtain wall buildings put up in this country, he asked, had made provision for external access for repair and maintenance?

D. W. SHARPE agreed that local authorities should experiment and give the profession the benefit of their findings. In Worcestershire they had found that anodizing of aluminium was scarcely necessary for structural sections and windows (except in badly polluted atmospheres) because the oxidization stopped at a shallow depth and protected the metal. If the grey and rather drab appearance was acceptable aesthetically there was little to be gained by anodizing or painting. For thinner panels even the slight penetration of oxidization could not be accepted: coloured anodized panels which had been tested in Worcestershire schools proved to give satisfactory surface protection, but after three years the colour had almost completely gone. Thomas Mitchell reminded Mr. Sharpe that one could see anodized aluminium breaking down on the shop front of the Electricity Board showroom in Lower Regent Street built in 1936-7, and said it was a pity that this kind of experience had to be gone over by different members of the profession in order to learn the lesson.

N. S. MORRIS said that his firm (Lanchester and Lodge) had done a number of buildings for Oxford University, where it was University policy to use aluminium windows in science buildings to avoid repainting costs. The Bodleian Library by Sir Gilbert Scott had aluminium windows before the war, and was there for everyone to see. Over a number of years flat roofs had proved reasonably satisfactory to the University, and where in one or two cases the roofs had had to be taken up the trouble was due to the insulating material under the covering—cork or vermiculite. Cleeve Barr intervened

here to say that he understood that whereas organic dyes were used in this country for anodizing, in America inorganic dyes were used, which had not faded in Pittsburgh after 15 years. This process was, he understood, now coming into this country. He quoted an LCC experiment with vitreous enamelled sheets, which were "out" on cost anyway, and tended to show streaks of rust from the edges after a year or so. This indicated the need for very special edge treatment.

J. GODFREY-GILBERT described an American practice with flat roofs where the first ply was nailed direct to the vermiculite screed, without a sand and cement topping, with special galvanized split nails which split with the last blow of the hammer and gripped the concrete. The felt upstand at the edge was not tucked into the parapet, but was overlapped by a metal flashing, and was only nailed at infrequent intervals so that any moisture trapped under the felt could escape.

Services

CLEEVE BARR raised the question of standards that might be too high: the Metropolitan Water Board's requirements for water storage in housing had increased in seven years from 30 to 80 gallons per dwelling—an enormous tank to provide in small dwellings. He wondered whether lifts were not of too high a standard, for on the continent lifts with only one door and without elaborate self-levelling and other devices were successfully operated by small children. The engineers had gone ahead and developed first-class lifts, but were they not spending too much on them in relation to the general standard of building?

A note of caution about single stack plumbing and untrapped waste branches was sounded by W. A. TAYLOR, who asked whether the profession, builders or operatives knew enougth about their design rules? Mr. Cleeve Barr, replying to this point, suggested that the MOE and BRS should check up on the performance of untrapped lengths of waste. Single stack plumbing was in the development stage, but the published literature enabled the architect to go forward with it safely.

HILTON WRIGHT put the problem of the small practice which had no consultants on its staff, and often could not persuade the client to employ a services engineer until the probable cost of the project was known and other difficulties surmounted, when it was really too late. He suggested that the RIBA might organize an interchange of information at regular intervals to enable specialist consultants and engineering firms to inform architects about new developments, and perhaps to explain a building with interesting features. He also suggested the possibility of post-graduate courses in services for architects, at schools of architecture.

J. E. K. HARRISON agreed with Cleeve Barr that we paid very high premiums to insure against very remote risks, particularly with drains. Because of a simple failure a statutory authority could at a stroke of a pen insist on millions of pounds being spent in future building. The electrical regulations, particularly, seemed really to be designed to protect those absolutely intent on suicide. Mr. Harrison "brought the house down" with a story about the reason given to him for the banning of the movable floor device in lift cars (which by means of contacts gave the occupant sole control of the car) and the substitution of a far more costly system of control. He was told, "Oh, well, it would be possible for someone in a lift, by putting his hands through the inner gate, to grasp hold of the outer gate, lift his feet off the floor, and get someone to press the button, and he might break his arm." Cleeve Barr followed this up by saying that the answer given to him when he asked the same question was that courting couples could immobilize the lift from inside.

ERIC L. BIRD said that the course on "architectural project management" at York had been very successful, and asked whether a similar course could not be held on aspects of the Conference subject. He, too, had a word to say on lifts, having seen a simple, foolproof single-door (side-hung) system in Sweden ten years ago.

Structure

R. B. HELLARD reminded the meeting that the need for information had come up at the two previous conferences also. Could the *RIBA Journal* not publish a monthly technical supplement edited by a skilled staff to publish information in the possession of architects all over the country?

CLIVE PASCAL said that he had just returned from the American Institute of Architects' Centennial Conference, in which the manufacturers took part, apparently as honorary members, had an exhibition in the building, and dealt with questions as they arose.

JOHN STILLMAN asked whether the architectural journals could not publish more articles describing buildings which had been up about 5 or 10 years, showing what happened to the materials. The reasons, he suggested, why wet, heavy and slow brickwork was cheaper and more practical than framed and panelled systems were that site labour was cheaper than factory labour, large components had not been standardized, and we did not think big enough. Even when buildings were reasonably large they were often phased, which seemed to be tremendously against any economic construction.

BRYAN WESTWOOD asked why shell roofs, in which the concrete was applied by trowel or spray to a steel mesh, and in which shuttering was eliminated, were not increasingly used. His firm had built five buildings in this way, with no trouble of any kind: it was cheap, and so far as he could see, effective.

D. W. SHARPE said that figures quoted by Mr. Womersley (page 94) on the cost of various forms of roofing material did not do justice to sheet metal, as they ignored the structural savings due to light weight and wider spans. There had been so many troubles with felt roofs that we should go over to low pitched sheet metal roofs, which were a little more expensive but had a much longer life and were a good deal stronger.

Finance

R. EMMETT said that it would be helpful if the RIBA could give some guidance on the economic life of different building types. Referring to the success of the previous day's study group, he asked whether it would not be possible at future conferences for study groups to prepare in advance so that delegates could make more detailed contributions to the discussion.

C. G. STILLMAN said that much of their work was based on generalizations; the MOE, for example, said that in schools they must absorb rising costs, but it also said that it should not be necessary to reduce design standards below tolerable standards. Were they not building what some people would call sub-standard buildings to get below the Ministry's cost limits? Cost analysis helped to tell them what they could afford, and set cost standards, but were they not overlooking performance standards? Short-life materials were being used for floors and roofs, not from free choice but because they were dictated by the initial cost.

J. M. AUSTIN-SMITH emphasized that the desire to interchange information on the behaviour of materials ran through the discussion. He suggested that the allied societies should organize regional information centres, and that the RIBA should co-ordinate the results they produced.

J. BRANDON-JONES said that he had been concerned as a witness at an enquiry into a projected office block costing a lot of money. He had collected information on the maintenance costs of similar buildings to show that the new building, although apparently expensive, was going to be economical, and this had been used by the local authority Treasurer to convince the inspector. Some local authority Treasurers, however, did not know so much, and could do with some private tuition from the architects.

G. L. GREAVES criticized the policies of building societies. He quoted a case in which the loan for a house had been withdrawn when the society's surveyors said it was "not a proper house" because its internal walls were not of brick. The house had to be redesigned on more expensive and less satisfactory lines.

THOMAS MITCHELL, in the last contribution before the formal vote of thanks, urged architects to resist the salesmanship of those who were trying to persuade them to part with their own or their clients' money. It was their job as architects to look at both sides of the penny before parting with it. He welcomed the valuable suggestion made by Arthur Ling at the study group that it would have helped the discussion if, at the same time as the authors of the papers were "sweating it out," they had also asked others who were known to be capable of contributing to the discussion to do the same.

The vote of thanks to the four speakers was moved by David Booth, and seconded by R. W. Cave. Thomas Mitchell replied.

CONFERENCE AND CONVENTION

This RIBA conference at Oxford, certainly the biggest and probably the best ever, is reported and commented on elsewhere in this issue. ASTRAGAL wishes only to point out that the weakness of these conferences is that rank and file members are not doing enough to make them a success. More architects should come prepared to contribute to the discussion periods. On the other hand congratulations are due to those—of whom William Allen is the leading member—who instituted the first study-group ever held at an RIBA conference. A most progressive step. It was, perhaps, regrettable that the discussions were held in the bleak, acoustically unsatisfactory, Playhouse theatre. What a pity the Sheldonian had not been obtained.

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In contrast with the architects, ASTRAGAL learns, the recent convention of the British Wood Preserving Association at Cambridge produced some lively and technically informed audience participation in the discussion which followed the papers read—and this despite the fact that many delegates must have found it hard to concentrate while their wives enjoyed themselves at nearby Newmarket. At the convention Dinner (held in the hall of St. John's College—alas, the architects in Oxford had to be content with the Town Hall), President T. G. Robinson made the significant point that there was evidence that private research by the industry was being supplanted by research directed by DSIR, a development which could hamper individual energy and initiative. He asked for closer collaboration on research programmes between DSIR and the industry.

IS PLANNING BUNK?

It is very hard to make any sense out of the attitude taken up either by the LCC Planning Committee or by the Minister of Housing and Local Government to the destruction of St. James's Theatre. They both admit that it should not be demolished, but plead that it "slipped through the net" before a firm decision had been taken to prevent this sort of thing happening. They both admit, too, that excessive concentration of offices in central London is the major cause of congestion: and the Ministry's report for 1956 urges the need for offices to be moved out.

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The compensation that would have to be paid is put at "upwards of £50,000," which does not strike ASTRAGAL as a prohibitive sum. Yet the theatre we need is to come down, and offices we do not want are to go up. It's not really surprising if the general public conclude that planning is bunk. The Minister can, of course, still persuade them otherwise by being big enough to change his mind. So can the LCC.

D AND W

Dell and Wainwright are just as much key names in the history of modern architecture in England as the MARS Group or Finella or P. Morton Shand, whose *Architectural Review* articles around 1930 provided the first link between the forward-looking Continent of Europe and backward-seeming Britain. The first modern buildings in Britain were sold to the public by the delectable photographs of Dell and Wainwright—official photographers to the *Review* until the war.

*

Mr. M. O. Dell then retired. The Royal Photographic Society has now done him the honour (seldom accorded to a living photographer) of holding a retrospective exhibition of his work. It should be visited not only for old time's sake (it is disappointing that it contains very few of Dell's architectural photographs) but because he is a real artist. His French landscapes, chiefly represented here are full of observation and atmosphere.

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The exhibition is at the Royal Photographic Society's house at 16, Prince's Gate, S.W.7, until July 25.

BRITISH DESIGNERS

*Designers in Britain** is out again—number five this time, and as smooth and as elegant as ever. It is still free from surprises for, whether or not the SIA has an official line, this publication certainly toes it as tidily as the Design Centre toes the COID line. A meaner-minded person than ASTRAGAL might have some sport reading between the lines, and working out the chances of having work included if you are not a member of SIA (about seven to one against in textiles, by the look of things).

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Agreed, then, that this is the taste of the professional establishment, let us also face the fact that this is the taste of most of us (established professionals that we are). Most of it is very well done indeed, as far as furnishings are concerned—without any startling originality. There is slightly less originality in the exhibition displays, the stage designs are not bad, the typography and graphics are a bit thin and there is practically a flat calm in packaging—not a soap-powder in sight. Nevertheless ASTRAGAL would say that there is solid evidence here that taste is improving in most fields of design, were it not for the fact that someone recently said that only the middle-aged ever believe that taste improves.

MUMFORD SPEAKS

Lewis Mumford bit off a pretty big subject at the ICA—modern art in relation to the predicament of modern man. After chewing it for twenty minutes or so, he threw it to the audience to worry away at. They threw it back at him, with increasingly bad temper as the evening proceeded.

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The basic point at issue, so far as ASTRAGAL could get *his* teeth into it,

* Andre Deutsch, 65s.

was that most modern art was unhealthy and disintegrated, or—alternatively—infantile and over-simple. Into one or other of these two categories went Jackson Pollock, Mondriaan, early Corb, Mies, Lever House, the Manufacturers' Trust bank, Tennessee Williams and several others. Offended parties fought back tooth and nail, and Mumford, professing to enjoy the battle, nevertheless trimmed his opinions on practically everything he had earlier attacked—except, one noted, Mondriaan and Mies.

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Where he seemed most in tune with his audience (and to ASTRAGAL'S mind, on his best form) was when talking about the general state of the world, rather than about art, and in his eulogistic appreciation of the Gabo and Zadkine sculptures in Rotterdam. This last arose from what sounded like a planted question, by chairman Sir William Holford, but one was grateful for it, because it gave the great man an opportunity to be nice about something for a change. The house responded to the warmer and more enthusiastic tone of his voice with a burst of applause.

AMERICAN OPPORTUNITY

The JOURNAL has already made its comments (June 6, page 832) on the design by the Ministry of Works for the enormous new office building to go up alongside Lutyens's British Embassy at Washington. The building is apparently to go ahead soon, so it's too late to do more than hope it won't turn out as dull as the perspective drawing made it look. But it is a pity the first sketches were not published in time to allow heed to be taken of criticism from outside the Ministry.

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However, it is most certainly *not* too late for ideas about how it should be furnished and equipped. It would be a great opportunity missed if ordinary MOW stock furnishings were to be used. Shouldn't the Embassy offices be made into a live exhibition of well-designed modern office furniture, furnishing textiles, floor-coverings and the like, chosen, perhaps, by a COID selection committee?

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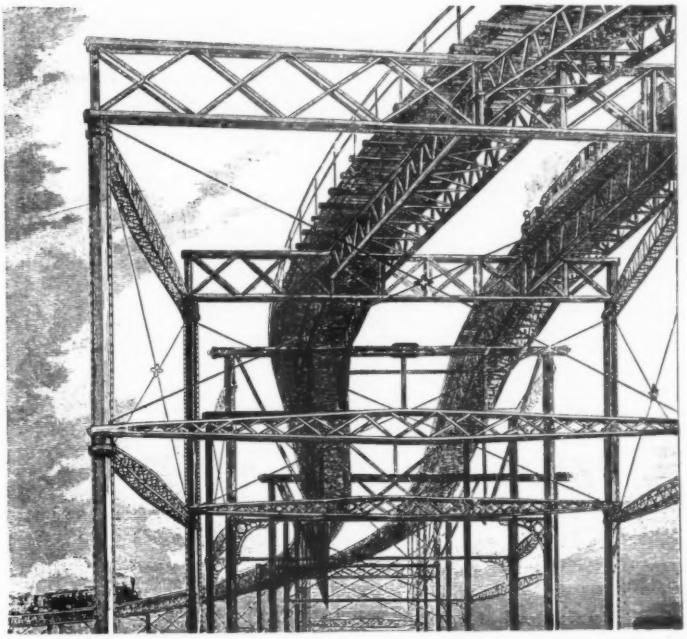
British products can't have too many shop windows abroad. Here is a ready-made one, asking to be filled with the best Britain can make, in the capital of the U.S.A.



The elevated railroad in New York. An illustration from The Gingerbread Age, *reviewed by* ASTRAGAL *below.*

VICTORIANA IN AMERICA

On our side of the Atlantic, the study of Victoriana is a rather specialist affair, involving mostly æsthetes, historians and students at the Royal College of Art, and in spite of the activities of the "home" magazines it is only slowly acquiring any wider hold on the public. But in the U.S.A. things have always appeared to ASTRAGAL to be the other way on. It is the popular media that have taken up Victoriana—and particularly Victorian architecture—to provide a set of easily-read symbols for this, that and the other.

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You all know, of course, the turreted and mansarded Charles Addams place, where the ghouls live; the fretwork porch where Grannie rocks; the Steamboat Gothic saloon where the gambling man deflects a passing stiletto with a prayer book that happened to come to hand; the false fronts of the main street in Tombstone.

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But the highbrows have hardly touched the subject, and the first book to come to my notice that really sets out to deal with Victoriana for its own sake, John Maass's *The Gingerbread Age**, is still more or less "pop" in its attitude. This is not to say that it lacks erudition; a great deal of hard work as well as genuine affection for the subject has clearly gone into it.

However, it is not an historical tome in the usual sense—thank Heaven—and makes entertaining if occasionally scatter-brained reading. The material covered includes all the usual sorts of folly and extravaganza in detail and great profusion, but here and there a different note creeps in, as where he salutes the Brooklyn Bridge for the masterpiece it undoubtedly is, or takes time out to illustrate a piece of the New York elevated railroad's substructure that reveals an extraordinarily twentieth-century attitude to space and all that.

FIDDLING WHILE THE ROAST BURNS

If you have been getting depressed lately, and feel that the colour, the poetry, the zest is going from the world, you might like to comfort yourself with the following glad tidings. A major US manufacturer of electric ovens is now advertising an ultimate model that not only times the roast by a thermometer sunk deep in the succulent tissues, but announces the fact that it is done to a turn by playing the opening bars of *Tenderly*. . . .

ASTRAGAL

*Rinehart & Co., New York, $7·95

RIBA

Appointments and Awards

At their meeting on July 2 the RIBA Council appointed as vice-presidents Harold Connolly, J. H. Forshaw, Leonard C. Howitt and Thomas E. Scott. Professor Basil Spence was appointed Honorary Secretary and E. D. Jefferiss Mathews was appointed Honorary Treasurer.

The RIBA Council has conferred the RIBA Award, for Distinction in Town Planning, on Arthur George Ling (Coventry City Architect, formerly LCC Senior Planning Officer) and H. J. Whitfield Lewis, LCC Principal Housing Architect.

Assistant Secretary for Professional Relations

The RIBA recently appointed a Secretary for Professional Relations to conduct research, with the help of any necessary staff, into a wide range of matters affecting the future of the profession. There is a strong economic or statistical content in several of these issues and the Royal Institute accordingly decided to appoint an Assistant Secretary with appropriate qualifications to work under the general guidance of the Secretary for Professional Relations.

Miss J. M. N. Milne, at present with the Board of Trade, was recently appointed to this post. Miss Milne was educated at Streatham Hill High School and Newnham College, Cambridge, where she took an M.A. in mathematics, economics and statistics. She is a Fellow of the Institute of Incorporated Statisticians, and from 1941 to 1948 worked on economic research and intelligence at the Ministry of Economic Warfare and at the Foreign Office. After some three years on general administrative duties with the South Western Electricity Board, she then joined in 1952 the Statistics Division of the Board of Trade, where she has since been concerned with the collection and interpretation of statistics about industrial production. During 1953-54 she was Joint Secretary of a Committee on Censuses of Production and Distribution, under the Chairmanship of Sir Reginald Verdon Smith.

ARCUK

Appointment of Registrar

The Architects Registration Council have appointed David Benton, B.A., LL.B., as their registrar, in succession to the late Pembroke Wicks. He will take up his appointment on August 1.

Mr. Benton is aged 49, and is married. He was educated at Cheltenham College, and Jesus College, Cambridge, where he graduated with Honours in Law. From 1930-1940 he practised as a barrister. He volunteered for service in the Army in 1940, being posted to the Royal Fusiliers and commissioned in 1941. After a period of service as a regimental officer, he volunteered for Special Operations. He later served as a staff officer in the Adjutant General's Branch.

On release from the forces in 1946, he took up an appointment in the Lands and Legal Branch, Ministry of Supply. He was appointed an assistant secretary on the headquarters staff of the RIBA in August, 1946, and has thus been concerned with very many aspects of the architectural profession.

BERLIN

Opening of Interbau Exhibition

On Saturday, July 6, Professor Theodor Heuss, the West German president, proclaimed the International Building Exhibition Berlin 1957 open, in a ceremony held in the gardens of Bellevue Palace, on the outskirts of the Hansa quarter.

More than 3,000 guests attended the ceremony, which ended nearly four years of preparatory work and threw open the gates of the Hansa district for the public to see until September 29, 1957.

The Hansa district, once an area housing 5,000 people at the northern edge of the Tiergarten park, was nearly completely destroyed during the war. Fifty-three architects, including 19 from European and American countries, have been asked to rebuild it. When completed, there will be 48 building blocks with 1,160 flats, two churches, a school, a library, a cinema, and a shopping centre.

But as the guests of the opening ceremony began their tour through the area, the whole district appeared still to be an immense building site.

Only one-third of the projects are completed or have neared completion; another third has workmen still busy on inside installations and the rest has not yet been started at all.

These latter include the terraces of one-family houses, designed by F. R. S. Yorke, the only British contribution to the exhibition.

Speeches at the ceremony were remarkably brief for such an occasion, to the relief of the guests, sitting in the bright sunshine at a temperature of 94 degrees. Professor Otto Suhr, the governing mayor of Berlin, recalled the apocalyptic field of ruins which the Hansa district presented 12 years ago and added that only those "who remember that sight can evaluate what these buildings mean to us. We call it an exhibition, but in reality it is much more. It is a work of international co-operation of the most famous architects of the world, attempting to test the conception of one of the most important and interesting ideas of our times—how to create in our mass cities of today a community settlement so organically that the people in it can live in the community but yet retain their personal and private lives."

Dr. Suhr said that "Not the form but the idea, not the struggle for a new style but for a new form of living" had been the theme of the exhibition. It was "an amazing but consoling fact that architects all over the world strive for that same idea. That means that the peoples of the world are closer linked in their ambitions for life than we had imagined."

He said that the fact that East Berlin was only two stations by elevated railway from the Hansa district would make the exhibition "a demonstrative documentation of freedom."

Dr. Preusker, the West German minister for housing, was prevented by illness from attending the ceremony. In his place, state secretary Dr. Hermann Wandersleb stressed the experimental value of the exhibition. He said his ministry had given research orders to seven institutions who had carefully watched progress and collected material from the beginning of the exhibition so that a complete survey of experiences made could be assembled. This would naturally only be possible after the completion of all buildings.

Professor Dr. Otto Bartning, the 70-year-old president of the German architects' association, who was chairman of the guiding committee of Interbau, said the aim of this committee had been to bring into tune the creative ideas of the architects and landscape designers to one unity. He said three ideas guided the exhibition:

1. The building of apartment houses, instead of the former high density houses with back yards, in a generously spacious area, letting the green from the Tiergarten park flow freely among the houses, in the form of green spaces around the tower blocks and recreation grounds and gardens for the one-family houses.

2. The free expression of 53 free-lance architects from 14 countries.

3. The apartments were built subject to the rules of the subsidizing of city housing schemes while, at the same time, testing and productively developing these rules, so that the doors for a further development of housing could be opened. It was here that the value of the Hansa district might go beyond the present worth of the flats by pointing a way to the future.

Professor Heuss said he had lived in the old Hansa district for a time in the 'thirties, when the pompous facades and large staircases were given as reasons for the high rents. Looking out from a back window he had had a "hideous view of back yards."

"I think" he said, "that we need a return to honesty in building. This must not be plain sobriety or snobism. I would call it marked functionalism."

In Brief

Mr. B. J. Collins, the County Planning Officer for Middlesex has been appointed the President of the Town Planning Institute.

Ludwig Mies van der Rohe has been awarded Germany's highest honour in the fields of science and art, having been named to the Order Pour la Merite. Only 39 men from all over the world are chosen to hold these lifetime memberships in the Order, which was founded in 1740 by Frederick the Great.

On the advice of the architects, Yorke, Rosenberg and Mardall, a piece of sculpture for the new hospital at Londonderry has been commissioned from Mr. F. E. McWilliam, whose portrait of Elisabeth Frink is one of the exhibits at the LCC's open-air sculpture exhibition. The sculpture will be a seated figure in bronze, about 8 ft. high, representing Princess Macha of the golden hair who, according to tradition, founded the first hospital in Ireland in the year 300 B.C.

DIARY

Planning Control. ICA Discussion: Lionel Brett, Peter Shepheard, Percy Johnson-Marshall, Ian Nairn and Peter Smithson. Chairman: J. M. Richards. At the ICA, 17 Dover Street, W.1. Members 1s. 6d., guests 3s. 8.15 p.m. JULY 23

City of Tomorrow. Talk by Nikolaus Pevsner on the International Building Exhibition in Berlin. In the BBC Third Programme. 10.10 p.m. JULY 30

CRITICISM

by J. M. Richards

OFFICE BUILDING in ALBEMARLE STREET, LONDON, W.1
designed by ERNÖ GOLDFINGER

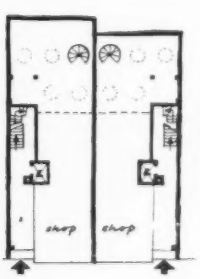
Like so many small urban jobs whose rôle it is to occupy a gap in an existing street, this modest but, in my view, rather distinguished little building can be regarded as consisting simply of a plan and a front elevation. There is no three-dimensional mass.

The plan in this case is almost as simple as it could be, since as with most modern office buildings—large as well as small—the purpose has been to create floor-space which the tenant can subdivide as he will, but it has several points of interest. The first is that what looks like one building is in fact two. The architect persuaded the owners of two adjoining sites (both made vacant by bombing) to co-ordinate their requirements so that they could be treated as one, but each half, either side of the central party wall, is self-contained. From entrances at the two ends of the frontage, corridors lead to small lift and staircase halls, placed nearer the back than the front of the building and so allowing the office space on the upper floors to extend across the full width. Maximum use of space was essential as this is among the most costly land in London. The ground floor space alongside the corridors is designed to be used as showrooms, and has a top-lit extension at the back. The upper floors are lit by windows at the back as well as the front.

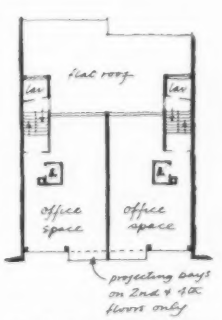
Another point about the plan is that the face of the building is set back 2 ft. 6 in. from the normal building line. This was done so as to get enough height, while conforming to the required angle of light, for a six-storey building (those on either side are four and five storeys). An alternative would have been to set the top storey back, but I am sure the architect was right in feeling that a flat facade, continuing in the same plane to the full height, is the proper, as well as the traditional, treatment in a central street of this character.

He has regained some of the floor space lost by this set-back by projecting a bay window forward to the building line on the second and on the fourth floor. Bringing part of the facade forward in this way also serves the purpose of preventing the set-back from making too disturbing a hole in the line of the street. As it is, the vertical white strip produced by the exposed side wall of the adjoining building creates something of an interruption, but the varied architecture of the street gives it already a vertical rather than a horizontal emphasis (see my first picture), so there can be no complaint about this.

I understand, incidentally, that the LCC at first demanded that the facade should maintain the original



Ground floor plan

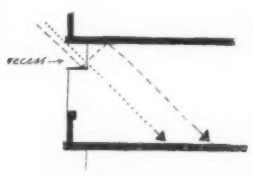


Typical upper floor plan

cornice line of the street, but as this is now more various than it is consistent, it would have been a somewhat pedantic restriction to impose. Far more important than lining up largely theoretical cornices in streets like this is the retention of the same scale and rhythm, which I think Mr. Goldfinger has done admirably.

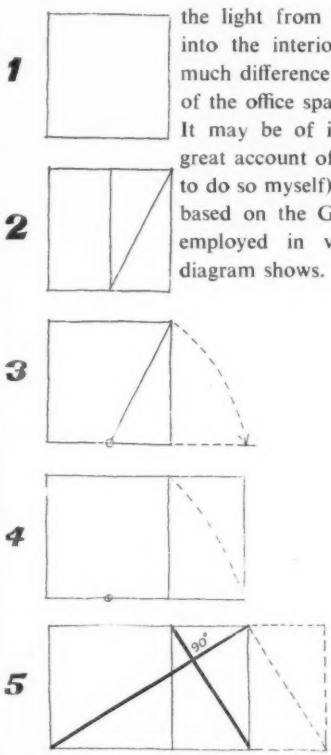
Purists will have one major criticism to make of his street facade: the centralized bay windows I have already referred to suggest a single building rather than the two buildings in one that this structure in fact is. The bay windows are shared by the adjoining offices and therefore cross the party wall, which logically should have been expressed by a vertical line rather stronger than the thin mullion up the middle of the bay. This wilful avoidance of an elevational treatment that reflects the planning is the odder because in Mr. Goldfinger's architecture generally form is most strictly related to function, and this particular building owes its distinguished character largely to the refined detailing of a number of extremely frank structural statements. Nevertheless, a departure from accepted dogma is no crime, and in this case the use of a central bay-window has the advantage of making the building read as one large unit, which is more in scale with the commercial character of the street and with modern street architecture generally than the small unit of only 24 ft. represented by each of the two sites—a unit surviving from the eighteenth-century street's domestic use. Inside, the effect of the bay-windows on the interior space is surprisingly agreeable considering the way they are pushed into the corners of the offices. The floor of the bay is one step above the general floor level.

To return to the street façade, this is strongly modelled, not only because of the projecting bay windows but because the other windows have an unusual section, the upper part being recessed quite a long way behind the lower (see sketch), providing a transom with a horizontal surface from which light is reflected on to the ceiling of the room. The idea is that by this means



Below, upper part of facade from across the street, showing central bay window shared by the two offices. Left, section through typical window showing how the recessed upper part is designed to throw light into the back of the room.

Above, central part of facade showing materials used.



Left, diagrams showing formation (beginning with a square) of the units of proportion on which the design of the facade is based. Right, elevation showing these units applied to the various elements of the facade.

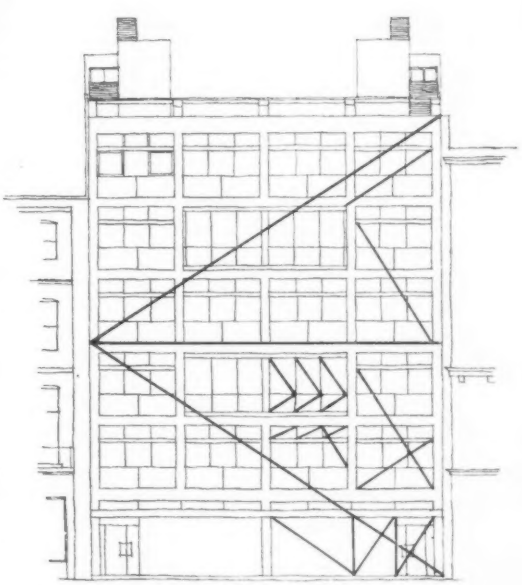
the light from the windows is thrown further back into the interior. I have no means of judging how much difference this actually makes, but the back part of the office space does seem very well lit.

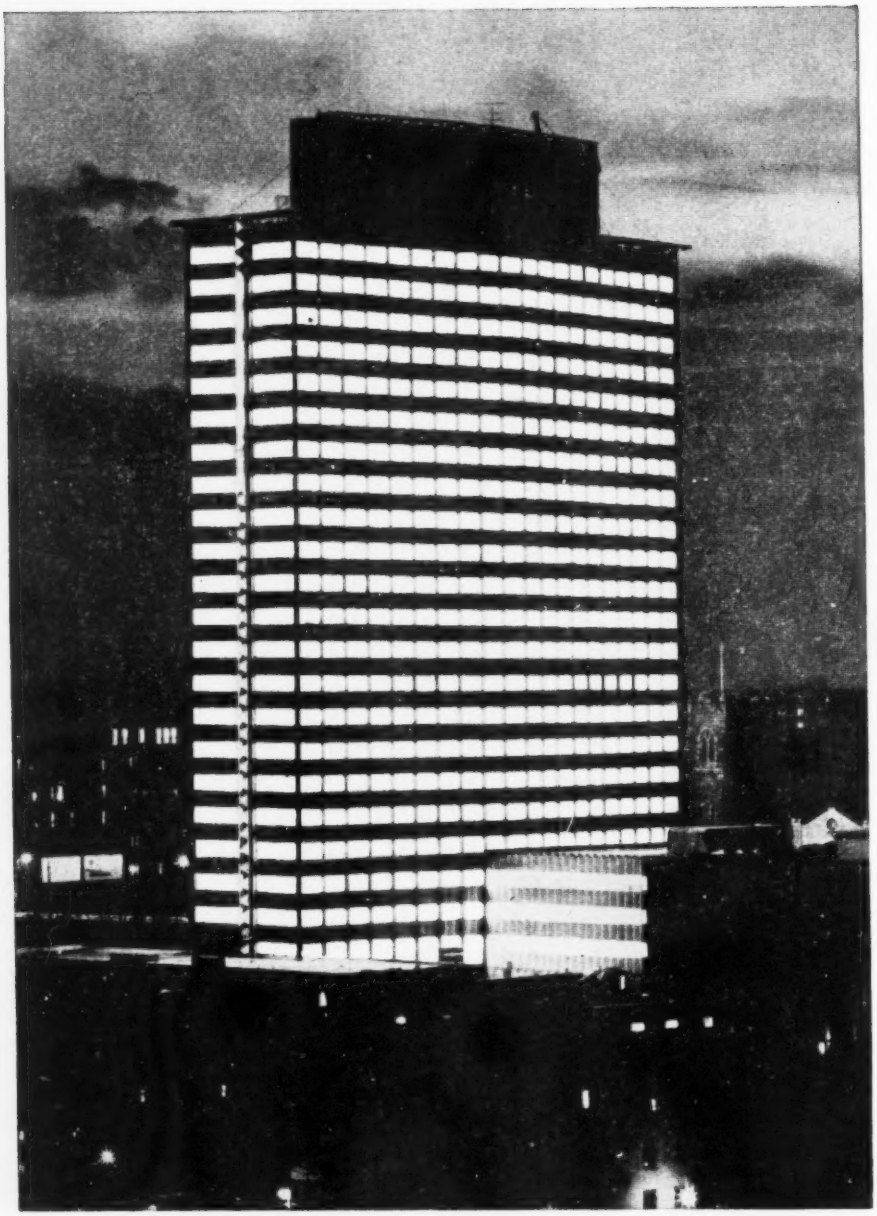
It may be of interest (because some architects take great account of these things, although I can't pretend to do so myself) that the proportions of the façade are based on the Golden Section, this relationship being employed in various ways, as the accompanying diagram shows.

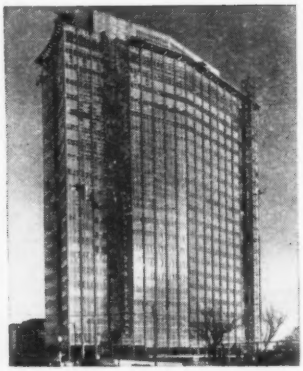
I have already mentioned the simple but elegant detailing of the street façade. The only detail I would question is the very heavy top horizontal member, supported on even heavier vertical members, which is simply a handrail for the safety of anyone using the flat roof but looks like a rudimentary cornice when seen foreshortened from below. Its shape—that of a sloping slab—is, to my mind, simply a cliché, and unworthy of so thoughtfully designed a building. It looks particularly awkward when seen from down the street (*i.e.* from Piccadilly—see picture). Surely a light railing would have been better?

Readers may wonder at first glance how Mr. Goldfinger got permission to expose the steelwork they see in the photographs. The reason is that this steelwork (which supports the bay-windows and forms the top member of the ground-floor show-windows) is not part of the structural frame of the building, which is reinforced concrete faced with Portland stone. The panels under the windows are glass of a warm grey colour, which is agreeable enough but perhaps too near the colour of the stonework to create the visual distinction between frame and infilling that this kind of architecture demands, and when time and the London climate have darkened the stone the difference will presumably be even less. Nevertheless, this somewhat timid colour is infinitely preferable to the garish blue which another architect has chosen for the same material in a nearby building, a most ill-mannered affront to a gentlemanly, dignified street. If we are to have æsthetic control by the planning authority, surely strident colours are much more worth worrying about than many of the things they do worry about. Do they approve an architect's choice of materials without asking what colour they are to be?

The quiet colours of Mr. Goldfinger's building are admirable in their setting, without being dull. The steeelwork is painted black and the metal windows white. The soffits of the bay-windows are of painted concrete and should weather well enough because they are protected by the overhang. I have only one more question to ask: is there not a risk of the stonework becoming streaky where rain drips from the corners of these bay-windows or, alternatively, of the stonework that is protected by them taking on a different colour from the rest, thereby destroying the geometrical pattern of the façade?







The B.C. Electric building, newly completed in Vancouver, is 258 feet high and has a total floor area of over 368,000 square feet. Architects: Thompson, Berwick & Pratt, Vancouver. Contractors: John Laing and Son (Canada) Limited. Wallspan curtain walling system by Williams & Williams Ltd.

The horizontal and vertical members supporting the wall cladding of this new Canadian skyscraper are all extruded sections in ***TIMINIUM.*** The Development Department of T I Aluminium Ltd. offers an expert advisory service. Architects and builders are freely invited to make use of it.

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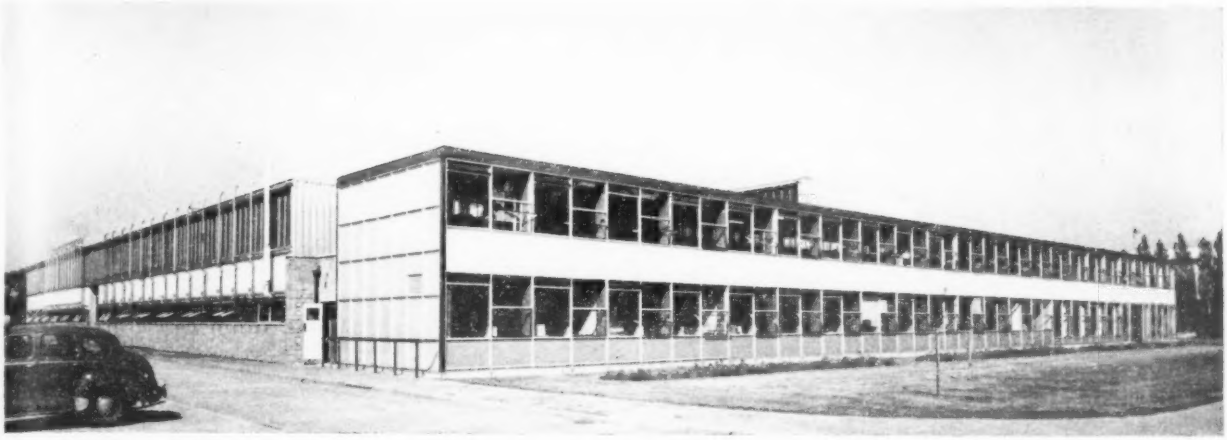
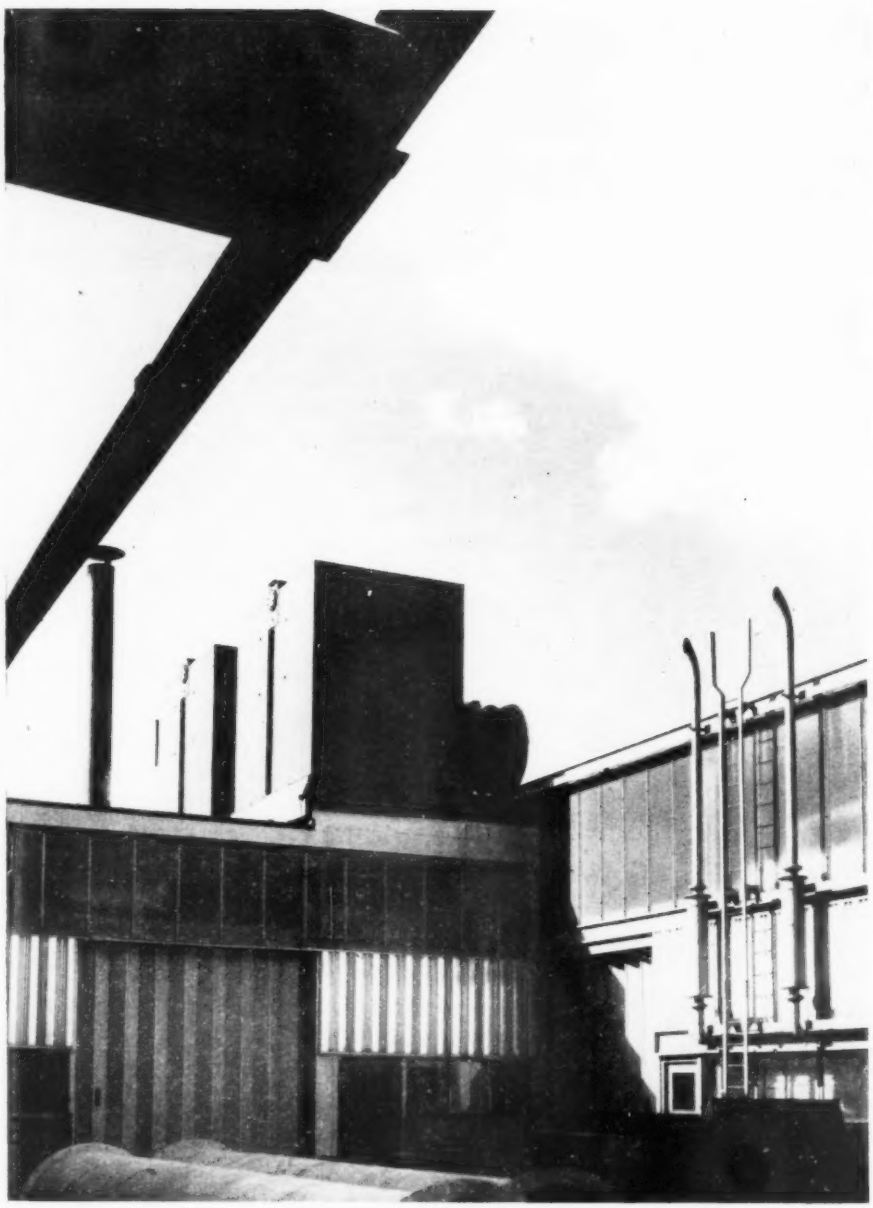
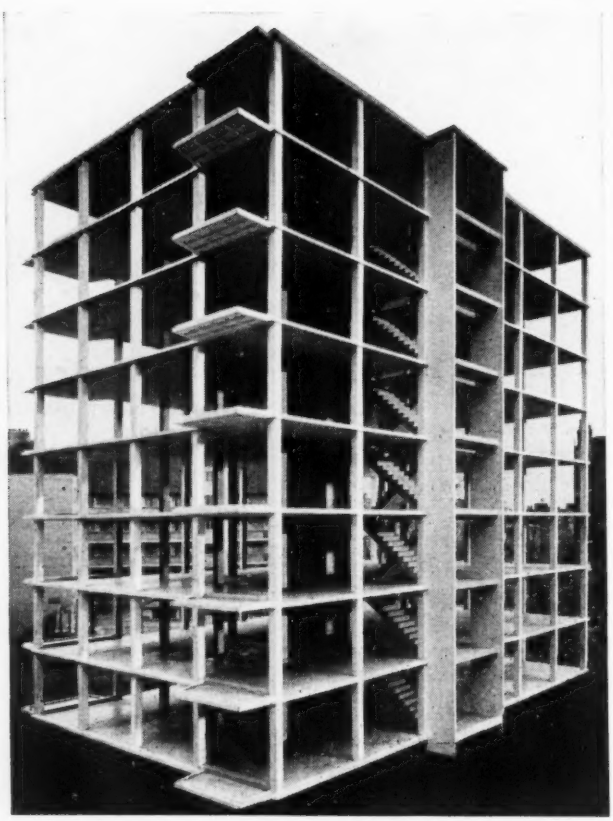
RESEARCH CENTRE IN BEEVOR ROAD, LINCOLN





The new research centre in Beevor Road, Lincoln for Ruston and Hornsby Ltd., was designed by J. C. Clavering. The consulting engineers were T. Bedford and Partners and Clarke, Nicholls and Marcel and the quantity surveyors were Thurgood, Son and Chidgey. The building has been designed to centralize under one roof the clients' facilities in research and technical investigation. Above, from the west, with the two-storey administration block in the foreground and the north-west facade of the machine shop and engine testing shop on the left. Left, the water cooling towers over the boiler room, centrally placed in the large single-storey testing area. The office block is steel framed on pile foundations, with a first floor and roof of prestressed concrete beams spanning the full width of the offices. The south-west facade is entirely clad in glass curtain walling. The test areas are also steel framed and external walling includes cavity brickwork, aluminium sheet on insulation board and patent glazing. The roof is of pressed steel decking. Heating is supplied by a recently designed oil-fired "packaged" boiler

The Plate System by Truscon



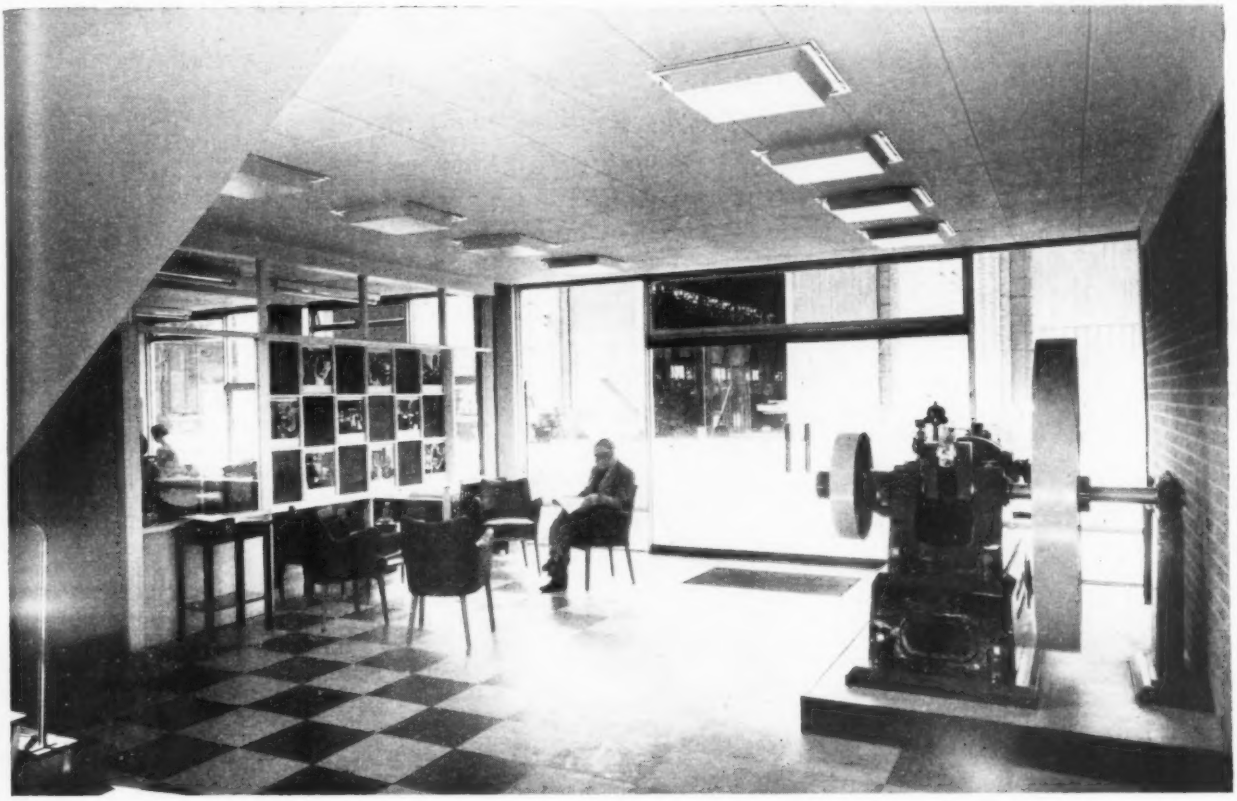
One of the finished blocks of Council Flats, Millpool Hill Estate, Birmingham (A. G. Sheppard Fidler, F.R.I.B.A., City Architect) compared with the model of its Plate structure.

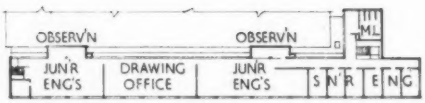
The Plate System provides a concrete frame without beams. This is done simply by designing the beams away. The Plate System is at its best with a regular grid, yet it is often the only reasonable solution when columns are irregularly placed. The Plate System does not compress an architect's work within the framework of a stereotyped plan, nor does it attempt to do his work for him. It is more than a system of design, for combined with careful planning and the use of cranes and precast components it has become a system of construction. It is cheap in cost but not in appearance. With good organisation it can be built very rapidly.

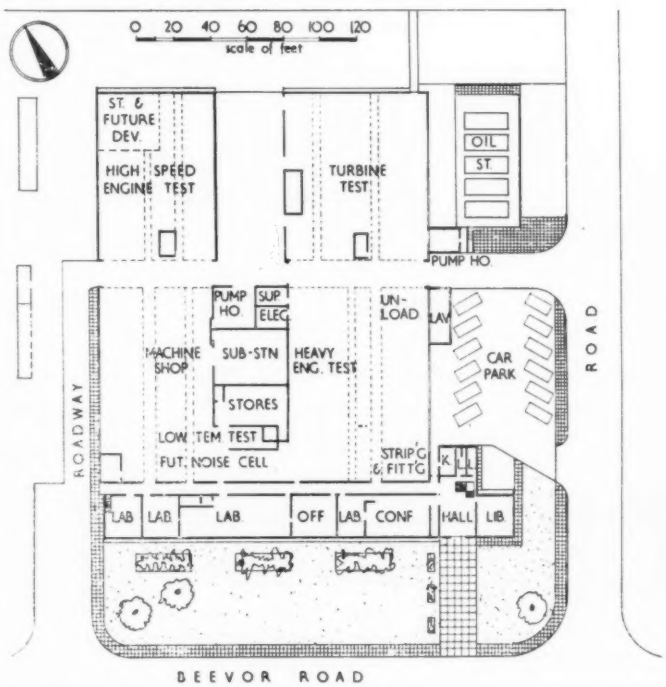
The outstanding application of the Plate System is for flats and offices; and recent developments have widened its scope to industrial work.

The Trussed Concrete Steel Company Limited, 35–41 Lower Marsh, London, SE.1: Telephone WATerloo 6922

RESEARCH CENTRE IN BEEVOR ROAD, LINCOLN continued







Ground floor plan

15 ft. 6 in. high by 7 ft. wide by 11 ft. high, rated at 4,000 lb. steam per hour at 120 p.s.i., which was manufactured by the clients. Above, the entrance hall at the south end of the office block, on the left, behind the partially glazed partition, is the library. Below, the conference room on the ground floor of the office block, with access direct from the entrance hall. The

general contractors for the centre were William Moss and Sons. Steelwork by Henry Smith Ltd. For sub-contractors see page 123.

THE INDUSTRY

From the industry this week Brian Grant reviews a new gas cooker, a washing machine with a polyester glass fibre bowl, a fire extinguisher, a new roofing material and a handbook on lifts.

NEW GAS COOKER

One of the more interesting exhibits at the British Industries Fair was a new English Rose gas cooker made by Flavels of Leamington. The cooker consists of an oven unit 5 ft. 6 in. high and a hot-plate with working height of 36 in. so that it lines up with the standard kitchen work top heights. The units are normally installed side by side, and the hot-plate can be either on the right or on the left of the oven, or the two units can if necessary be installed in entirely separate parts of the kitchen. The hot-plate contains four quick-boiling burners with automatic lighting from a pilot light, and there is a large capacity storage cupboard in the place where the oven would be in a normal cooker.

The oven unit has, at the top, a control panel incorporating time switches and immediately below this is the grill, which has a bottom hinged door. Immediately below this, and roughly at waist level, is the oven, while below it is a large plate-warming drawer which has no independent heating but which is warmed by the surplus heat from the oven. Below this again, and at floor level, is an unheated storage cupboard. The automatic oven control can be set up to 11 hours in advance of turning-on time and will then cook at a predetermined thermostat setting for up to a maximum of 9 hours before it automatically turns itself off. The pilot burner for lighting the oven also operates a bi-metal safety strip of the type used in multi-point water heaters and this prevents any gas from reaching the oven burner if the pilot light should by chance blow out. There is a separate gas connection at the back of each of the two units and in addition a 5 amp. electricity supply is required for the oven unit to operate the automatic time switch.

The new cooker is produced with a finish in green, cream or white and is designed to match the existing English Rose range of kitchen furniture. Retail price is £135. (*C.S.A. Industries Ltd., Warwick*)

NEW WASHING MACHINE

The photograph below right shows the new Vactric washing machine which has a number of quite interesting features and seems reasonably priced at 75 guineas including purchase tax. It is the first machine, so far as I know, to make use of a polyester glass fibre bowl which is large enough to hold 8 or 9 lb. of clothes and 10 gallons of water although the overall dimensions of the machine are only 20 by 22 in. by 36 in. high. A further advantage of this material is that the water loses heat at the rate of only 3° F. per hour as opposed to nearly 40° F. per hour with metal bowls. The machine has a twelve inch wide power driven wringer which folds away inside the bowl when it is not in use and does not have to be lifted off, while it can be swung out and away from the bowl and used while another batch of clothes is being washed. Although the machine is normally used with hot water direct from the tap there are two thermostat-controlled electric heating coils underneath the agitator and these are controlled by an interlocking switch arrangement which allows the full 3 kW. load to be used for quick water heating or alternatively 1½ kW. and the motor for continuous heating while the washer is being used. Standard finish is green or white and as the total weight with the wringer is only 118 lb. it is comparatively easy to wheel about on its plastic ball bearing castors. (*Vactric Ltd., 196, Sloane Street, S.W.*1.)

NEW FIRE EXTINGUISHER

A new type of fire extinguisher which uses powder instead of the more usual liquids has recently been developed by Nu-Swift. It has been designed specifically for use on fires involving alcohols and industrial solvents and electrical equipment, the powder being discharged in a fan shaped cloud from a range of about 10 ft. The powder used contains a number of oxidation inhibitors, principally sodium bicarbonate, and is ejected from the extinguisher by a charge of compressed carbon dioxide. The extinguisher has been approved by the Fire Officers Committee for Class B and Class C

Flavel's "English Rose" gas cooker.

The Vactric washing machine.

NEW DEVELOPMENTS NEED NEW DEPARTURE BUILDINGS

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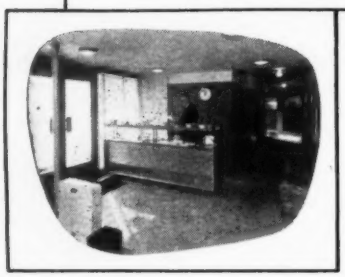

Main foyer and corridor

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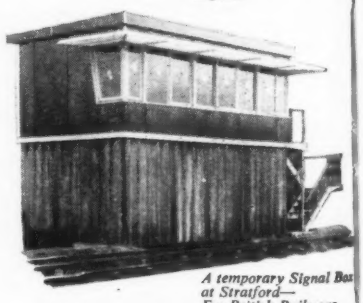

A temporary Signal Box at Stratford—For British Railways, Eastern Region.

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technical section

fires and the powder does not coagulate when the extinguisher is not in use, so that routine inspection is reduced to a minimum. (*Nu-Swift Ltd., Elland, Yorks.*)

ROOFING MATERIALS

Some time ago it was announced that the manufacturers of Nuralite were prepared to give a 25-year guarantee for their material provided that it was properly fixed. In order that there should be no doubts about this guarantee, the company has now formed a subsidiary known as the Weatherall Roofing Co., which will both supply and fix the material.

At the same time a new material known as Nuraphalte has been announced. This is very like Nuralite but is made in 4-ft.-sq. sheets, pre-formed in such a way as to eliminate the use of drips and rolls. It can be used for flat or curved roofs as well as the normal pitched roof and one of the first jobs was the Phoenix public house at Harlow, while further work is in hand for British Railways and the Port of London Authority. (*Nuralite Sales Ltd., Whitehall Place, Gravesend, Kent.*)

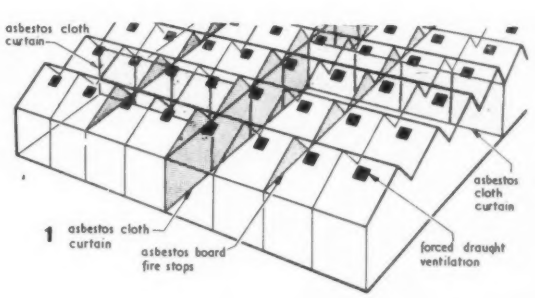
ALL ABOUT LIFTS

Hammond & Champness Ltd. have recently issued a handbook on lifts which provides, in 120 pages or so, virtually all the information which an architect is likely to need when planning a lift installation. By means of graphs and tables, the architect can not only decide the number, size and speed of the lifts required for any particular building, but is also able to plan the lift wells accurately with pit depth, head room, dead loads on the building and the approximate sizes of the machine rooms required. Recommendations are made on the most suitable equipment for use with lifts in all types of building, including those in council flats and hospitals, or goods lifts in factories. Part 2 of the book provides detailed specifications of the component parts of lifts and includes a full description of the many types of control systems available. Part 3 describes the Shepard home lift, service and hand-powered lifts and the book concludes with reprints and extracts from the British Standard Code of Practice as well as all the relevant clauses in official publications relating to lifts.

This is a most informative publication, very well produced with a great number of diagrams and photographs and the manufacturers are to be congratulated on an exceptionally thorough piece of work. The dust-jacket carries a price figure of 3 gns. and I should think this is very nearly the sum which the book would have cost to produce. Although I have little doubt that it would be available free of charge to any genuinely interested enquirer, I think it would be only fair to the manufacturers if applications for it were limited to people reasonably likely to have a respectable sized lift job in the comparatively near future. (*Hammond & Champness Ltd., Gnome House, Blackhorse Lane, Walthamstow, London, E.17.*)

MOCK FACTORY FIRE

Right, is a fire test on a full scale three-bay factory building carried out by Cape Building Products Ltd. and Colt Ventilation Ltd. to try the effectiveness of a system they have worked out jointly to confine fires in wide span factories (e.g. Jaguar). This system is to hang ranges of asbestos curtain with asbestos board firestops above in positions which, when the curtains are unrolled, will divide the factory into volumes of not greater than 250,000 cu ft. (see diagram, below) and to fit dual purpose fusible link heat and smoke exhaust ventilators above each volume. The idea is that the curtains will contain the fire and the ventilators (which open automatically when the temperature rises above a certain point) will extract the smoke (which has been proved the big bugbear in fighting fires of this kind) and, in doing so, serve to keep the temperature down. The curtain is, of course, an extra charge on factory building and it is interesting to note that the cost of 100 ft. of curtain, 18 ft. high, was given as approximately £1,300 to £1,500. As the ventilators (which in this case were calculated on an area of 2 per cent. of the floor area) can serve to extract unwanted heat in normal summer use they may be considered as adding to the general amenity of the building. In the test two of the factory bays were loaded with combustible material which was then lighted. An asbestos curtain was then lowered to sever these two bays from the third in which a number of objects were put. Though the temperature on the "hot" side rose rapidly to 2,450° F. at 10 minutes after ignition, the operation of the fans was sufficient to keep the air clear of smoke and to lower the temperature by approximately 200° F. every five minutes. At the moment when the temperature was at its highest on the "hot" side that on the "cool" side was only 810° F. Thereafter the temperature on the cool side continued to rise to a maximum of 1,570° F. at 20 minutes, and a wooden crate near the edge of the curtain caught fire. It was pointed out, however, that as the object of the system was not to stop the fire but to limit it and to enable the fire-fighters to get near in time, this was of small concern, and the test was considered very successful.



Right : diagram of factory building showing how, by unrolling curtains of asbestos cloth in the event of fire it can be divided into volumes from which the smoke can be extracted through the ventilators in the roof.

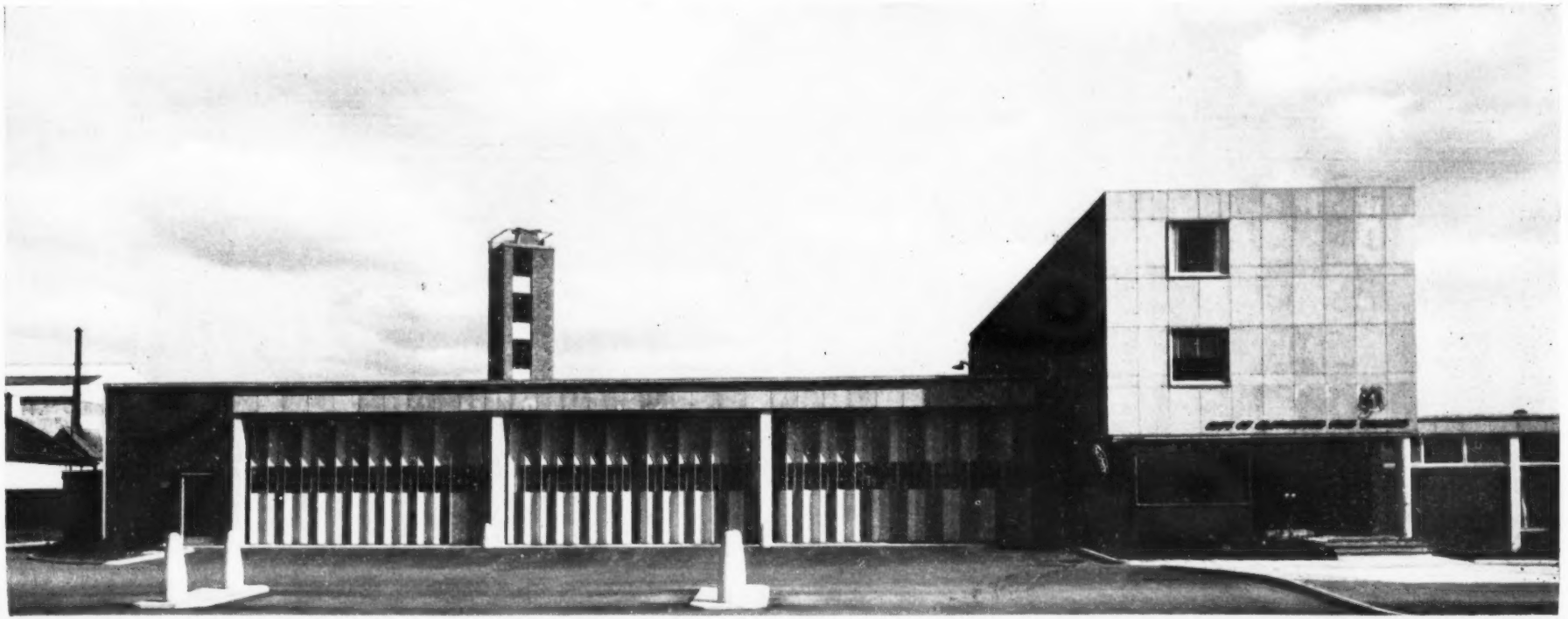
building illustrated

FIRE STATION

in EASTERN AVENUE, GLOUCESTER; J. V. WALL, city architect, T. W. GREGORY, deputy city architect; sketch design J. K. PROSSER, assistant-in-charge R. D. FITZSIMMONS; assistant M. H. CRITCHLEY; consultants (heating and electrical) HOARE, LEA and PARTNERS; quantity surveyors E. R. BABBS and SONS

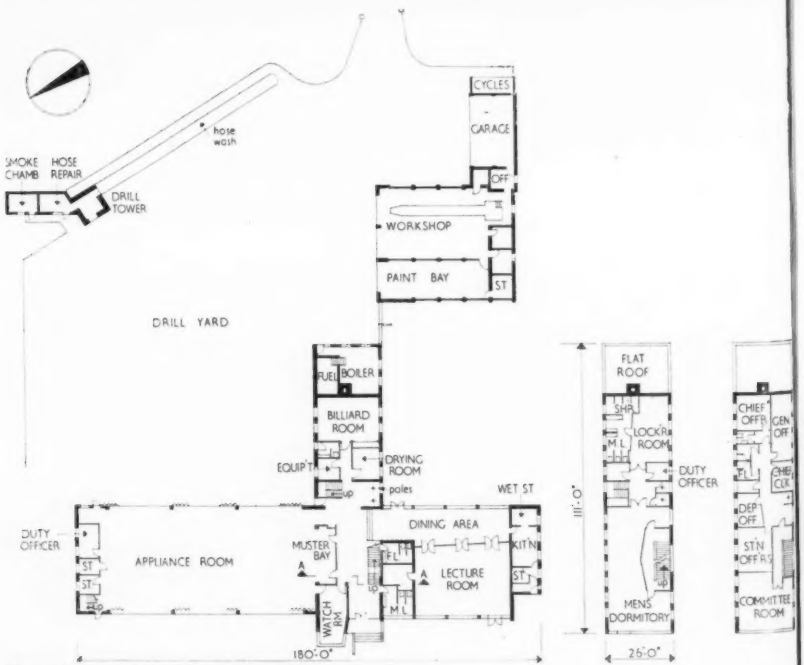
This fire headquarters was sited in a strategic position on the Eastern Avenue ring road, Gloucester, in order to give a choice of routes into the city and thus to avoid level crossings, the Ministry of Transport permitting no more than one continuous access to the ring road. A complement of 15 officers and men and 14 appliances are in constant readiness and answer some 600 calls a year. This is the second fire station to be cost analysed in the JOURNAL; the Slough Fire and Ambulance Station was analysed on January 31, 1957.

Viewpoint 1: looking across Eastern Avenue. The concrete bollards were designed in the city architect's office and have also been used on other sites.

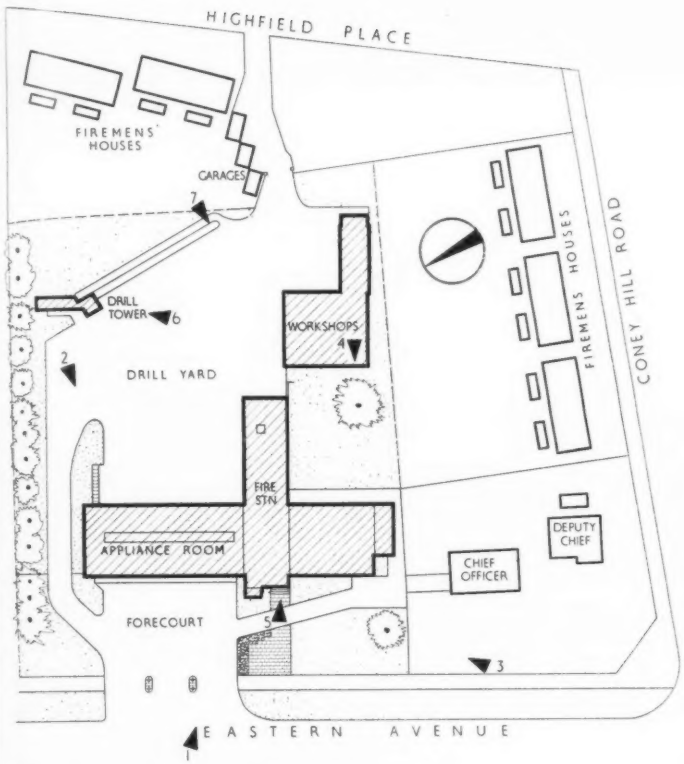


building illustrated

Viewpoint 2 (left): the practice yard, across which stretches the shadow of the drill tower. The financial phasing of the job into two contracts necessitated the inclusion of the water tank in the first contract and the tank weight is carried on the end wall of the main block on the left. The sliding doors of the appliance room are painted alternately off white and duck egg blue (Arch·ome 17 and 29) with a central glazing strip, and the bricks are sand faced. Viewpoint 3 (below): The main entrance from Eastern Avenue, with the lecture room in the foreground. As it faces south-east, venetian blinds have been fitted.



Ground, first and second floors plans [Scale: $\frac{1}{64}$" = 1' 0"]



Site plan showing photographic viewpoints

Viewpoint 4: the rear of the dining area, where the purpose made steel windows in hardwood frames have buff and red glass ply panels below sill level (Archrome 20 and 5).

analysis

CLIENT'S BRIEF: his stated requirements

Fire headquarters to serve an area of 92 square miles, comprising the City of Gloucester and certain rural districts. Accommodation was required for 14 fire appliances of various sizes, garages for four staff cars, facilities for vehicle maintenance, hose drying and repair. Continuous operational manning of the station by crews of 14 men per watch required eating, sleeping, instructional, drill and recreational facilities, together with headquarters for administrative staff. There is a total of 48 operational firemen and 10 officers, and headquarters staff.

SITE: topography, surroundings, access and planting

The building is sited on the dual carriageway of the City ring road which affords alternative accesses to all parts of the City and avoids difficulties caused by level crossings bisecting central traffic routes. The side and rear frontages were developed some years ago with firemen's houses. The Ministry of Transport required no more than one continuous access to ring road.

PLAN: general appreciation

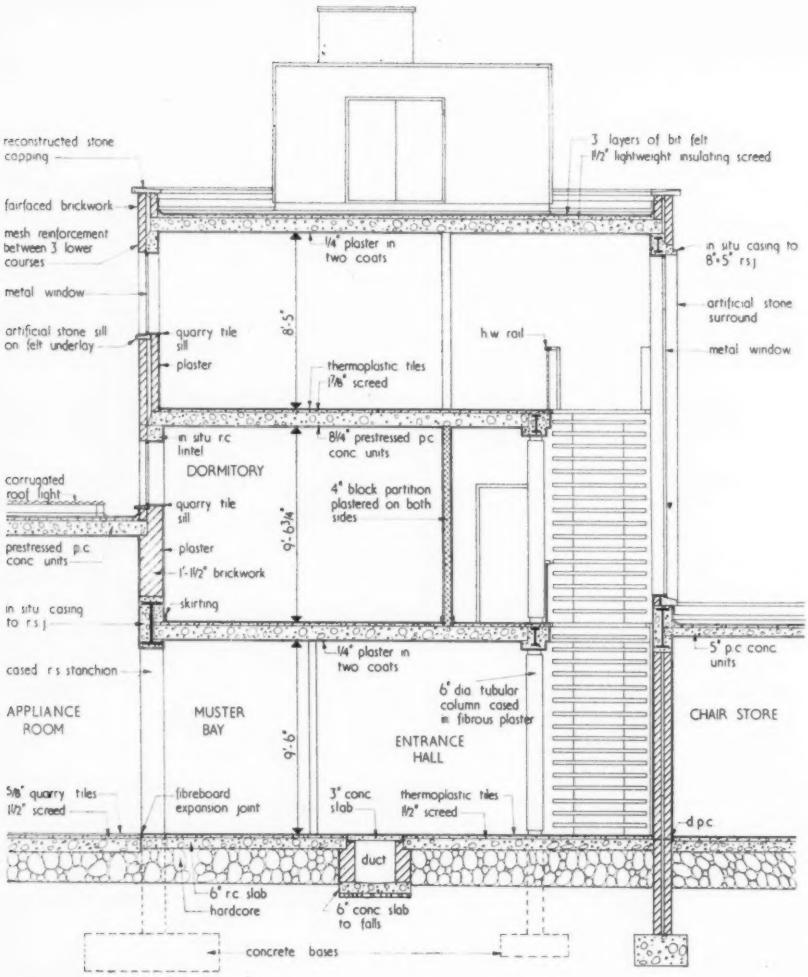
The appliance room fronts the road from which it is separated by an 80-ft. forecourt, and has rear access to the drill yard. The use of large span openings with industrial type metal sliding folding doors rather than conventional single bay doors made it possible to fit 14 appliances into a nominal 6-bay station. The doors of the first two call-out bays are power operated, the others are hand operated. To avoid confusion emergency access to appliance room is by one entrance only, fitted with an indicator showing the vehicles to be manned. These are approached from the rear, and to allow this, sliding poles from the upper floors are located outside the appliance room, contrary to normal practice. The watch room oversees the appliance room, forecourt, main road and entrance; the officer riding the appliance calls here en route to take the address to which he is to go. All calls made by the public are taken in person here, by firewomen. This nerve centre includes telephones, short wave radio, internal loudspeaker and call back control, sliding door control, vehicle indicator panel, future traffic light control, and operational charts. The lecture room is also used by public for instruction and recreation and has kitchen, dining and toilet facilities off the entrance hall and remote from appliances. This is the firemen's main recreation area during long duty hours. On the first floor are firemen's ablutions, lockers, and dormitory, with access to the appliances by staircase or sliding pole. The other facilities provided make it unnecessary to plan the dormitory for use also as a recreation area. The second floor, with separate stair access, houses the headquarters administration not directly connected with operations, a committee room that is also used for lectures, and a quiet room. The 60-ft. drill tower is on the north side of the drill yard (so that firemen drill with their backs to the sun), has two drill faces and a vertical hose drying shaft using natural ventilation which has proved satisfactory on this site. In order to retain two drill faces, internal access to the 8-ft. × 4-ft. drill platforms is by continuous cat ladder in the drying shaft. There is a two-bay vehicle workshop, a paint shop and garage for four cars.

MAIN CONSTRUCTION: general appreciation

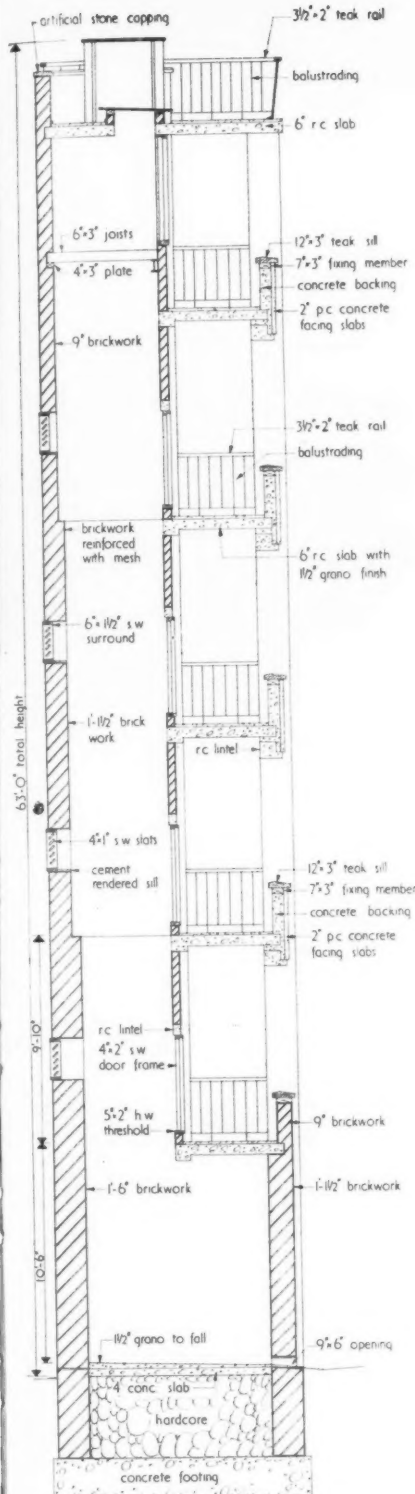
The 3-storey block is of load-bearing brickwork on strip foundations. The appliance and lecture room blocks are of structural steelwork, with floors and roofs of prestressed

building illustrated

Viewpoint 5 (left): a closer view of the entrance. Red lettering is set against 2-in. precast Bath stone panels 4-ft. 3-in. × 2-ft. 8-in. which are hooked back with ⅛-in. copper cramps into mortar pockets. The push plates on the polished mahogany entrance doors are engraved with the City coat of arms, and the projecting watch room has been treated differently from the main facade, being rendered red (Archrome 5) with all round ¼-in. glazing and ex-12-in. × 1¼-in. hardwood fascia. Viewpoint 6: the 65-ft. drill tower, being scaled externally here, has unusual features: it offers drill practice on two faces, and access is by a cat ladder in a shaft in which hoses are dried effectively by natural ventilation. No traditional trap doors to each 8-ft. × 4-ft. drill platform are therefore necessary, and a rough-aggregate surface on the precast-concrete panels prevents ladder sway.



Section A-A [Scale: ⅛" = 1'-0"]



Section **B-B** drill tower [Scale: ⅛" = 1' 0"]

analysis

concrete beams. The drill tower is of load-bearing brickwork with in-situ concrete floors and raft foundation. Garages and workshops are brick pier and infill panels, steel lattice beams and decking of compressed flaxboard. Roof finishes are 3-layer felt with applied grit. The main staircase is a reinforced concrete cranked spine beam with cantilevered hardwood treads. The appliance room is 80 ft. long with three openings each 24 ft. clear width. The part-glazed metal sliding-folding doors collapse behind the columns and give maximum openings; one door is automatically power operated when the alarm is sounded.

	cost per sq. ft.	s	d
	preliminaries and insurances	3	9

STRUCTURAL ELEMENTS

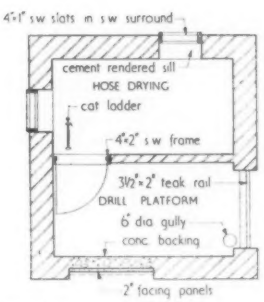
Work below ground floor 4 9

Load bearing walls: mass concrete strip foundations; reason: compact gravel subsoil (main building, garages, workshop).
Steel columns: reinforced concrete bases.
Drill tower: reinforced concrete raft.

External walls and facings 5 5

Generally: 11-in. cavity and 18-in., 13½-in. and 9-in. brickwork, sand faced (main building, garages and workshops).
Front elevation and tanks: 2-in. precast facing slabs, Bath stone faced.
RSJ's: 2-in. precast facing slabs, Bath stone faced; reason: used as permanent shuttering.
Between openings of drill face on drill tower: 2-in. precast slabs, rough texture coloured aggregate; reason: prevents lateral slip in hook ladder drill.

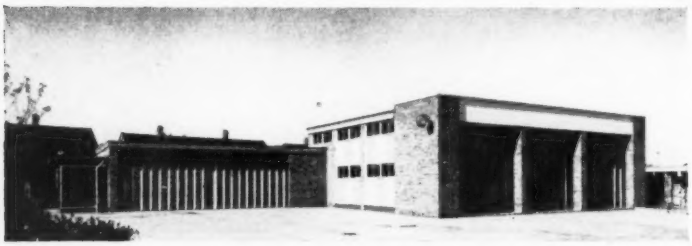
$$\frac{\text{solid wall}}{\text{floor area}} = \frac{0{\cdot}6290}{1}$$

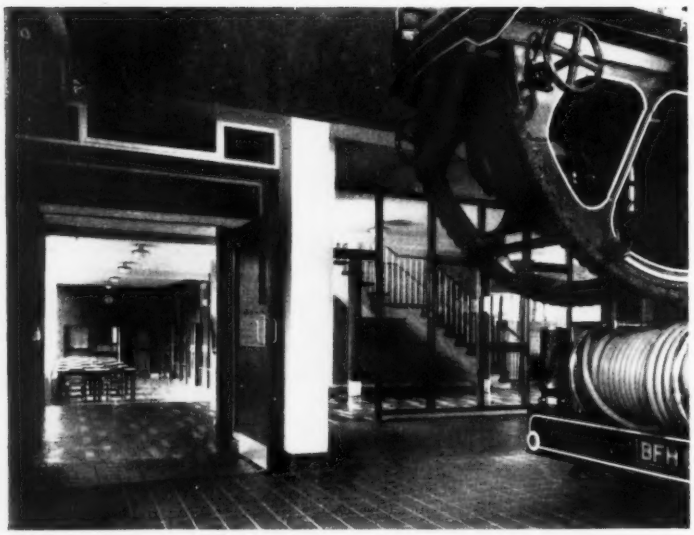


Typical upper floor plan

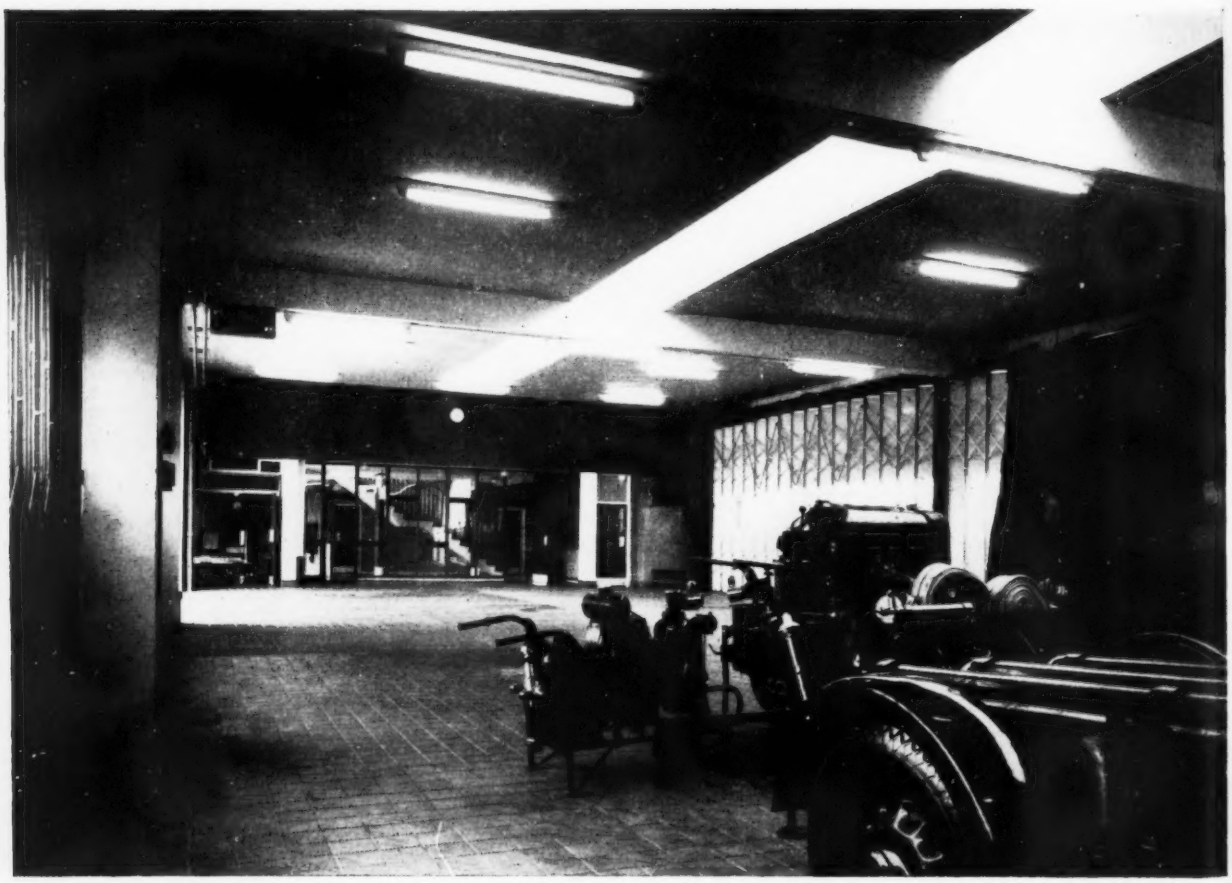
Ground floor plan, drill tower [Scale: ⅛" = 1' 0"]

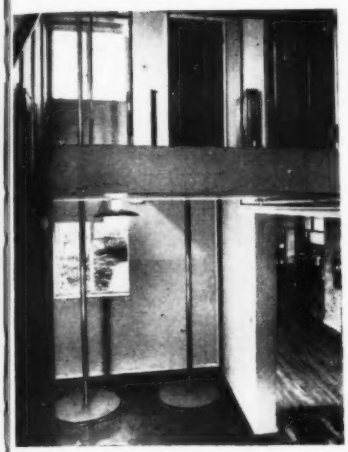
building illustrated



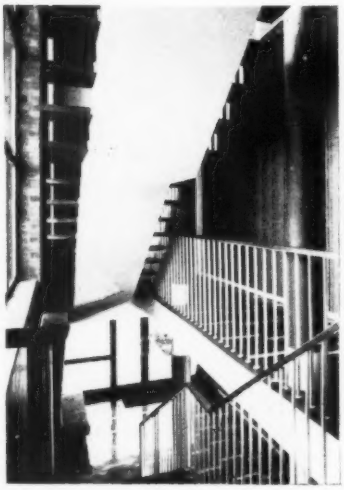


Viewpoint 7 (left): an external view of the garage for 4 staff cars, bicycle shed, maintenance workshop, and paint bay; in the background, firemen's houses which surround two sides of the fire station. These buildings, together with the drill tower and drill yard, were executed in the second phase of the work under a negotiated contract. Centre left: the spacious atmosphere which has been achieved can be seen in this view from the appliance room towards the dining area, which is approached down a flight of steps that uses the natural fall in the ground to give extra height. A red (Archrome 5) free-standing column by the stair and a red panel over the doors on the left contrast with a deep green end wall in the distance and a pale pink ceiling. The dining area floor is loliondo hardwood strip and the entrance hall generally is finished in ilex green marble thermoplastic tiles with white inset strips. Beyond again is the kitchen which is clear of the main circulation area. Below : a long view of the appliance room shows the 41-ft. 6-in. clear span of compound r.s.j. cased beams supporting prestressed precast roof beams and in-filler blocks spanning 25-ft. and surfaced in the three layer felt, chippings or vermiculite screed. Similar slabs are also used elsewhere. The floor is finished in 6-in. × 6-in. ribbed ironstone tiles on screed. Corrugated plastic roof lights down the centre give even light distribution, and the doors seen in the 24-ft. bay on the right are power operated to open in 15 seconds immediately a call is received. This non-traditional use of sliding folding doors saves space, allows two or three vehicles in each bay without intermediate posts and has proved so satisfactory that it is likely to become general practice. The appliance indicator for crews can be seen on the top left.





Left: the watch room. This is the nerve centre of the headquarters, the near end of this console desk being the general radio link to appliances and cars. Beyond are the alarm bell, sliding door and station lighting control. It was not found possible to change the design of the standard Post Office telephone exchange in the centre of the group, and the result of this inflexible policy is clear. Beyond again are emergency telephones, call in panels, sprinklers, alarms fixed in high risk buildings and station intercom. Below: this view takes in the underside of the cranked r.c. stair to second floor as well as the yellow sofa near the entrance and a glimpse of the forecourt. The fibrous plaster casing to the r.s.j. column is painted red, while the ¾-in. × ½-in .m.s. balusters are white and let into cantilevered 2-in. hardwood treads. Left: the

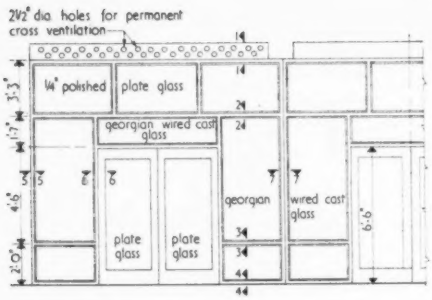


pole jumps, sheathed in stainless steel on 3½-in. diameter m.s. tube and delivered to the site prepared. The circular mats at the foot are sponge rubber with a rough red surface, and red painted gates are swung open at each floor level when the poles are in use. The doors at the top right lead on to the first floor dormitory which is used for sleeping only. The next photograph. shows a typical bunk to store bedding, designed by the architects and fire service and made by the firemen. Bottom left: this inspection pit in the workshop is painted white and lit with fluorescent lighting recessed under the guard kerb.

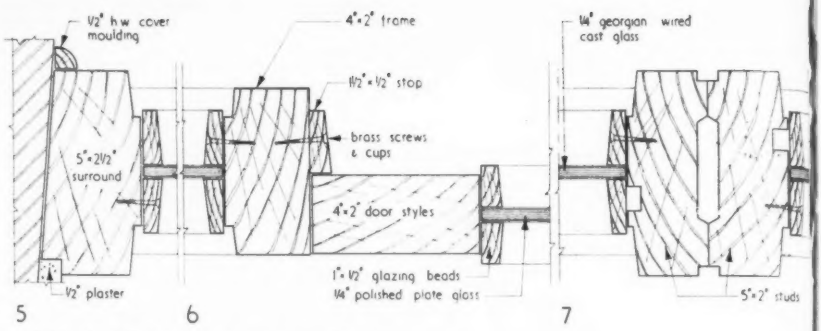
analysis

	s	d
Frame or load bearing element Appliance room, lecture/dining area: beam and column, cased RSJ's, 41-ft. 6-in. beam spans, generally 25-ft. bays; reason: for maximum openings and flexible layout. Remainder of scheme: load bearing brickwork	3	5
Upper floor construction 1st and 2nd floors, three storey block: beams spanning 24 ft., pre-stressed precast concrete 7 in. deep, with infiller pots.	1	5
Staircases Main stair: cranked spine beam with cantilevered reinforced concrete, and hardwood treads. Secondary stair: concrete precast steps on brick supports; finish: granolithic with carborundum. Timber stair to appliance room mezzanine store. Height: floor to floor = 10 ft. 2½ in. Width between landings = 6 ft. generally. No. of staircases: 3. Widths: 4 ft. 2 ft. 11 in. 2 ft. 11 in. Total rise: 20 ft. 5 in. 10 ft. 2½ in. 8 ft.	1	1
Roof construction Main building: 24-ft. and 30-ft. spans: pre-stressed precast concrete beams with infiller pots, vermiculite screed, 3-layer felt with chippings finish, 6,147 ft. super. Garages and workshops: compressed flaxboard slabs on lattice steel beams and purlins, 3-layer felt with chippings finish, leadwork included in cost. 2,750 ft. super.	7	0
Roof lights Appliance room: corrugated plastic continuous 60-ft. long lights; reason: even light distribution. Kitchen, toilets and store: cast glass square domes, metal ventilating upstand. No. of rooflights: 1 continuous, 5 domes. Total area, 535 ft. super.		7
Windows Generally: hot dip galvanised steel, some wood frames for standard windows. Stair, lecture and dining areas: hot dip galvanised steel, some wood frames for special windows. $\frac{\text{window area}}{\text{floor area}} = \frac{0{\cdot}1441}{1}$	1	10
External doors Appliance room, garages and workshops: glazed metal sliding folding doors, painted; reason: wide openings easily controlled hand or power with no obstruction. Main entrance: 1¾-in. hardwood double swing doors, polished. Generally: external quality plywood solid flush doors, polished. $\frac{\text{external door area}}{\text{floor area}} = \frac{0{\cdot}1683}{1}$	4	4
Glazing Lecture/dining: ¼-in. polished plate. Sliding folding doors: ¼-in. Georgian polished plate. Generally: 32 oz.		7

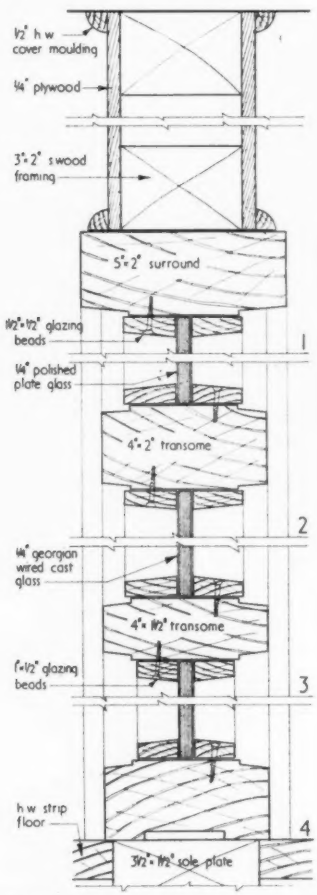
building illustrated



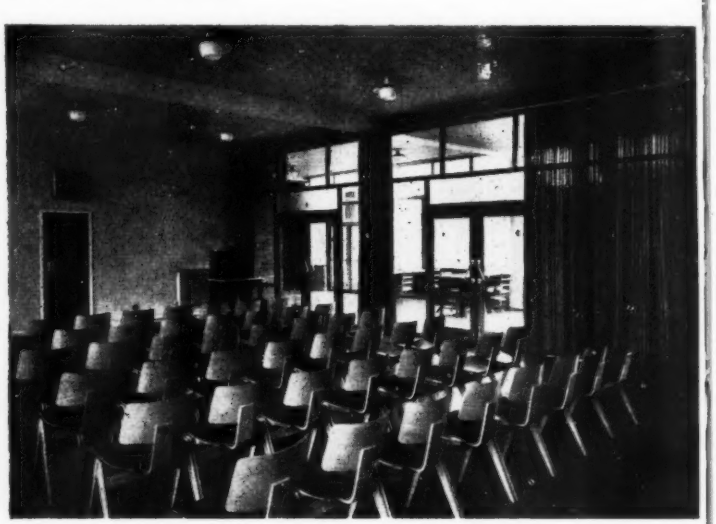
Elevation of screen in lecture room [Scale: ½" = 1' 0"]



Plan details of screen [Scale: 3" = 1' 0"]



Section details of screen
[Scale: 3" = 1' 0"]



Above: the lecture room. The floor is loliondo strip, giving a variety of light brown colours. The end wall is finished grey wallpaper and the ceiling pale pink emulsion paint. Sound absorbing curtains across a glazed screen separate the dining area, while over the door on the end wall there is a typical two-way loudspeaker with press button control. Under window panels are painted lime green (Archrome 26) and exposed radiators are painted pale grey. Below: the committee room at the head of the stairs. Lime green cushioned chairs of natural beech combine with a grey thermoplastic tile floor livened with a red strip pattern. The rear wallpaper is khaki green and black which contrasts with a glazed mahogany screen having bold projecting splayed beads.

analysis

PARTITIONING

Internal partitions — 2 2
Generally: 4-in. hollow clay pot, ½-in. plaster.

Screens
Entrance/appliance room, lecture/dining rooms and landing/committee room; polished mahogany.
Cost included in internal partitions.

W.c. doors and partitions — 3
Toilets and showers; terrazzo partitions and flush doors, gloss painted.

Internal doors — 10
Throughout: timber and glass, flush plywood faced doors, polished.
47 single doors excluding w.c. units
7 pairs of double doors

Ironmongery to internal doors — 7
Throughout: anodised aluminium door furniture; some to architect's design.

FINISHINGS

Floor finishes — 3 8
Offices, dormitory, circulation: 9-in. × 9-in. thermoplastic tile on screed with contrasting colour strips.
Excluding battens area 537 yards super at 18s. 8d.
Lecture and dining: hardwood strip on battens and clips, loliondo sealed.
Excluding battens, area 189 yards super at 12s. 1d.
Appliance room: 6-in. × 6-in. ribbed ironstone tiles on screed.
Excluding screed, 484 yards super at 43s.
Toilets and showers: 4-in. × 4-in. unglazed tiles on screed.
Excluding screed, 56 yards super at 39s.
Garages, workshops and tower: granolithic chemical and oil resistant.
335 yards super at 15s. 2d.

Wall finishes — 1 7
Main building generally: ½-in. plaster, emulsion paint, wallpapers.
Entrance hall, landings, appliance room; facing bricks.
Toilets and showers: glazed tiles, related decorative colours.
Boilers, garages, workshops and stores: common bricks, emulsion paint.

Ceiling finishes — 1 7
Generally: emulsion painted plaster on prestressed beam soffits.
Garages and workshops; flaxboard slabs to roof, untreated.

Decorations — 1 5
Softwood: 3 coats gloss finish on primer, archrome (Munsell) range.
Plaster: primer, 2 coats emulsion.
Hardwood: polish.
Selected walls: wallpaper.
Reason: vistas through screens necessitate integrated colour scheme through building.

FITTINGS

Cloak rooms and other fittings — 1 0
Drying room: metal hangers.

Other fittings
Hall landings: two sliding poles; price £151 delivered.
Lecture room: Venetian blinds.
Lecture room and certain offices: curtains
(certain joinery and furniture dealt with outside building contract, e.g., watch room console, personnel panel, dormitory beds, cupboards, desks, lockers, etc.).

Kitchen equipment
Electric double oven range, hot cupboard and tea urn all included in cost of electrical sub-contract.

SERVICES

Plumbing: external and rain water disposal — 6
Main building generally: cast iron r.w. goods, painted.
Parapets: cast iron standard r.w. heads, painted.

Plumbing internal, cold water installation and sanitary fittings — 2 7
Soil pipes: cast iron, Angus-Smith.
Waste and anti-siphon: burnished copper with clear lacquer finish.
Cold water storage: galvanized ⅛-in. plate, 600 gallons in tank room.
Hot water storage: copper $\frac{5}{16}$-in. plate, 200 gallons indirect cylinder in boiler room.

Sanitary fittings
Ablutions and toilets: white glazed fireclay.

Heating and hot water installation — 5 11
Generally: cast iron and steel radiators, painted.
Appliance room and entrance hall: steel forced warm air convectors, painted.
Cavity walls: " U " = 0·30.
Prestressed beams vermiculite screed: " U" = 0·20.
Boiler house: two cast iron sectional boilers, 200 seconds oil fired, 643,000 B.T.U.'s per hour each.
Appliance room, stores and corridors, 60° F.
Recreation and offices: 65° F.
Dormitory: 55° F.
Ablutions: indirect cylinder gravity feed from heating boilers.
Entrance, cloakrooms and kitchen: electric storage heaters, 12 gallons, 3 gallons and 1½ gallons; reason dispersed demand.

Ventilation system — 3
Drying room: electric 12-in. diameter extract fan.
Kitchen: electric extract fan and canopy.

Drainage: type of system — 2 9
Separate soil and surface water.
Generally: salt glazed stoneware pipes, cast iron under building and brick manholes with cast-iron covers, petrol interceptor to workshops.

Electrical installation — 4 9
Appliance room: 10 lumens/sq. ft. fluorescent, warm white. Generally in main building, garage and workshops: 10 lumens/sq. ft. tungsten.

analysis

	s	d
Drill yard: flood tungsten.		
Generally: emergency lights, 50 volt from battery, automatic on mains failure controlled from watch room.		
Wiring: heavy gauge screwed conduit p.v.c. and cotton braided cables.		
G.P.O. conduits in offices, special boxes distributed by looping system from central points, for neatness.		
Power supply generally, 13 amp socket outlet distributed by ring circuit.		
Equipment: vehicle battery charger distributed direct to vehicles by floor sockets (for emergency disconnection) in appliance room. Door motor in appliance room, controlled from watch room. Short-wave radio, internal loudspeaker and speak back system, watch-room amplifier. Clock system, master clock and slave dials, giving accuracy and independence of mains failure.		
Paved areas	7	3
Vehicular: road, forecourt and part of drill yard: 15-in. ballast, 3½-in. tarmac.		
Washdown, drill yard near tower: 8-in. hardcore, 6-in. reinforced concrete.		
Reason: to avoid scour and indentation.		
Pedestrian: forecourt, concrete paving slabs, granite sets.		
Paths: 6-in. ballast, 2-in. tarmac.		
total cost per sq. ft. floor area £58,866 / 16,522 sq. ft.	71	3

These prices do not include drill tower, which cost £3,206.

TIME SCHEDULE (main building)

Drawings	*Tender date*	*Contract signed*
June, 1953	April, 1954	August, 1954
Work commenced	*Work completed*	*Type of contract*
August, 1954	December, 1956	RIBA with quantities

Completion was protracted on account of financial resolutions by the Home Office which necessitated passing the work in two contracts..

Note: This contract was for the main building only. The garage and workshops and the drill tower were the subject of a separate negotiated contract under which work commenced in April, 1956, the price being based on original tender rates amended in respect of subsequent fluctuations in costs of materials and labour with relevant profit thereon.

COST SUMMARY

Total ground floor area (drill tower excluded)	11,564
Total floor area (excluding basement)	16,522
Price of work above ground floor level	£46,271 17s. 5d.
Price of foundations and basement	£3,877 8s. 9d.
Price of external works	£8,717 6s. 7d.
Gross total price, based on final account	£58,866 12s. 9d.
Price of drill tower	£3,206 18s. 6d.
Price per ft. cube of drill tower excluding external works	5s. 8¾d.
Total price per ft. cube including external works	4s. 4d.
Excluding externals; price per ft. cube:	
Main buildings	3s. 9½d.
Workshops and garages	2s. 11¼d.

COST COMMENTS

Comparison of the above cost analysis with the analysis of the Fire and Ambulance Station, Slough (see AJ, January 31, 1957) provides the following points for consideration:

1. Gloucester Fire Station, although not including the cost of the drill tower is more costly per square foot of floor area than the one at Slough. Account must be taken of the client's accommodation requirements which are different for the two schemes and will affect the overall cost picture. It would appear that there are no definite cost limits laid down for this form of government building or indeed, any pattern to which an architect can apply a rule of thumb costing, i.e. based on number of appliances, number of personnel, etc., to arrive at his total allowable cost. The procedure is for a scheme and estimate to be submitted to the Home Office, who then decide whether it is too costly or about right. Lack of a target makes it difficult for the architect to ensure that his client gets full value for money.

2. The external walling and facings at Gloucester are by comparison and adjustment of floor ratios more elaborate and costly than those at Slough, i.e.

$$5s.\ 5d. \times \frac{0{\cdot}5684\ \text{(Slough)}}{0{\cdot}6290\ \text{(Gloucester)}} = 4s.\ 11d.\ \text{per sq. ft. of wall}$$

against the actual cost at Slough of 3s. 11d.

3. Roof constructions on the two schemes composed of dissimilar materials and techniques provide the following comparison, against adjusting for differences in actual area covered between the two schemes.

Gloucester

$$7s.\ 0d. \times \frac{16{,}522}{8{,}897} = 13s.\ 0d.\ \text{actual cost per sq. ft. of roof.}$$

Slough

$$8s.\ 1d. \times \frac{17{,}770}{15{,}374} = 9s.\ 4d.\ \text{actual cost per sq. ft. of roof.}$$

4. External doors, although including the special exit doors constructed and operated by different methods, are similar in costs.

5. Electrical installation at Gloucester appears costly but this is mainly due to the duplication of lighting and power in case of mains failure—a client requirement apparently not asked for at Slough.

SITE ORGANIZATION

Site labour and equipment: a general foreman was in charge of this contract throughout, and was assisted by a bricklayer foreman and ganger. Site excavation by ⅜-in. cubic yard excavator with skimmer attachment. Bulk concrete to foundations, slabs, etc., was by 7/5 mixer and distribution by power barrow. Precast floor beams were hoisted by mobile crane. General materials to main block and drill tower lifted by ant queen and ace hoists respectively.

Sub-letting: tile paving, plastering, plumbing, glazing, painting, polishing and tarmacadam paving.

Job management: weekly visits to site by area manager and surveyor and monthly visits by director from head office.

CONTRACTORS

Clerk of Works: F. H. Hogg. *General contractors:* William Moss & Sons Ltd. *Sub-contractors—Heating and electrical installations:* W. T. Turner & Sons Ltd. *Structural steelwork:* John Williams & Sons (Cardiff) Ltd. *Prestressed concrete floor and roof beams:* Pierhead Ltd. *Built-in felt roofing:* Anderson & Son Ltd. *Floor and wall tiling in lavatories:* Carter & Co. (London) Ltd. *Hand and power operated sliding folding doors:* Potter Rax Ltd. *Sanitary fittings:* Adamsez Ltd. *Ironmongery, coat of arms, lockers and drying room fittings:* James Gibbons Ltd. *Lettering over main entrance:* Ward & Co. *Hardwood strip flooring:* Horsley Smith & Co. (Hayes) Ltd. *Thermoplastic tile flooring:* Semtex Ltd. *Balustrading:* The Cotswold Casement Co. and W. T. Blundell. *Paint:* Duresco Products Ltd. *Furnishings: furniture and blinds:* Contracts Dept. Bon March (Gloucester) Ltd.

working detail

STAIRCASES: 32

STAIRCASE: FACTORY AT AMAGER, DENMARK

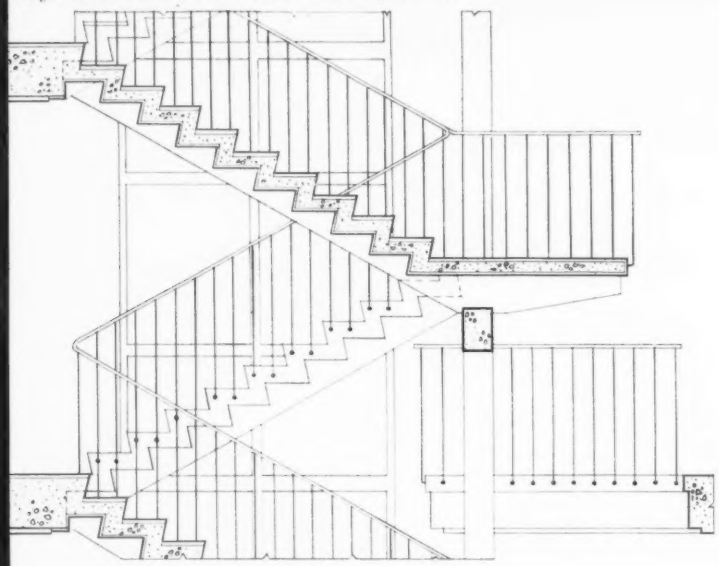
Alf. Cock-Clausen and Preben Hansen, architects

The interest of this in-situ *concrete stair consists in the handling of the trim. Note particularly the carrying of the plaster on the soffit across the exposed face of the string to finish against a brass strip cast* in situ *in the top surface of tread and riser. Note also the small screwed coverplates to cover the joint where the balusters enter the string and the welding of the m.s. core of the handrail to the corner post of the lift cage.*

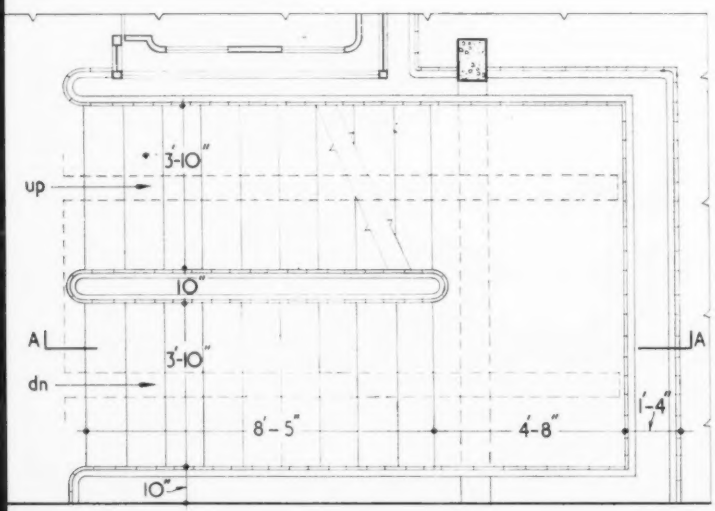
working detail

STAIRCASE: FACTORY AT AMAGER, DENMARK

Alf. Cock-Clausen and Preben Hansen, architects



SECTION A–A. scale 1/4" = 1'–0"



PLAN. scale 1/4" = 1'–0"

DETAIL OF TREADS. scale 1/8 full size

note: figured dimensions in feet and inches are approximate

working detail

PORTER'S LODGE: FACTORY AT AMAGER, DENMARK

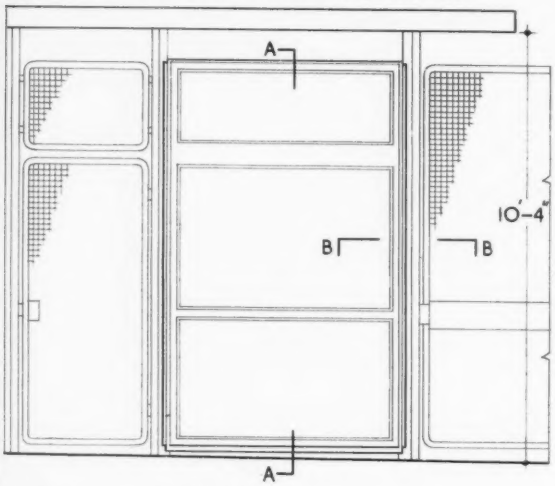
Alf. Cock-Clausen and Preben Hansen, architects

The subject of this detail is the small glazed enclosure at the far end of the canopy. This is a control point from which a doorkeeper can keep a watch on those entering and leaving the factory. Though fully glazed above sill level and provided with two outside doors, it still maintains a comfortable temperature in cold weather. Heating is by ceiling panels (not shown in the large-scale drawing) and the lights are double-glazed throughout. The neat effect is gained by the use of wrought softwood framing with hardwood heads (note particularly the hardwood strips in the built-up corner posts) and the use of m.s. angle framing on the doors.

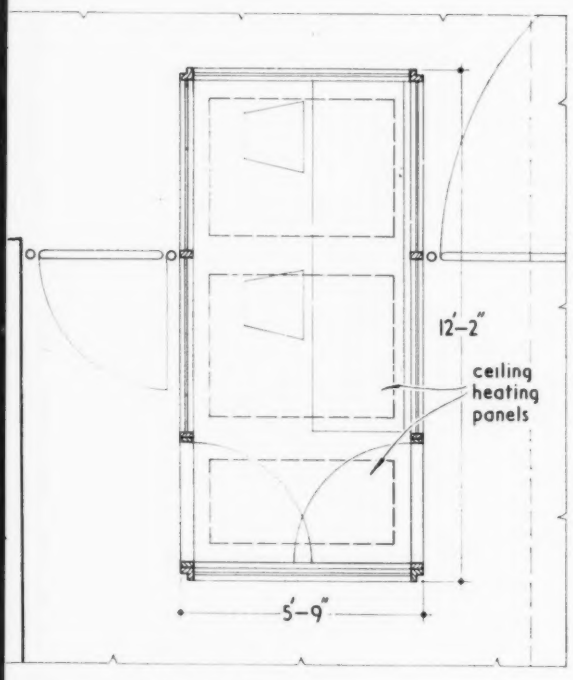
working detail

PORTER'S LODGE: FACTORY AT AMAGER, DENMARK

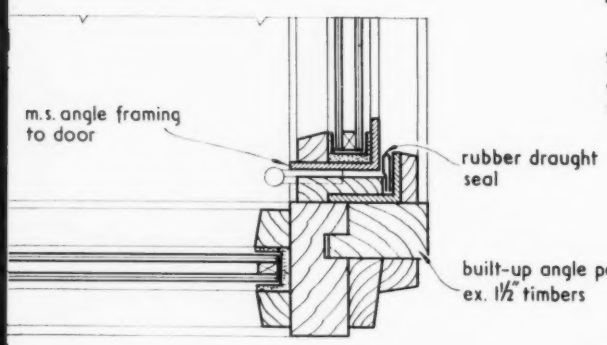
Alf. Cock-Clausen and Preben Hansen, architects



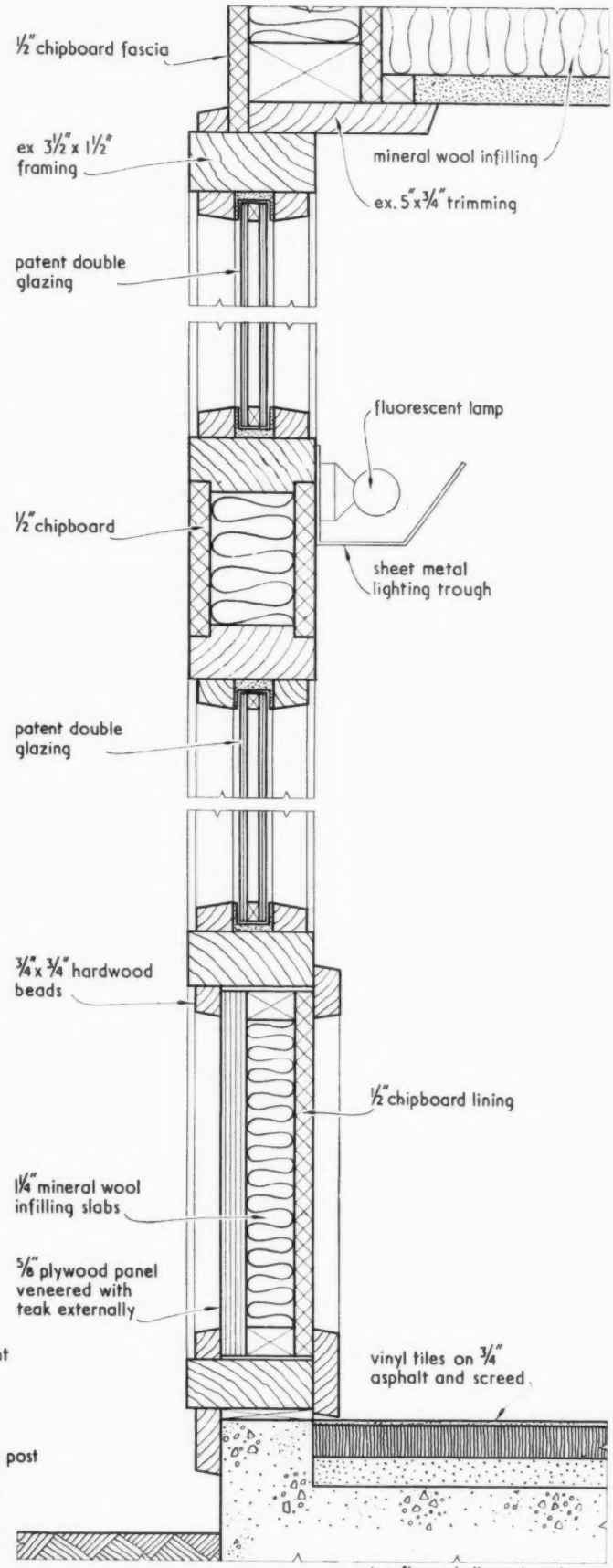
ELEVATION. scale ¼" = 1'-0"



PLAN. scale ¼" = 1'-0"



PLAN AT B–B. scale ¼ full size



SECTION A–A. scale ¼ full size

note: figured dimensions in feet and inches are approximate

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Architects: L. A. G. Prichard & Son, A.R.I.B.A.
Contractors: Frederick Clark & Son, Liverpool

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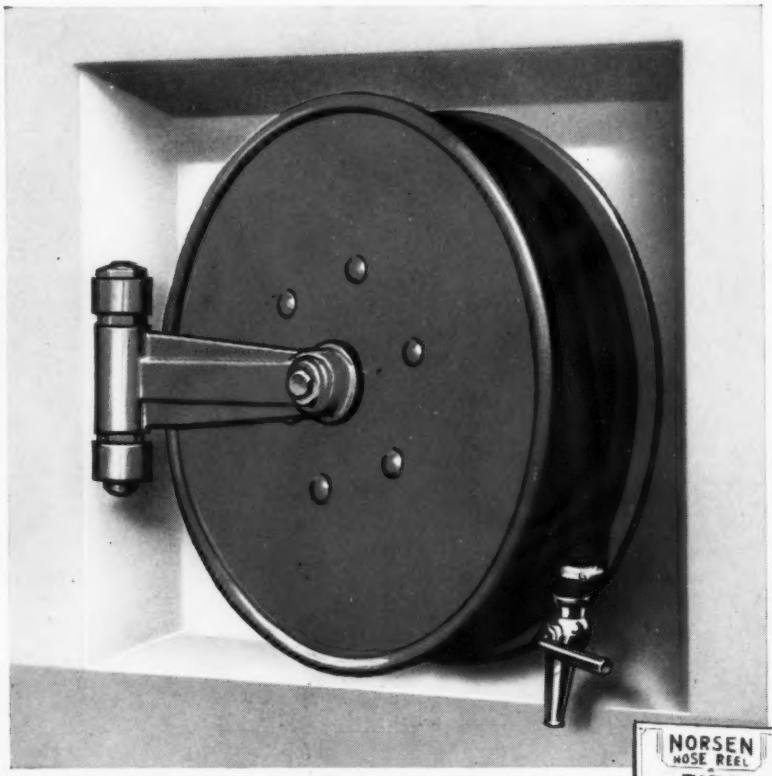

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Exhaus
Alterna
contrac
oil filt
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Contractors

Ruston & Hornsby Research Centre, Lincoln (pages 108-109). *Architect:* J. C. Clavering, F.R.I.B.A. *General Contractors:* William Moss & Sons Ltd. *Sub-contractors: Piles for building foundations:* Franki Compressed Pile Co. Ltd. *Wallspan units to front elevation:* Williams & Williams Ltd. *Metal windows & patent glazing:* Manchester Slate Co. Ltd. *Kynalok aluminium sheeting:* I.C.I. Ltd. *Roof decking to test area:* Robertson Thain Ltd. *Electrical contractors for lighting fittings and cables:* Edison Swan Electric Ltd. *Electrical:* James Scott & Co. Ltd. *Heating and piped services:* G. N. Haden & Sons Ltd. *Rectifier and switchgear:* Electric Construction Co. Ltd. *Switchgear:* English Electric Co. Ltd. *Acoustic ceiling:* Newall's Insulation Co. Ltd. *Main doors to test area:* Bolton Gate Co. Ltd. *Ventilation fans:* Woods of Colchester Ltd. *Perforated acoustic hardboard:* Spencer Lock & Co. Ltd. *Wash and drinking fountains:* William Farrer Ltd. *Fire extinguishers:* Pyrene Ltd. *Office block linoleum floor:* Limmer & Trinidad Lake Asphalt Co. Ltd. *Dynamometers and water-cooling towers:* Heenan & Froude Ltd. *Overhead cranes:* Herbert Morris Ltd. *Exhaust silencers:* Servais Silencers Ltd. *Alternators:* Crompton-Parkinson Ltd. *Steel contractors:* Henry Smith Ltd. *Air, fuel and oil filters:* Vokes Ltd. *Pressure connections* British Ermeto Corporation Ltd.

Announcements

PROFESSIONAL

Leslie Barefoot and Peter Barefoot, A.A.R.I.B.A., wish to announce that the name of the firm of Cautley and Barefoot, Chartered Architects, has been changed to Leslie and Peter Barefoot, Chartered Architects. This follows the retirement last year of Munro Cautley, F.S.A., A.R.I.B.A. The partners will continue to practise from 22, Thorofare (Butter Market), Ipswich, Suffolk.

Samuel Morrison, A.R.I.B.A., M.S.I.A., T.D., of Morrison and Partners, has commenced partnership with J. B. Jefferson, Dip.Arch., A.R.I.B.A., and C. A. E. Davy, Dip.Arch., A.R.I.B.A., under the name of Morrison Partners and Jefferson. Their address is 15, Northumberland Road, Sheffield, 10 (telephone 65207). This practice will be conducted in association with Morrison and Partners present offices at 103, Belper Road, Derby, and 30b, Wimpole Street, London, W.1.

G. R. Vaughan Ellis, A.R.I.B.A., is carrying on the practice of Venning and Ellis, of N.P. Bank Buildings, Liskeard, Cornwall, under his own name and has also opened an office at Higher Market Street, East Looe, Cornwall.

Richard H. Pickles, A.R.I.B.A., has taken Brian Hollos, A.R.I.B.A., into partnership. The practice will continue as Richard Pickles & Partners from 1, Harrison Road, Halifax (telephone 62151), and also at N.E.M. House, 51, Bromham Road, Bedford.

Alan Thompson, A.R.I.B.A., has commenced practising at Queens Chambers, 6-7, Victoria Parade, Torquay (telephone 7766), where he will be pleased to receive trade catalogues, etc.

J. F. Ashford & Partners, quantity surveyors, announce that their Ipswich address is now 32, Princes Street, Ipswich (telephone 51799), where they will be pleased to receive trade catalogues, etc.

The Hertfordshire Chapter of the Essex, Cambridge and Hertfordshire Society of Architects are inviting nominations for the award of the certificate of craftsmanship for 1956-1957 in respect of work executed in the county of Hertfordshire within the past two years. The award is made in two classes: 1. for general excellence of workmanship, and 2. for an individual piece of workmanship. Further particulars from the Hon. Secretary, W. Wesley Turney, L.R.I.B.A., of 63, Wood Street, Barnet, Herts.

TRADE

D. Whitehead, Ltd., of Higher Mill, Rawtenstall, announce that the name of their company has been changed to David Whitehead Fabrics Ltd.

Catesbys Contracts and Export Ltd. announce that they have appointed E. C. Thomas, F.V.I., F.I.B.D., as manager and K. Dixon as surveyor in their Building Department.

The Unit Construction Co. Ltd. announce that they have moved their head office to Faggs Road, Feltham, Middlesex (telephone Feltham 5751/5). Their accounts department will remain at 34, St. James's Street, S.W.1 until the completion of their building at Feltham, which should be about September.

Correction

In the AJ for July 4 on page 44 James Dunbar-Nasmith's name was spelt incorrectly. Also the title of their firm was omitted, this is, Law and Dunbar-Nasmith, Architects.

WAITING ROOM, CAFETERIA AND BAR AT CREWE STATION

Travellers, who, like the girl in the music hall song, get carried on to Crewe, can now make use of the self-service cafeteria, tea and sandwich bar, licensed bar and waiting room which have replaced the former refreshment and dining room. The new services are contained in a single room 100-ft. long, which is brightly illuminated. The walls are finished with framed panels coloured pale blue, yellow, imperial red and black. The floor is black terrazzo inset with white and blue sections. The modernization was designed by the British Transport Hotels and Catering Services. The consultant for interior design was John Carter, and the general contractors A. Edmond & Co. Ltd.

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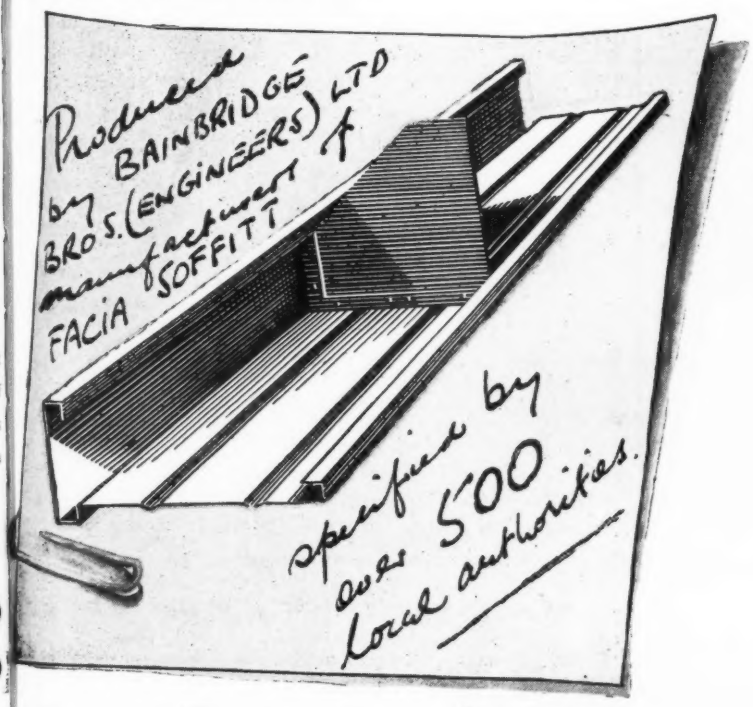
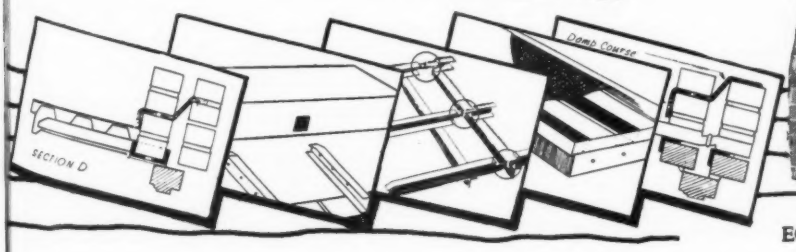
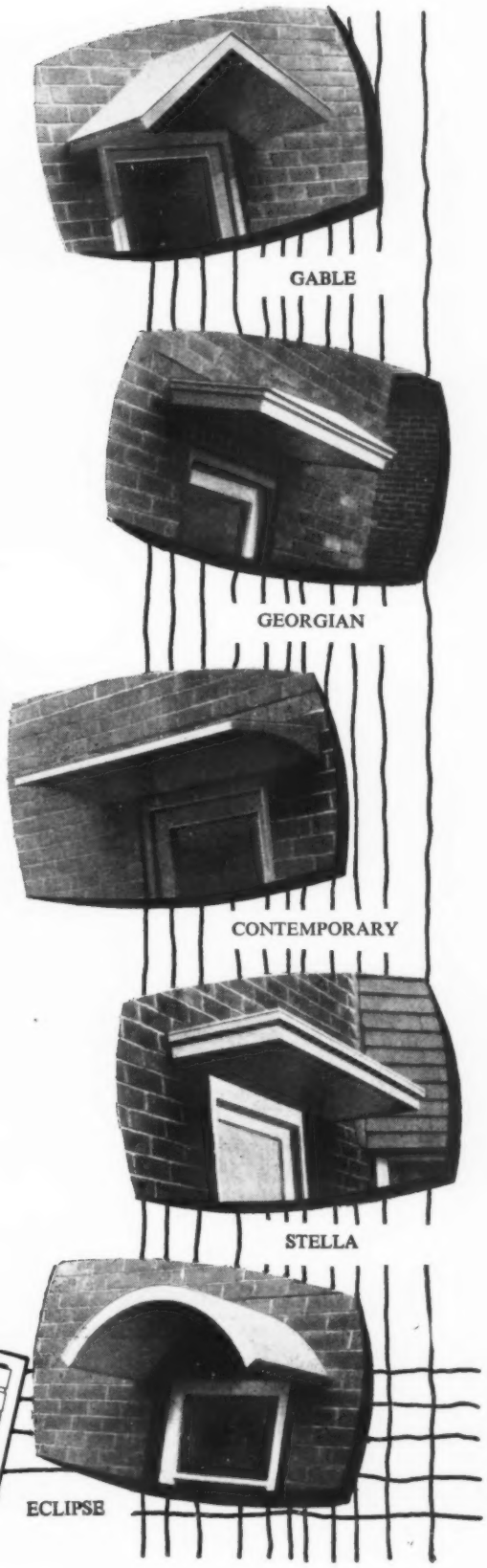


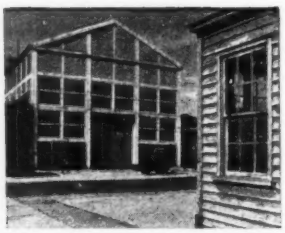




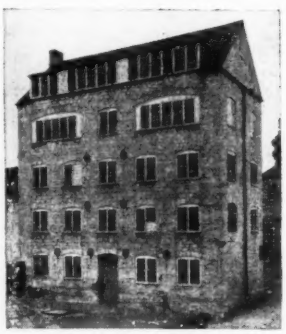
Early Industrial

July Architectural Review

Mills, docks and harbours, warehouses, fences and gates, railways and canals—all bear witness to the theme of July's special issue of the Review, *The Functional Tradition*, compiled and edited by J. M. Richards. In our present need to consolidate the results of the technical revolution that has overwhelmed architecture in this century, we need the discipline of an unconscious vernacular, a simple way of doing things simply, and we have no better guide for this than the monuments of the functional tradition that dot the country from end to end, even in the most remote and rural areas. The tradition is not limited to any material—with its wooden water-mills, its brick warehouses, its iron framed naval boatsheds, its stonework by canal and railway—it had the adaptability we admire in the great masters of today, fitting together material, function and form, but into an unselfconscious unity. Most architects know of the great tradition's existence, have seen one or two textbook examples illustrated, have discovered one or two favourites of their own, but in *The Functional Tradition* they will find for the first time a systematic analysis of the nature and value of the tradition, supported by the results of an extended photographic campaign by Eric de Maré, which has rescued many unknown and forgotten buildings from undeserved obscurity.



Sheerness Naval Dockyard: cast iron frame extension, 1858.

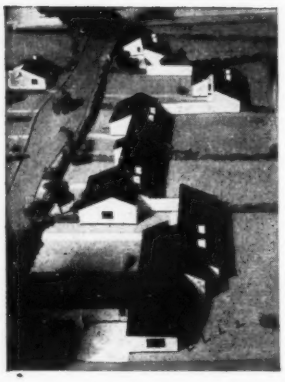


Bentley's piano factory, Nailsworth.

Draught-Stoppers
Hotels
Advertising

August Architectural Review

The year-round English draught makes *Weather-stripping* a subject of perennial interest and in the August issue of the Review, Peter Whiteley will make a study of the products available for remedial work on both doors and windows, as well as the kind of preventive design that is better than even the best of cures. Two hotels of outstanding interest will be described and illustrated; the *Malmen*, by Wallander and Varhelyi in Stockholm, and Louis Erdi's *Coachotel*. A creative and broadminded approach to a vexed question, outdoor publicity, will be outlined in the new proposals for *Advertising in Stevenage*, and the social and architectural problems of building new *Urban Nuclei* in rural areas will be considered in an article by Hilda Selem on recent re-settlements in Italy, and a study of Richard Llewelyn Davies' and John Weeks' rebuilding programme for *Rushbrooke* in Suffolk. Historical features in this issue will cover the early romantic days at the Weimar *Bauhaus*, whose expressionist and religious fervours are recalled by Helmut von Erffa; a sheaf of notes on out-of-the-way aspects of Italian architecture, and a study of Bernardo Bellotto's four magnificent views of the mysterious *Wilanow Palace* outside Warsaw, now on view at the Whitechapel Gallery. In *Skill*, the *Interior* of the Month will be the new offices for the Orient Line, and in *Design Review*, John Blake will survey recent developments in wallpapers and furnishing fabrics.

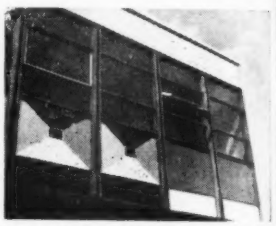


Model of a village at Rushbrooke, Suffolk, by R. Llewelyn Davies and John Weeks, to be illustrated with pilot houses.

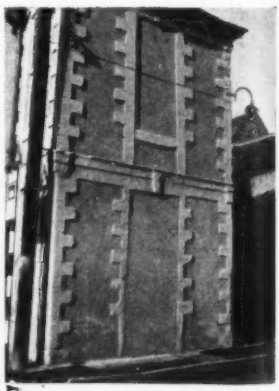
Curtain Walls
Roman and Gothic
Shepton Mallet

September Architectural Review

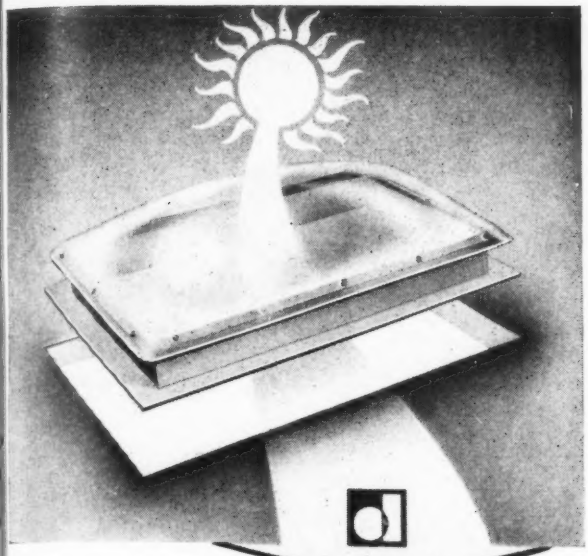
A major feature of the Review's *Machine Made America* issue, and rapidly becoming a dominant topic in discussions of the economics, technics and aesthetics of building today, *Curtain Walling* will bulk large in the September number of the Review. Michael Brawne will contribute a full scale study of the potentialities and perils, scope, materials and methods of this fully industrialised means of clothing buildings, while in *Skill* there will be a supplement on some of the products and systems that are available on the British Market. Also in *Skill* will be new Jaeger shop *Interiors* by Dennis Lennon, as well as *Design Review* and other regular departments. Aspects of the diversity of English nineteenth-century architecture are covered by Hugh Honour's account of the improbable *Roman Church at Everingham*, in Yorkshire, whose decorators were a suitably incongruous combination of Yorkshire and Rome, and a narrative of the building activities at *Strawberry Hill* of Frances Waldegrave, recounted from original sources by Osbert Wyndham Hewett, author of a recent full-dress biography of Lady Waldegrave. September *Townscape* features will deal with *Shepton Mallet*, whose multi-level town-centre will be discussed by Gordon Cullen, and *Hampstead Garden Suburb*, source of so much good and so much evil in English planning, whose status after a half-century of existence will be evaluated by Ian Nairn. And, as usual, the *Counter-Attack Bureau* will give the latest battle-bulletins on the continuing fight against Subtopian blight.



Curtain Walling detail of the new BEA terminal now under construction off Cromwell Road, Kensington.



House in the lower town, Shepton Mallet



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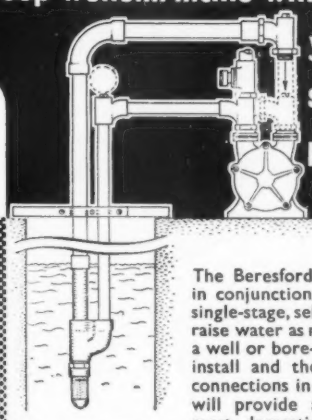

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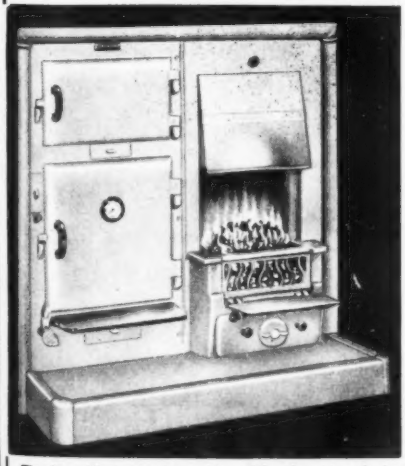

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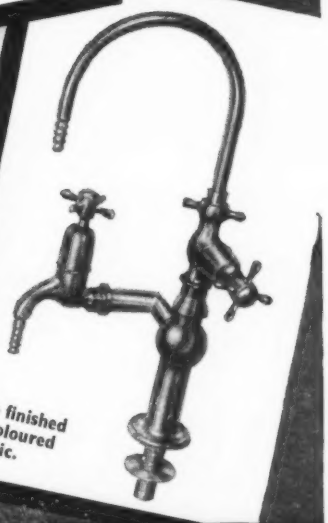

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[CLASSIFIED ADVERTISEMENTS

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

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

Public and Official Announcements

30s. per inch; each additional line, 2s. 6d.

LONDON COUNTY COUNCIL
ARCHITECT'S DEPARTMENT

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

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

BOROUGH OF REIGATE

ARCHITECTURAL ASSISTANT required on Grade A.P.T. II (£609 17s. 6d.—£691 17s. 6d. p.a.). Commencing salary according to qualifications and experience. Intermediate examination R.I.B.A. desirable. Housing accommodation provided, if necessary, for married man. Application forms obtainable from Borough Surveyor, Town Hall, Reigate, to be returned by 25th July, 1957.

HEBER DAVIES,
Town Clerk.

Town Hall, Reigate.
June, 1957. 6882

LEEDS REGIONAL HOSPITAL BOARD
PROPOSED GENERAL HOSPITAL AT HUDDERSFIELD
CLERK OF WORKS (BUILDINGS)

In connection with the construction of a new (600 beds—approximate contract value £3,000,000) General Hospital at Huddersfield, applications are invited for the appointment of a TEMPORARY CLERK OF WORKS (BUILDING). This project will be carried out in four consecutive phases under the direction of the Regional Architect, P. B. Nash, Dip.Arch. (Leeds), A.R.I.B.A., in association with Messrs. Pite, Son and Fairweather.

Phase 1 embraces the Roads and Services and Ring Mains Contract and it is anticipated a start will be made in August/September, 1957. The main building contract is estimated to start in the first half of 1958 and will continue thereafter for a period of approximately 7 years.

Applicants for this post must possess a thorough knowledge of the building trade and have had previous experience as Clerks of Works on multi-storey reinforced concrete frame buildings. Membership of the Institute of Clerks of Works or possession of the Clerks of Works Diploma of the Association of Building Technicians an advantage.

The salary for the appointment will be £900 per annum and the Conditions of Service will be those set out in Whitley Circular PTB.66.

Applications, stating age, qualifications, previous experience, together with the names of two Architects to whom reference may be made, should be forwarded to the Secretary, Park Parade, Harrogate, not later than 29th July, 1957. 6938

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

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

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

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

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

Applications stating age, past and present appointments, qualifications and experience, together with copies of three recent testimonials should be delivered to the undersigned not later than 12 noon on Saturday, 27th July, 1957.

Canvassing in any form will disqualify.

T. S. EVANS,
Town Clerk.

Town Hall,
Merthyr Tydfil. 6902

THE UNIVERSITY OF MANCHESTER

Applications are invited for the post of LECTURER in ARCHITECTURE from candidates with professional membership of the Royal Institute of British Architects and not less than three years of practical experience. Salary on a scale from £900 to £1,650 per annum, initial salary according to qualifications and experience. Membership of the F.S.S.U. and Children's Allowance Scheme. Applications should be sent not later than August 2nd, 1957, to the Registrar, the University, Manchester 13, from whom further particulars and forms of application may be obtained. 6776

BUCKS COUNTY COUNCIL

Applications are invited for the position of DEPUTY CHIEF QUANTITY SURVEYOR in the County Architect's Department, salary within J.N.C. Scale "A" (£1,155 × £55 to £1,320 p.a.).

Candidates should be A.R.I.C.S. and have had considerable experience in all sections of the Quantity Surveying profession.

The appointment is superannuable and subject to medical examination.

A weekly allowance of 25s. and return fare home once every two months may be paid for six months to newly appointed married officers of the Council unable to find accommodation.

Applications, on forms provided, must be returned by the 31st July, 1957.

F. B. POOLEY,
County Architect.

County Architect's Department,
County Offices,
Aylesbury, Bucks. 6897

CUMBERNAULD DEVELOPMENT CORPORATION
DEPARTMENT OF THE CHIEF ARCHITECT AND PLANNING OFFICER

Applications are invited for the following posts in the Quantity Surveying Section of the Department:—

SENIOR ASSISTANT QUANTITY SURVEYOR (Ref. Q.S.2).

Salary Scale A.P.T. VIII (£1,100—£1,320). To be responsible for assisting and deputising for the Chief Quantity Surveyor in connection with all professional and administrative functions of the section. A.R.I.C.S. required.

ASSISTANT QUANTITY SURVEYORS (Grade B) (Ref. Q.S.3) (Two Posts).

Salary Scale A.P.T. V—VI (£815—£1,107). To take charge of a project from pre-planning stage to final account, working in close co-operation with the Group Architect. A.R.I.C.S. required.

ASSISTANT QUANTITY SURVEYORS (Grade C) (Ref. Q.S.4) (Two Posts).

Salary Scale A.P.T. II—IV (£610—£907). To assist Senior Assistant Quantity Surveyors as above. Intermediate A.R.I.C.S. preferred or otherwise must be suitably experienced.

APPRENTICE QUANTITY SURVEYORS (Ref. Q.S.5) (Two Posts).

Salary Scale General Division (£185—£513) (Commencing salary according to age). Must have passed five subjects at Scottish Leaving Certificate Lower Grade (at least three at one time) including English and Mathematics and a pass in Arithmetic. This affords an excellent opportunity for young men of, or approaching school leaving age, to secure professional training with a view to qualifying as Chartered Quantity Surveyors. Arrangements for attending part day and evening school tuition courses will be made. The Chief Quantity Surveyor is a member of the Royal Institution of Chartered Surveyors.

Salary scales are those of the Whitley Council for New Towns Staff and appointments may be made above the minimum of the scale. The Corporation will endeavour to give, in approved cases, assistance in the provision of housing accommodation.

Write to L. Hugh Wilson, O.B.E., A.R.I.B.A., Dist.T.P., A.M.T.P.I., Chief Architect and Planning Officer, Cumbernauld House, Cumbernauld, Glasgow, for application form (quoting reference number of post) to be returned not later than

CITY OF NAIROBI
APPOINTMENT OF PLANNING ASSISTANTS GRADE II

Applications are invited for the above-mentioned posts (two) in the City Engineer's Department. The appointments are permanent established posts and the consolidated salary scale is £1,427 × £50 to £1,577 × £50 to £1,827 per annum.

Applicants should have had experience in the office of a Local Planning Authority and preference will be given to candidates who are Associate Members of the Town Planning Institute.

The successful applicant will be required to pass a medical examination before appointment.

Application forms, together with a summary of main Terms and Conditions of Service applicable to the appointment are available on request from the East African Office, Grand Buildings, Trafalgar Square, London, W.C.2, and applications on such forms should be addressed endorsed "Application for Employment" so as to reach the Establishment Officer, P.O. Box 30037, Nairobi, Kenya, not later than 17th August, 1957.

Canvassing either directly or indirectly will be a disqualification

JOHN RISEBOROUGH,
Town Clerk.

Town Hall,
P.O. Box 30075,
Nairobi.
8th July, 1957. 6951

STAFFORDSHIRE COUNTY COUNCIL
COUNTY ARCHITECT'S DEPARTMENT

Applications are invited for architectural staff on the following salary grades:—

A.P.T. II — £609 18s.—£691 18s.
A.P.T. III — £656—£784 3s.

Applications, together with copies of three recent testimonials should be forwarded to P. Woodcock, F.R.I.B.A., Deputy County Architect, Martin Street, Stafford, not later than 25th July, 1957, giving full details of experience and qualifications and stating age, present salary and grade applied for.

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

8th July, 1957.
County Buildings,
Stafford. 6937

CAMBRIDGESHIRE COUNTY COUNCIL
COUNTY ARCHITECT'S DEPARTMENT

Applications are invited for the following appointments:—

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

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

(*b*) ENGINEERING DRAUGHTSMAN, A.P.T. Grade I-II (£543 5s.—£691 17s. 6d.).

Applicants should be neat and expeditious draughtsmen and capable of preparing working drawings from sketch designs.

Preference will be given to persons who have passed the Intermediate Examination of the Institute of Heating and Ventilating Engineers.

The appointments are subject to the Local Government Superannuation Acts, 1937-1953, the National Scheme of Conditions of Service, a satisfactory Medical examination and termination by one month's notice on either side.

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

CHARLES PHYTHIAN,
Clerk of the County Council.

Shire Hall,
Cambridge,
9th July, 1957. 6936

UNIVERSITY OF SHEFFIELD

Applications are invited for the post of SENIOR ARCHITECTURAL ASSISTANT in the Surveyor's Office, at a commencing salary of £800 per annum. The post is permanent and superannuated, plus child allowance.

Candidates should be suitably qualified (Intermediate R.I.B.A. desirable), have a sound knowledge of building construction and site supervision. The work includes design of laboratories, lecture rooms, etc., alterations and conversions.

Applications, giving full details of qualifications, experience, naming two referees to be sent to the Bursar, The University of Sheffield, Western Bank, Sheffield 10, by 29th July, 1957. 6911

COUNTY BOROUGH OF TYNEMOUTH
BOROUGH SURVEYOR'S DEPARTMENT

Applications are invited for the following posts:

1. CHIEF TOWN PLANNING ASSISTANT, A.P.T. V/VI, £815—£1,107 (according to qualifications and experience).
2. TOWN PLANNING ASSISTANT, A.P.T. I/II, £543 5s.—£691 17s. 6d. (according to qualifications and experience).
3. ASSISTANT ARCHITECTS, A.P.T. III (Special), £708—£861.

Application forms together with conditions of appointment should be obtained from D. M. O'Herlihy, Esq., O.B.E., B.Sc.(Eng.), M.I.C.E., 16, Northumberland Square, North Shields, and returned before 10 August, 1957.

In the case of appointment No. 1, the Corporation may be prepared to assist in the provision of housing accommodation.

F. G. EGNER,
Town Clerk.

9th July, 1957. 6940

QUANTITY SURVEYING ASSISTANTS required by Air Ministry Works Directorate in London and Provinces. Grade and commencing salary based on not less than 3 or 5 years' previous experience under Quantity Surveyor or Building Contractor. Approved full-time study will count towards 5 years period. Normally technical qualifications in Builders quantities or building, *e.g.* C. & G. Final or O.N.C. or proof to equivalent standard. Duties include abstracting and billing, site measurement and preparation of estimates. Salary range £520 to £830 London rate starting pay dependent on age qualifications and experience. Salaries somewhat lower in Provinces. Pensionable and promotion prospects. Five-day week, three weeks' leave a year. Applicants normally should be natural born British subjects. Write stating age, qualifications and previous appointments including type of work done, to Manager, Professional & Executive Register, Ministry of Labour and National Service, 1-6, Tavistock Square, W.C.1, quoting reference PE 106/745. No original testimonials should be sent. Only applicants selected for interview will be advised. 6512

THE NORTH WESTERN ELECTRICITY BOARD
ENGINEERING DRAUGHTSMAN
SUB-AREA ENGINEER'S DEPARTMENT, OLDHAM

Applicants should have had a good general and technical education, and be experienced in one or more of the following subjects:—

Electrical diagrams, layout of switchgear, transformers, etc., within susbstations and Drawing Office routine.

Possession of a technical qualification such as the O.N.C. or H.N.C. in Electrical Engineering will be an advantage.

Salary within the range: £595 × £20—£715 p.a. Schedule "D" Grade 6 N.J.B. Conditions.

Applications, naming three referees, to Sub-Area Manager, No. 3 Sub-Area, The North Western Electricity Board, Union Street, Oldham, by 27th July, 1957. 6941

COUNTY BOROUGH OF STOCKPORT
QUANTITY SURVEYORS required (2 posts). Salary £814 17s. 6d. to £994 5s., commencing according to age, qualifications and experience. Varied and large scale building programme. Applications, giving age, qualifications, experience, two referees, and stating if related to any member/senior officer of Council, to Borough Architect, Town Hall, Stockport, by 22nd July, 1957. Canvassing disqualifies. Posts pensionable, subject to medical examination. 6854

LANCASHIRE COUNTY COUNCIL
Vacancies exist for SENIOR QUANTITY SURVEYORS within the scale £902—£1,107. Applicants must have had a wide experience in all branches of quantity surveying, and the successful candidates will be expected to deal with large contracts from taking off to settlement of final accounts.
Application forms, obtainable from the County Architect, P.O. Box 26, County Hall, Preston, to be returned by Monday, 29th July, quoting Ref. A/AJ. 6837

AIR MINISTRY require workers-up in Quantities Division London, must be fully experienced and competent to work-up entire bills of quantities. Preference holders C. & G. (Quantities), O.N.C., or equivalent technical qualification. Salary range £660 at age 26 to £980 starting pay dependent on age, qualifications and experience. Pensionable and promotion prospects. Five-day week. Over three weeks leave a year. Applicants normally should be natural born British subjects. Write, stating age, qualifications and previous appointments including type of work done to P.E.104 Manager P. & E. Register, Ministry of Labour and National Service, 1-6, Tavistock Square, London, W.C.1. No original testimonials should be sent. Only candidates selected for interview will be advised. 6781

MINISTRY OF AGRICULTURE, FISHERIES AND FOOD require ARCHITECTURAL DRAUGHTSMAN in Bristol. Applicants should have at least three years' drawing office experience; a knowledge of farm buildings would be an advantage. Duties comprise preparation of sketch plans, working drawings, and line diagram farm layouts. Starting salary according to age on scale £508 to £805 per annum. Five-day week. Application for interview, stating age and experience should be addressed to the Ministry of Agriculture, Fisheries & Food, Burghill Road, Westbury-on-Trym, Bristol. 6910

COUNTY BOROUGH OF BURNLEY
Applications are invited for the undermentioned appointments in the Borough Engineer and Surveyor's Department :—
(*a*) PRINCIPAL ARCHITECTURAL ASSISTANT, Grade V (£814 17s. 6d.—£994 5s.).
(*b*) ARCHITECTURAL ASSISTANT, Special Grade (£707 5s.—£861).
(*c*) ARCHITECTURAL ASSISTANT, Grade II (£609 17s. 6d.—£691 17s. 6d.).
Applicants for appointment (*a*) must have had considerable experience in all types of Municipal work, and applicants for all three positions must hold appropriate qualifications for the Grade.
Provision of housing accommodation will be considered if required.
Forms of application may be obtained from the Borough Engineer, 22/24, Nicholas Street, Burnley, to whom they should be returned not later than Saturday, 3rd August, 1957.
C. V. THORNLEY,
Town Clerk.
6909

BOROUGH OF MALDEN AND COOMBE
BOROUGH ENGINEER AND SURVEYOR'S DEPARTMENT
Applications are invited for the following appointment :—
JUNIOR ARCHITECTURAL ASSISTANT. Grade A.P.T. II/III (£609 17s. 6d.—£784 2s. 6d. plus London weighting). Commencing point according to experience and qualifications.
Forms of application may be obtained from John Apse, A.M.I.C.E., Borough Engineer, and should be returned endorsed accordingly to the undersigned by not later than 31st August, 1957.
HAROLD E. BARRETT,
Town Clerk.
Municipal Offices,
New Malden,
Surrey. 6959

UNIVERSITY OF ST. ANDREWS
The University Court invites applications for the newly created post of RESIDENT ARCHITECT. The person appointed will be required, *inter alia*, to give professional advice to the University in connection with the large building programme which the University expects to complete with the aid of outside Architects during the next few years. Applicants must be qualified architects, preferably with experience of Scottish building practice. A degree in civil engineering would be an advantage and so would some knowledge of university buildings. Salary between £1,500 and £1,800 according to qualifications and experience; family allowance of £50 per child per annum; a grant may be made towards removal expenses. The appointment will be made for five years in the first instance, with possibility of extension for a further five years. Further particulars may be obtained from the undersigned, with whom six copies of the application, together with the names of three referees, should be lodged not later than 31 August, 1957
D. M. DEVINE,
Joint Clerk to the University Court.
College Gate,
St. Andrews. 6963

COUNTY COUNCIL OF THE WEST RIDING OF YORKSHIRE
OFFICE OF THE COUNTY ARCHITECT
Applications are invited for the appointment of ASSISTANT ARCHITECT in Grade A.P.T. V, salary range £814 17s. 6d.—£994 5s.
Applicants should be registered architects, and have had good experience in the design and construction of modern buildings. Opportunities available for taking responsibility and supervising works in progress in connection with extensive and interesting programmes of first-class architectural work.
The appointments are subject to the provisions of the Local Government Superannuation Acts.
Applications, on forms obtainable from this office, must be delivered not later than the first post on Monday, 12th August, 1957.
A. W. GLOVER, F.R.I.B.A.,
County Architect.
Bishopgarth,
Westfield Road,
Wakefield. 6961

CITY & COUNTY OF THE CITY OF LINCOLN
CITY ARCHITECT'S DEPARTMENT
Applications are invited for a JUNIOR ARCHITECTURAL ASSISTANT, Grade A.P.T. I (£543 5s.—£625 5s.) to work on a varied programme of new buildings.
The appointment will be subject to the Local Government Superannuation Acts and the successful applicant will be required to pass a medical examination.
Applications, stating age, qualifications and experience together with the names of two persons to whom reference may be made, should be delivered to R. R. Alexander Esq., F.R.I.B.A., M.T.P.I., City Architect, Stamp End, Lincoln, not later than the 2nd August, 1957. 6960

COUNTY BOROUGH OF SUNDERLAND
PUBLIC WORKS DEPARTMENT
Applications are invited for :—
(*a*) ONE CHIEF ASSISTANT (Building), A.P.T. VI (£902—£1,107 p.a.).
(*b*) ONE CHIEF ASSISTANT (Civil Engineering), A.P.T. VI (£902—£1,107 p.a.).
(*c*) ONE SENIOR ESTIMATING SURVEYOR, A.P.T. V (£814 17s. 6d.—£994 5s. p.a.).
(*d*) ONE MEASURING AND BONUS SURVEYOR, A.P.T. IV (£727 15s.—£907 2s. 6d. p.a.).
(*e*) ONE ASSISTANT ESTIMATING SURVEYOR, A.P.T. II (£609 17s. 6d.—£691 17s. 6d. p.a.).
Full particulars of these appointments may be obtained from the Public Works Manager, Ivor House, 1 and 3, Otto Terrace, Sunderland, together with forms of application which are to be returned to the undersigned not later than 6th August, 1957. Canvassing will disqualify.
G. S. McINTIRE,
Town Clerk.
Town Hall,
Sunderland. 6962

NATIONAL COAL BOARD, North Eastern Division, require the following in the Chief Architect's Branch at Conisborough, near Doncaster.
ARCHITECT, Grade II.
Salary Scale : £700 × £30 to £1,000 per annum.
Qualifications : A.R.I.B.A.
QUANTITY SURVEYORS, Grade II.
Salary Scale : £700 × £30 to £1,000 per annum.
Qualifications : A.R.I.C.S.
QUANTITY SURVEYING ASSISTANT, Grade I.
Salary Scale : £625 × £25 to £750 and up to £900 per annum in certain circumstances.
Qualifications : Preferably Intermediate R.I.C.S. or considerable practical experience.
JUNIOR QUANTITY SURVEYING ASSISTANT.
Salary Scale : According to age—£4 5s. per week at 18 to £8 15s. per week at 25.
Qualifications : G.C.E. in five subjects including English, Mathematics, History or Geography.
Five-day week. Staff Canteen.
Apply : Divisional Chief Architect, P.O. Box No. 4, Denaby Main, near Doncaster, by 27th July, 1957. 6964

Architectural Appointments Vacant

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

RONALD WARD & PARTNERS require ARCHITECTURAL ASSISTANTS with contemporary outlook and willing to use own initiative. Salary range £600 to £850. Congenial working conditions. Apply 29, Chesham Place, Belgrave Square, S.W.1. Telephone Belgravia 3361. 6322

CO-OPERATIVE WHOLESALE SOCIETY LTD. ARCHITECT'S DEPARTMENT, MANCHESTER
APPLICATIONS are invited for the following appointments :—(*a*) SENIOR ASSISTANT ARCHITECTS with experience of work on commercial and industrial projects (salary range £820 to £975 per annum). (*b*) ASSISTANT ARCHITECTS capable of preparing working drawings from preliminary details (Salary range £550 to £820 per annum). There is a five-day week in operation and both appointments offer prospects of upgrading. 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 4. 6023

ASSISTANT, Intermediate standard, required, busy West End office. State age, experience, and salary required.—Box 6046.

ARCHITECTURAL ASSISTANT required in busy London Office with varied practice. Good salary and prospects for suitable applicant. Five-day week. Write, giving particulars of age, qualifications, experience, etc., to Box 851 c/o 7, Coptic Street, W.C.1. 6376

NORTH & PARTNERS, Chartered Architects with extensive practice, seek partner's personal ASSISTANT. Poeition will afford excellent opportunity for capable assistant. Reply : 40, Broadway, Maidenhead. 6568

ASSISTANT ARCHITECT. Co-operative Wholesale Society, Ltd., invite applications for the position of Assistant Architect. Must be capable of preparing working drawings from preliminary details. The post is superannuable, subject to medical examination. 5-day week in operation. Applications, giving details of age, experience and salary required, to—W. J. Reed, F.R.I.B.A., Chief Architect, C.W.S. Ltd., 99, Leman Street, London, E.1. 6350

LONDON office with widely varied practice urgently requires all grades of ASSISTANTS, preferably with London experience. Five-day week. Lewis Solomon, Son & Joseph, 21, Bloomsbury Way, London, W.C.1. Holborn 6108. 6331

RAMSEY, MURRAY, WHITE & WARD require recently qualified ASSISTANTS, with two to five years' practical experience, to work on interesting industrial and office buildings. Salary by arrangement.—Apply 32, Wigmore Street, W.1. 5929

WELL-KNOWN London Architects require ASSISTANTS between Intermediate and Final standard. Interesting projects. Five-day week. Write Box 853, c/o 7, Coptic Street, W.C.1. 6583

NORTH AND PARTNERS, Chartered Architects, with large and varied practice, require a capable experienced ASSISTANT for drawing office, salary by arrangement. Reply : 40, Broadway, Maidenhead, Berks. 6573

ARCHITECTURAL ASSISTANT of Intermediate R.I.B.A. standard required in varied practice in Croydon. Good draughtsman with practical knowledge of building construction essential. Salary according to experience. Apply Hugh Macintosh & Partners, 33, High Street, Croydon. 6568

YOUNG ARCHITECTURAL ASSISTANT (male) required in West End office. Write stating age, experience and salary required. Box 6583.

JUNIOR ARCHITECTURAL ASSISTANTS required in the Architect's Department of Multiple Retail Company, Birmingham Area. Applicants must have had sound architectural training up to Intermediate standard, and are required to prepare working drawings and details under supervision of senior staff. Salary within the range of £450 to £500 p.a. Five-day week. Staff canteen and pension scheme available. Replies to Box 6763.

S. V. 742. ARCHITECT, Grade II. Salary : £700 × £30 to £1,000. Candidates should be corporate members of the R.I.B.A. with varied practical experience.
S. V. 730. ARCHITECTURAL ASSISTANT. Grade I. Salary : £625 × £25 to £750 p.a. (exceptionally £900). Preferably Intermediate R.I.B.A. although regard will be paid to good practical experience.
The architectural work of the department covers the design of colliery surface buildings of all types, including workshops, stores, power plants, offices, pithead baths, canteens, medical centres and recreation buildings.
The point of entry into the salary scales of the respective grades will depend on qualifications and experience. The posts are superannuable and superannuation rights under Local Authority and certain other schemes are transferable. Facilities for part-time study at the Nottingham School of Architecture may be granted to Assistants in certain circumstances.
Applications giving age, present salary and full details of education, qualifications and present appointment should be addressed to The Divisional Chief Staff Officer, National Coal Board, E.M.D. Sherwood Lodge, Nr. Arnold, Nottinghamshire, within 14 days. Please quote appropriate reference number. 6863

YOUNG ASSISTANT required to work with Principal, Cumberland, Westmorland and Lancashire. Payment related to ability. Real prospects for rapid advancement. First class education and references essential. C. B. Martindale, F.R.I.B.A., Castle Street, Carlisle. 6514

ASSISTANT ARCHITECTS required in busy and varied practice, with main office in the West Riding of Yorkshire, as follows: (*a*) SENIOR ARCHITECTS, to be Associates of the R.I.B.A., with considerable experience, preferably in Schools, commercial or industrial work. Salary £1,000 per annum, according to experience. (*b*) Qualified ASSISTANT ARCHITECTS, with minimum 2 years' office experience. Salary £650—£800 per annum, according to experience. (*c*) ASSISTANT ARCHITECTS, Inter./Final standard. Salary £550—£650 per annum, according to experience. Pension Scheme in operation, and good prospects for promotion.—Apply, with full particulars, to J. G. L. Poulson, Chartered Architect, 29, Ropergate, Pontefract, Yorkshire. 6789

ROBERT MATTHEW & JOHNSON-MARSHALL, F./A.R.I.B.A., have vacancies in their London office for ARCHITECTS, recently qualified or up to 5 years' office experience.—Applicants should apply, in writing, to 24, Park Square East, Regent's Park, N.W.1. 6785

ASSISTANT required, Intermediate standard; also JUNIOR, in West End office. Write stating age, experience and salary required to Box 6724.

ARCHITECTS' ASSISTANTS required immediately. Inter./Final standard. Salary according to experience. 5-day week. Staff canteen. Pension Scheme.—Applications in writing, giving full details of age, experience, and salary, to Personnel Department, British Home Stores, Ltd., 129, Marylebone Road, London, N.W.1. 6806

ARCHITECTURAL ASSISTANT required for busy Central London Office. Intermediate standard. Competent to assume responsibility. No Saturdays. Good working conditions. Salary according to qualifications. Howard, Souster & Fairbairn, 81, Piccadilly, W.1. 6856

SENIOR ASSISTANT required of Intermediate/Final standard in Croydon office. Varied practice of interesting work. Good draughtsman and sound knowledge of construction essential, together with ability to manage jobs. Five-day week. Salary according to experience. Apply George Lowe & Partner, 4, High Street, Croydon 3608/9. 6851

OLIVER LAW & PARTNERS (Chartered Architects) have a vacancy for an ARCHITECTURAL ASSISTANT with office experience, but full qualifications not essential. Box 6894.

SENIOR ARCHITECT, age 25-35, is required for very unusual and interesting work requiring a high degree of initiative and originality coupled with outstanding design ability. Salary around £1,100 per annum, good superannuation and working conditions.
Applications to: The Secretary, Vic Hallam Ltd., Langley Mill, Nottingham. Tel. No. Langley Mill 2301. 6891

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