THE ARCHITECTS' JOURNAL

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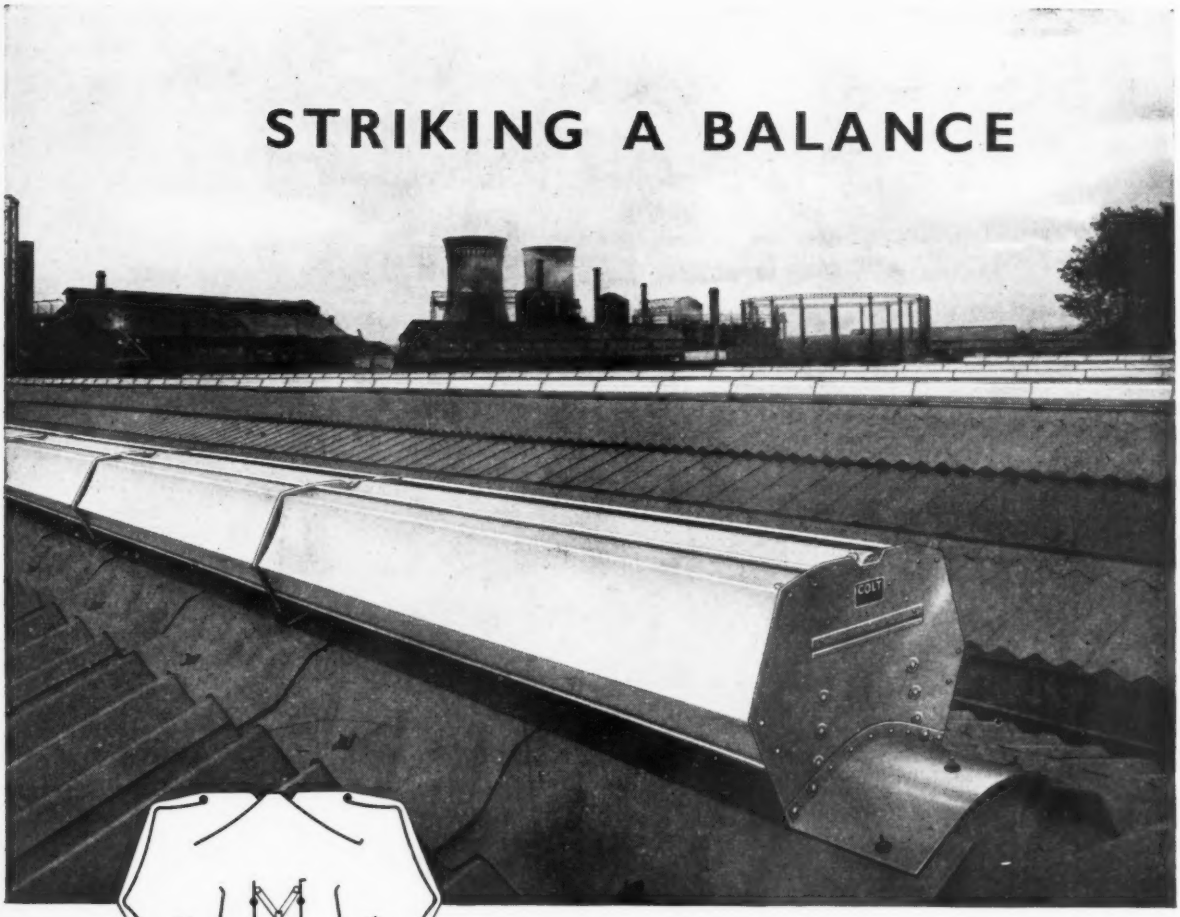
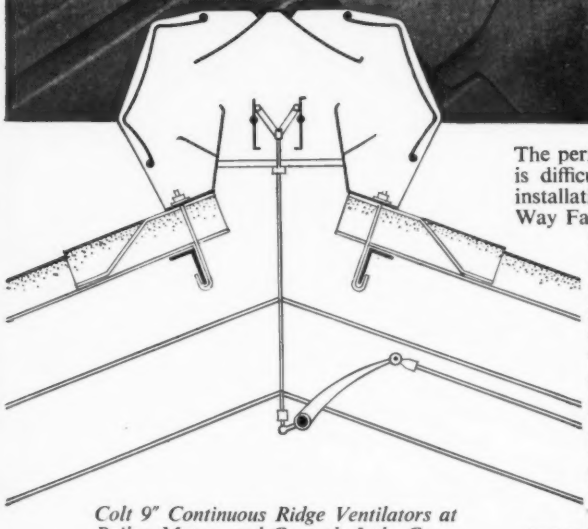
★ A glossary of abbreviations of Government Departments and Societies and Committees of all kinds, together with their full address and telephone numbers. The glossary is published in two parts—A to Ig one week, Ih to Z the next. In all cases where the town is not mentioned the word LONDON is implicit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

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

STRIKING A BALANCE





Colt 9″ Continuous Ridge Ventilators at Bailey Meters and Controls Ltd., Croydon, Surrey. Architect: Reginald Lone, F.R.I.B.A., F.R.I.C.S., F.R.San.I.

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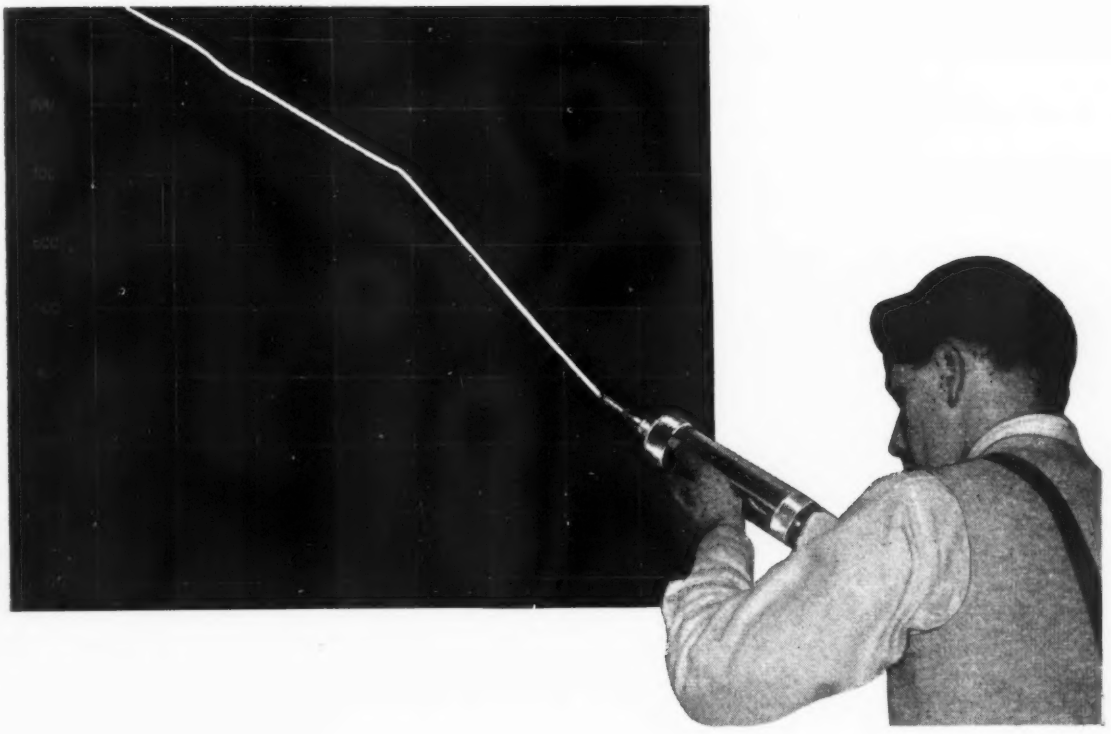

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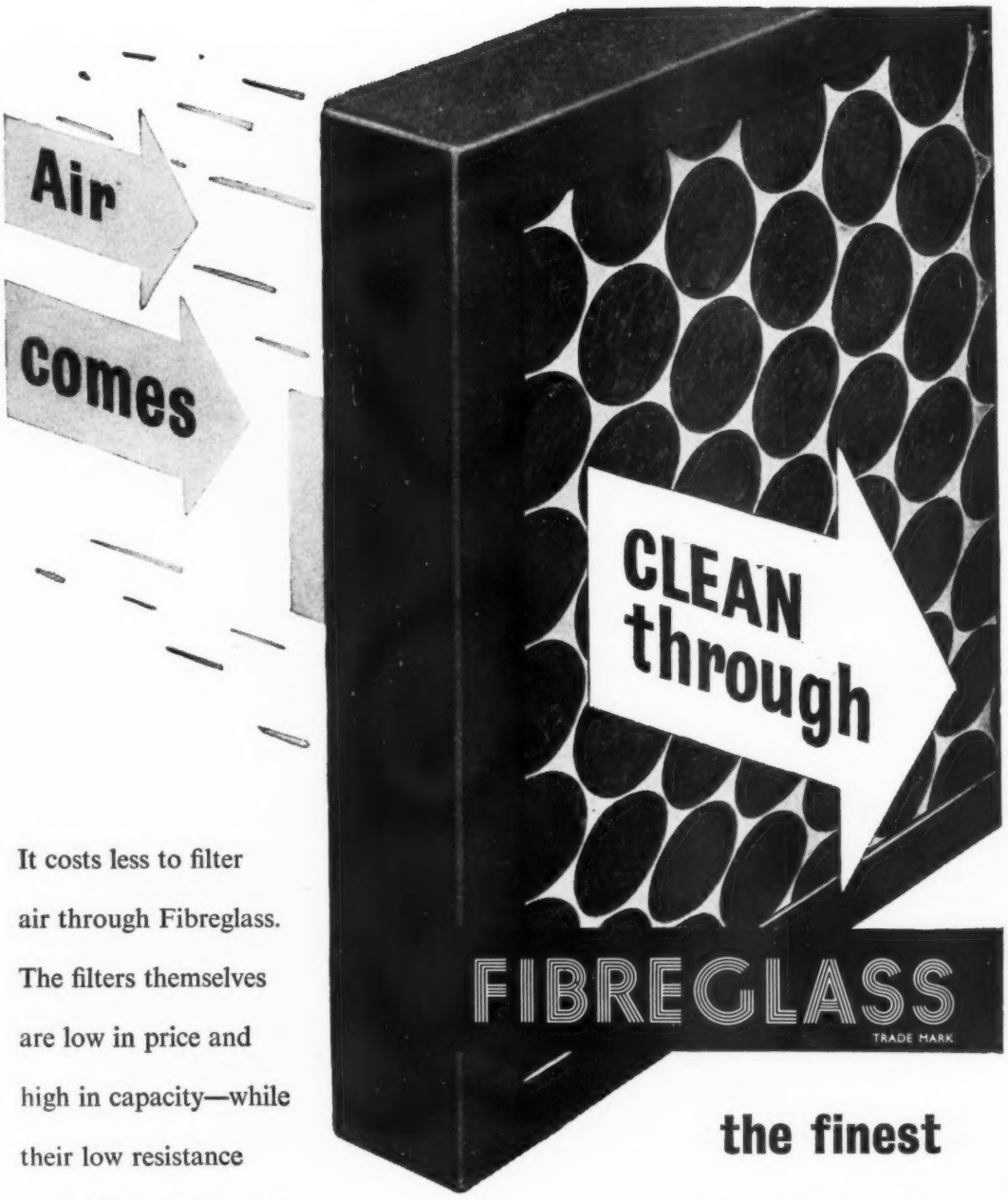

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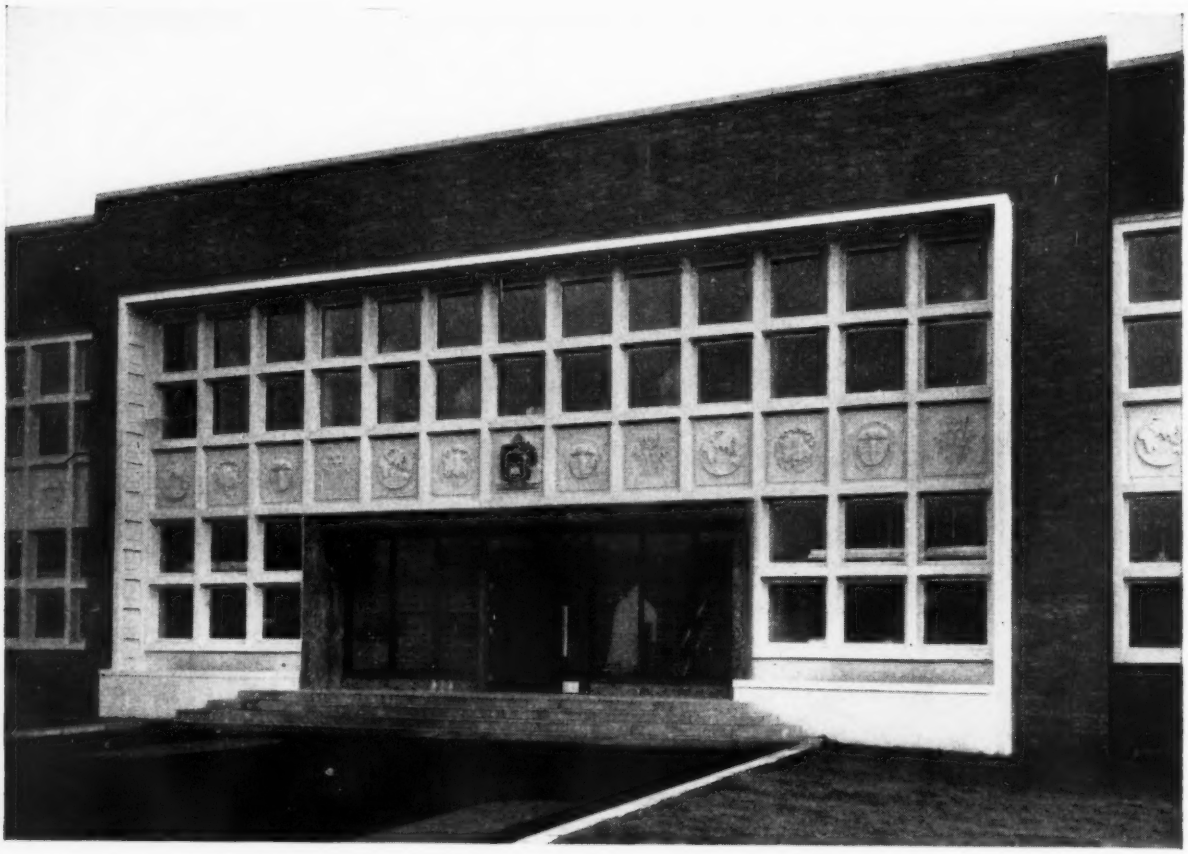
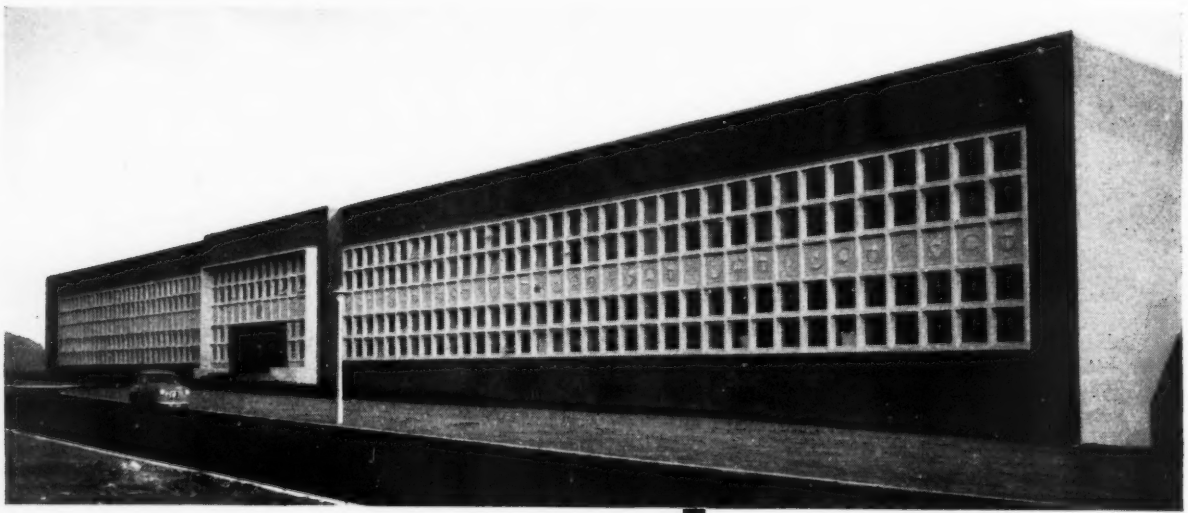


University College of Swansea—Natural Sciences Building *Architects: Sir Percy Thomas & Son, PP.R.I.B.A., A.R.I.B.A.*



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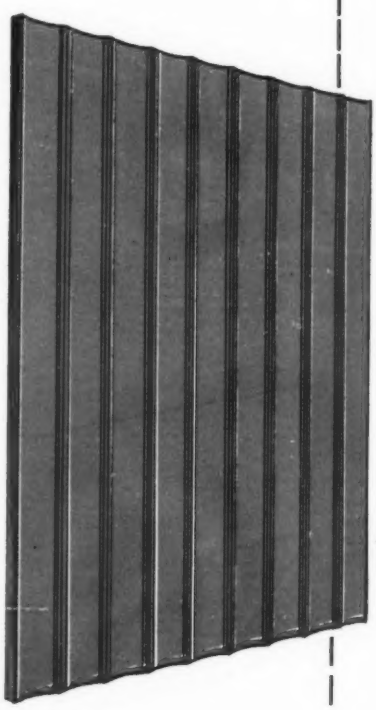

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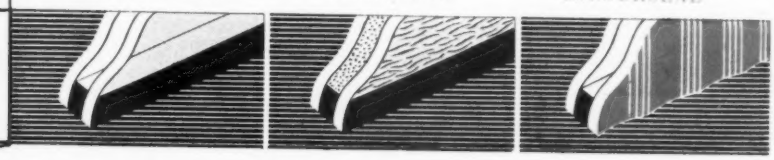

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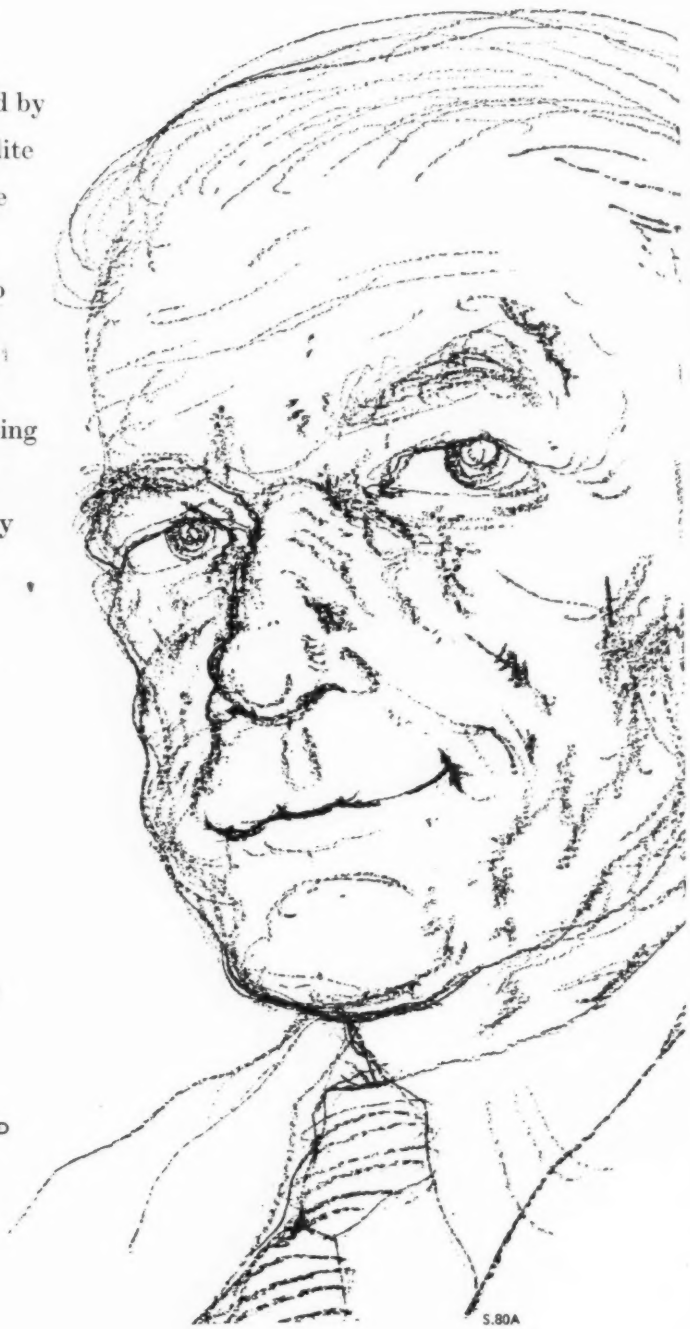

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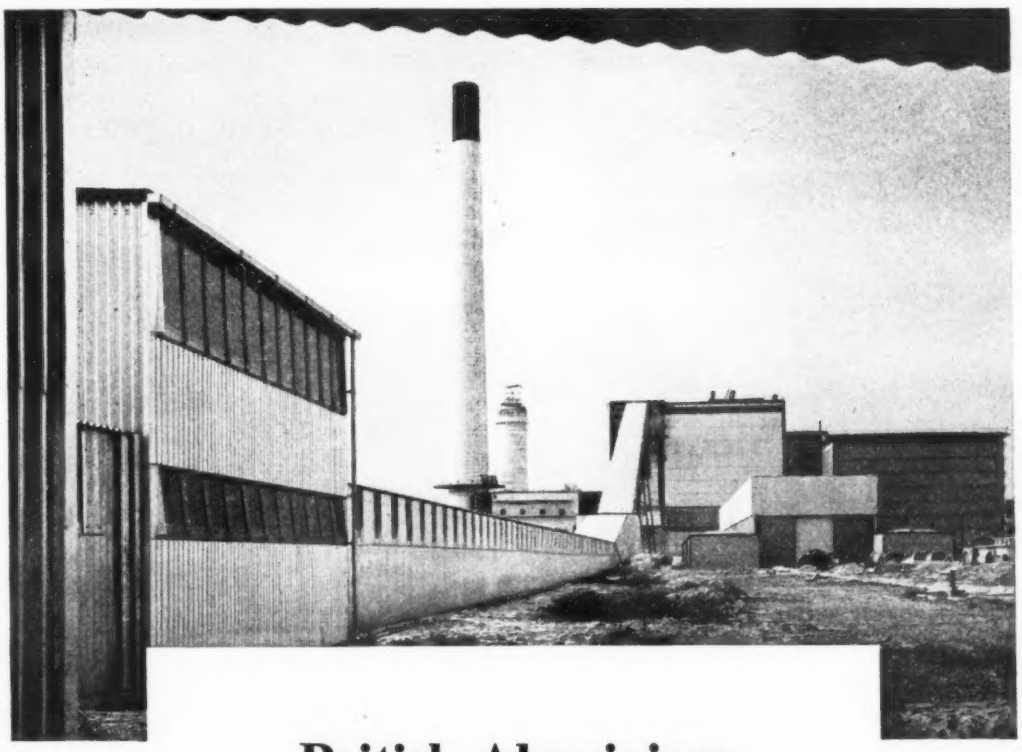

British Aluminium at Marchwood Generating Station: (3)

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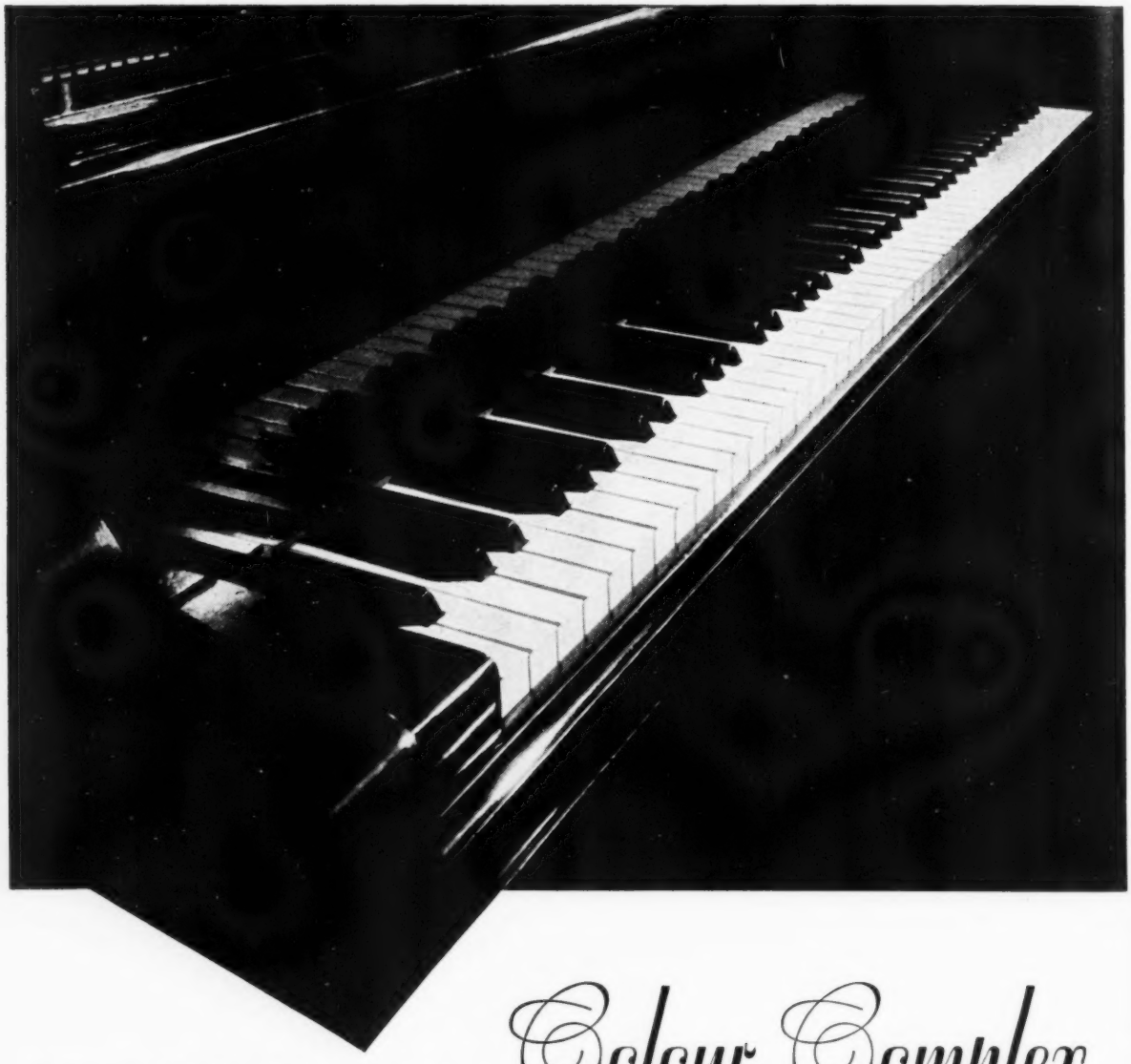

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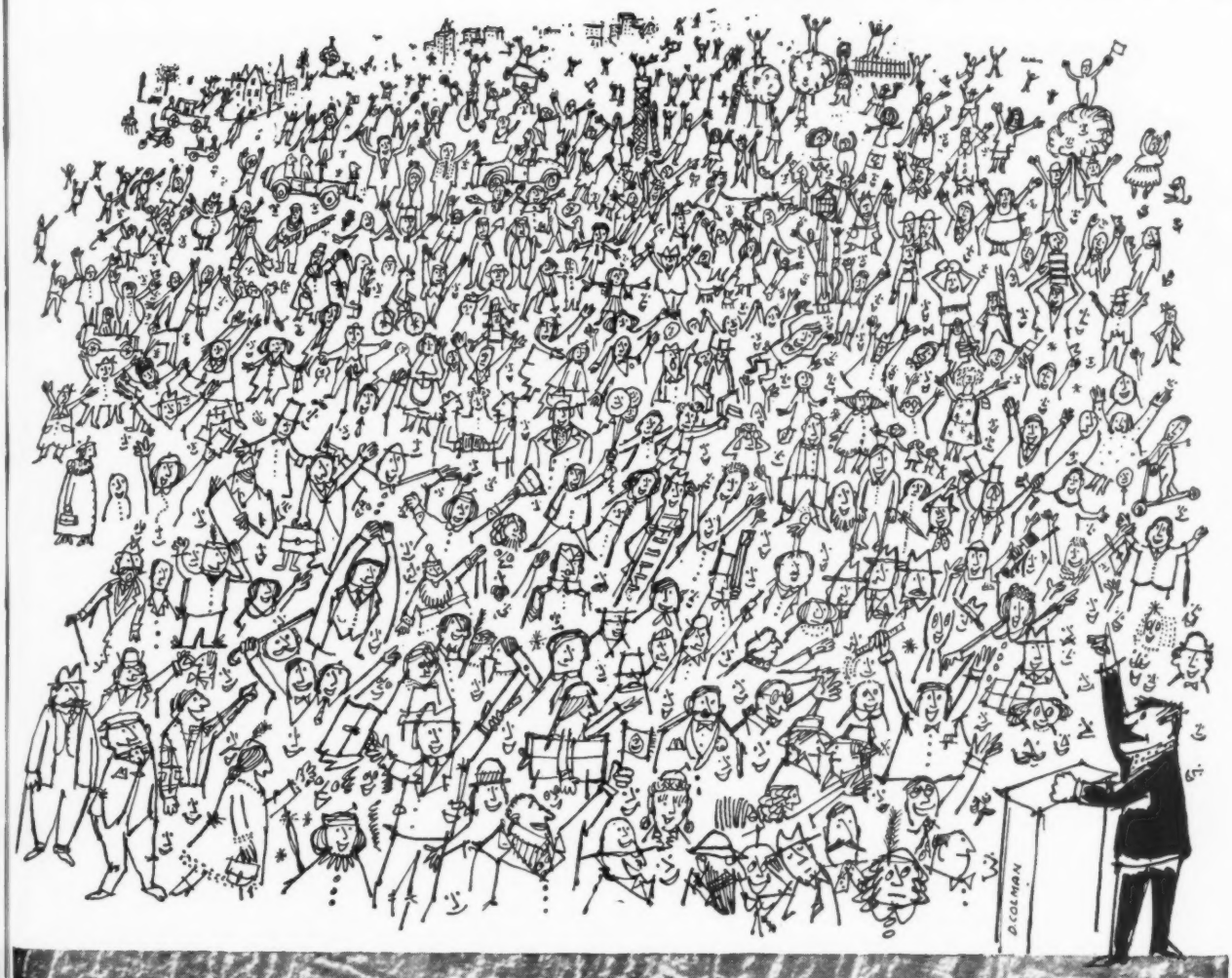

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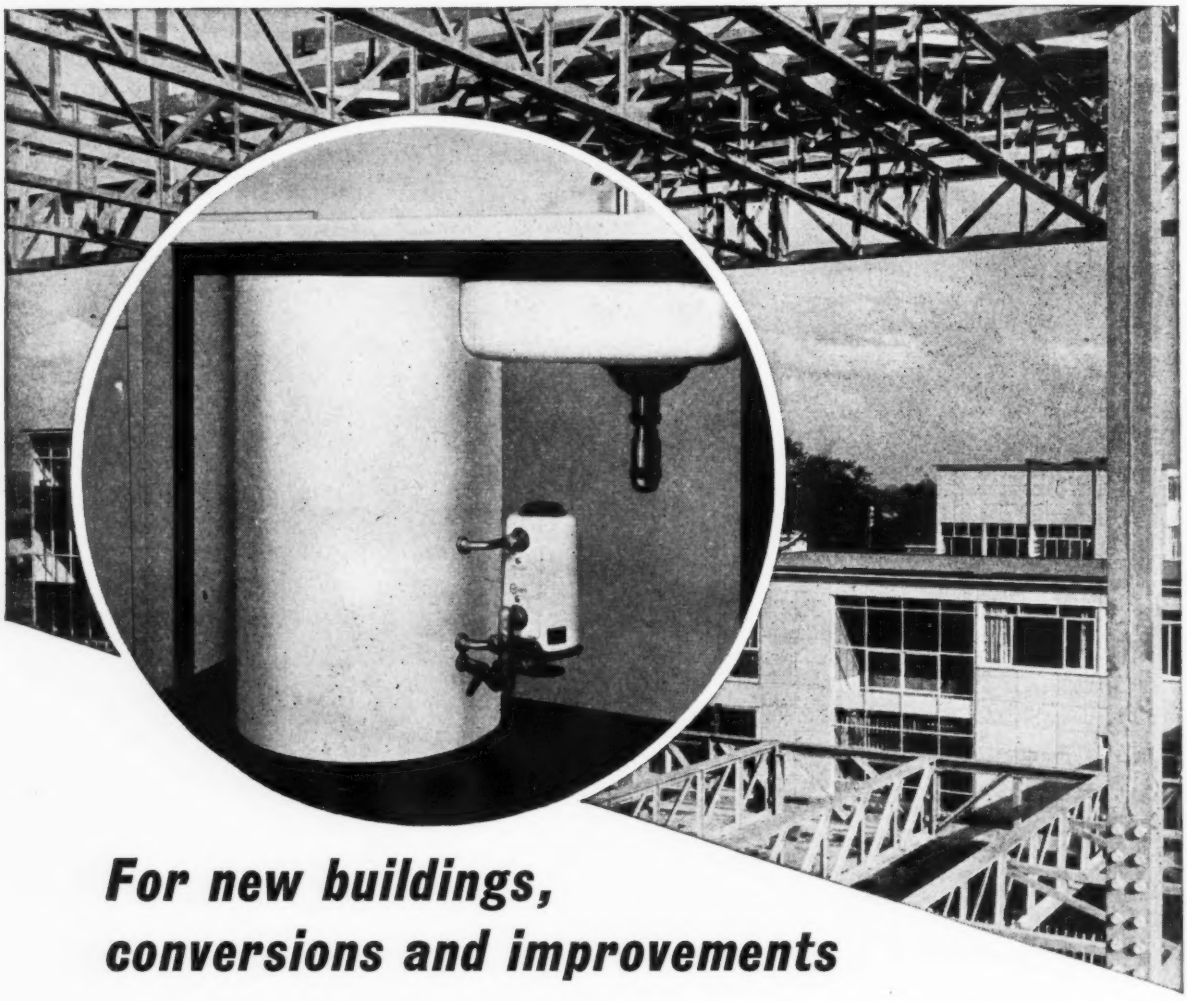

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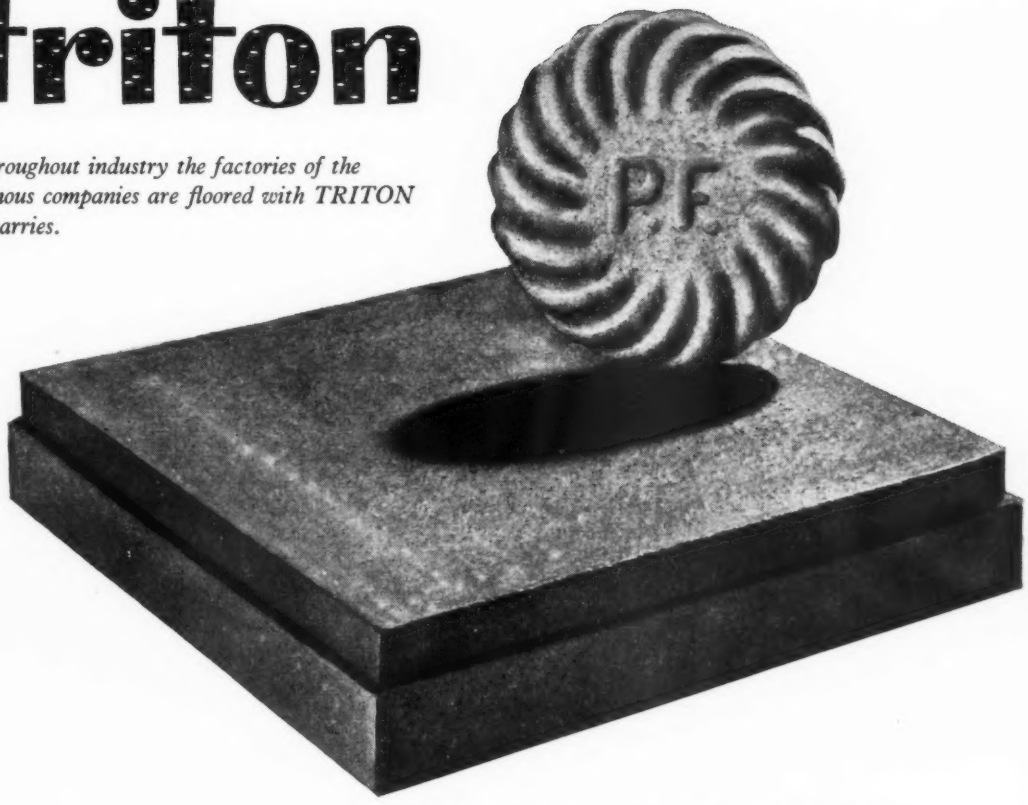

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LIGNACITE (South Eastern) Ltd., Ninfield, Sussex. Telephone: Ninfield 345

LIGNACITE (Brandon) Ltd., Brandon, Suffolk. Telephone: Brandon 350

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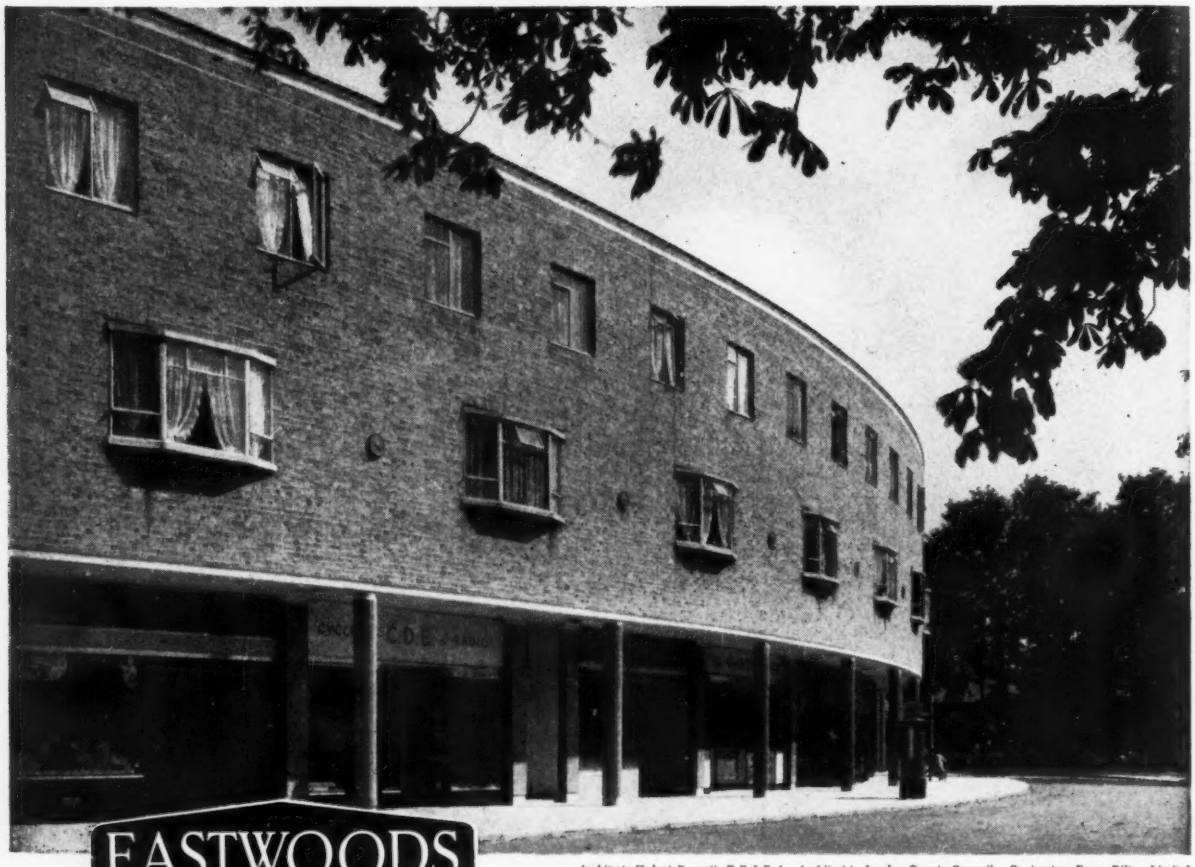

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Architect: Hubert Bennett, F.R.I.B.A. Architect to London County Council. Contractor: Percy Bilton Limited

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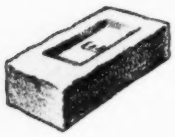
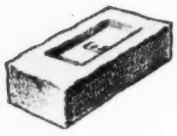


YELLOW FACINGS

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



SECOND HARD STOCKS

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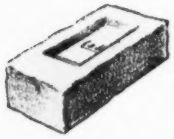

MILD STOCK FACINGS

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

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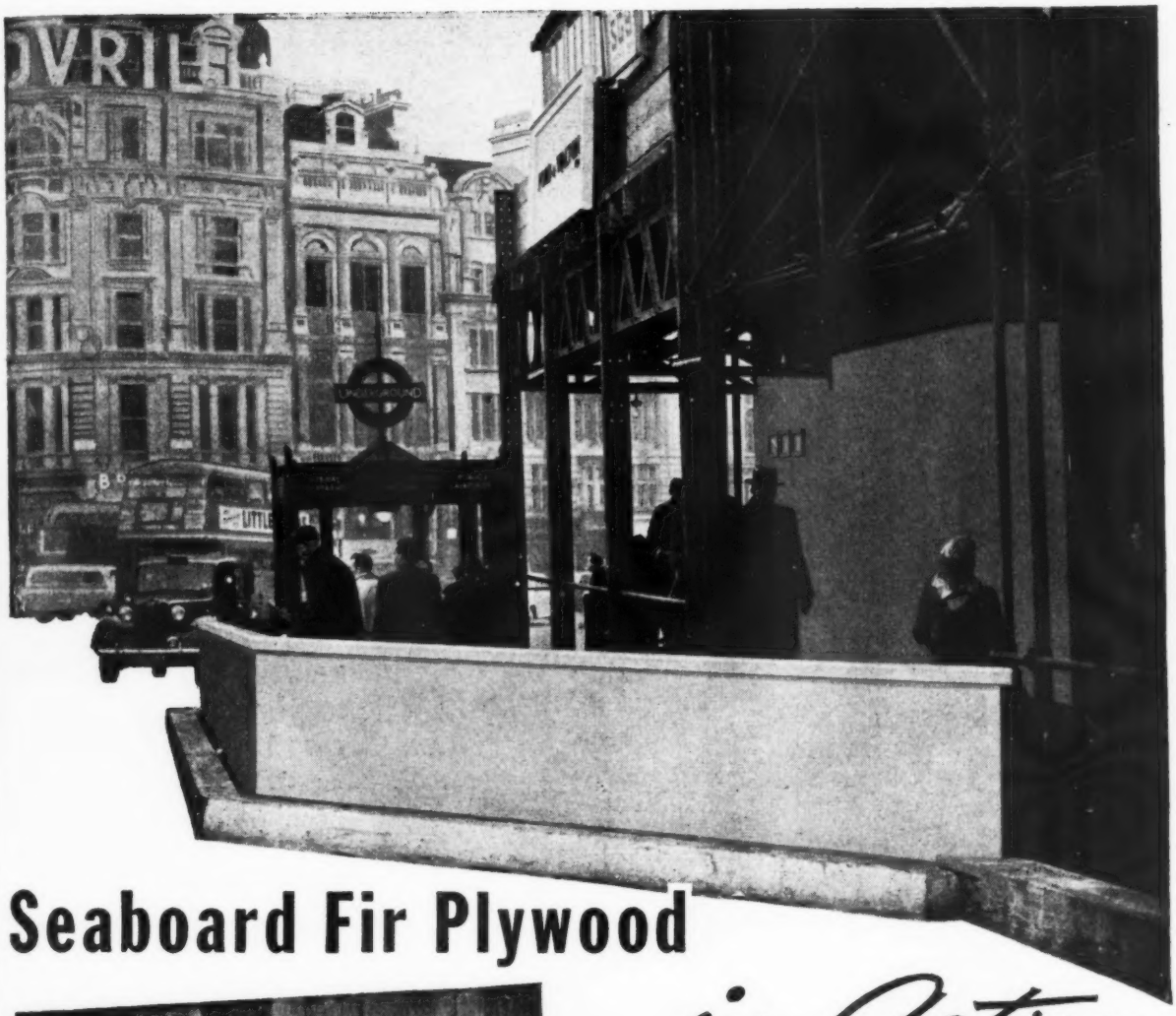
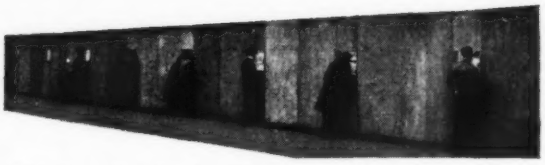


Seaboard Fir Plywood *in Action*



With Canadian fir plywood available in lower cost sheathing grades, British builders are taking advantage of its many structural qualities in new and interesting ways.

Top picture shows fir plywood used as a hoarding and as a low buttress shielding pedestrians at a site in Trafalgar Square. Lower picture shows Canadian fir plywood hoarding at the site of the new Ministry of Works building, Manchester. The large panels cover 32 square feet, need fewer nails and are erected in half the time. They are split-proof and impact-resistant.

For the same reasons, British builders are using Seaboard Canadian fir plywood for roof decking, floor underlay, laminated beams, contractors' huts, etc., etc.

Seaboard Canadian fir plywood is readily available throughout the country.

Standard Sizes:—8 x 4 feet (Lengths over 8 feet available on order).

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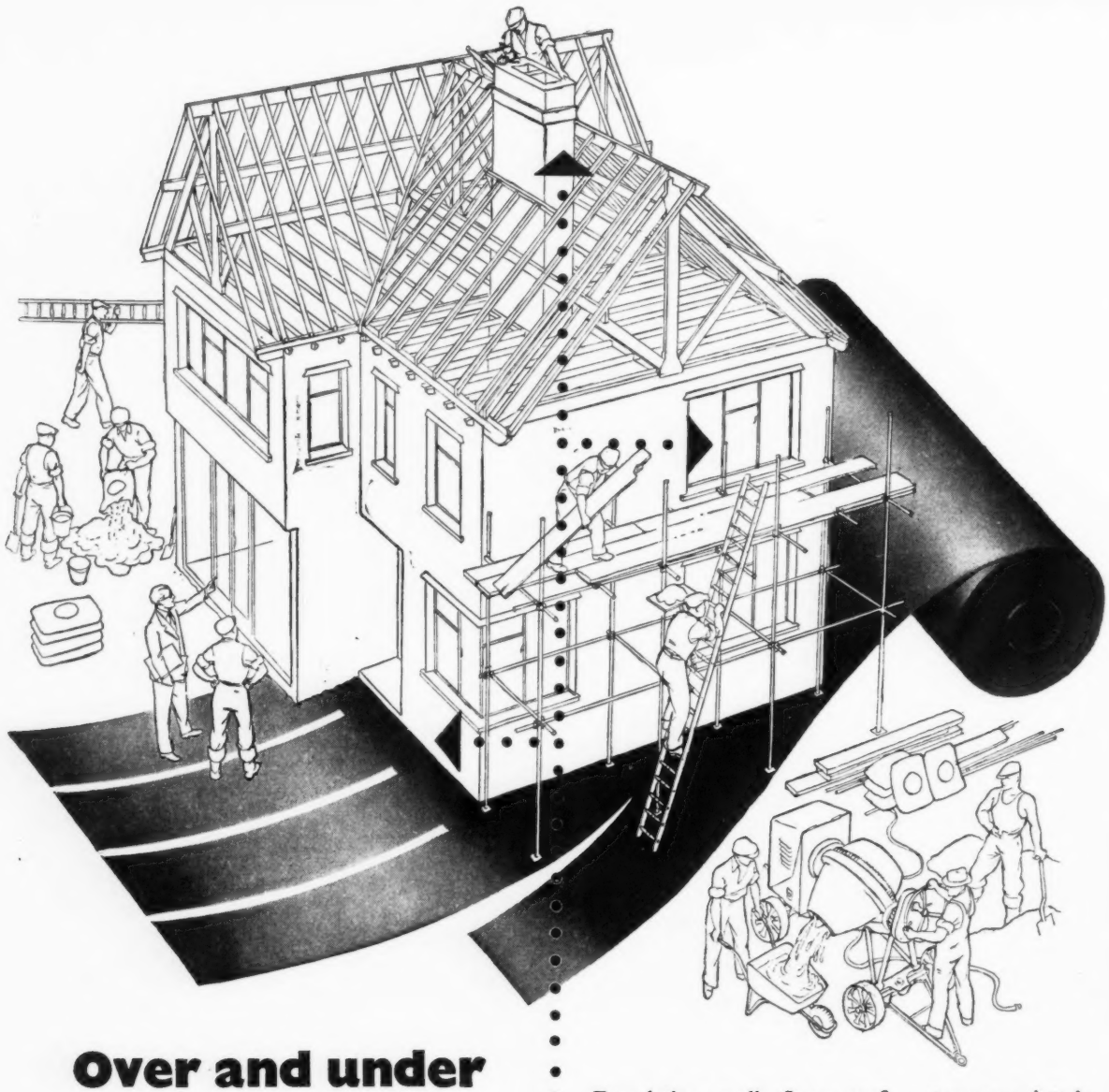

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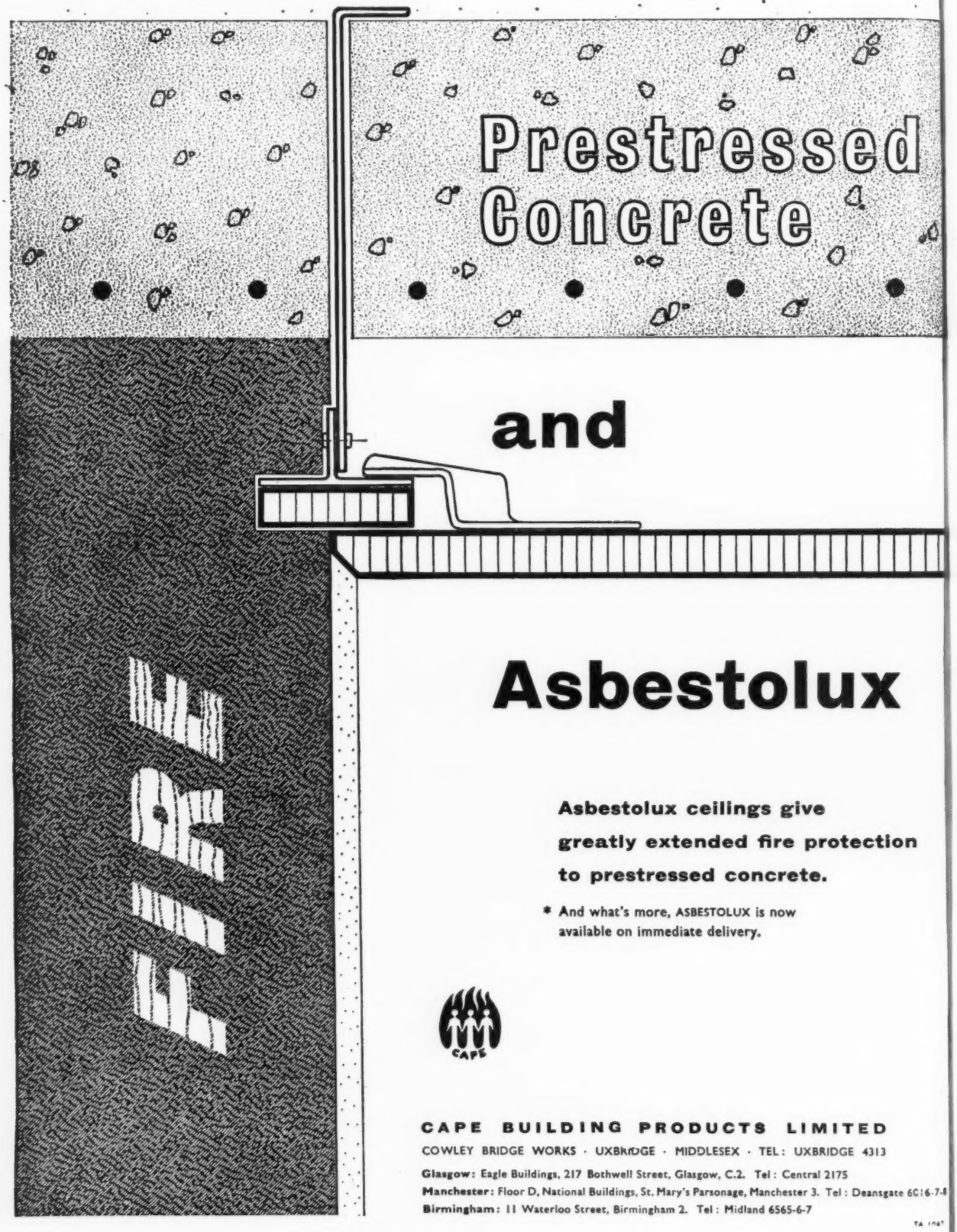

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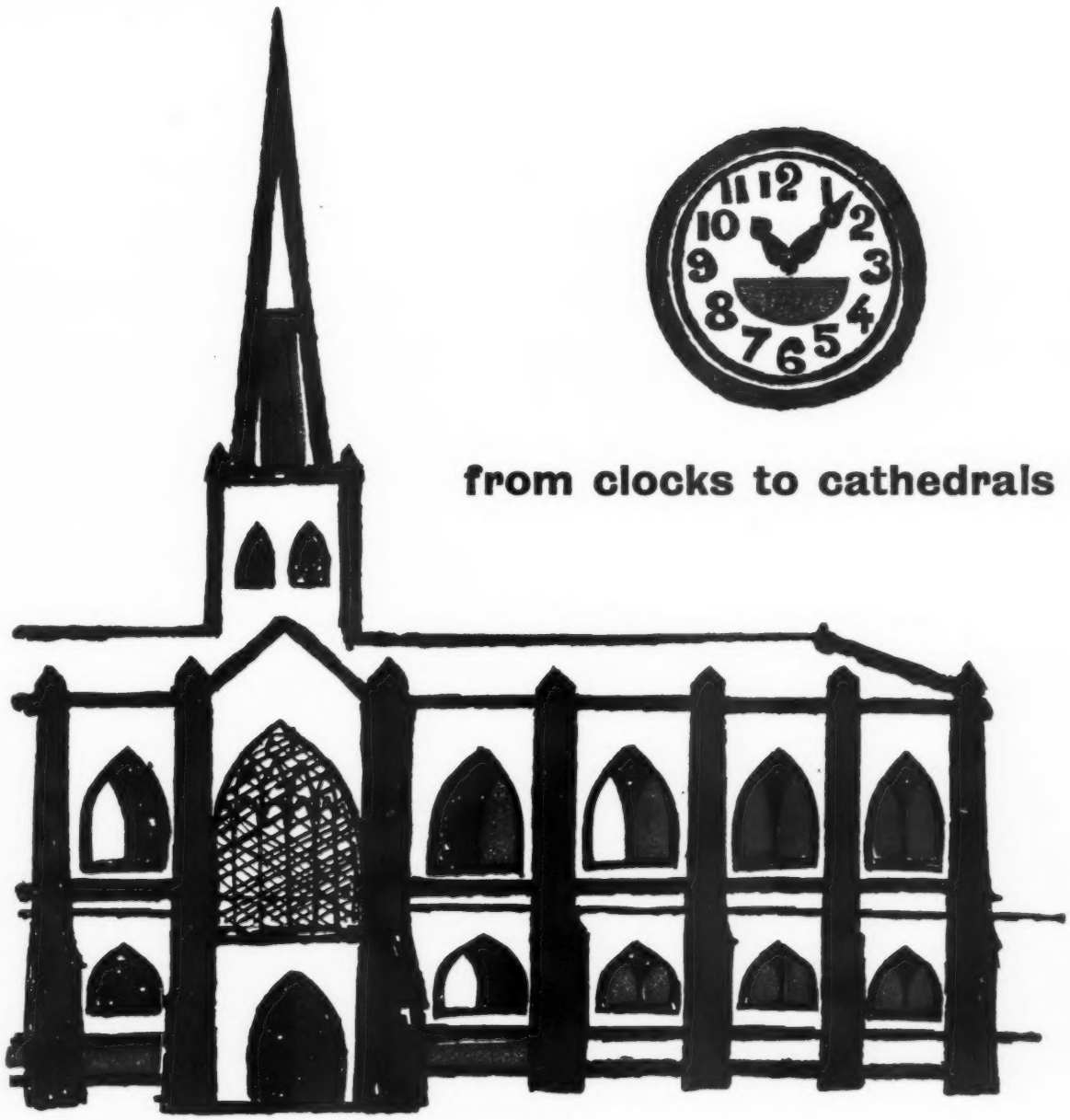

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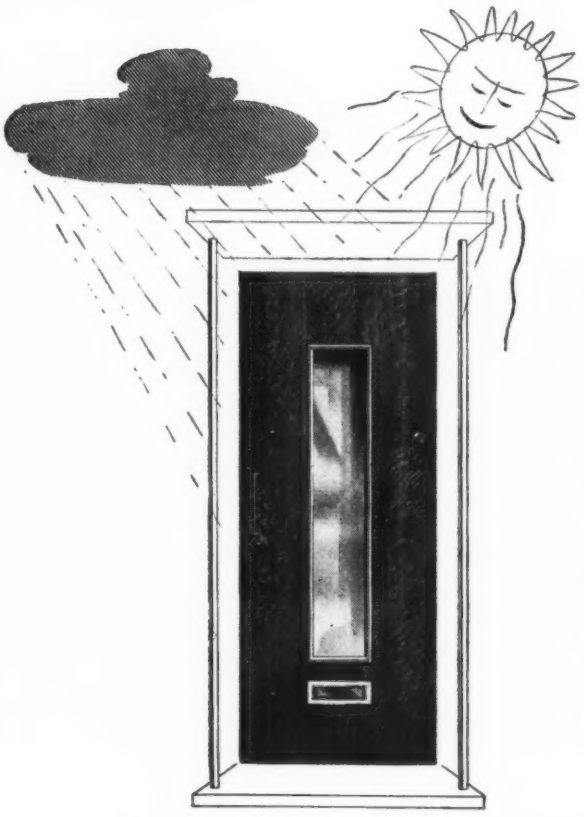

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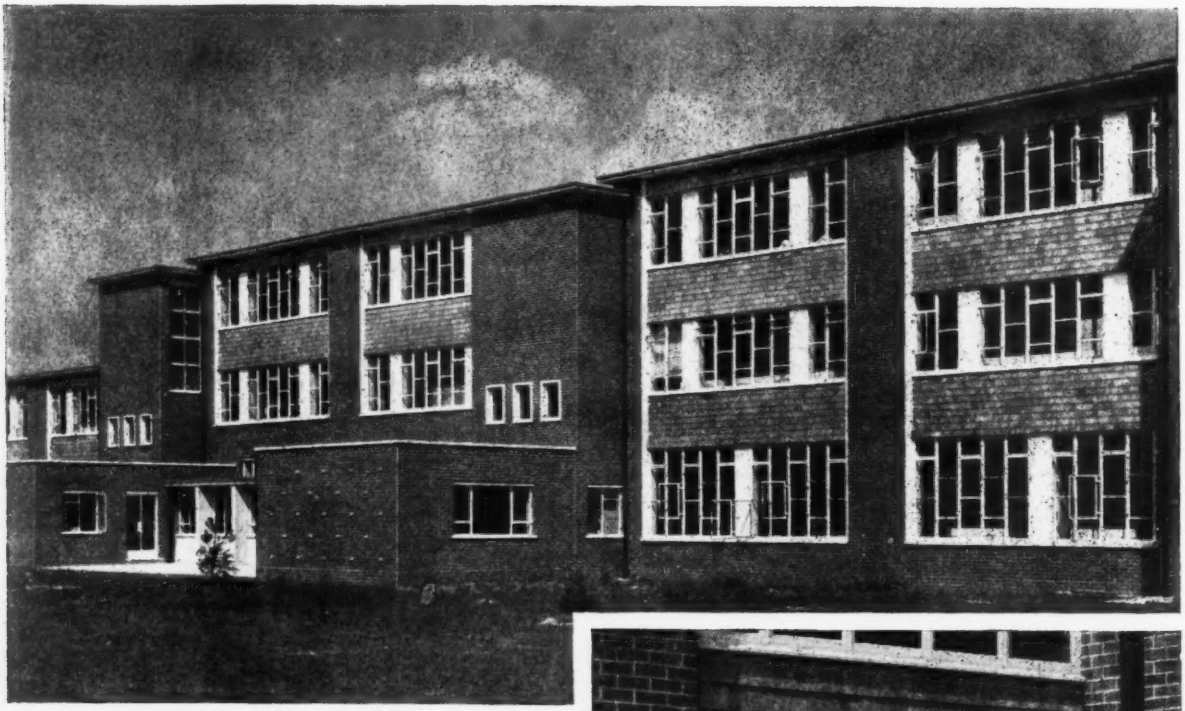

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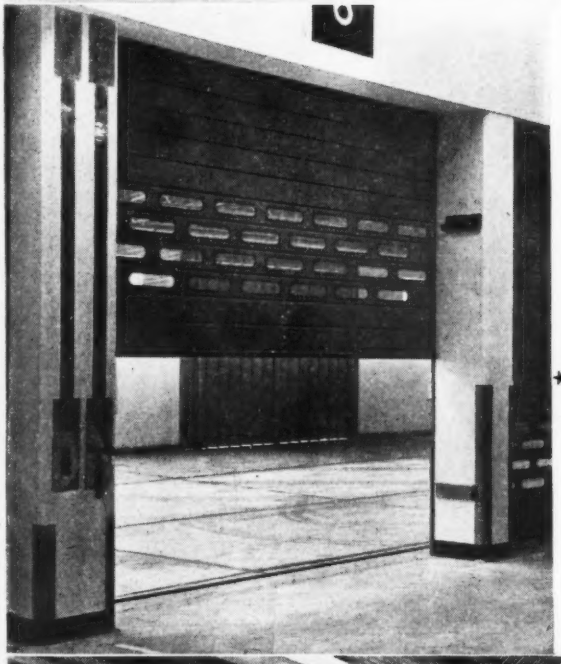

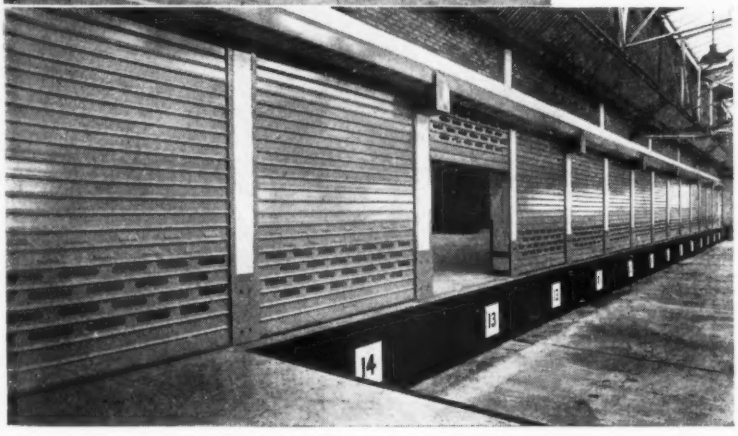

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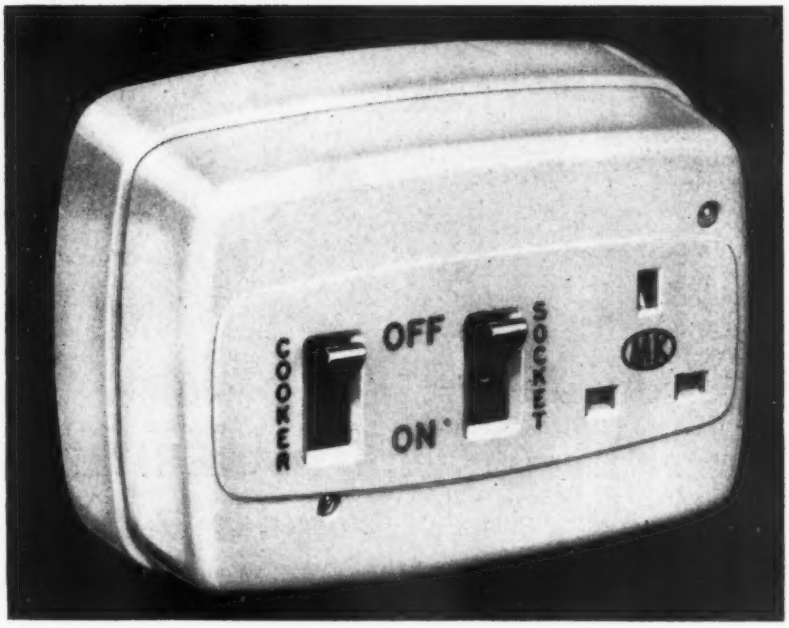

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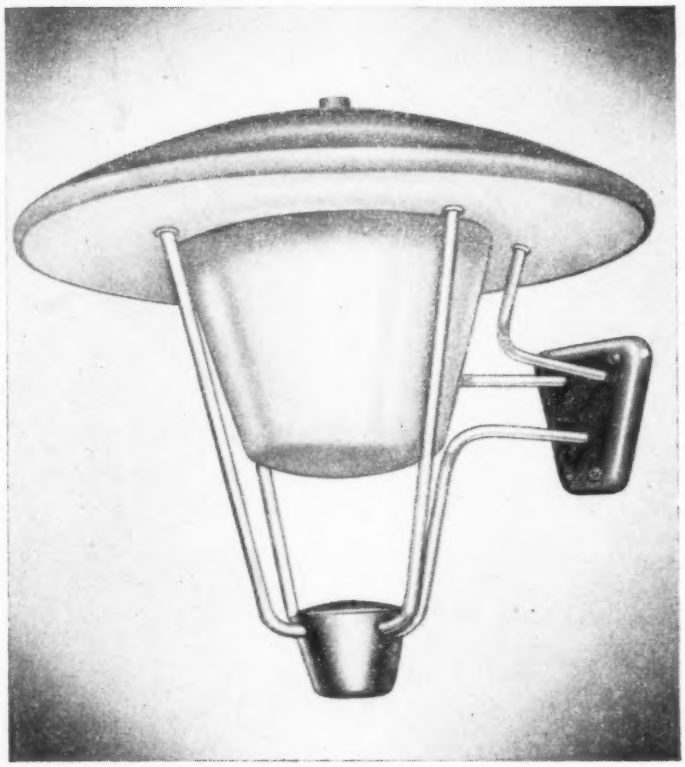

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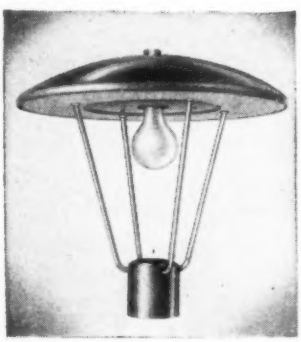

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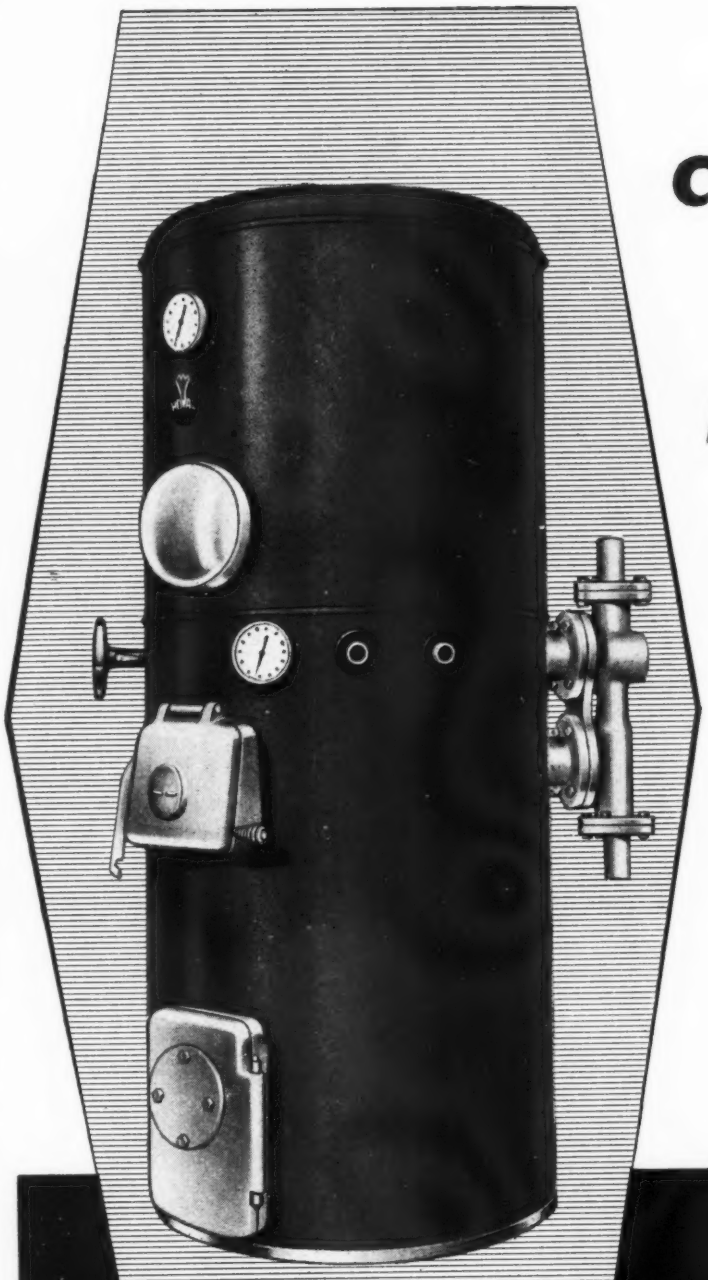

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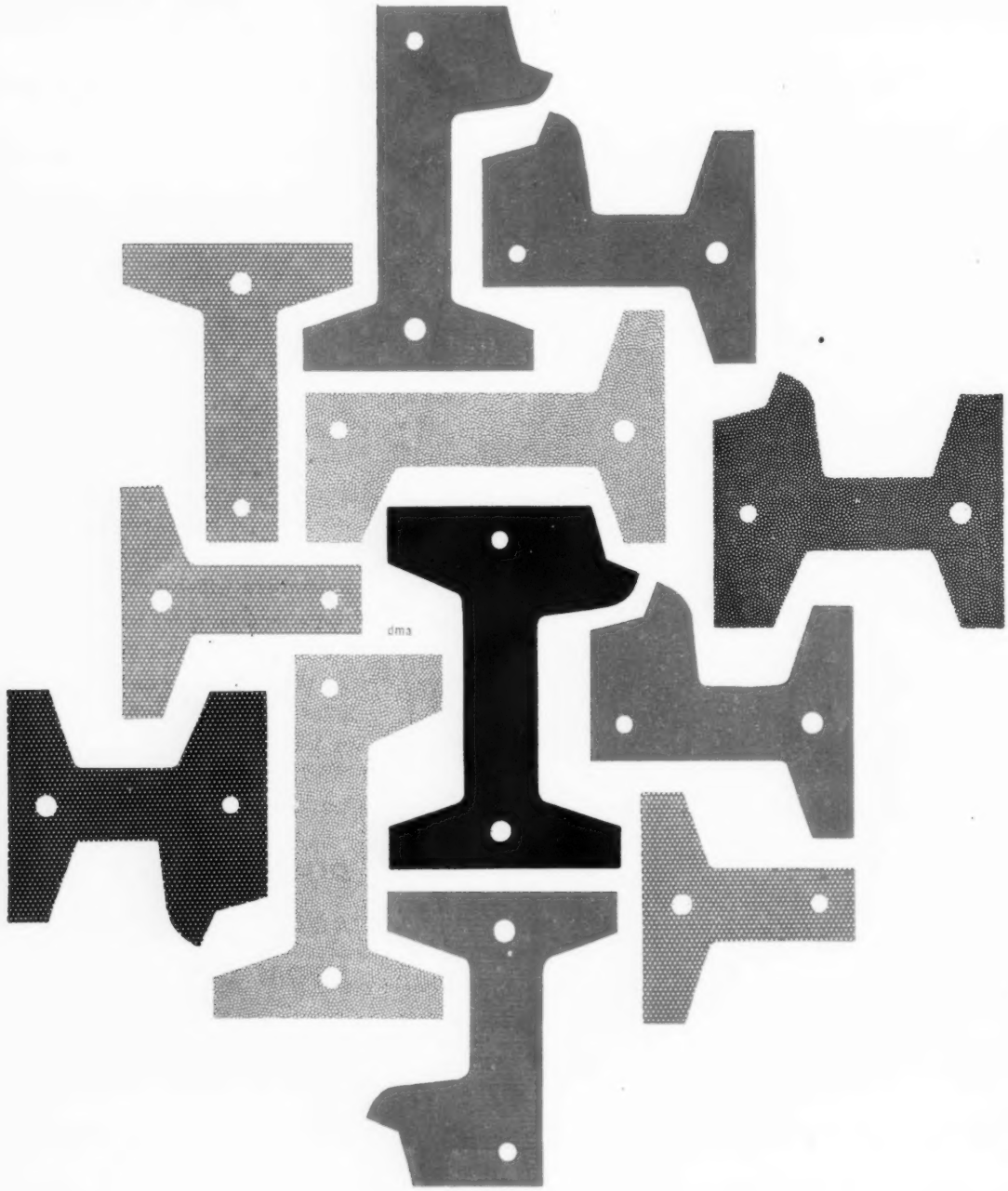

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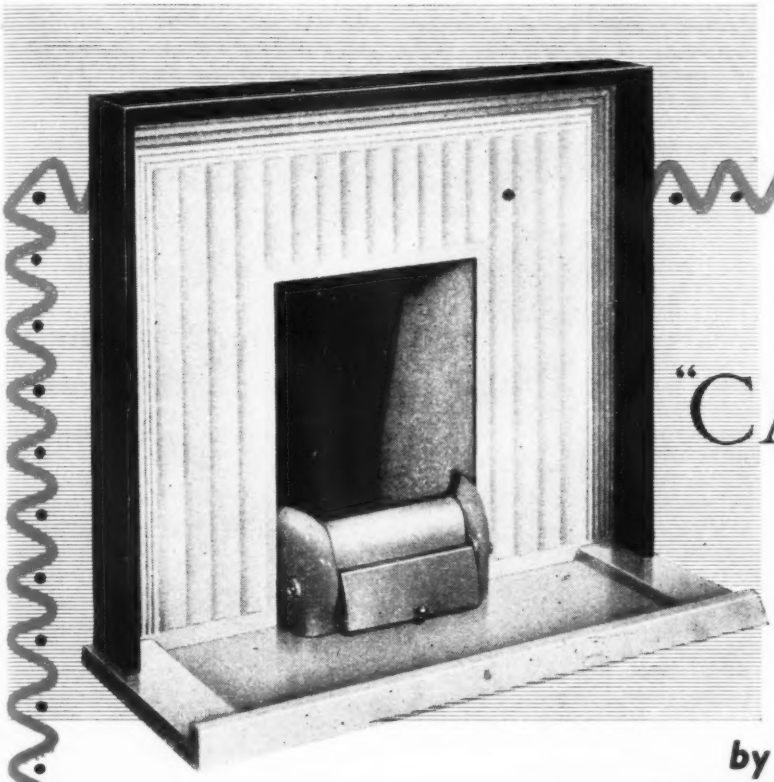

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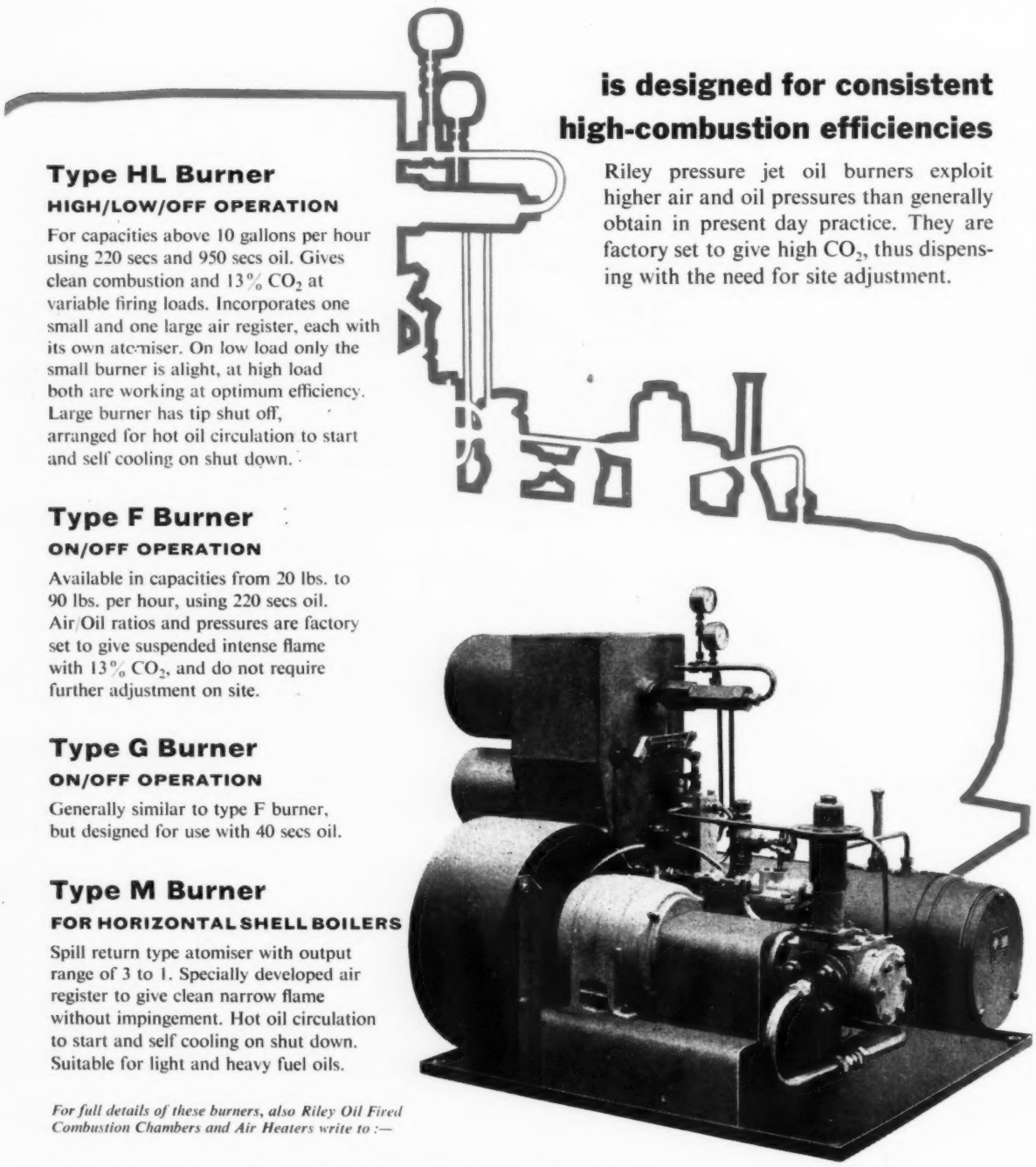

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For capacities above 10 gallons per hour using 220 secs and 950 secs oil. Gives clean combustion and 13% CO_2 at variable firing loads. Incorporates one small and one large air register, each with its own atomiser. On low load only the small burner is alight, at high load both are working at optimum efficiency. Large burner has tip shut off, arranged for hot oil circulation to start and self cooling on shut down.

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Restore and protect stonework with Monsanto Silester

Proved effectiveness! *These photographs, taken (left) in 1938 and (right) in 1955, show how treatment carried out on Cranbrook Church, Kent, under the supervision of Lt. Colonel B. C. G. Shore (by whose courtesy these photographs are reproduced), has weathered 17 years of South West exposure.*

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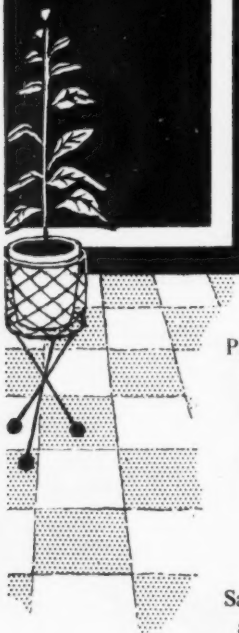

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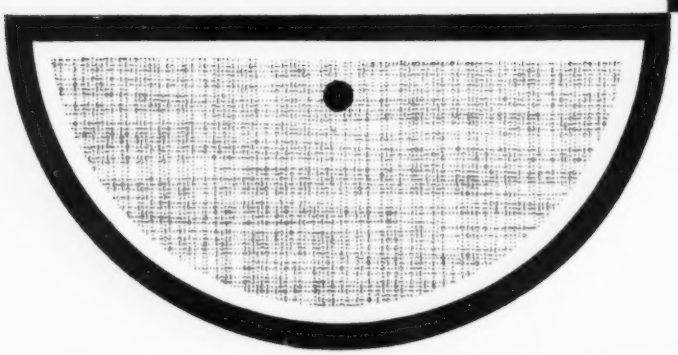

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with impact adhesives. An adhesive suitable for any surface and conditions under consideration will gladly be recommended.

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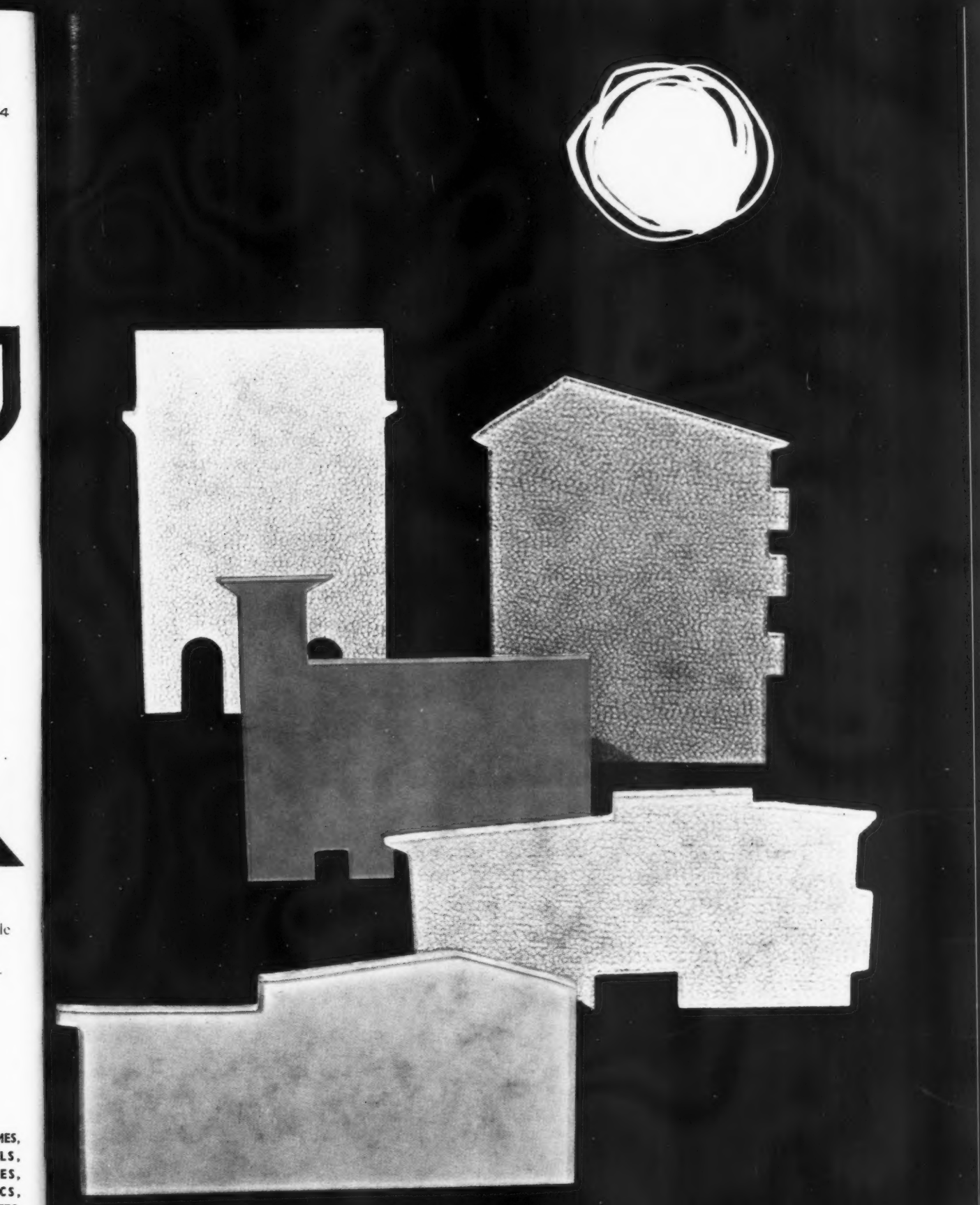

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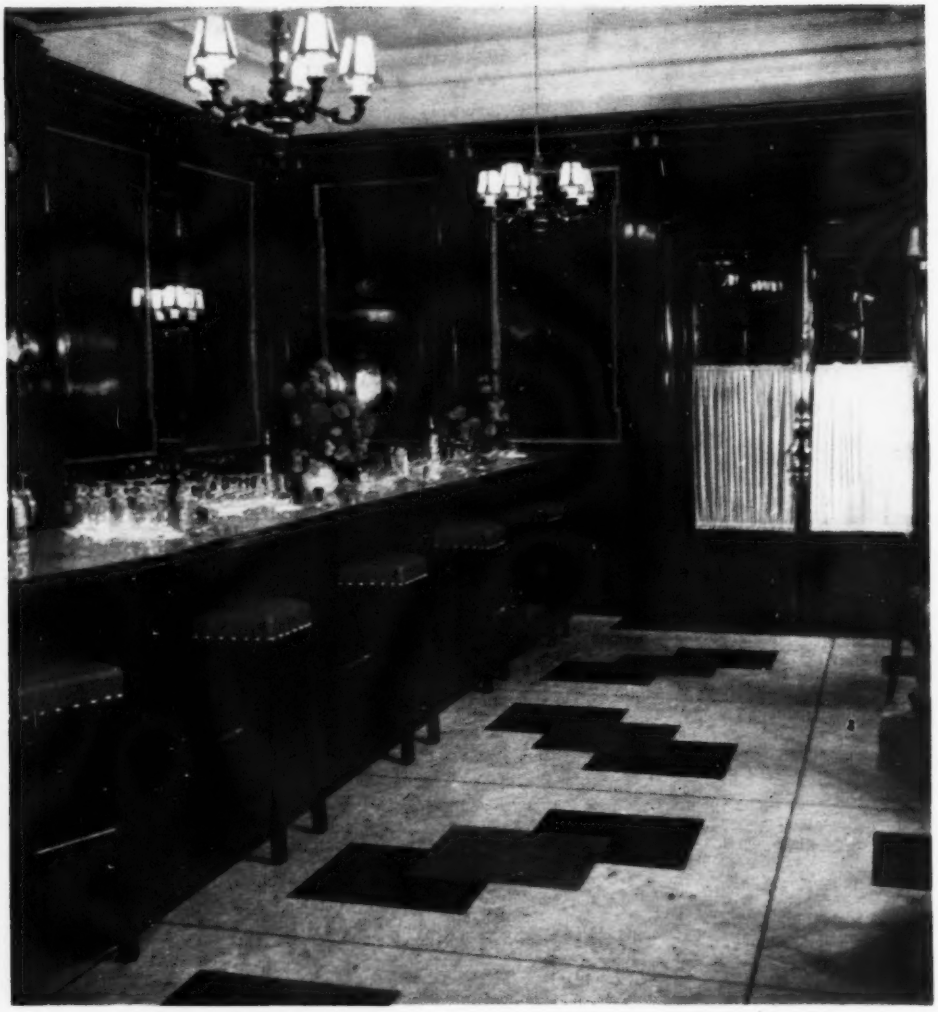

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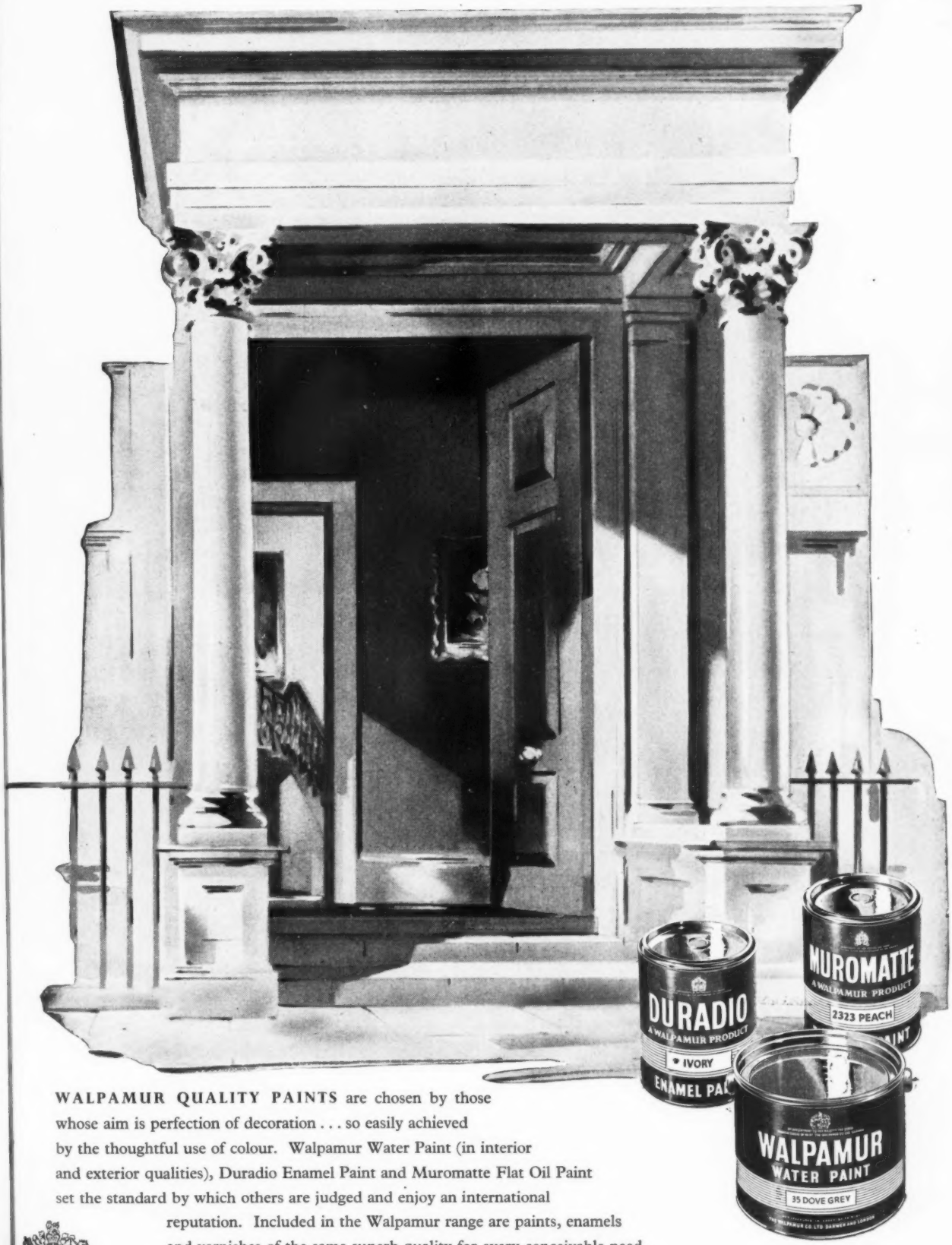

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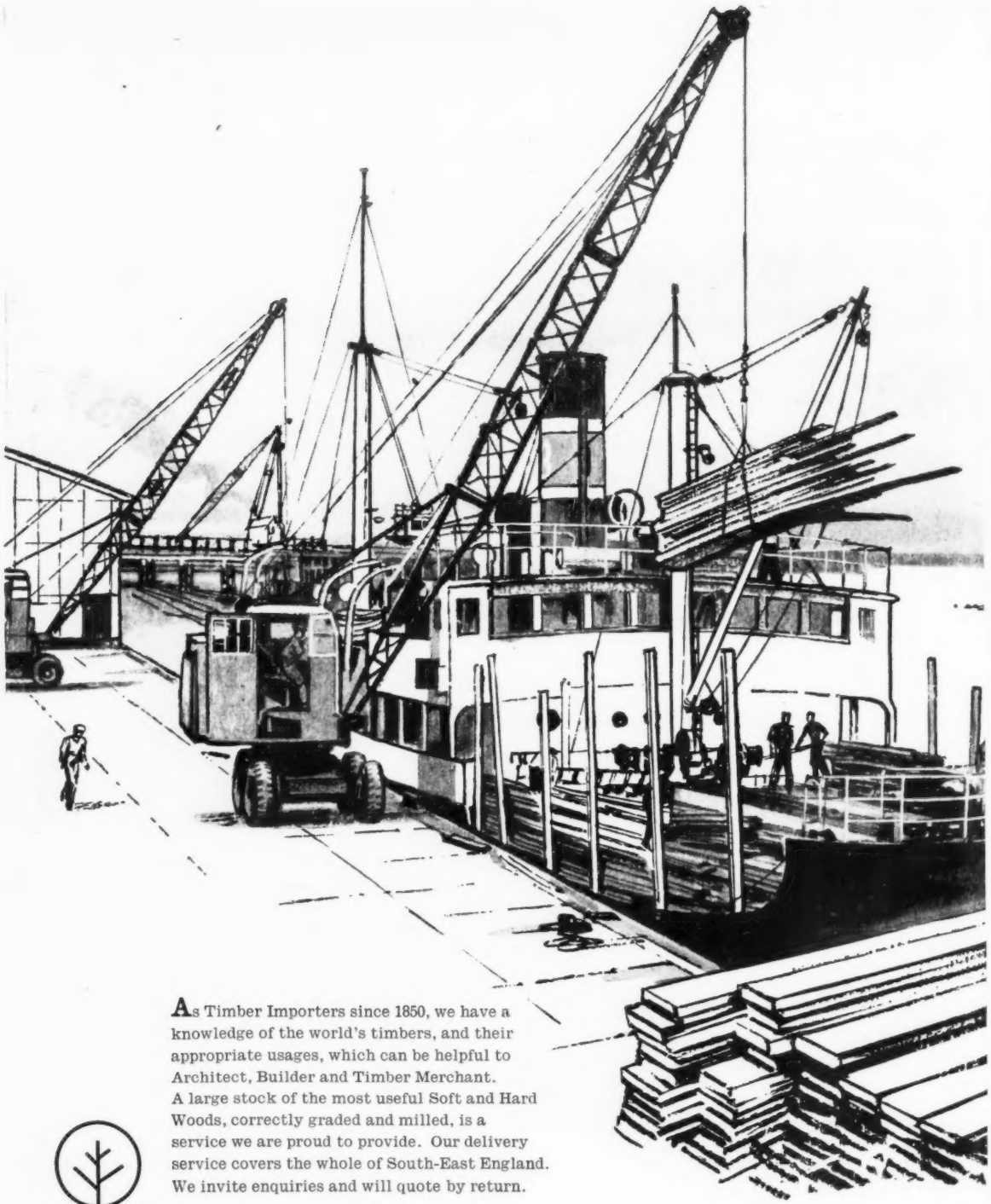

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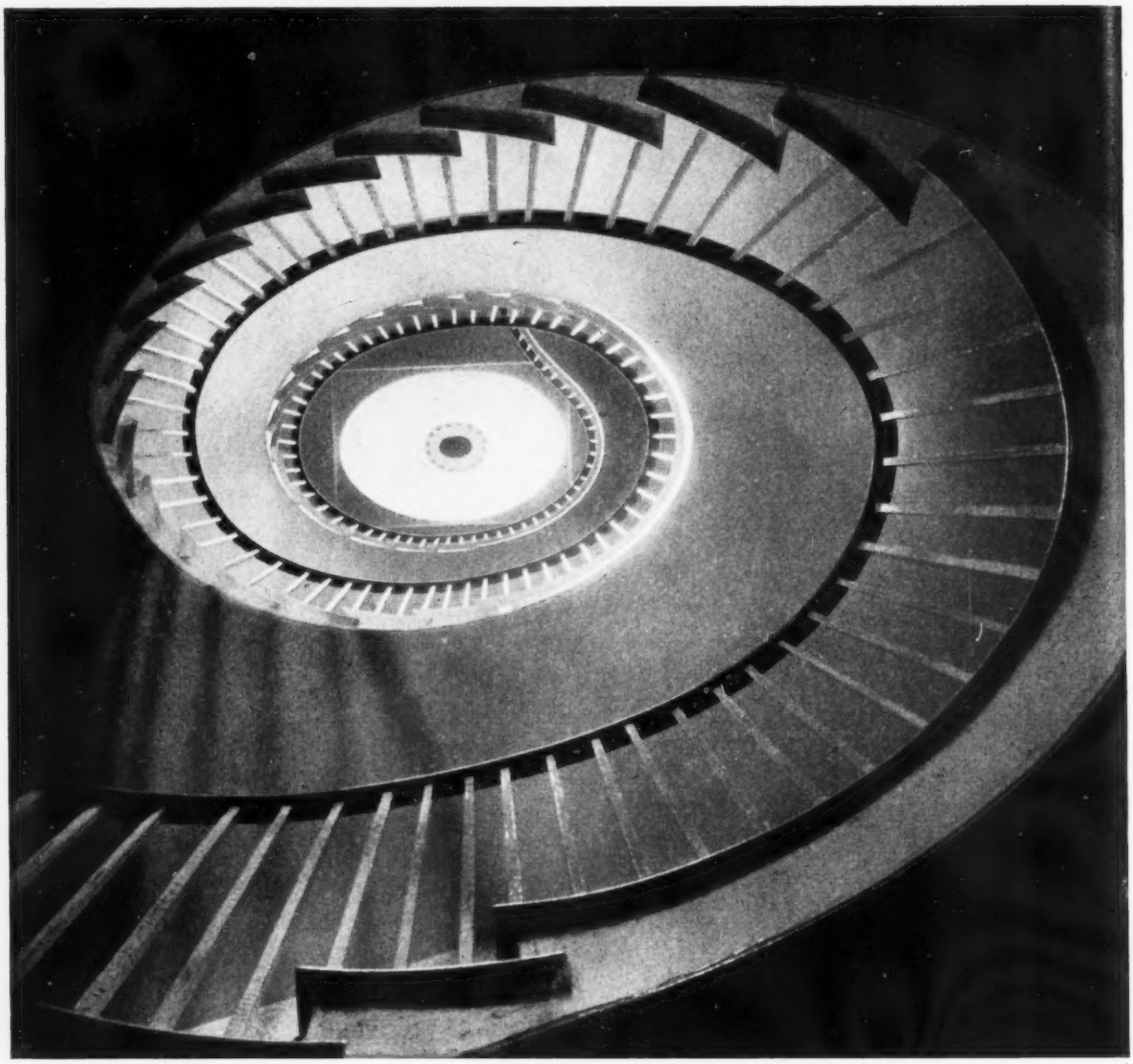

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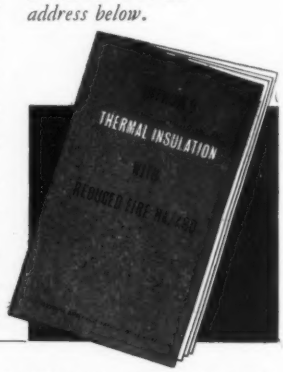

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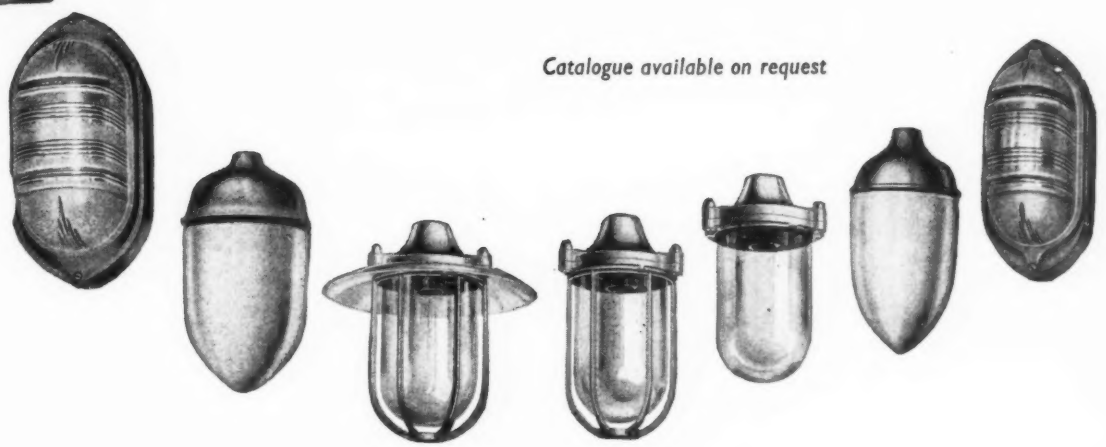

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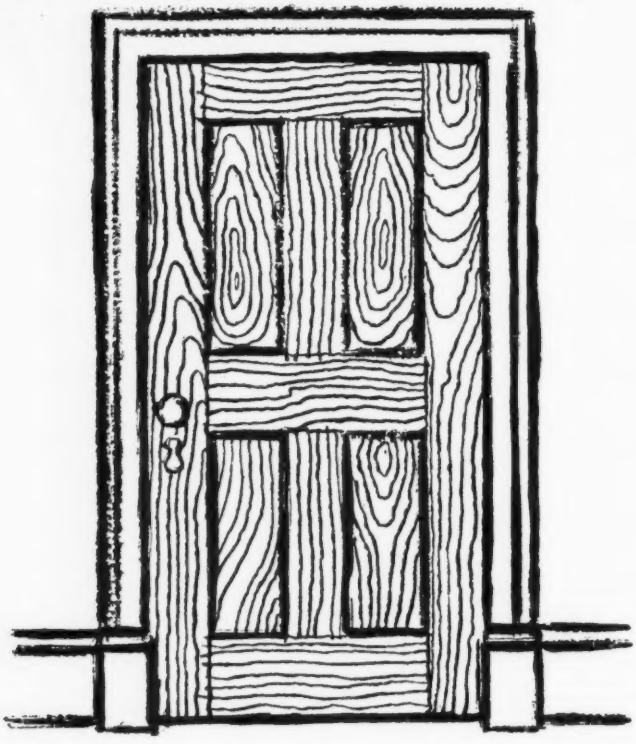

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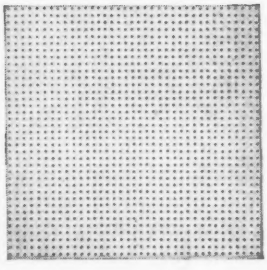

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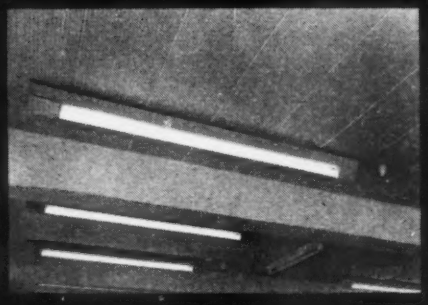
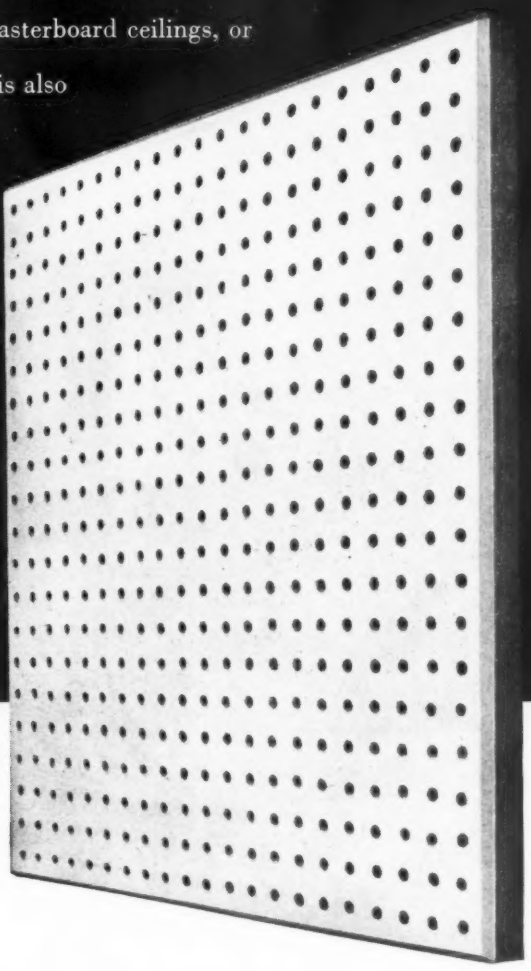


Illustrated above is a typical Fibre Acoustic installation, showing how simple it is to fix varying methods of lighting.



OTHER MATERIALS. There are many other treatments which can be used in dealing with acoustics and our booklet entitled "Buildings should be seen and not heard" is available on request.
It deals with many aspects of noise and sound control, and illustrates some of the ways in which John Dale Engineers have dealt with them.

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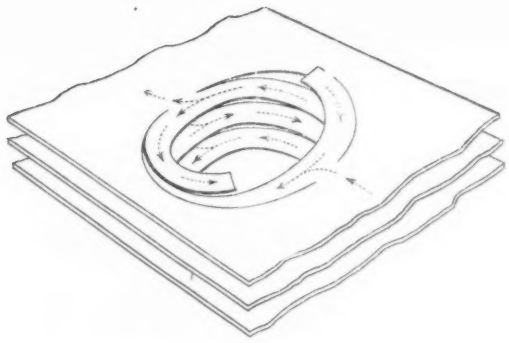

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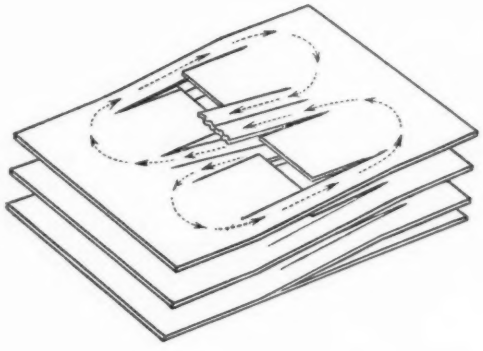

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AS REINFORCED CONCRETE SPECIALISTS we have designed and built a number of multi-storey garages in the past — and hope to build a lot more in the future. For the background is changing... ever-worsening traffic congestion has resulted in a marked increase in demand for this type of building. We believe that multi-storey parking garages will soon become a common sight in many of our towns and cities.

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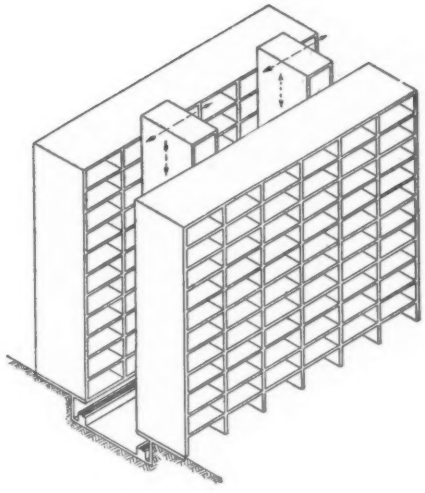

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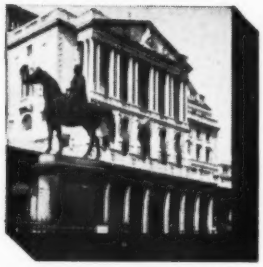

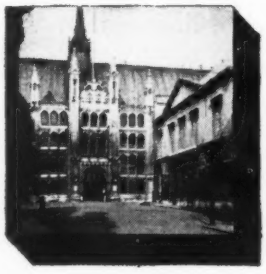

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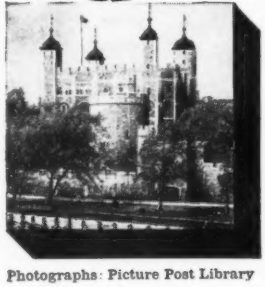

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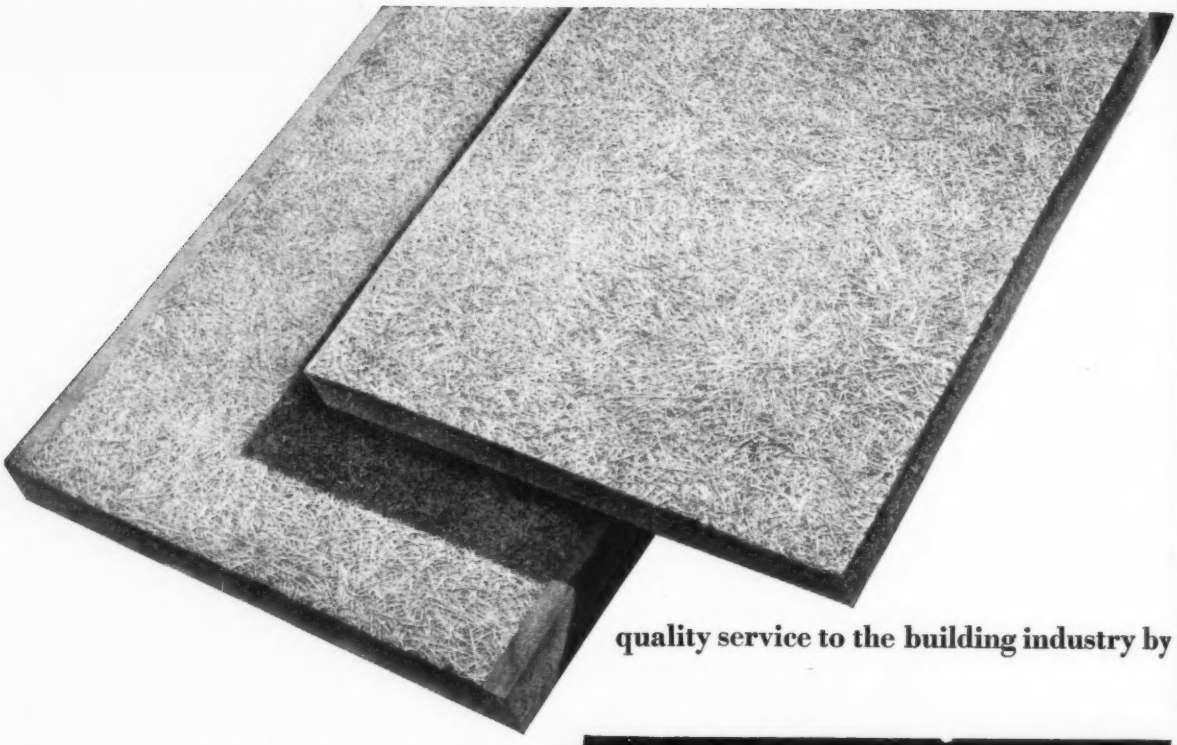

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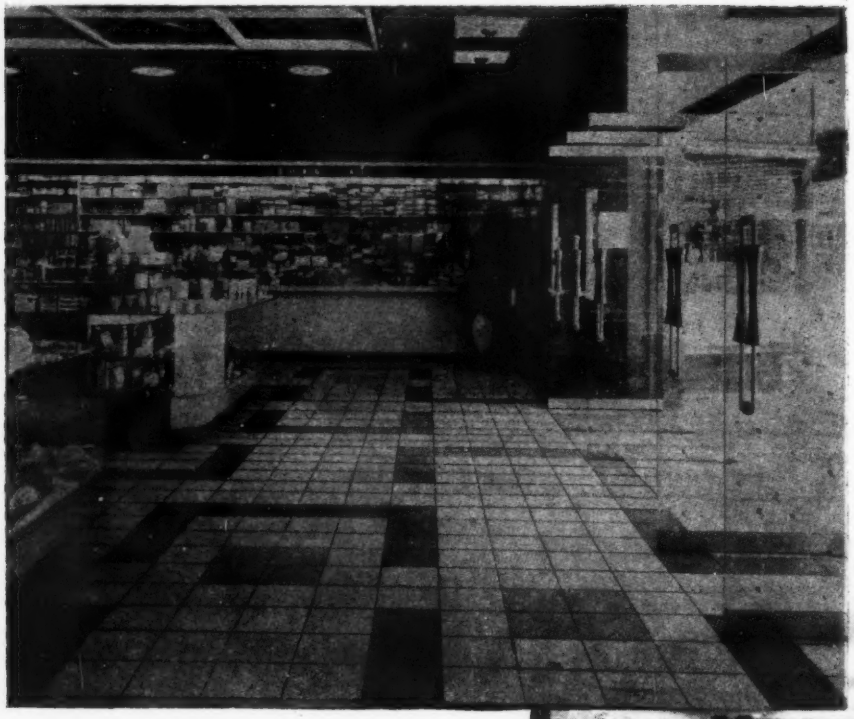

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THE mosaicist was no doubt amused at his own creation as he put together a picture of a fat and bibulous Silenus over-burdening his beast. Yet the years have given proof of the long-lasting endurance of this miniature form of "tiling" and the lively opportunity it gave for the use of colour in decorating floors. Semtex, the modern flooring tile, affords a more general opportunity for design. *Whole* areas can follow an integrated pattern in either traditional or contemporary style, which can be picked out in contrasting colours.

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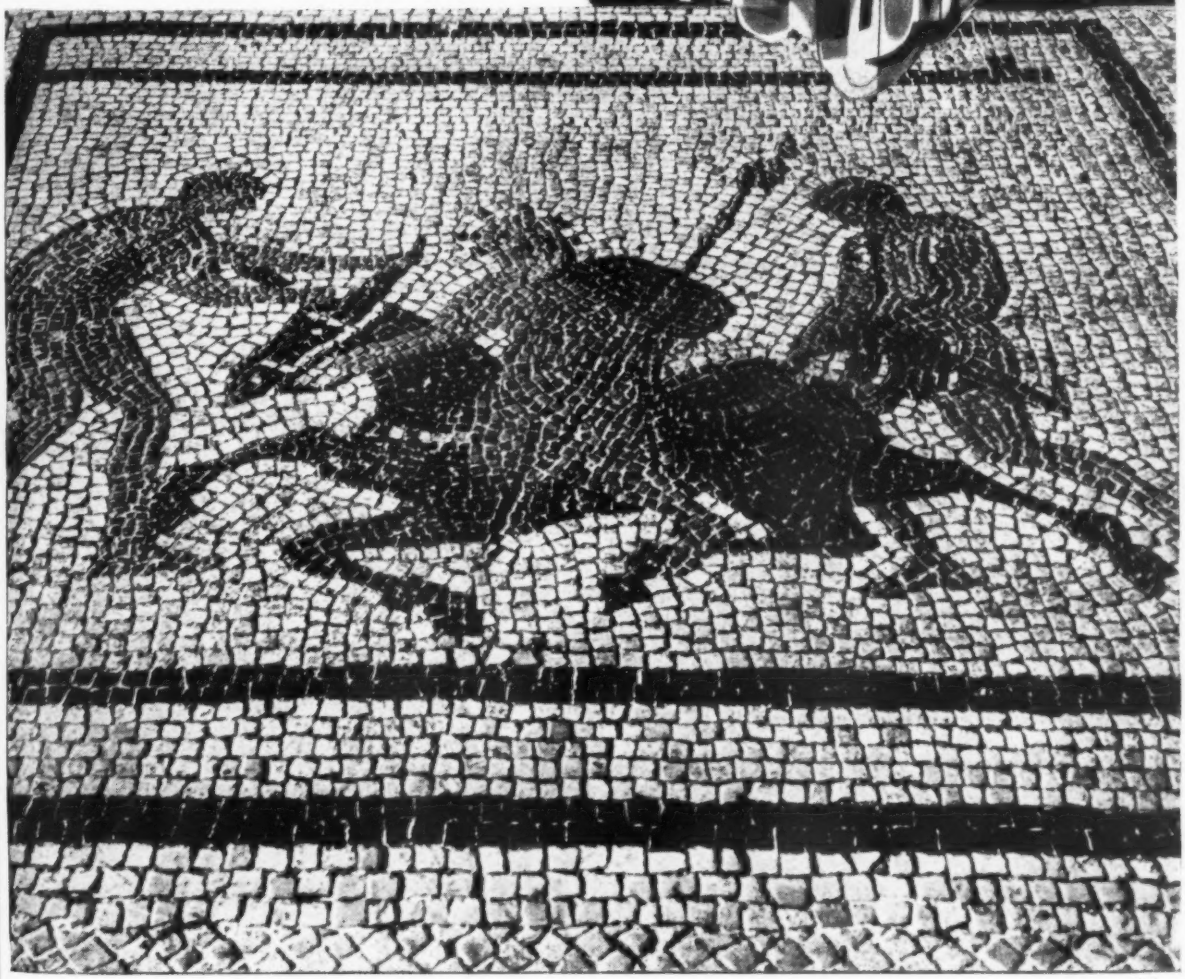
NS OF PROGRESS

This mosaic, now in the Museo Nazionale, Naples, originally formed part of the floor in the house of Paquius Proculus, a citizen of ancient Pompeii. It depicts Silenus, son of Pan, nurse, preceptor and attendant of Bacchus, proving too great a burden for his ass.



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Sprayed 'Limpet' Asbestos has been used in this modern cotton weaving shed to reduce noise and for anti-condensation purposes. Photograph by courtesy of Richard Haworth & Co. Ltd., Hindley Green.

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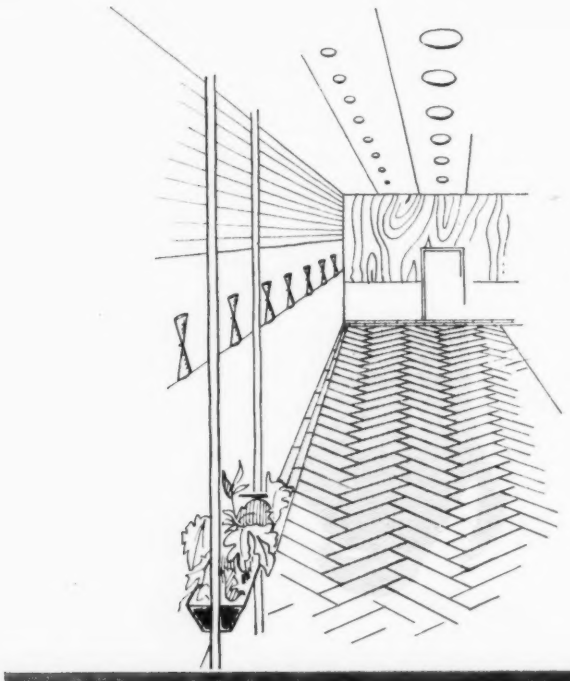

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Notre-Dame High School, Eccleston. St. Mary's College, Blackburn.	Messrs. Wm. and J. B. Ellis, St. Helens.
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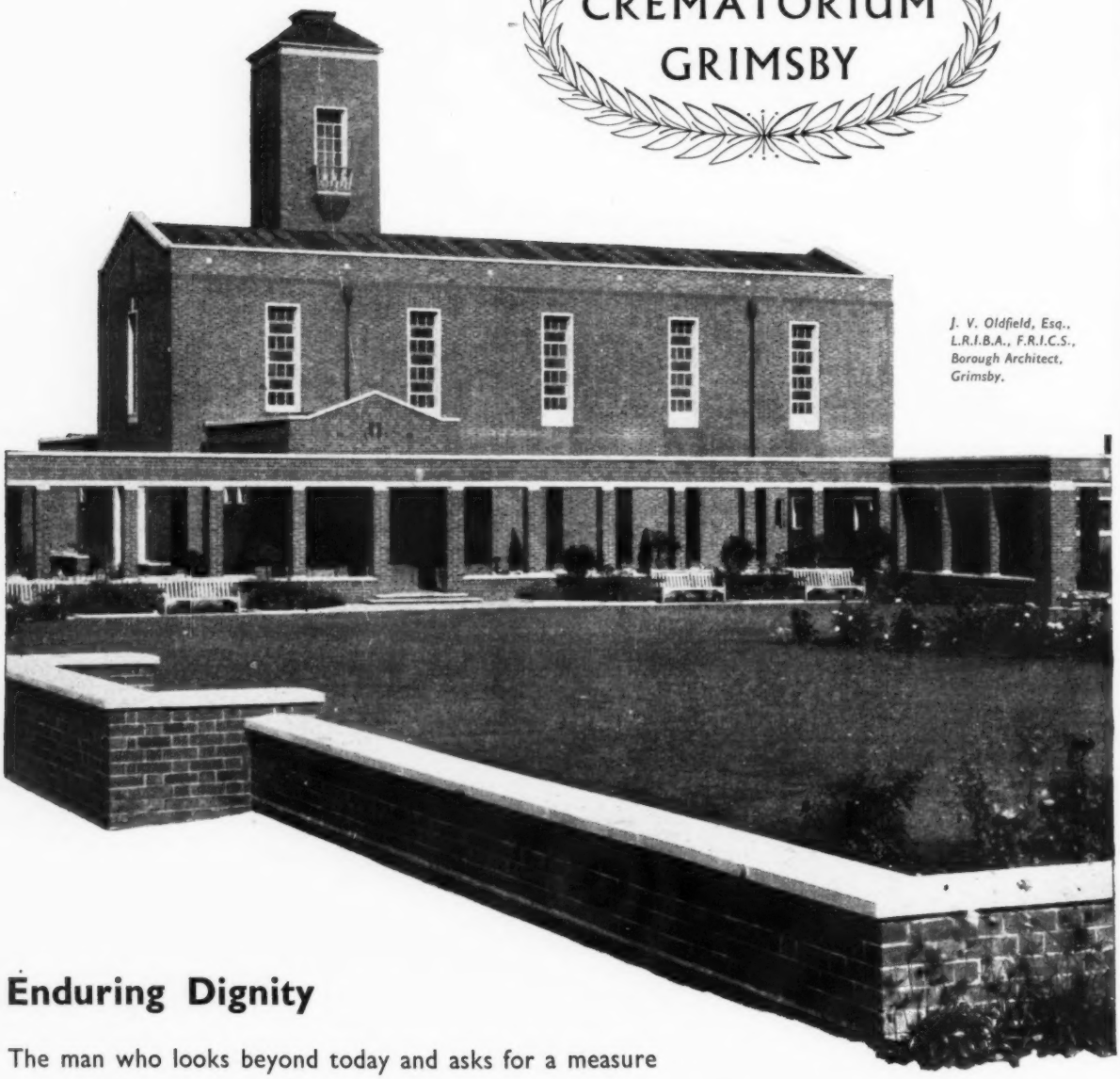

J. V. Oldfield, Esq., L.R.I.B.A., F.R.I.C.S., Borough Architect, Grimsby.

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WILLIAMS & WILLIAMS NEWS SHEET

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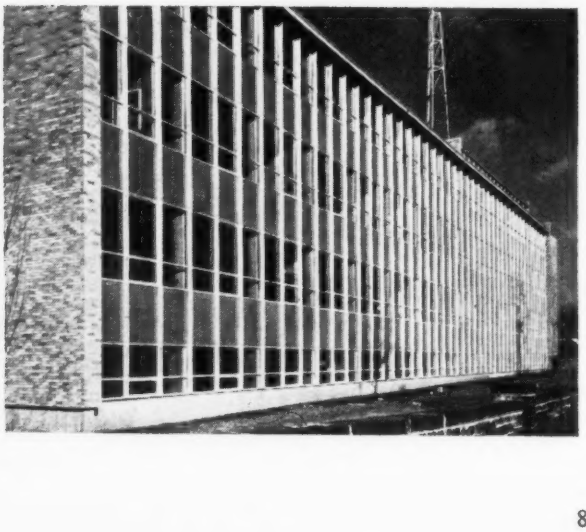

In the United States, Williams & Williams 'Wallspan' is finding frequent and favoured mention in architects' specifications. For the new Loyola Hall of Science at Scranton University, for example, 'Wallspan' was chosen to clad the two long sides of the building. A rare feature (to American as well as to English architects) is the absence of a stub wall behind the spandrels.

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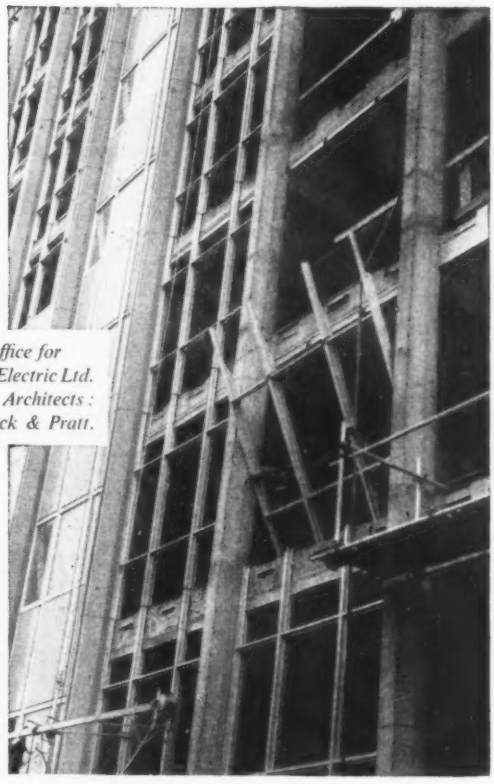
New Science building for Scranton University.
Architects: Gilboy, Bellante & Klaus.

New Head Office for British Columbia Electric Ltd. Vancouver. Architects: Thompson, Berwick & Pratt.



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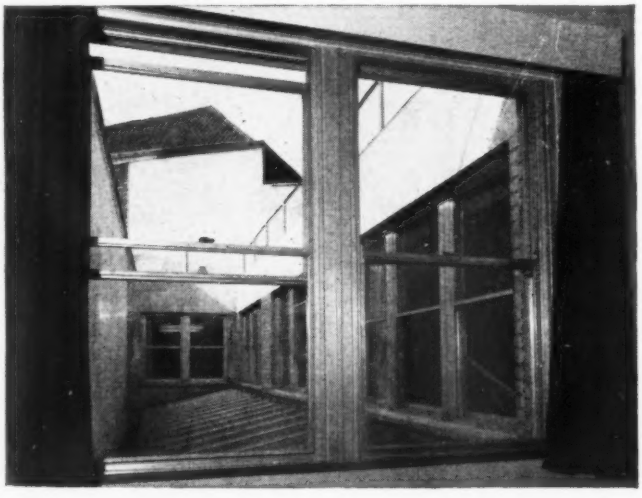

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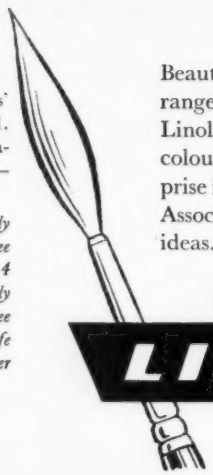

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THE ARCHITECTS' JOURNAL

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NOT QUITE ARCHITECTURE

PEDESTRIAN PLANNING . . .

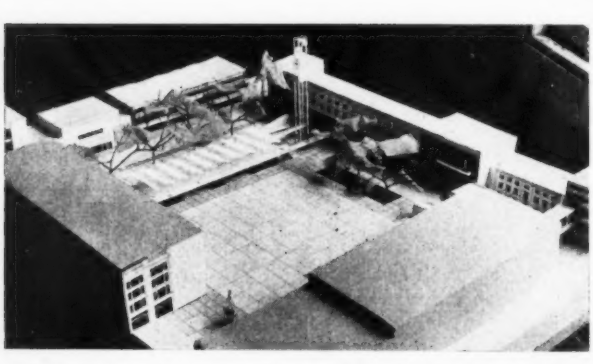
. . . But not for People

Gloucester is visually one of the most disreputable cities in the country. Its once pleasant collection of minor domestic architecture has settled fast into apparently irredeemable decay; and the twentieth-century replacements, whether "modern" or "Georgian" (as they are amusingly called), are as wretched as those anywhere else: one or two interesting new buildings *have* been built—far out, well away from any danger that they might be seen. Despite a costly-looking ring road, traffic congestion gets steadily worse, the various piecemeal improvement schemes only increasing the confusion. Chain-stores are all the rage, adding their characteristic attractions to the streets. To the south and east are some of the worst bits of speculative and local authority sprawl anywhere—Gloucester has, during the last few years, joined itself to Cheltenham, nine miles away. On top, of course, is the usual intensive cultivation of subtopian bric-à-brac, which has eventually reached the cathedral—the once quiet College Green now a car-park with all its attendant huts and signs, cars blocking the doors of the cathedral itself.

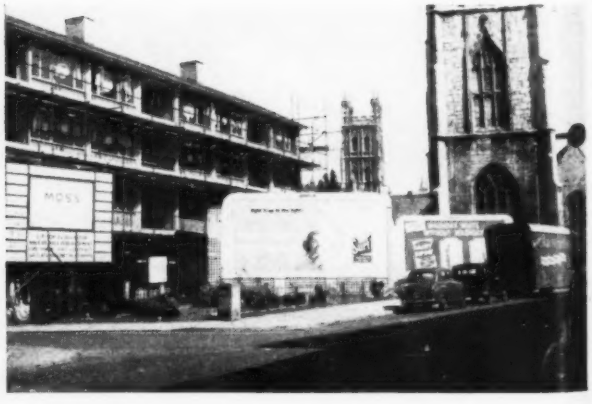
*

As the first step in a Counter-Attack campaign, a group of young architects recently staged an exhibition of local outrage in one of the city's department stores. Its accuracy made up for its small size, and the attack seems to have been shrewdly directed. Separate boards of photographs covered all the main subtopian categories (there was a wealth to choose from in each case), with, wherever possible, examples of how the thing might have looked if anyone had bothered to use a bit of enterprise

There Was A Young Lady Of Gloucester . . .



. . . whose private life caused some anxiety to her parents. And who can blame her for the subtopia in her soul? Didn't she live in what Andor Gomme has called "one of the most disreputable cities in the country"? A few of the young gentlemen in Gloucester recently realized that something must be done about the growing visual horrors of their city, and their "Outrage" exhibition which was shown locally is reviewed by Mr. Gomme in the adjoining column. Part of the exhibition display concerned the future of King's Square, which is now used (see above) as a bus station. It is thought that when the buses are moved to what used to be the cattle market, this square will become a car-park, and the exhibition organizers illustrated their belief that it should, in fact, be converted (left) into a pedestrian centre. Mr. Gomme, who embarrassed the city of Cambridge when he attacked its subtopian high spots during his term of editorship of the *Cambridge Review*, took the other photographs when he visited Gloucester as a missionary from the Architectural Press's Counter-Attack Bureau. The picture on the left shows how three messages can be put over with the maximum of expense and ugliness. And the picture below raises the question: "Will these temporary hoardings eventually give way to stultifying prettyfying?" It remains to be seen if the local "Outrage" exhibition will have any effect on the city fathers. In the meantime, our congratulations to the organizers.



or imagination. In one or two cases, the exhibitors had been able to find existing local alternatives with which to confront officialdom (the odd decent lamp or an occasional bit of sensible planting), but mostly the other side was put by drawings given extra force by their point being as much "This is how things might be" as "This is how things might have been."

*

The centre-piece of the exhibition was a sketch-plan for King's Square, an area (it can be called nothing else) at present used as the bus station. No official proposal has yet been published, but the general impression is that when, quite soon, the buses move out, it is going to be just another car-park. The counter-attackers of Gloucester have reacted sharply against the intention to make yet one more dead area close in to what would be the centre of Gloucester if Gloucester had a centre; and they have produced instead drawings and a model of King's Square redesigned as a pedestrian square surrounded by shops and houses and linked by shopping lanes to the streets which should enclose it. To answer the continual clamour for more parking space they propose a multi-storey park (with room for as many cars as King's Square would hold) on a desert space adjoining; but the main idea of the scheme is to try to give Gloucester something that might become a city's heart, a *place* (in several senses of the word). At present the middle of Gloucester is a chaotic traffic junction; any usable space is already choked with cars, so that walking about or just being in the city quickly becomes intolerable. A big square in the centre where pedestrians—that is people—come first and cars not at all would bring some sort of shape back into Gloucester and some sort of meaning into the confused shambles that the city is now. It is surely not too late for the city to take up this excellent idea: it is certainly not the line of least resistance, so that it wouldn't be easy. But it would be a great pity if such an opportunity were thrown away: it will need much care, thought and imagination, above all a sense of style in the design of the buildings: perhaps this will be the hardest of all to come by.

*

This little exhibition has been a model of what such things should be. On a very small budget, but as directly as possible, a whole attitude of mind has been challenged, the laissez-faire view that today commerce comes first, second and third, looks hardly anywhere and life nowhere at all—the kind of attitude so neatly summed up by "Circa 1450" in neon lights on the front of the New Inn. Above all, by being *local*, locally conceived and inspired, the exhibition has affirmed a belief in Gloucester as Gloucester and not just the next traffic block on the A.38. And this is the great principle of Counter Attack. If the belief means anything Gloucester has a chance; if not it may as well be written off right away as one more mess to be avoided.

ANDOR GOMME

The Editors

NEW TOWNS: A NATIONAL ISSUE

EVERYONE will wish the LCC well in their endeavours to build a New Town. The question remains: should a local authority be concerned with building new towns? There is no doubt that of all local authorities the LCC would appear the best fitted to undertake such a step. Even so, there are signs that the great design impetus, created by having first-rate architects and planners on the staff, and which made the Council internationally famous, is dying away. This is largely due to the fact that so many eminent architects have now left. With insufficient staff of the right calibre, coupled with pressure from the councillors to put quantity before quality, an LCC New Town might be no advance on the existing new towns.

But the main danger lies in the fact that a local authority, when developing a new town, will find it almost insuperably difficult to see the new town as an end in itself, a self-developing entity, and not merely as a solution to the authority's own urban problems. It is because the siting, and the creation, of a new town is an important national issue, and not a local authority one, that we are certain the Government must take responsibility for developing new towns—using the development corporation system, though, if necessary, in close collaboration with the local authorities most directly concerned.

BUILDING RESEARCH, 1956

The cream of the report for 1956 of the Building Research Board has been licked off by the annual report of DSIR, referred to in the JOURNAL last month. Nevertheless the report is essential reading for architects who want to keep informed about what is going on at the Building Research Stations. A succinct survey of BRS studies and recent discoveries is contained within 60 pages. For those architects whose performance in reading important articles falls short of their ambition the following points from the report are worth noting:

There is evidence that there are a number of deficiencies in some of the "jellied" paints now on the market. Solutions of silicones as colourless water repellents promise to be at least as effective as those colourless water repellent liquids based on oils and fats, provided that it is remembered that they seal only very fine hair-cracks. Studies are being made of prestressed, ceramic floors in Europe, in addition to developing hollow bricks and blocks for walling. There is a great deal of work still to be done on problems of sound insulating lightweight partitions. Surveys show that, even when a kitchen is inconveniently small, the majority of families try and eat one or more meals in it, so architects should allow for this. To combat condensation on sheeted roofs, the outside of roofs should be insulated—the most expensive answer—alternatively, the lining should be cocooned and painted to act as a vapour barrier. Packaged bricks, when crane

handled, save ten shillings per thousand bricks in man-hours, and reduce wastage by breakage in transit by rail from 100-200 bricks broken when carried loose to a mere 3-4 when carried strapped.

A subject which the BRS Board point out as having received very little systematic attention is the design of flushing systems with a view to water economy, and the report emphasises that in the whole field of waste outlets, traps, vents and soil pipes, current design is largely empirical. There is obviously great scope for development in the whole field of sanitation.

The report ends by giving figures of enquiries received from manufacturers, builders and the professions. These amount to under 30 a day—a surprisingly low figure considering the ignorant state of the industry. Enquiries are likely to remain at that figure because the Station is limiting the number of staff it employs to answer questions and on advisory work generally. The reason for this is understandable and sound: it sees its rôle as that of developing new ideas. For the application of well-established knowledge it is relying on the industry itself. This can only come about by the industry raising its standards of technological training and developing its own advisory services. Here is a direct challenge to the architectural profession and its schools.

MISSING THE POINT

The contractors for the atomic power station at Hinkley Point in Somerset were announced one day last week; they are English Electric, Babcock & Wilcox, and Taylor Woodrow. A day later, glossy booklets appeared, describing the station and showing sections through the turbine house, front elevations of the steam raising units and—more interesting—artists' impressions of the power station under construction and when completed. The first detailed impression of the station is shown opposite and will do little to reassure those who feared that it would visually destroy this part of the Somerset coast. Six months ago—when my other photograph was taken on the site of the turbine house—Hinkley Point was still untouched. Tall trees extended right down to the beach and the waves left seaweed and driftwood among their trunks. It was a scene which was most unusual in England, where we are more accustomed to cliffs or long lines of dunes breaking the link between woodland and seashore; it had a lonely and impressive beauty that is hard to forget.

*

Once the plans for the power station were approved these trees and the lonely fields behind them were doomed, but there was some comfort in the Central Electricity Authority's promise that a first-class landscape consultant would be employed to control the station's surroundings. It is to be hoped that this appointment will be made very soon, because the "artist's impression" is discouraging: there is no planting, unless we accept the geometrical lawns and a small garden in the centre of the administration blocks, all surrounded with crude wire fences and with a wide sterilized band of country beyond, so that the group of buildings is left exposed in a manner more appropriate for a concentration camp than a power station. Behind the station the acres of switchgear appear for the first time (the CEA have been very vague about this in the past and have much preferred to talk about the design of the reactor building), surrounded by their own concrete and wire cage, at the beginning of the line of pylons which will carry the power into the grid.

*

The station buildings at Hinkley Point are honestly and simply designed (by Frederick Gibberd), so that the station, in itself, seems likely to be extremely successful. But unless someone with imagination is called in quickly to prepare a scheme for replanting—a scheme which will bring the wild country right back to the immediate boundaries of the station and conceal all the wire and concrete posts and switchgear, Hinkley Point will become, instead of a show place, an open sore on the coast of Somerset.

CITY OF SCHEMING ASPIRERS

The TPI held its recent Summer School in Oxford, and it could not have thought of a better way of having a lively and controversial meeting—particularly as a lot of the delegates were housed in Meadow-coveting Christ Church. But although the problems of Oxford were discussed at length (and occupied two full sessions), the main attention of the School was directed to matters relating to the country as a whole. The purpose of the principal speakers was to examine the effects, in terms of land use, of our post-war social and economic revolution on the pattern of large-scale industry, the great cities, rural Britain and the national transport network.

*

So many British and British-trained planners are now employed overseas that the TPI decided this year to provide them with a chance of discussing their own particular problems. After the main Summer School was concluded, representatives from 22 countries talked about the most urgent problems encountered by planners in

tropical conditions. Their findings, which will be published in the JOURNAL when the School is fully reported, will be of use to planners and architects with interests overseas.

NEW PANEL GAME

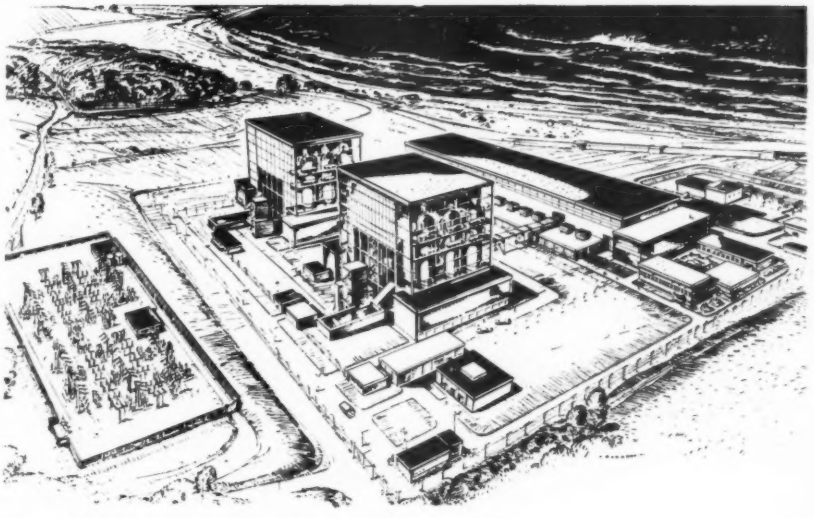
For a national institution almost as tradition-hallowed as the monarchy, *The Times* is singularly unpredictable. Its Architectural Correspondent produced recently a neat note on the work of Philip Johnson, with a picture of the Port Chester synagogue. The text doesn't stray far outside the usual terms by which Johnson is evaluated —Mies, Soane, geometry, monumentality—except for a sudden excursion into territory that architectural critics of less distinguished journals are rarely bold enough to tread. Trailered by a reference to an *eminence grise* a couple of paragraphs earlier, there comes the observation, "Moreover it is doubtful whether the exposed metal frame would have spread its influence so widely if Philip Johnson had not so cunningly played Père Joseph, so to speak, to Mies's Richelieu."

* * *

This is high-level stuff with a vengeance, and it gets us well off the tie-versus-sports-shirt plane of criticism that seems to be mandatory at the moment. Let us hope *The Times* will keep up the good work. There are quite a number of architects who could benefit from this treatment before their obituaries are due, and there are plenty of equally recherché historical parallels that could be drawn. We all look forward to Marcel Breuer as the Alcuin of the Bauhaus; Corb as Hercules to Perret's Cheiron; Leslie Martin as Pope Julius II of the LCC; and Team Ten as the Trojan Horse of CIAM.

THE MAN WHO CAME TO DINNER

The discovery that Sir Edmund Bacon's *Saint Jerome* is a Durer and not a Caroto (supposing it *is* a Durer, that is—my Scholarly Spy assures me that art-boffins are not quite united on the subject), is another coup for David Carrit, who also indentified a spectacular early Caravaggio for what it was some six years ago in another country house. He seems likely to become a very popular visitor around England's stately homes if he can keep up the present output, which has caused the value of our landed art-works to appreciate by about £20,000 a year.



The top picture shows Hinkley Point, in Somerset, before work began on clearing the site for an atomic power station. ASTRAGAL *comments on the opposite page, on the siting and landscaping of the proposed building (sketch above), which was designed by Frederick Gibberd*

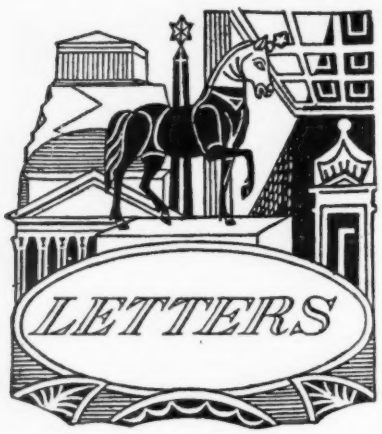
All the same, plain men and non-boffins like ASTRAGAL cannot fail to wonder how a simple re-attribution can rocket a picture into up to six figures. A mild re-valuation, on being transferred from the œuvre of a relatively dim painter to that of a major master could be understood, but it is still—if I have my facts straight—the same picture. Culture-vultures will point out that it enriches our knowledge of the artistic personality of Durer and all that, but what does it do for poor Caroto? Another re-attribution or two, and his reputation will be sunk without trace.

WORDS

For the semantically-inclined, here is a letter I've just received.

"I notice that the Peter Robinson store, which is being reinstated after war damage, displays the usual contractors' name board with the following description in large letters: Reinstatement of War Damage for Messrs. Peter Robinson Ltd., etc., etc. Another similar one I have noticed is: Conversion of Existing Buildings. Perhaps you or your readers will explain these phenomena to me."

ASTRAGAL



W. G. Phillips, L.R.I.B.A.

G. A. Bendell

E. H. Laithwaite and E. W. Skerrey

"Pommie"

E. J. Wilson

The Jaguar Fire : Important Revelation by the Factory's Architect

SIR,—Referring to Kit Evans' letter of September 5, may I introduce myself as the architect concerned.

Mr. Evans appears to be fairly comprehensive in his wholehearted criticism of officials generally and the architect in particular, but maybe at the time this particular factory was erected (1940) he did not appreciate the circumstances prevailing.

I would hasten to state that this factory (originally an Aero Shadow Factory) was not designed for the purpose for which it is now being used *viz:* Line car production, with its attendant "hazard spots" such as paint spray shops, bodyworks, sawmill, tyre-stores, etc., but as an Engineering Machine Shop with little or no hazards. The buildings stood throughout the war and were twice bombed during construction and attracted incendiary bombs by the hundreds and still the roof never caught fire, even with incendiaries burning themselves out in the gutters (iron). As Mr. Evans will no doubt appreciate, this and other shadow factories very successfully provided the engines for the "Few."

Although I and my firm are not now concerned professionally with these premises, since they have now been taken over by Messrs. Jaguar Ltd., your correspondent and readers may be interested in the following facts:

The factory was erected for Messrs. Daimler acting for and on behalf of the Minister of Aircraft Production. My instructions included a proviso that insofar as it was practicable, the construction was for a life of 7 years.

The Government are their own insurers and I believe it is general policy that sprinkler installations would not be provided to that type of building.

Government departments are not subject to control by building bye-laws in relation to their own premises, but nevertheless I was instructed to respect them and to conform except in instances which were contrary to the exigencies of the project.

The buildings were steel-framed throughout and in the design of such factories any hazardous operations in connection with aero-engine works were located inside brick enclosed annexes both with brickwork between the annexe and the main machine shop area and in the construction of the external wall, thus also providing some measure of protection to personnel and machine tools against blast. Blast walls were also later constructed inside the shop area for the same purpose.

The roofing materials and construction was generally as detailed in the DISR report (your issue August 29) but the only space between the lining and the bitumen protected corrugated covering was the depth of the corrugation—and was therefore not a *continuous cavity*. Both materials were originally laid *on top of the purlins*, but subsequently alterations were made to the original construction (I believe to repair further bomb damage) when it was impossible to obtain the fibreboard lining and at a later date this lining *was* obtained and to avoid stripping the roof it was fixed to the underside of the purlins by others. *It was in this area that the worst fire damage and fire-spreading occurred*, which I consider to be due to the increased combustible space provided.

The ventilators provided were, of course, not for the egress of smoke, or fumes, but were the most economical form of automatic ventilator obtainable and controlled by dampers. Movable portions of the roof glazing (ultimately blacked out) were not at all desirable as being likely to show lights and in the event of panic would probably not be closed.

Thermal insulation of this construction was very satisfactory, although not quite up to the present-day standard called for in the Thermal Insulation (Industrial Buildings) Act, 1957—17 years afterwards!

The requirements of the MAP in those days were not for academical building but for speed and more speed in the erection of the buildings required—to which this form of construction was particularly suitable—the trusses being carried by about 80 ft. span lattice girders. This design was adopted in many shadow factories erected under my supervision in many parts of the country and for the largest aero-engine concerns and never once were we troubled by fires throughout the war attributable in any way to the buildings, or to fire-spread from the materials used.

The use to which these types of buildings have been put subsequently is not my concern, but they can be easily adapted to modern requirements—in fact my firm is at present engaged upon the completion of the reinstatement of a similar building burnt out a few months before the Jaguar fire—which again was being used for another purpose. This reinstatement has been carried out with due regard to all suggestions made by the DISR in their Report.—Yours faithfully,

W. G. PHILLIPS.

London.

What Happened Before the Jaguar Fire ?

SIR,—Kit Evans' letter on this subject, in the September 5 issue, interests me and I can give some of the answers about what the chaps were doing before the fire.

The chief officer of the Coventry city fire brigade had drawn the Jaguar people's attention to the dangers of fire in their factory—some months before the fire occurred. What the Jaguar people had done about it I do not know, but it is my understanding that the factory was a Ministry of Supply factory and that the Jaguar people were only tenants. The responsibility, therefore, may have been either the tenants—Jaguar—or the Government's.

I am given to understand that the fire hazard of this factory was well known amongst the members of the fire service and other people in Coventry.

This, of course, raises the question as to how many other of these factories there are where similar fires may occur. The Nash-Kelvinator factory at Crewe, the whole of which went up in flames, was a similar type of building. That fire occurred in September, 1956. After the Crewe factory burnt, surely somebody should have seen that similar factories throughout the country represented a potential fire hazard, including the Jaguar factory, and should have done something about it.

With regard to the attitude of Jaguar's Safety Officer and the Coventry factory inspectorate, I have no information.

Under the Fire Services Act, 1947, the responsibility for maintaining an efficient fire service is placed upon the councils of the counties and the county boroughs. The Act requires the fire service administered by local authorities to give advice on fire prevention matters, if called upon to do so, and, even when advice is given, it is only advice and not mandatory. There is a body of opinion in the country which thinks that it should be compulsory for architects and others concerned with the designing of buildings to consult the fire service of the area in which the building is to be erected, and to be compelled to act on the advice which would then be tendered by the fire service officers.

Whether or not this is a desirable thing is not for me to say, but one could well imagine that if the Jaguar fire and other similar fires which have occurred had resulted in loss of life, something of the sort might have been insisted on by Parliament—much in the same way that Parliament has now insisted on the conservation of fuel through the Thermal Insulation (Industrial Buildings) Act with its safety from fire clause. Any legislation making compulsory the obtaining of advice from fire services and the acting upon that advice would be designed to conserve life as well as property.

In the meantime, the chief fire officers of the various fire services throughout the country welcome approaches from architects and others as to measures for fire prevention which can be incorporated in their plans at the drawing board stage. Many architects do consult their chief fire officers and surely it is up to the rest of the profession to take advantage of the excellent advice which can be given by the chief fire officers. Neglect of this consultation by the architect may lead to serious loss of life—a matter which may well be on his conscience throughout the rest of his life.

G. A. BENDELL.

Middlesex.

We Deny It !

SIR,—While we do not envy Mr. Kennedy his difficult task of summarising six lengthy papers dealing with metal corrosion (August 1), we would like to deny one or two statements which he would appear to have attributed to us.

It is certainly not necessary to paint "all fully heat-treated alloys" used in building work, and only in the case of the aluminium-copper alloys sometimes used for accessories is this advisable. The fully heat-treated alloys of the H9 and H10 type have all been successfully used in structural applications

and do not generally require any paint treatment except when in direct contact with certain other metals.

Mr. Kennedy states that "steelwork in contact with aluminium (sheeting fixed to mild steel purlins for example) should be sprayed with aluminium and not zinc . . ." While this treatment may be a worthwhile economy in the long run, it is not always necessary. The recommendation normally made is that steel purlins or sheeting rails should be provided with an adequate paint coating. The "galvanizing, cadmium plating, or nickel-chrome plating" to which Mr. Kennedy refers are alternatives to sprayed zinc for application to steel or copper alloys in contact with aluminium under corrosive conditions.

Mr. Kennedy's remarks relating to finishing paints on aluminium are presumably based on the recommendations of bituminous coating for aluminium in contact with concrete or cement work, while neoprene base coatings were in fact the only type giving good protection to steelwork at the severe marine site mentioned in our paper. There are, in fact, no particular requirements in the choice of finishes for aluminium alloys which would not apply to other metals (assuming that lead pigments would not be used in a finishing coat).

The summary also contains the statement "Details of good design include . . . avoidance of exposed horizontal surfaces." This presumably is based upon recommendations regarding adequate fall on roof surfaces, which, of course, apply equally to all forms of metal roof. It is obviously neither possible nor necessary to avoid horizontal surfaces in all applications of aluminium in building construction.

E. H. LAITHWAITE.
E. W. SKERREY.

London.

It's Not What You Think

SIR,—A recent letter from a correspondent in Vancouver (June 13) interested British architects in Adelaide, S.A. The two cities have much in common.

Many of the architects here have genuine grievances arising from distorted or incomplete information about working conditions and prospects, living costs, housing, etc., supplied by official emigrationists. To those who wish to return to Great Britain the cost of transport and ultimate re-settlement is an almost insurmountable barrier.

I believe the JOURNAL would perform a very great service if it maintained a corps of active correspondents in all probable centres of migration and frequently publicized the fact.

"POMMIE."

Australia.

Another Satisfied Reader

SIR,—As a regular reader of the JOURNAL, I would like to express my appreciation of the "Information" and "Working Detail" sheets which appear regularly, and which, I feel, many readers accept as a matter of course. The high standard of presentation of these sheets, together with the inclusion of the many "continental" Working Details are refreshing and interesting, and of great reference value.

May this service continue for many a long time to come.

E. J. WILSON.

Nottingham.

MOHLG

Annual Report, 1956

A Correspondent writes:

The MOHLG's annual report for 1956 (Cmd. 193, HMSO) is a useful document, in that it gives the official synopsis of developments. But it is as notable for what it leaves out as for what it says. Let us be fair. It is one thing to criticize the Government; quite another thing to criticize the able and conscientious officers who have to implement the Minister's policy, and who have to work in next-to-impossible conditions in a machine which to some of us seems better designed to prevent things being done than to initiate positive action.

The Report falls into sections dealing with Housing, Local Government, Planning and Welsh affairs. The most interesting section is that on Planning, and the most interesting part thereof is the special discussion of the London problem.

The housing section may be briefly dealt with. The shape and form of the Government's housing policy is well known. In the light of the growing proportion of housing being provided by private builders, one would have liked to see some mention of the urgent need to improve the standard of private house building. There is not only the matter of design which is causing so much searching of heart, but also the question of standards of building. One would like to see some vigorous Government action directed to ensure that purchasers of houses are not fobbed off with shoddy building such as no local authority clerk of works would tolerate. Voluntary efforts in this direction do not seem to be having much effect. As for design, I do not think we shall ever achieve any noticeable improvement until the speculative builder is very largely replaced by group organizations working on a large scale, such as those in Holland or Sweden. This would involve a radical alteration in the whole conception of the function of the Building Society and an amendment of Building Society law. All this is enormously important to those of us who detest the spattering of the face of England by shoddily - built and shoddily - designed houses. It is a pity that there is no reference to the issue in the Ministry's report.

As for the Local Government Section of the Report, the year 1956 was dominated by the publication in July of the White Paper on the Local Government re-organization followed by the subsequent papers on functions and finance. Here again, one has the uneasy feeling that the problem is being tinkered with. Much useful work was done by the late Local Government Boundary Commission, by no means all of which is out of date. Therefore, it seems rather unnecessary to appoint more commissions of investigation. Planning administration in Greater London was dealt with by a Departmental Committee years ago; hardly anything has been done to implement its recommendations. "O'er forms of Government let fools contest, whate'er is best administered is best." One hopes that the eventual organizations for the conurbations will include not only the existing built-up areas, but also those round about which are required for the reception of overspill.

The Planning Section of the Report refers to the limited progress that has been made in respect of the movement of overspill. The Town Development Act of 1952 has not been effective. There are lamentably few areas where development assisted by this Act is actually taking place, such as Swindon and Bletchley, but many more schemes have fallen by the wayside. Surely there is need for further legislation to repair the deficiencies of the 1952 Act. Of this there is no hint in the Ministry's Report.

The Ministry's Green Belt policy does seem to be working quite well. It would be interesting to have figures of the number of appeals dismissed in green belt areas. This was an excellent initiative of the late Minister, Mr. Duncan Sandys; none the less, it is only part of a complete policy for land-use planning. It is no use constricting the urban sprawl unless one is prepared to indicate alternative areas for development. This issue cannot be evaded, but this did happen, for example, in the case of Manchester. As is generally known, the New Town at Congleton was ready for designation when the present Conservative Government took office. One suspects that its abandonment was far more a political than a technical matter yet Manchester was offered no alternative, and it has involved 12 years of correspondence, agitation, and much waste of time on the part of highly skilled man-power before the Government has at last been driven to the conclusion that Manchester must have at least one satellite town. This necessity has been accepted, equally belatedly, in the case of Glasgow, but there are other conurbations whose plight is no less serious. Why should it have taken so long for facts obvious locally, to penetrate to Central Government?

Of course the Mark II New Towns will eventually materialize, even if under different administrative arrangements from those used for the first echelon. It remains to be seen whether this will provide the stimulus and the opportunity for experiment in urban design, going beyond the limits laid down by the Reith Committee.

The Report draws attention to the rise in the number of appeals from 6,553 in 1955 to 6,699 in 1956. These range in scope from minutiae to the Barbican scheme. One of the disturbing features has been the extent to which the Minister has recently been prepared to dismiss appeals relating to buildings of advanced design. Clearly, good architecture involves good neighbourliness. Nevertheless, there are powerful forces of inertia and conservatism ensuring that most new buildings will be stereotyped. Surely the Minister should do nothing to discourage the more enlightened minority by upholding the objections of backward authorities and outraged neighbours. If the present policy of the Ministry were consistently applied, Coventry Cathedral would not be built in its present form.

The special section on Planning in Greater London is a straightforward factual account. It draws attention to the enormous problem posed by the inordinate growth of office accommodation since the ending of building licensing. The LCC has taken certain measures to limit this growth by altering plot ratios, but the problem is beyond the power of the LCC to handle. It was becoming apparent years ago and the

Minister could, if he had been so inclined, have called in all cases of proposed office accommodation in London. He could have refused permission and he has not done. If compensation be the stumbling block, it may be recalled that when the financial logic of the 1947 Town and Country Planning Act was destroyed by the Act of 1954, the Minister stated that good planning would not be prejudiced by financial considerations. This is manifestly not working out. Any Government worthy of the name could pass a short Act ruthlessly stopping all further office development in London until such time as a rational scheme is worked out. In the absence of the will to take any such step, one can hardly blame either the Ministry or the LCC for the resulting chaos. No reference is made in the Report to the various suggestions for a levy on commercial development in London, a proposal which demands serious consideration. The proceeds could be put into a fund for financing the Victoria line tube and the urban motorways. Since they are a London matter, they should not be financed from national funds. The capital ought to bear the cost of its own congestion. Developers unwilling to pay such a contribution could be firmly told that they could build their office blocks anywhere they liked, but at least 50 miles away. In any case, it is idle to expect private enterprise to de-centralize, if the Government itself is not prepared to give a lead. There are still all sorts of routine functions of Government carried on in and around London which could well be transferred to the provinces.

The whole story is a sad one of failure to implement the clear-cut recommendations of the Barlow Report which is still the official national policy.

It is the task of the Civil Service to administer the Acts. It is easy to criticize from outside; if existing legislation does not permit the Ministry to take sufficiently vigorous action in the face of problems which are so generally recognized, then fresh legislation is necessary.

TPI

Summer School at Oxford

For those reared in the depression of the 30's, writes John Craig, the best way to get a quick University appraisal is to attend the Annual Town Planning Institute Summer Schools. Cambridge one year, then Northampton, Oxford this time, next year Bangor; who could wish to be more eclectic?

Behaviour pattern is much the same at each school. One arrives, is registered, given a round lapel badge with name and source, then allotted quarters. These may vary from genuine Tudor to modern Gothic sandstone according to the university. This year many of us were fortunate to stay at Christ Church, with quarters overlooking the Meadows.

The opening address by the Very Rev. John Lowe, Dean of Christchurch, was about Oxford, somewhat naturally because of THAT ROAD. The Dean's address was a rather unleavened business after the manner of a serious adult student planner; somewhat partisan. Some felt disappointed, for these opening addresses normally have a more literary and philosophical approach. However, whatever the arguments about the new road system, two facts about Oxford stand out. First, the hideous volume and noise of traffic for long hours through the centre of the town; second, the planning and architectural abortion of the waste land between the railway station and the colleges (a Nairntopic of sinister import in relation to visitors arriving by train).

The main school began next morning in the examination halls where the papers were read and discussed. The lectures were good and one's attention did not wander overduly to the lugubrious examination halls' interior with its two unusually hideous clocks. Several remarked that the past examination anguish of thousands hung glumly in the air.

S. L. G. Beaufoy's paper, "Modern Industrial Development and Land Planning," broadly conceived, collated factors on progress and location of major power and production industries. Full of significant facts such as the one that since 1949 nearly 400 gasworks have been closed, the paper pointed to the way of a possible large-scale amenity clean-up by concentration. Major developments now taking place in nuclear energy, petroleum, steel and chemical developments are a big challenge to planners. No longer can we conceive land planning by reference to past wrongs. Brave New World is not ahead, it is here and we are in it. This time we must not fail.

Mr. Sheppard Fidler dealt with "Slum Clearance and Redevelopment from the Design and Economic Point of View." Though interesting and admirably illustrated, it told us nothing very new about the technique of comprehensive area development. In the subsequent discussion, however, some of the present social issues so vital to planners, density, garage provision, space between buildings, proportion of flats to houses, were left unresolved.

The paper on "Planning Problems of Rural Areas," by Geoffrey Clark, was read for him in his absence through illness. The lecture was of general interest, containing as it did a succinct history of rural England over the last hundred years. Only when he came to the impact of science on the rural structure, particularly of Dorset, did Mr. Clark appear to falter a little. Mr. Clark, however, thought it would be wrong of planning to resist developments at Milford Haven. He said "provided the development is not allowed to spread its tentacles into that glorious, curious, sea-swept, beloved area, probably no harm will come."

Following Mr. Beaufoy's survey of present events, Mr. Clark's plea was for planners to ensure that rural beauty remained. One can only agree with his horror at a tendency (which he feels is arising) to consider the countryside only as Open Spaces, Green Belts or Designated Areas. He is right; many current phases are in enmity with humanism; administrative spears against beauty.

A. J. White spoke on the "Future Developments of Transport in the United Kingdom." Mr. White concentrated on two main issues, the non-competitive nature of the freight charges side of British Railways and the competition of the motor car. As common carrier the railways have hitherto had to take any goods fit to be carried at uniform mileage rates, but, the speaker claimed, the road hauliers are ready to carry selected traffic at bargain prices. Given true competition, Mr. White thinks the railways will come into their own once more on their merits.

Several times Mr. White lit the blue touch-paper and stood well back. His most controversial suggestion was for new toll roads. This got the discussion groups well steamed up, and, as the bedevilling issue of the road fund crept in, emotion tended to obscure the issue. There is something to be said for the idea, but only if the income is used to pay off the initial capital losses.

It was a most interesting week. One great value of these schools is to help us to look into the other man's garden. The grass is not always greener. It is humbling for an urban planner struggling with problems of over-population to discuss with a planner from North Wales the worries of de-population.

LCC

The New Policy for Floor Space Limitation

A recognition of the urgency for measures against congestion is the basis of the LCC's new policy of floor space limitation in the Central Area. The proposals, which have now been approved in Council and explained in this booklet, were outlined in the JOURNAL of July 25, 1957. The efforts of the LCC to set out in a simple and attractive way both the problem and their proposals, are entirely commendable, writes a correspondent. Publicity of this kind will do much to gain the support of architects and intending developers.

It is certainly right to view the problem of congestion in central areas in terms of traffic generation. The new policy is an extension of the idea that control of floor space per acre is an effective tool for limiting traffic generation, in that the load on the traffic system can be spread over as wide an area as may prove necessary. But at the same time this new policy departs from orthodox use-zoning technique.

The problem to be dealt with is, briefly, that new office space already built, or pending, will result in a further large increase in the present office population of Central London. At the same time, for one reason or another, the residential population of this area has continued to fall. In addition, and partly in consequence, over one million people now travel daily to work into the centre of London. Evidently the point has been reached when there are too many jobs over too small and too specialized an area for the roads and transport system to cope. There is also thought to be a danger that existing trends will bring about a change in the character of the West End.

These problems are dealt with in two ways which are expected to limit the amount of office employment and encourage an increase of the residential population. The former rests on the general assumption (which has never apparently received a rigorous examination) that the number of people employed in offices and similar buildings is directly proportional to the total floor area in use. A limitation of floor space will, it is assumed, limit employment in the area. Secondly, it is assumed that the lost residential population can be induced to return to the central area by the provision of a floor space "bonus," which may attract intending developers.

On the basis of these assumptions, which are not expressly stated as such in the booklet, the new policy continues with the operation of a control of density by plot ratio zoning, but in a form somewhat different from the system adopted by the LCC in 1948. The new plot ratio zoning scheme leaves unchanged the density of much of the central area—those parts previously zoned at PR $5\frac{1}{2}:1$ and $5:1$, as well as many of the main shopping streets. But there is to be a reduction of the maximum plot ratios for office and commercial buildings in some areas. Furthermore, some of these areas are now zoned as suitable for residential development, up to a (residential) PR $1\frac{1}{2}:1$, over and above that permitted for office purposes. If use is made of this "bonus," resulting plot ratios may be as high as were permitted previously, but the development would be mixed. The idea of mixed development is in effect a qualitative approach to the problem of congestion. It is intended to reduce the number of journeys to work by a form of use-zoning. This is the most original feature of the proposals.

The idea of use-zoning is based on the fact that the requirements of certain buildings, such as offices and flats, can best be

met if separate areas are set aside for each main use. Although the proposals will present unusual and interesting architectural opportunties (the models shown in the booklet make this clear), there will be some difficult problems to be faced. For example, how far will it be possible to develop flats and offices together on confined sites while giving each type of user reasonable conditions of quiet, daylight and space for access or parking? The difficulties which will arise may be imagined if it is realized that, in addition to an office block at fairly high density (at least by standards of provincial cities), there may, on the same site, be further residential accommodation at PR 1½:1—representing, say, 180-360 rooms per net acre, the figure depending on the standards adopted for floor area per room.

Will the policy and proposals achieve the desired results? This seems impossible to determine with any certainty, although it must be said that the arguments presented and the underlying assumptions are not entirely convincing. So much depends on whether the pressure being exerted for more office space in the central area can be deflected. This may depend less on the real facts of the case and more on the view held by intending users on the advantages of being centrally located. It seems possible that the projected reduction of office floor space will result ultimately in a lowering of standards of floor area per worker. To the extent that this takes place, the expected fall in employment would not be realized.

Again, the extent to which residential population can be enticed back into London's central area seems to be problematical. What is the cause of the decline in their numbers—cost of buildings and rents, the condition of the environment, congestion, or the attraction of other outer residential areas? The policy and proposals do not seem to take account of the forces drawing people away. It would be surprising if the trend could be reversed merely by now permitting residential buildings in certain office zones. Is the "bonus" offered really considered to be sufficiently attractive to reverse the trend?

Even if we suppose that the policy will be effective in reducing office employment and in increasing the residential population in the way hoped for, will it result in a significant reduction of the journey to work and congestion? This cannot be assessed since information is not given to indicate the possible scale of the expected changes. In fact, congestion in the West End may in some ways be increased if the policy of mixed development is successful. For example, new traffic will be generated by the servicing of the residential population and by their social life—there may be even some journeys to school. Potential traffic generation is very great, at high densities, with or without mixed development. No attempt seems yet to have been made to relate, in a systematic study of the facts, the capacity of the streets, traffic generation, and floor space of various kinds. Until this has been done plot ratio maxima will remain largely empirical, with their effect at best somewhat unpredictable.

A weakness of the policy is that it is largely negative, emphasis being on resisting the forces making for more office space in the central area. Admittedly the proposals are intended to complement the endeavours being made to encourage development in the suburbs and in the new and expanded towns. Meanwhile methods of drawing attention to the advantages of decentralization are being studied by the LCC and others. Although it is the intention to restrain office development, the importance of London precludes an embargo on further office development. A policy is being sought at the LCC which would allow the continued development of the headquarters of firms while limiting space available for routine clerical functions that could be carried on elsewhere. In spite of its many attractions, this idea could result in a further and lamentable specialization of areas and further segregation of the classes. The large peripheral estates would become increasingly "clerical" for those with work nearby, while the central area would contain expensive dwellings for directors, managers and the like, with their work areas also nearby.

Would not a policy of sub-centralization in the *inner* suburbs be more hopeful? Certain types of users could be regrouped in places round, but close to, central London. Such areas, which might well be designed as comprehensive units, could have an identity and character of their own, as the City of London has on a larger scale. At the same time, the central area could gradually be thinned out without loss of its real advantages of character. Congestion problems would be greatly eased by the creation of more widely spaced sub-centres. Of course, there would be administrative difficulties, but surely not insuperable ones, in such a plan. There are places of relatively low land value and with good transport facilities—possibly such as the Camden Town-Kentish Town area—which might be suitable and whose future redevelopment prospects now seem so uncertan. In any case, it does not seem that the present policy of relatively mild incentives and deterrents, is a sufficiently bold approach to achieve in good time what is really wanted—a complete reorganization of the central area.

ILA

Conference on Landscaping of Industry

Now that wasted land and industrial mess have become more than just a significant feature of our national economy, writes W. Gillespie, remedial action is necessary, and it was the Institute of Landscape Architects who set the ball rolling at their conference on the "Landscape of Industry" held recently at the University of Durham at Newcastle-upon-Tyne.

About a hundred delegates—representing industry, local planning authorities, agriculture, forestry and other associated professional and technical groups—were reminded of the great warts of waste heaps towering out of a once beautiful countryside, of the vast tracts of derelict land lying useless and ugly at a time when land is most at a premium, of factory yards bulging with trash shoved there for cheapness and easiness in the past. All this is the most spectacular side of industrial mess and was to occupy the main attention of the delegates.

D. E. Baird (deputy chairman of the Durham Division of the National Coal Board), in a paper delivered during the first general session, gave an appreciation of the extent of the coal board's problem by quoting figures for disposal of surplus spoil in the Northumberland and Durham coalfield. For the 39 million tons of coal, brought to the surface annually in this area, 10 million tons of dirt and 2½ million tons of pure (but useless) stone have to be disposed of—12½ million tons of waste per year, averaging 50,000 tons, or enough to cover an acre of ground to a height of 30 ft., per day. These are formidable figures. There were, he said, three methods of disposal used—stowing underground, shipping out to sea, and surface disposal. The intensive mechanization and dirtier, thinner seams of today do not lend themselves to disposal underground and the expense of this method is some five to six times that of surface disposal. Although dumping in the sea is some three to four times as expensive some 1½ million tons are disposed of in this way each year. The 1s. to 2s. per ton cost of surface disposal is, therefore, obviously attractive from the financial point of view but must be set against the unsightliness of the heaps and the cost in terms of agricultural land.

Mr. Baird's appeal to the landscape and engineering professions to look into the possibilities of increasing the size of our island at selected points along the coast and, in particular the reclamation of the Wash, was received with interest, but while the conference was prepared to welcome this positive attitude many delegates were looking a little closer to the bone. J. Herbert (Southampton), for instance, pointed out that spoil disposal was not just an engineering problem—the NCB must make a stronger attempt to see the visual effect of their development and the board might eliminate much of the long-drawn-out process of negotiations with the planning authorities if they were to accept the rôle the landscape architect could play on their staff. This plea to industry not to rely on the staffs of the local planning authorities in these matters was also made by Mr. Ross (Northumberland County Planning Officer) who urged those concerned to turn the nuisance of waste into an advantage by making a fuller use of our technical and professional knowledge.

The evaluation of costs of tipping in certain ways against the value to the community and loss of agricultural land was put forward as a necessity by I. C. Laurie (Durham County Planning Department) and, although Mr. Baird assured the conference that this would be a most difficult thing to do, one got the feeling that most of the delegates felt that such an evaluation would be necessary before any action "on the grand scale" could seriously be taken. It is imperative that a start on the greater problems of waste disposal must be made, and made soon, and with so many interests at stake it would seem that the only way of tackling the matter satisfactorily is for the Government to set up a Commission of Enquiry to look into the whole question and settle the responsibility for carrying out its recommendations.

There exists, too, the legacy of thoughtlessness from the past in the form of land already tipped and laid derelict and great strides have been made in reclamation of such areas since the several improvement societies of the 1930s first made their small but valuable contribution. In discussing the extent of this type of waste land A. Bates (County Planning Officer, West Riding County Council) pointed out the difficulty of assessing waste tipping statistically when there is no yardstick to measure its impact upon the landscape. The figures he quoted, however, from the MOHLG Memorandum No. 7 (Derelict Land and its Reclamation) give an indication of what this amounts to—4,134 spoil heaps covering an area of 51,035 acres is the estimate for England and Wales alone—and these figures do not include other types of derelict land the amount of which is, in itself, staggering. It was, indeed, heartening to see the work that has already been carried out.

C. R. H. Howard (Lancs County Planning Department) assured the conference that successful landscaping could be achieved simply and cheaply, and he illustrated this with examples of work carried out in Lancashire which have cost as little as £30 an acre. "There must, however, be a genuine desire by those responsible, to improve the country for the country's sake and this is most naturally directed towards those areas that have been robbed of their natural features in the past." In another section of his paper Mr. Howard told of the good response the Lancashire planning authority was getting to its policy of planning control as an agent in land reclamation, and interesting examples were given of co-operation by the several extractive industries, including the NCB.

There is now no doubt whatsoever that colliery and some other wastes can be brought to bear a grass or tree crop quickly and cheaply and the experience of those progressive bodies who have pioneered this work in this country, together with the results of research now going on in the universities, are a challenge to every local authority in the kingdom.

A paper prepared and read by A. Blenkinsop (soil chemist, Min. of Agric.), discussed some of the aspects of the problems of the restoration of open cast coal sites and it seems that the Ministry of Agriculture, who have a big part to play in this work, have solved many of the problems concerned in the restoration to good quality agricultural land. Indeed, in many cases the soil has been found to grow better crops after restoration than before the extraction of coal began. They are still faced with drainage problems, however, and waterlogging of sites is a matter of some concern. One wonders whether these sites would not benefit from a covering of shale, brought up as waste from the underground workings, before the top soil is replaced—if this were done some interesting contouring could be effected and there might be great possibilities of improving the landscape as well as the land.

Papers read by R. E. Newell (managing director, Wilton Works of I.C.I. Ltd.) and W. R. Garret (Northern Gas Board) showed that industry is beginning to think upon these lines but one was left with the feeling that they will only appreciate the problem when it falls in line with their own requirements and there is much room for improvement in their approach. It might be mentioned here that the delegates were given the opportunitity of seeing the site of Messrs. Rowntrees' new works at Fawdon where the landscape architect was called in at the very early stages of the development. That this had been to great advantage was, I think, evident to all present.

A. E. Neales (Messrs. Cadbury Bros. Ltd.) gave an interesting talk on planning and maintenance of factory gardens in which he pointed out how a pleasant environment for working was not only of morale value to the workpeople, but also good advertisement value for the firm concerned and, in the wider sense, a good attraction to other industries to come to the area. In helping to foster this point of view both by propaganda and by practical efforts the North Eastern Trading Estates Ltd. under the chairmanship of S. A. Sadler Forster have been a powerful influence in the north east and delegates were taken round the latest of the 34 trading estates now in operation in this area.

The second and shorter session of the conference dealt with the problems of afforestation and agricultural landscapes. In his opening address the chairman, Lord Bolton, traced the main differences between private foresty and the larger scale planting carried out by the Forestry Commission. The Forestry Commission, he said, must plant up new land, while competing as little as possible with the farmers' interest—such land is of poor quality both of soil and site and the choice of trees is restricted. The private woodland owner was much more fortunate, he had to deal with established uneven-aged woodlands which were possibly the last outposts of that vast primeval forest which covered the country years ago and, where he introduced new planting, his choice of species was a wide one. In both fields, however, it was his (Lord Bolton's) experience that woodland managed for profit on sound economic and sylvicultural lines was almost automatically beautiful in that, by the methods of modern forestry practice, planting was almost always of mixed species. There is, therefore, no excuse for failing to produce beauty or to damage it by the planting of trees in whatever number.

P. F. Garthwaite (Forestry Commission) stated that the main object of the Forestry Commission now that the required acreage of forest was nearly achieved was to translate this planting to a "normal" forest producing a steady supply of timber. The present problem, he said, was the background of unbalance of the country's timber stock. On the question of siting major afforestation he referred the delegates to a report of the Natural Resources Committee called "Forestry, Agriculture, and Marginal Land" (HMSO, 5s.), which he said was a most valuable guide to the whole question of this type of land use.

Mr. Garthwaite described the present condition of the Forestry Commission's plantations as the "ugly duckling" stage. It has been necessary to plant pioneer softwood species in order to build up a forest soil. Now, however, is the time for the real skill of the forester to come in—the time for a management towards normality in order that they might begin to create a variety of structure, age and species in their forests for the purposes of protection, variety of out-turn, for economic reasons and to prevent wind blow and diseases. Here the forester's aims are similar to those of the landscape architect (although for different reasons) and in 20 years time we may see the coniferous blankets of the pioneer trees replaced by hardwoods such as beech in practically all our moorland forests. We will, he said, never go back to the ugly duckling stage. Delegates were glad to hear this and impressed by a visit to Kielder and the Border Forest Park, but one still got the feeling that this state of affairs was only so because it suited the cause and that there is room for more co-operation between the various interests concerned.

The questions of restoration of small woodlands and tree groups was covered in a paper by J. F. Durr (Lambton) who issued a stern warning to all concerned with trees to look not only at their beauty but also at their age. Most of our existing countryside trees were planted in the eighteenth and nineteenth centuries and are now, in the main, at a very advanced stage of maturity. This is a most serious matter and no amount of preservation for preservation's sake will help. "The urgency of this problem must not be underestimated," he said. "Britain cannot afford to neglect her small woodlands and the legacy of desolution from the last world war calls for drastic and immediate action. Here, then, is yet another example of dereliction.

J. W. R. Adams (Kent County Planning Officer) had been invited to speak from the agricultural point of view and he made the point that we must all recognize the inevitable changes which are going on in agriculture. Here again thoughtless preservation will achieve nothing and his council's policy is only to prevent unnecessary or unintelligent changes. Agriculture has become a major industry, especially in his own county, and he can see no reason why agriculture as an industry should not accept greater control over, for instance, siting and design of farm buildings (sausage factories!). Agricultural land has been defended tooth and nail and it is time for it to be prepared to come to terms with the planning authorities and the landscape profession over such matters as the interference with farm economy to remove electricity lines, build trunk roads, etc. The interrelation of all land uses and structures affecting the agricultural landscape are becoming so frightening that Mr. Adams feared the effect this might have on the local planning committees—they do a fine job at the moment but are faced with increasing difficulties. He felt that it was time for the Ministry of Agriculture to appreciate what "might" happen, as well as what "is" happening to land.

Two tips at Eppleton, Hetton, showing different approaches to restoration. The National Coal Board hope to acquire the 200 ft. tip (shown top) for tree planting, if only on the exposed parts. The alternative method of restoration is to replace top soil, stripped from the site before tipping commences, immediately behind the tip face. The soil is then seeded to provide the glass slopes shown on the left. Tipping is in progress on the right.

Following recent articles on architectural education, Alan Tate, an architect who was formerly training supervisor to Bovis (Holdings) Ltd., has written on the important but, to architects, little known subject of education for the building industry. In the first article he describes the arrangements for technical education, the role of the employers, and the various courses available—full-time, part-time, sandwich and correspondence. A second article will appear next week.

TRAINING FOR MANAGEMENT

EDUCATION FOR BUILDERS

by Alan Tate

Technical courses in building are available by night classes, day release classes, sandwich courses, full-time courses, and correspondence courses. The entrance qualifications are more flexible than those required for architecture, and the Institute of Builders, which corresponds roughly to the RIBA, does not exercise anything like the same degree of direction and control as the latter, largely because of the enormously diverse organization of building companies. The Institute of Builders recently inaugurated a Registration and Exemption Scheme based on recognition by the Institute of specific study courses in technical colleges. Students of acceptable general educational standard enrolled in these courses may register, first as student members, and subsequently as probationer members of the Institute. Registered students completing one of the 74 courses now recognized are offered a modified Licentiate Diploma Examination. Whatever theoretical studies are pursued, training of a practical nature is essential in Building Management and is undertaken within the resources of building and civil engineering companies. The type of practical training given varies enormously but usually includes the chance of working in a number of different departments and on the site. Most young men taking courses in Building Management are paid during training, are indentured to their employers and secure deferment so as to qualify before doing National Service. The majority of building students (80 per cent.) attend part-time courses where emphasis is necessarily laid on the acquisition of essential facts with little time for fundamental thought and for the consideration, interpretation and evaluation of facts that may emerge. The lack of opportunity in part-time courses for fundamental thinking and intellectual development constitutes a recognized gap which the industry and the technical colleges are trying to fill by more full-time attendance "post-graduate" study at week-end schools and so on.

Unlike architects, who usually have to satisfy only the RIBA as to their competence (by passing recognized school examinations), builders often have four separate hurdles to surmount. The first is the Ordinary National Certificate in Building, taken after three years' training; the second is the Higher National Certificate, taken after a further two years; the third is the Licentiate Diploma examination of the Institute of Builders; and the fourth the Associate Diploma of the IOB, taken normally two years after the LIOB. A building student can therefore be regarded as being in approximately the same position as an architectural student at an unrecognized school. He takes his school course and final exam (submitted to the Ministry of Education for his National Certificate) and subsequently (subject to the IOB "exemptions" referred to) takes his Institute of Builders Diploma examinations "externally." Not all building students proceed to AOIB standard of course and those who take full-time educational courses do not require to take ONC but proceed to the Higher National Diploma Examination (equivalent to HNC) in a total of three or four years' study. The essential point of difference between the student builder and the student architect is the close ties of the former to his employer and of the latter to his school. The general educational standard of student builders varies considerably, but most large firms with organized training schemes require trainees

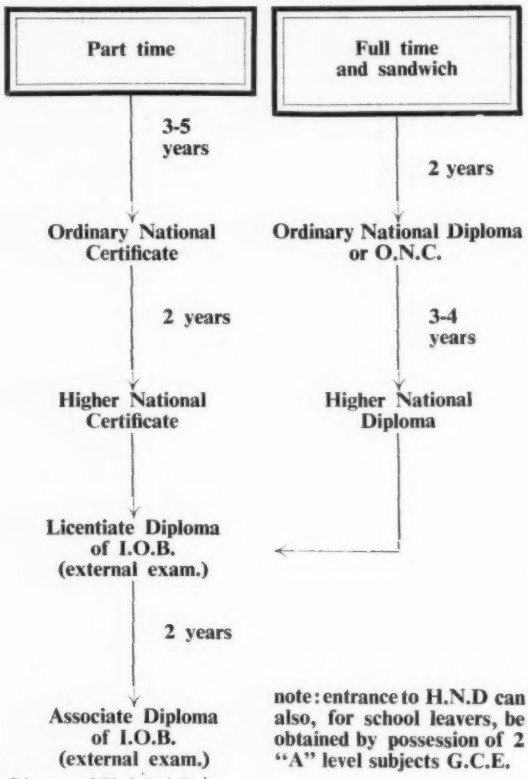


Diagram of Technical Courses.

to hold about three GCE subjects at ordinary level. In the case of these larger firms the starting point in a trainee's career is an interview at which he is offered employment and training. The basis of this is formalized in a Deed of Apprenticeship (Management) in which he agrees to take a recognized course of training, to stay with his employer for four to five years, and to conduct himself "as an honest and faithful apprentice ought to do." In practice, most boys attend day-release or evening classes but this is by no means universal.

Some companies, including very large ones with well-organized training courses, move students about the country either for wider experience or for reasons of business expediency, and the young men in these cases must study either by a series of technical college courses or by correspondence. Since building is a flexible and highly mobile industry, such moves are very likely to occur and many master builders would not regard the sacrifice of continuity in technical education as too great a price to pay for the right experience in the industry at some place far from head office.

This emphasis on the practical, on the immediately useful and on the direct relationship between learning and doing is universal in building education, and is conditioned by the fact that the students are already part of the industry learning to do their jobs better so as to justify better jobs.

The employer's position

The importance of the employer in building education may be illustrated by the relationship between the IOB and the NFBTE on the Board of Building Education. There was in building education no counterpart of the Board of Architectural Education until August, 1955, when the Board of Building Education was set up by the IOB. It consists of 18 members: 10 are appointed by the Institute of Builders and eight by the National Federation of Building Trades Employers. The RIBA, the Committee of Vice-Chancellors of Universities, Technical Teachers' Organizations (Principals and Teachers), the NFBTO, The Scottish Education Department, The Scottish National Building Trades Federation (Employers), and the Ministries of Education and Works have nominated representatives for co-option and the independent Chairman is Sir E. Graham Savage, C.B. This body is at present preparing a survey of the educational system in Great Britain, with particular reference to technical and especially building education.

The LMBA (the London region of the NFBTE) launched in late 1955 a "Pupilship" scheme for young men taking a sandwich course of training—a "Studentship" scheme for young men taking the day-release or night class type of training having been in existence for some years (see AJ for November 24, 1955). The LMBA maintains a register of companies and a list of indentured pupils who participate in its scheme. Managerial training schemes are now established in three regions of the NFBTE and are partly established or under consideration in the other regions.

In general, the student builder—for all the imperfections of present schemes—is well looked after and building employers are at least as progressive as employers in other fields in sponsoring new forms of training. It is worth noting that in 1952 the NFBTE submitted a memorandum to the Joint Committee on Architectural Education pointing out that experience on building sites and a general appreciation of the technique of building crafts would be of great value to the young architect.

Courses available in building

The courses available in building management generally lead to the Higher National Certificate, or Diploma, and/or to the Licentiate Diploma of the IOB but it should be made clear that the term "building management" is used loosely in the industry. The courses available are designed primarily to give the general and technical educational "base" which together with appropriate practical experience will enable selected personnel to advance to managerial positions. Apart from a one-week course conducted for the industry by a firm of management consultants and some experimental courses for improving grades, no recognized course within the industry of the "executive development" type exists.

Courses may be part-time, correspondence, full-time, or sandwich, and the main function of each is as follows:

Part-time courses

Training by part-time attendance at technical college might be said to be the "typical" method of training. Courses are organized on a "night class" or "day release" basis. The former method involving attendance on about three nights a week and the latter on

Sample Examination Papers

ORDINARY NATIONAL CERTIFICATE EXAMINATION

Two questions from a *Building Science* examination for evening students set in 1957.

1. Distinguish between conduction, convection and radiation of heat. Describe how these methods of transmission of heat are concerned in heat losses from buildings.

Give an account of the methods employed for the thermal insulation of buildings and the various types of insulators.

2. How would you produce a sample of lime in the laboratory? Describe the chief properties of lime, especially those which make it of use in building.

Calculate the weight of water needed to slake 1 cwt. of quicklime.

$$\underset{\text{quicklime}}{CaO} + \underset{\text{water}}{H_2O} = \underset{\text{slaked lime}}{Ca(OH)_2}$$

Atomic weights of Ca, O and H are 40, 16 and 1, respectively.

Two questions from a *Building Construction* examination for part-time day students, set in 1957.

1. A chimney stack 1 ft. 6 in. × 2 ft. 7½ in. on plan passes through the side of a 45 deg. pitched roof. Draw two elevations showing the timber trimming, plain tile covering and the necessary weatherings around the stack. Scale 1½ in. = 1 ft.

2. Draw sections to show two forms each of eaves and ridge to a roof of 45 deg. pitch covered with plain tiles. Timbering and covering to be shown in each case. Scale 1½ in. = 1 ft.

HIGHER NATIONAL CERTIFICATE EXAMINATION

A question each from an examination in *Builders' Quantities* and in *Building Regulations*, for evening students.

1. "Take off" the drainage example complete, measuring the drains up to the boundary of the site and include a p.c. sum for the Local Authorities connection to the sewer.

Brief Specification

Ground level at Manhole 1 is 100.00, at Manhole 2 is 103.00 and at boundary is 103.50.

Manholes: Both manholes 1 and 2 to be 1 ft. 6 in. × 2 ft. 0 in. internally to the invert depths shown with 9-in. walls in stock bricks in cement mortar (1:3). 6-in. concrete base projecting 6 in. with 4-in. concrete cover slab perforated for 24-in. × 18-in. cast iron medium duty manhole cover and frames. The 4-in. drains and the fittings are to be salt glazed stoneware "standard" quality jointed in cement and sand (1:2) on 4-in. concrete beds haunched up. Give your own specification for items not mentioned here.

2. (*a*) Define for the purpose of complying with the standards of fire protection set forth in the Constructional Bylaws "element of construction."

(*b*) What are the main items to be considered in arriving at the fire-resistance of the elements of construction of a building?

(*c*) In a building used partly for trade and partly for dwelling purposes, how is the fire-resistance of the elements of construction arrived at?

one full day a week (though sometimes a night class is taken in addition). The courses in either case extend over five years and are designed for those who will be concerned with supervision of work on the site—general foremen, contract managers or the equivalent. The entrance requirement is a sound general education, but possession of GCE ordinary level in maths., English and physics will usually grant exemption from equivalent subjects in the first year of the building course thus enabling a student to complete it in four years instead of five.

Part-time courses normally include the following subjects:—

1st year:	Building Construction, Building Science, Building Maths., Geometry.
2nd year:	Building Construction, Building Science, Building Maths.
3rd year:	Building Construction, Building Science, Maths. (the ordinary National Certificate is taken at the end of this year).
4th and 5th years:	Building Construction, and two of the following in each year—Builders' Quantities, Surveying and Levelling, Theory of Structures, Bookkeeping and Accountancy. (A limited number of the larger colleges, *e.g.* Birmingham, offer Builders' Organization and Management in the final year.)

Sample questions from some of the examination papers are printed on this and the next pages.

It will be noted that this syllabus does not include management subjects as such, nor is any real attempt made to stimulate architectural appreciation. Some subjects are obviously outside the range of purely architectural study—Builders' Quantities, for instance—and in most other subjects there is a difference of emphasis. Nevertheless, many subjects (especially in the early years) would be appropriate for student architects and approximate closely to the subjects as taken by student architects, the same textbooks often being used.

Concurrently with this the building student is learning by experience in industry. The effectiveness of this experience must depend to a large extent on the jobs he is able to do, and many builders have a system whereby trainees "rotate" through departments likely to give the necessary breadth of experience. On site, the student may act as assistant general foreman, or may help with the measurement of work for bonus calculations or costing.

The amount of responsibility a trainee can assume increases as his training proceeds. He may in the first months be drawing and colouring progress charts, filing, running back and forth to sites, and so on. Later, he may be sent to jobs to prepare reports on site troubles or he may be allowed to arrange for odd jobs to be done, perhaps during the maintenance period of a contract. By his final year he should be able to assist in running jobs under supervision.

Payment to indentured management trainees is usual and ranges from about £3 a week at age 16 to £6 or £8 at age 20.

In addition, some firms pay college fees, others have

Sample Examination Papers (continued)

HIGHER NATIONAL DIPLOMA EXAMINATION

One question from an *Accountancy* examination and two from a *Building Construction* examination for part-time day students, set in 1957.

1. (*a*) Explain the difference between
(i) Authorized Capital. (ii) Subscribed Capital. (iii) Called-up Capital. (iv) Paid-up Capital. Which would provide the figure appearing in the Balance Sheet.
(*b*) Explain what is meant by (i) Cumulative preference shares. (ii) Deferred shares. (iii) Debenture.
(*c*) A £1 ordinary share 15s. paid up is offered on the Open Market at 10% premium. If you bought such a share how much would you pay the vendor.

2. Draw neat diagrams or freehand sketches to show the form and application of three distinct types of shoring used as temporary support during certain building operations, and name the component members.
To a larger scale draw details at all salient points of any of the systems illustrated. Scale 1½ in. = 1 ft.

3. State why single lap tiling has become so popular in recent years as a roof covering and discuss the economies, if any, it can effect in present-day house construction.
Sketch three distinct types of single lap tile in common use and, selecting ONE of these, draw details at the ridge and the eaves of a roof of 35 deg. pitch to show the finish at these points, including the lap of the tiles. Scale 1½ in. = 1 ft.

prize schemes and some pay an annual bonus. All companies pay lodging allowances as well as salary to boys who are required to live away from home.

Correspondence courses

The correspondence course must often be used, especially for trainees in larger firms where mobility is essential. It cannot be regarded as equivalent to Technical College training. At least one large building and civil engineering company trains a large proportion of its boys by this method, giving the successful ones the total cost of their correspondence school fees. The disadvantages of the system are well known —lack of personal contact with the tutor, no opportunity for discussion, and so on. Moreover, correspondence courses do not qualify a student to sit for the O. and H.N.C. examinations. The courses available can prepare students for the Diploma examination of the Institute of Builders, but it should be made clear that the Institute of Builders does not favour the correspondence method of study in building subjects and will only accept it for examination purposes in cases where for good reason attendance at a school is impossible. Correspondence training permits the greatest possible mobility on the part of the student and might therefore be said to give the fullest opportunity for practical experience. It is important to note, however, that this experience is not a part of the course and may not even be related to it. Moreover, study by correspondence cannot directly assist in the intellectual development necessary for management positions though such development may be secured by the right experience in the business.

Full-time courses

Full-time courses are of three or four years' duration and lead to the Higher National Diploma in Building (of the same standard as the H.N.C.) which is awarded on the successful conclusion of a five-year part-time course. Sample questions from an H.N.D. paper are shown left. The courses are normally held at Technical Colleges but full-time degree courses exist at Manchester University and at the University of Wales.

Full-time Diploma courses at a technical college or degree course at university allow the study of a wider range of subjects than is possible by a part-time course and may be completed more quickly than the part-time. In full-time courses practical experience is, however, limited to vacation periods and is normally undertaken on a similar basis to architectural students' vacation work.

For admission to full-time technical college courses students do not require to reach such a high standard as for degree courses but they are usually 16 to 18 years old secondary school boys. The organization of these courses enables a boy to take O.N.D. in two years or H.N.D. in three or four years. The subjects of instruction are: Mathematics, Science, Building Geometry, Building Construction, Theory and Design of Structures, Reinforced Concrete, Builders' Bookkeeping, Quantity Surveying, Estimating, Surveying and Levelling, Equipment of Buildings, Building Management, Sanitation, Law.

A full-time course, whilst it has educational advantages, could tend to be "theoretical" and to balance this most courses of this type include visits to buildings in course of erection, and to works connected with the manufacture or production of building materials. Vacation work is also undertaken in various capacities. Three typical boys from a full-time course were employed during summer, 1956, for instance, on site work in connection with work measurement, on office work in a buying department of a large company and on a labouring job "on site."

Sandwich courses

The sandwich course is one in which periods of full-time training alternate with periods of full-time employment. Building courses are organized on a six-

months' study/six months' business basis, but courses based on other periods—say three months each—are possible and have, in fact, been suggested. Candidates for entry must

(*a*) Hold a G.C.E. covering Maths. and a Science subject at "A" level or

(*b*) Hold an O.N.C. in building or

(*c*) Have passed a college entrance examination of equivalent level in Maths. and Science and satisfied the principal as to ability to express themselves in English.

A typical sandwich course occupies four years of which six months (approximately) in each year is spent at College. The remaining six months being spent in the industry. The course leads—as full-time courses do—to the H.N.D. in building and is recognized by the IOB as suitable preparation for the Licentiate Diploma of the Institute. The Brixton School of Building Sandwich Course is recognized under the IOB Registration and Exemption Scheme and qualifies students for exemption from part of the Diploma Examination. The subjects taken at Brixton include:

1st year: Building Construction, Building Science, Mechanics, Maths., Building Geometry, Land Survey and Fieldwork, Accountancy, Social, Industrial and Economic studies.

2nd year: Building Construction, Building Science, Theory of Structures, Land Surveying and Fieldwork, Builders' Estimating, Builders' Accountancy, Law, Economics, Organization and Management, and Industrial studies.

3rd and 4th year: Building Construction, Building Science, Structural Design and Detailing (Steel and R.C.), Heating and Ventilation, Sanitary Engineering, Lighting services, Builders' Quantities, Estimating, Law, Organization, Management, and Industrial studies.

Generally, this course can be regarded as being of University standard—the syllabus is broadly based and questions are approached in a discursive spirit. A typical exercise for first-year students, for instance, requires them to trace the development of a small house design from 1918 to date, with references to the relevant social and economic circumstances. The approach may also exist in normal full-time courses but the sandwich course is unique in that "industrial practice" is an essential part of the course, unlike vacation work which is often unrelated to the subject taken at college.

The actual work undertaken by students during industrial practice depends on the employing company, but in at least one large organization all sandwich course students are given the chance to lay bricks, fix joinery and perform other trade jobs. They work as assistant general foremen, and in various departments at head office, in the plant yard, the joinery works, and so on.

Sample Examination Papers (continued)

L.I.O.B. EXAMINATION

Sample questions taken from five of the eleven papers set in 1956 The papers not quoted are: Quantities and estimating, Book-keeping and accountancy, Masonry, Carpentry and joinery, Painting and decoration, Plastering. Each examination is based on a building, working drawings of which are supplied to the candidates.

Building Construction

A reinforced-concrete chamber 20 ft. × 15 ft. × 10 ft. deep is to be constructed below ground level adjacent to a tidal river. It is proposed to drive steel sheet piling around the perimeter of the chamber. High tide level is approximately 6 ft. below ground level. Briefly discuss the following:

(*a*) The type of cement to be used.

(*b*) The stages in which the work should be executed.

(*c*) Means of ensuring that the chamber shall be waterproof.

Brickwork and Drainage

State what is meant by the term "additives" and the reason for their use.

Steel and Reinforced Concrete

A cross of reinforced concrete is to be erected on the roof of the church tower, as shown in Fig. 1.

(*a*) Calculate the total wind pressure acting on its face above the roof, at 30 lb. per sq. ft., and the bending moment in inch-lb. at the ridge of the roof.

(*b*) Draw the bending moment diagram for the vertical limb due to this wind pressure, using scales of ½ in. = 1 ft. and 1 in. = 10,000 inch-lb.

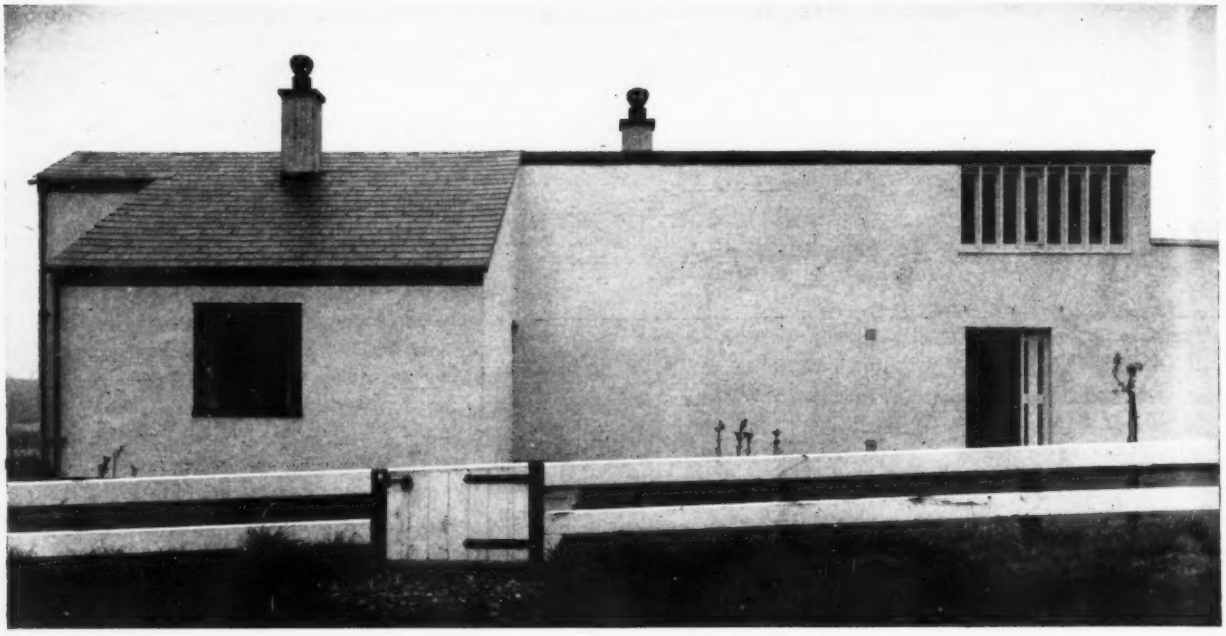
Plumbing and Sanitation

Assume that the lavatory basins in the Cloakroom and the Toilet are to be supplied with hot water from a heating unit in the Boiler Room. Describe fully the system you would recommend for this work.

Heating, Lighting and Ventilating

Discuss the effects of double glazing of windows on heat loss and on daylighting.

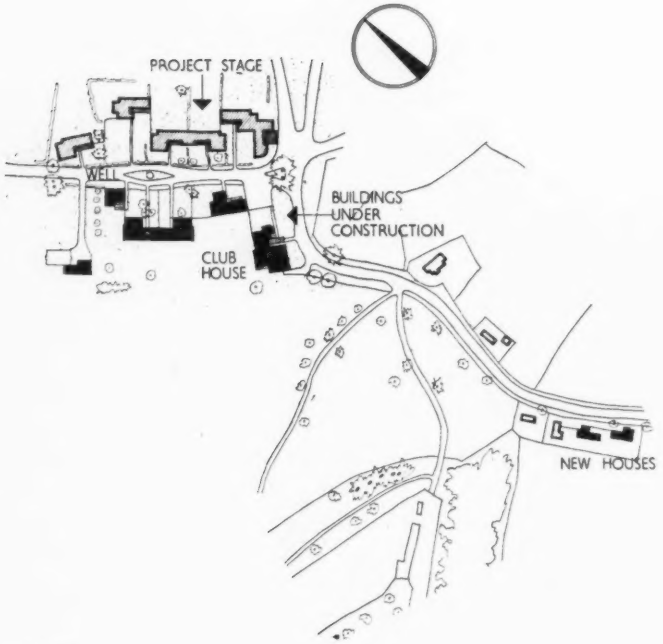
Draw a circuit diagram to show the principal items of equipment for an electric lighting installation for a church.



1 *One of the pilot pairs of two-bedroom houses*

VILLAGE HOUSING

The rebuilding of Rushbrooke village, Suffolk (architects, Richard Llewelyn Davies and John Weeks) is the subject of this article by W. G. Howell. There follows a brief description of four projects for housing designed for the 1955 and 1956 CIAM, in which Mr. Howell finds interesting comparisons with the ideas on the design and grouping of the village housing at Rushbrooke.



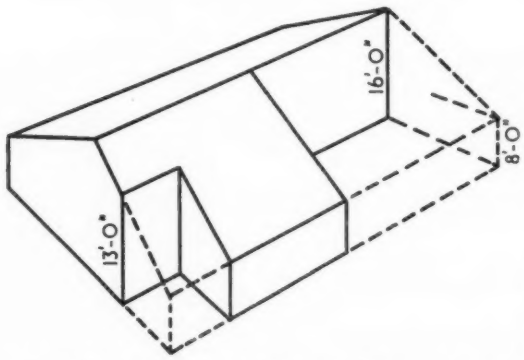
Site plan

HISTORY: Rushbrooke is a small village near Bury St. Edmunds, with a church, two dozen houses, and a club run by the villagers. There is no shop or pub. Most of the houses are occupied by agricultural workers on the surrounding Rushbrooke estate. The old village was inadequate for the present population, and the existing houses did not lend themselves to conversion. The owner therefore decided to rebuild almost the whole village to provide the necessary additional accommodation. The church, a few cottages and an ancient well-head remain, and all the existing roads and trees. The new layout has been evolved within this fixed framework.

DESCRIPTION: The houses are designed to suit the needs of country people, and have a front parlour, a kitchen-living room, scullery, plenty of storage, sheds, etc. Three different house sizes were required to suit the needs of the existing inhabitants—one-, two- and three-bedroomed, and these latter might have to be on the north or the south of the road. The architects evolved four basic type-plans for these different requirements, and these can have minor variations to suit particular situations or occupant requirements. The way in which these basic types are used in the layout is explained in the caption to 2.

2

The houses have 25 degrees slated and felted roofs, springing from a basic eaves height 8 ft. above the plinth. The four different types have different depths, so there are four different ridge heights.



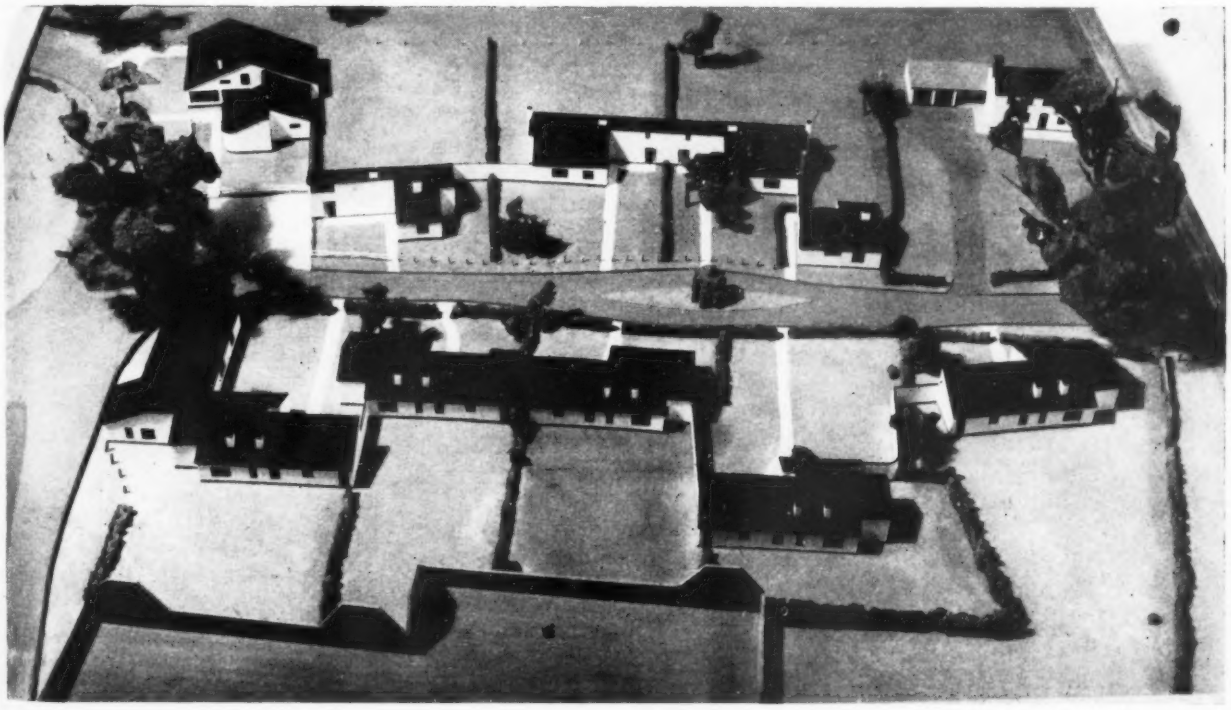
An analysis of one of the pilot pair of houses gives a key to the system used on all four types. This house is based on a rectangle 56 ft. wide by 33 ft. deep. The ridge occurs half way across the 33 ft. dimension. From this basic shape, two slices are omitted, giving one intermediate eaves height of 13 ft., and one part where the spine wall is exposed running right up to the 16 ft. high ridge.

CRITICISM: Rushbrooke is the first scheme I have seen which breaks right outside the established imagery of post-war rural housing. It is particularly remarkable in that an existing village is being demolished, and replaced by something which is better from every point of view. The new houses are better than those they replaced, bigger, drier and warmer (all of which the Housing Manual and the By-laws automatically ensure), but where Rushbrooke breaks new ground is that they also look better. Furthermore, the village has become socially and architecturally more coherent, the picturesque intricacy of the haphazard having been replaced by an organized complication which, within a system of repetition, gives its own clear identity to each house and each corner of the village.

The housing system described above uses repeat plans, a constant roof pitch, absolute uniformity of materials and colour (white-painted brick walls, slate roofs, black and white paint work), and variety proceeds from using the basic types in different relationships arising from the different families to be rehoused and the specific nature of each part of the site.

2. *Model of main part of village. The pilot pair of houses and the church are off to the top left. The part south of the road (upper part of picture) is now built, but will not be cement-painted for a year to allow the flettons to dry out: for this reason photographs of it would be misleading. The part to the north of the road will follow. The top left building is the club (television room behind curved corner). Adjoining it is a two-bedroomed house, similar to the pilot pair. Next a mirrored pair of three-bedroomed houses, and at the end a one-bedroomed house. An existing building remains in the top right-hand corner. The knobbly object in the middle of the road is the well-head. North of the road all the houses are three-bedroomed, having been specially designed for this position, two are handed. The only variation is that the second house from the right and the one on the far left have bedrooms 2 and 3 slid over six feet to give a recessed porch, which shows as a kink in the roof. The house to the far left butts up against a pair of offices and a shop: this also has a curved corner, which is not appreciable in the photograph, opposite that of the club.*

2



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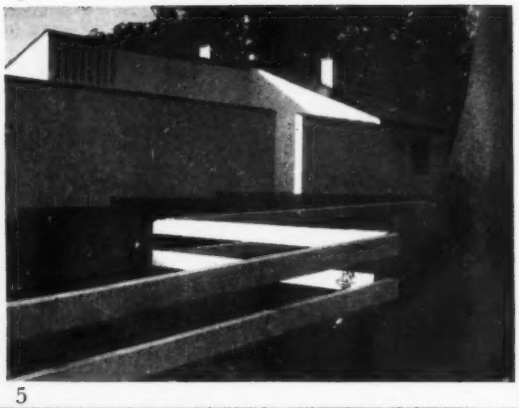

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OPPOSITE : 3, *the pilot pair of two-bedroomed houses.* 4, *yard of one of the pilot houses; the other house beyond.* 5, *entrance to yard; the front door is in the re-entrant angle.* 6, *private garden side. Entrance to store on left. Scullery, living-kitchen, bathroom and bedroom windows reading towards the right.*

The colour scheme is, of course, widely used in this area (even the cows in the neighbouring field are black and white Friesians), but the new Rushbrooke seems to accept all this as a happy coincidence—there is no straining after bogus rusticity or parochialism. In fact, the result is highly sophisticated, twentieth-century and aware of what goes on in the Big City—as one would expect in a village which has a television room in its club, and was designed by a pair of London architects. Technologically the houses stay well within the scope of the small country builder, but the whole formal system and detailing are an attempt to break through accepted practice.

As an example, take the detailing of the roof-to-wall junctions. Here the architects have set out to achieve the greatest clarity for the basic form of the house. In other words, they have tried to solve all corners and junctions in the cleanest possible way, with as few bits and pieces as possible, so that the volumes speak for themselves in the most direct manner.

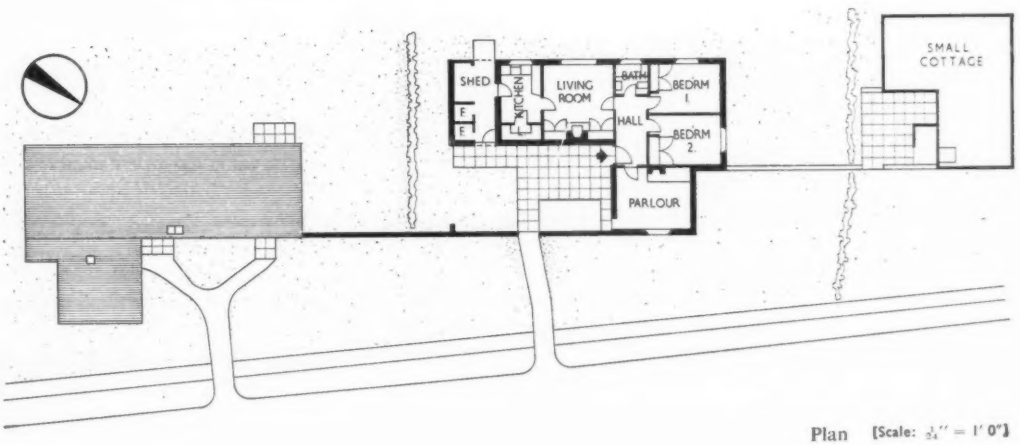
This seems to me to raise a basic polarity in modern architectural thinking. On the one hand one can accept all the complications of details thrown up by modern technology or by traditional construction, and try to co-ordinate them as elements of the complete statement. Alternatively one can strive for maximum clarity in the basic forms of the building by cutting the multiplication of elements at junctions to the minimum. Arne Jacobsen and Mies are examples of this latter approach. So were the 1930's architects who wanted their pure white cubes to read cleanly against the red-filtered sky, uncomplicated by any superfluous cornices, cappings or drips. Wright, too, achieves some of his most dramatic effects by resisting the standard proliferation of frames, coverstrips, skirtings, etc. There is an example at Taliesin West of a sheet of plate glass butting up against a knobbly stone wall. The wall is very rough indeed, so that there is a gap of varying width between the two elements (*i.e.*, permanent ventilation, and jolly nice, too, in the middle of Arizona).

It is obvious, of course, that the detail-eliminators are always sailing closer to the wind than the acceptance-school. In fact, many of the most celebrated failures of modern buildings have come about through an attempt to manipulate out of existence traditional junction and termination solutions, in the interest of formal clarity.

At Rushbrooke, the wall/verge junction is made very clear by simply bedding the slates direct on to the cut bricks of the gable wall. There is a small projection (Jacobsen sometimes uses none), but there is no barge-board. There is a slight upsweep at the verge to discourage water from running off down the gable wall. At the ridge there is a lead flashing, which sits on the slates more or less flush (1), and allows the two pitches to meet almost at a point (3), and gives a very sharp termination where a single pitch meets the spine wall (4).

The only point of inconsistency is at the eaves, where there is a fascia-board, which I feel is unfortunate. This can be seen especially in (3), where the short lengths of fascia, stopping off where they come to a corner, detract from the purity of the blocks far more than just a gutter would have. (5) shows another instance. Here the architects may have felt that the garden wall should carry on into the wall of the houses as one clean rectangle, and that the fascia would help it to read as such. Seen in perspective, however, I feel that it would have been infinitely preferable if the fascia had been detailed out of existence, so that the block of the house would have read round the corner over the top of the wall, and the front elevation would have had a slight kick where the change occurred from wall to house. These lengths of fascia look quite convincing on the elevational drawings, but don't look so satisfactory when one sees that they fail to go round the corner. I wonder if the architects fully visualized this in 3-D, and, if so, if they are satisfied with it now it's built.

I admit that it is difficult to get rid of the fascia,



Plan [Scale: $\frac{1}{24}$" = 1' 0"]

7. One-roomed cottage, showing the modified ridge details used on the later part of the scheme.

7

especially if one wants the rafters to sit on both leaves of the cavity wall. Also it is the kind of detail which may be sailing rather close to the wind, and might tempt providence in rather the same way that the very sharp lead ridge has. Those who derive pleasure from the failure of other architects' details should examine the ridge in (1). It will be seen that two slates have come adrift (one has slipped down the roof, and is sitting precariously over the re-entrant angle) and two more are loose. Although not visible in the picture, there are some under the ridge flashing in 6. Obviously the nails have failed to hold down the top course of slates, where there is no superimposed weight on top of them. The architects have faced up to this in the latter part of the scheme, and have introduced a Staffordshire Blue ridge tile. This projects well above the general level of the slates, and being a symmetrical object cannot be used to end a single pitch. So on the rest of the village there are no more single pitches, all roofs going on over the top, and having at least one course of slates on the other side (7).

This constitutes what I have referred to earlier as acceptance-detailing. The buildings are a little less simple and direct, the ridge is less sharp, the dramatic single-pitch gable (4) disappears. On the other hand, the slates stay on. The buildings look a little less like cubist paintings, and a little more like cottages. The pilot pair are more dramatic (dare one say "crisp"?); the later ones look more sensible, a little less sophisticated. Take your pick. A minor shift has taken place between two extreme modes of thought, each proceeding from perfectly valid and laudable urges.

In view of the ultra-simplification of roof detailing on the pilot pair, I feel that the down-pipes are a minor stylistic inconsistency. The acceptance of the rather obvious socket joint and fixing lugs do not seem to belong to the same school of thought as the highly refined ridge and verge details, and I feel that a jointless aluminium pipe would have been better. On the other hand the chimney seems to me to be a most successful departure into complication, just where it is needed. Here instead of having a plain cube or cylinder, the architects have introduced an overhanging slab with a piece of apparatus of complicated shape on top. These cowls are obviously more than just a practical solution to the problem of short flues under trees, and exist as *objets* in their own right (presumably *trouvés* after many hours searching through the catalogues).

To me the chief disappointment on the outside of the houses is the windows. I feel this particularly acutely because in every other respect the architects have so successfully broken through the council-house image—in the choice of materials and colour, the avoidance of two-storey equal-gabled boxes, in the use of linking walls and the design of the front doors and loft windows. In fact all that one can see in any of the pictures except (6) creates a most successful and coherent architecture in a new image, but the bedroom and kitchen windows in (6) seem to me to step

right back into the world of the housing manual. They are certainly helped by being painted black and white, and being set in a white wall, but nevertheless to me they lack the new feel that I find elsewhere. Largely it's those wretched little night ventilators—so terribly useful and so beloved of housing committees, but almost always so fatal to the architecture. On the second part of the scheme these windows have been modified a little, and the sections have departed even more from the BS. All of this helps, but to my mind the bedroom and kitchen windows still do not achieve the level of distinction found in the design of the other openings, and carried even further in the windows of the club.

The placing of the windows raises some interesting points. One of the basic problems in a bungalow, or in the upper floor of a two-storey house, is getting enough brickwork left between the window-head and the roof. There comes a point where there is so little left, that the windows might just as well go right up to the roof. In the case of the private garden elevation (6), which I feel is the least successful, the black fascia referred to earlier does not help—it covers two brick-courses more than just a gutter would have, leaving less than one course above the three main openings. The extra 6 in. of brickwork would have made a lot of difference, as can be seen in (1), where the fixed parlour window is set lower in the wall. The bathroom window is also set lower down (with a crafty air-brick to overcome any objections to too low a window-head in a w.c.), and this and the deliberately non-aligned opening into the store go a a long way to save the situation, but I question whether it was wise to try and get away with five openings in one wall. The whole success of the other elevations derives from there never being more than two openings in a fairly large area of brick wall.

In the pilot pair, the bricks over the windows are carried by concealed lintols; in the subsequent houses, concrete lintols are shown on the outside (7), which read merely as a change of texture once the cement paint goes on. This can be seen over the entrance to the store in (1).

The interiors of the houses go a good deal less far than the outsides in departing from the established conventions of well-designed local authority houses. The interiors consist almost entirely of distempered surfaces and white painted joinery, and I would have welcomed some departure from this universal post-war decor. A major improvement on normal council-house interiors has been achieved by manipulating the quality of light round the window openings, by using splayed reveals—on one or both sides of the windows depending on the placing in the wall.

All rooms have flat ceilings (except for the loft-store), and each house has the same floor level throughout. I was sorry not to see the shape of the single pitch exploited, and maybe an occasional change of level in the floor, which can have such a remarkable effect in a single-storey house. I am by no means sure whether the occupants would agree with me—level floors are much more convenient, and though raked ceilings can be very spectacular, what you gain space-wise you have to pay for fuel-wise.

In the club the ceilings do follow the slope of the trusses and are boarded, the walls are of painted brick and there are odd, high-level, windows. The resultant interior is very exciting, and produces an environment wholly consistent with the exterior architecture.

CONCLUSION: What are the implications of Rushbrooke? Perhaps it is fortunate that it provides no straight crib for our immediate problems. It was designed for a private client, with his own programme. The space standards are not the same as the Ministry's for rural housing. The particular solution adopted relies on single-story development, which can't be as economic as two-storey. Also having got twice the amount of roof as a two-storey solution, Rushbrooke has them made of slates, which are about twice as expensive as one can ever afford on local authority housing.

Also the houses have more external wall and corners than a rock-bottom economic scheme could afford. The linking walls, too, such a vital part of the whole concept, are just the kind of item that gets cut out when the tenders come in. The amount actually used is very small per house (see 2), but it still costs more than post-and-wire. Also there is more roof-space to be paid for than in conventional pitched-roof solutions. So Rushbrooke does not present a precise prototype to be lifted for rural housing or residential areas of new towns. And this is just as well, because usually the scheme which offers a straight lift will end up by having its superficial characteristics copied and its fundamental lessons forgotten.

What Rushbrooke does postulate is a set of principles, which I suggest are relevant to all housing layout problems. First a set of type-houses has been evolved, belonging to a consistent system, so that they can be added together in a coherent manner. Such addition allows each house to remain separately identifiable, while at the same time becoming part of a larger comprehensible pattern. The repetition offers economies in building, estimating and in architects' work, as well as helping coherence by establishing a limited number of basic elements. The basic types can be modified in various minor ways to suit particular user-requirements or site peculiarities. But most valuable of all is the ability of the basic types to add together in a series of infinitely variable relationships. This means that while coherence is achieved by the repetition of a simple set of materials and range of colours, each space, street-corner or angle between houses can have its own special character and be unlike any other.

To me the lesson of Rushbrooke is an encouraging one. It is that we *could* have better housing layouts in our villages and new towns. It is no use blaming the programmes, the economics or the authorities—these will change if we can show that they must. What is desperately needed is architectural invention, based on valid principles. Of course this would get nowhere without sympathetic encouragement from all the authorities concerned. This is most likely to be forthcoming the less people are satisfied with what is going on. Rushbrooke is enough to make one very dissatisfied indeed.

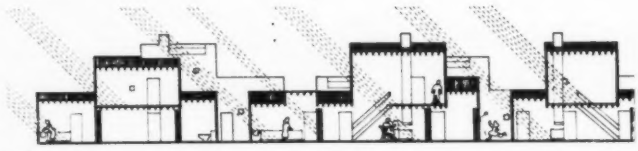
VILLAGE PROJECTS

The ideas behind Rushbrooke village housing (described on the preceding pages) run closely parallel to the research of the English group of CIAM into village development which was going on at about the same time. It is interesting, writes W. G. Howell, that not only was there no contact with the architects at Rushbrooke, but the members of the CIAM group worked in comparative isolation from each other and did not see each other's schemes until they were assembled just before the Congress. It is also interesting to find the same search for variety within a coherent system, and the same search for domestic architectural solutions within familiar technological limits which break new ground.

PROJECT BY JAMES STIRLING

James Stirling's scheme shows a system for development based on the use of three parallel walls and a constant 30° pitch. The structural walls are pierced with a few low-level windows, the main lighting and ventilation coming from the infill gable panels. The separate identity of each house is not explicit, but is implied by the broken silhouette The system seems to be very flexible, and can produce a wide variety of layout pattens—viz., the village street or the alley-way type illustrated. In these variants, each house is expressed as a separate entity.

Road elevation



Long section

Sections

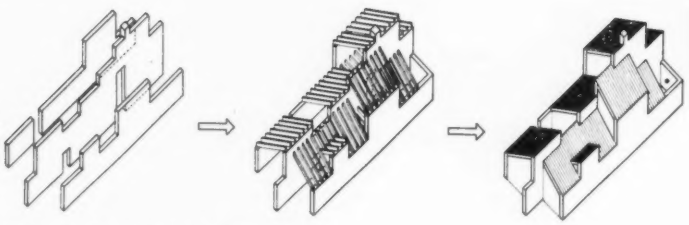
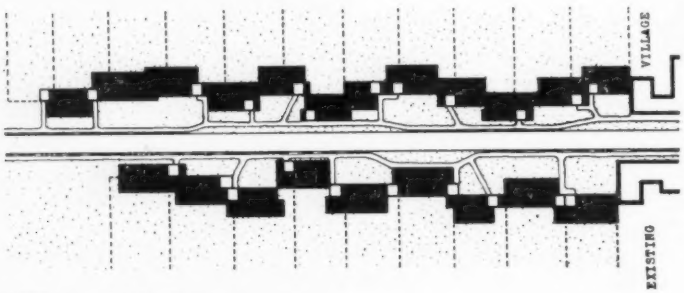
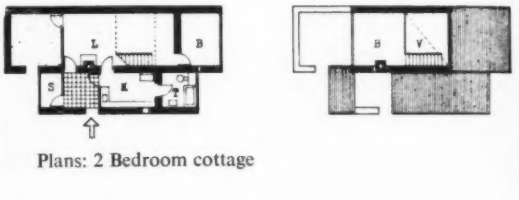


Diagram of load-bearing walls

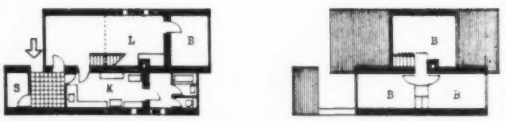


Village street development

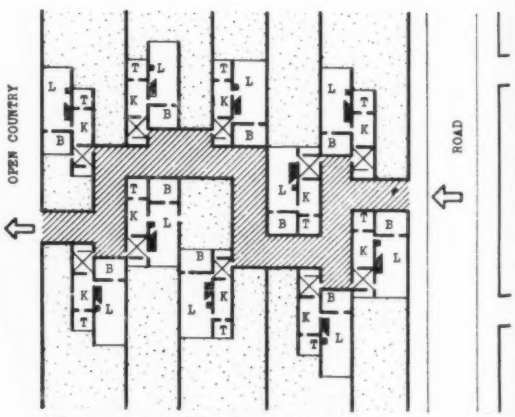


Plans: 2 Bedroom cottage

Plans: 3 Bedroom cottage



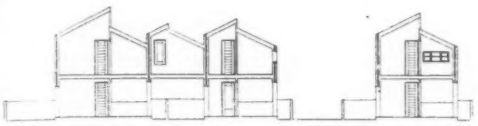
Plans: 4 Bedroom cottage



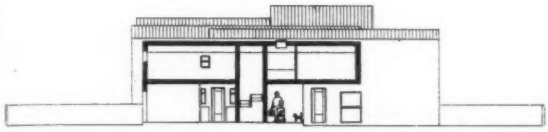
Alley-way type of development

PROJECT BY PETER AND ALISON SMITHSON

Elevation



Section



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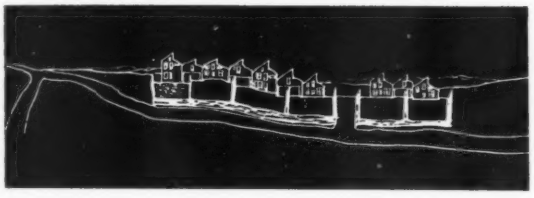
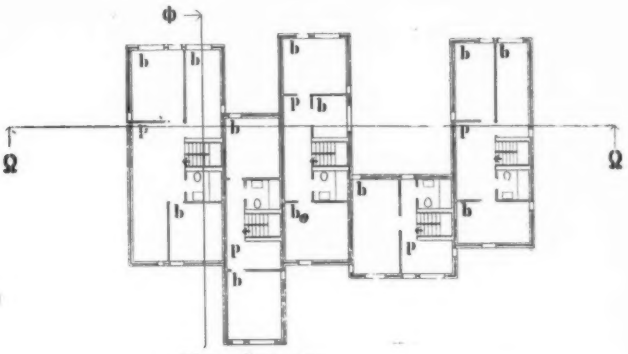
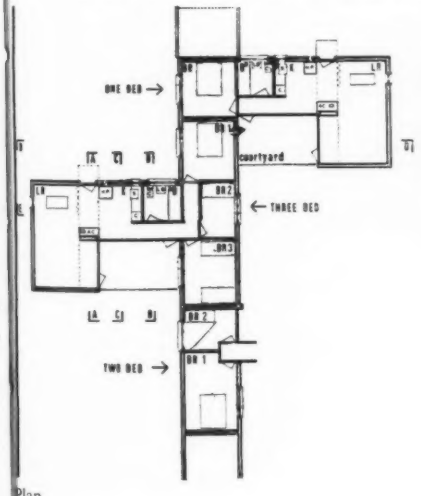


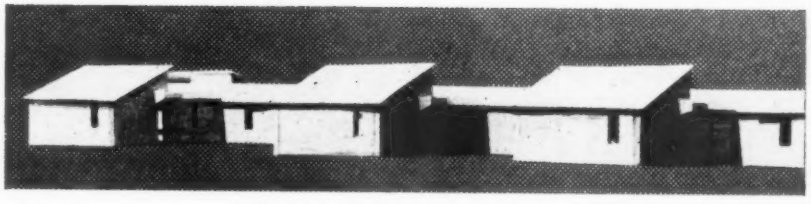


The scheme by the Smithsons is based on an interior road, with houses of various frontages. Again, there is a constant pitch, here used to give top light. Standard metal windows, assembled in highly original arrangements, are used in conjunction with timber French windows. The windows are mainly in the gable walls, where the window heads do not come into conflict with the eaves. Here each house is clearly expressed as an individual element in the complex.

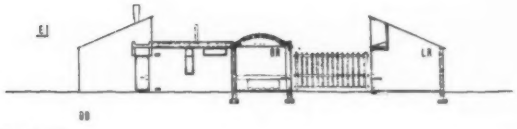
PROJECT BY JOHN VOELCKER



Plan



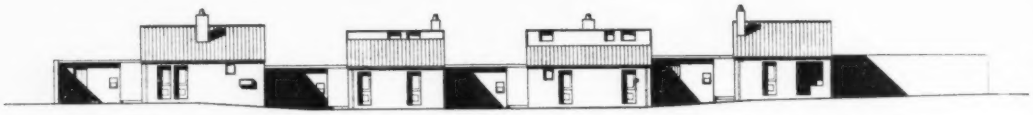
Elevation



Section

John Voelcker's scheme is based on a bedroom spine. The living accommodation is linked to this spine with a services block, forming a private terrace for each house. The living accommodation and the method of linking can vary to suit tenants' needs or site characteristics. The bedroom spine forms an unbroken unit, but the living quarters set up a rythm based on the individual unit.

PROJECT BY W. G. HOWELL AND JOHN PARTRIDGE



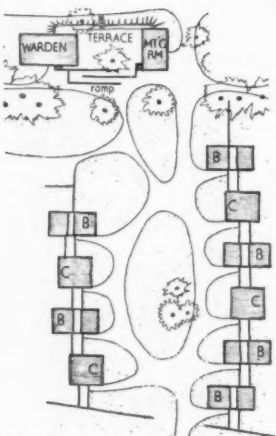
Elevations: Types C, B, and C and B back-to-front

Entrance side, Type A

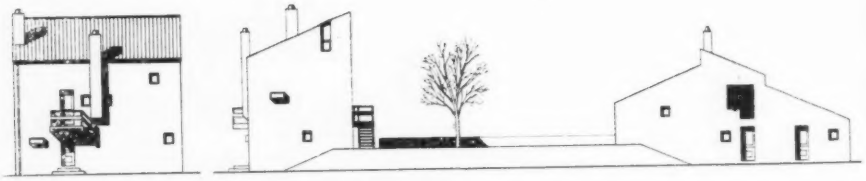
Entrance side, Type B

Entrance side, Type C

This scheme is a development of a scheme for the ABS competition for old people's houses. It uses a single roof pitch in various ways to give a characteristic silhouette to each different type of house. The high level windows where the roof sets down give great flexibility of orientation, sun being able to get into a north-facing room. The houses are linked by stores and porches. There are a large number of French doors used, split so that they can be used as ordinary windows. They run up to 9 in. below the eaves, so that the brickwork can continue over the top. There are also boxed-out fixed view-windows (which would present an extremely deep reveal from the inside) and are usually at sitting eye level, and small inward opening ventilators at high level. These usually run right up to the roof. The same roof pitch, windows and doors are used for a group of communal buildings.



Lay-out.



Elevations, meeting room (left and centre) warden's house (right).

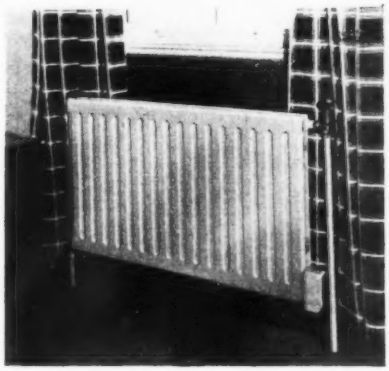
Elevations: warden's house (left) meeting room (centre and right)

All these experiments make an interesting corollary to the Rushbrooke houses, chiefly in that they show a common urge to break out of the rut in which rural housing seemed to be so firmly settled, not only at the level of organization and layout, but down to the smallest design details. A question they raise seems to be: how much system is necessary to achieve coherence? For instance, all the CIAM schemes use right angles for the lay-out of the houses, at any rate, in the sample lay-outs here. Rushbrooke, however, does not. The linking walls play an important rôle here, because any change in orientation between two houses manifests itself as a curved wall, which somehow makes the non-alignment seem less arbitrary. Most of the schemes here imply a unity of materials, and to a certain extent of colour. The Smithsons' scheme, and Stirling's alley-way development would obviously come off very well with multi-coloured houses (in the same way that the LCC's Horndean close at Alton estate does). Rushbrooke's system is to nibble bits out of a basic rectangle so that a large house, being split up into small sections of wall, does not just look like a small house inflated. This, however, is just precisely what the Smithsons allow to happen: triumphantly in my opinion.

The conclusion is obviously that there is no universal validity in any one system or any particular rule. There is only a difference between good and bad architecture.

THE INDUSTRY

From the industry this week Brian Grant describes three new solid fuel fires, a combined electric and hot water radiator, aluminium door canopies, a system of adjustable shelving, new pencils, cork tiles, a shower fitting, a lighting fitting for schools, a refrigerator, and a gas convector heater.



Top left, the Sofono Super-view convector fire. Above, the Merton convector fire. Left, the Hurseal and Gulf combined radiator.

Solid fuel fires

Suitable for heating a space of about 2,000 cu. ft., the new Sofono Super-view convector fire costs £14 18s. 6d. and is made in 8 different vitreous enamel finishes. A single model fits 20 and 24 in. high and 16 and 18 in. wide standard fire openings with Milner backs to BS dimensions or larger, and installation is simple without any structural alterations. In addition to radiant heat from the open fire, the unit gives out a large volume of warmed air through the grille over the fire, and this grille works in conjunction with an adjustable throat restrictor. The connection for gas lighting can be on either side. (*The Grange-Camelon Iron Co. Ltd., Falkirk.*)

Hattersley Bros. have recently announced two new fires; one the Swinton sunk model arranged for underfloor air ducting, and having an air inlet which can be arranged to face in any one of six directions. The fire is at hearth level and a back boiler can be provided if required.

The Merton convector has, illustrated here, an adjustable throat restrictor and is capable of heating rooms up to 1,700 cu. ft. Fuel consumption can be reduced to about 1 lb. per hr., and there is the usual extension plate for overnight burning. The fire will fit openings from 16 in. by 20 in. upwards and gas ignition is provided. (*Hattersley Bros. Ltd., Queen's Foundry, Swinton, Mexborough, Yorks.*)

Twin radiators

When outside temperatures, even in this country, can vary by as much as 30 degrees in 24 hours, heating systems must obviously be extremely flexible. Hurseal and Gulf Radiators have attempted to solve this problem by producing a combined electric oil filled radiator and an ordinary hot water radiator. The electrical section of the unit is welded to the front of a panel hot water radiator of the same surface area, leaving a gap of about 1½ in. between the two. The hot water radiator is connected to the heating system in the usual way, and the advantage claimed for the combined unit is that in very cold weather electricity can be used to supplement the hot water, while in between heating seasons the electric unit only will be able to deal with short cold spells when a boiler would be uneconomic. These units would also be useful when extensions to an existing system are beyond the capacity of the boiler.

The unit illustrated is a 1-Kw. electric radiator combined with a hot water type having a heating area of 14·7 sq. ft., and the price of the combination would be about £25. (*Gulf Radiators Ltd., 229 Regent St., London, W.1.*)

technical section

Prefabricated canopies

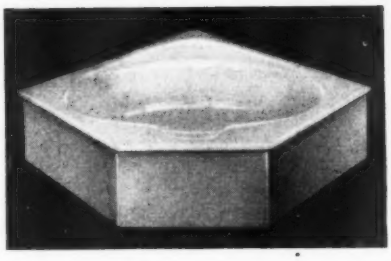
Bainbridge Bros., who started producing a combined fascia and soffit in aluminium some years ago, have now followed this up with a range of door canopies in various styles. The general principle of all of them is to build into the wall over the door a pre-assembled frame of supporting channels and angles. The channels project over the door and act as bearers for the canopy, which slides over them and is held with set screws at each side. The whole assembly is made of aluminium, and each canopy is supplied with a flashing piece already bent for building into the brickwork. Various designs are produced, with prices starting as low as £5 17s. 6d. for a 5-ft. wide model with a 20-in. projection. The canopies are robustly constructed to prevent drumming under rain, and are also cork insulated for the same reason. (*Bainbridge Bros. (Engineers) Ltd., Facia Works, Woodhill Road, Bury, Lancs.*)

Adjustable shelving

The Spur system of adjustable shelving is made up with cantilever shelf brackets supported in slots in an upright screwed to the wall, or in a double-sided upright fixed to floor and ceiling. There is a comprehensive series of components, brackets from 5 to 18½ in. long, 110 degree brackets (see illustration) for display purposes or reading desks and shelf ends which can also be used for subdivisions. The system is very flexible as the shelves can be adjusted by moving the brackets up or down, and the brackets themselves will carry a considerable load, 160 lb. for the 18½-in. length. All components are phosphated and are supplied stove enamelled on four alternative colours, or they can be plated or galvanized. The system seems suitable for most kinds of job, including offices or shop displays, the freestanding double-sided shelving on posts being particularly suitable for the latter. (*Savage & Parsons Ltd., Watford, Herts.*)

Pencils for draughtsmen

I have been sent some samples of the new Koh-I-Noor draughtsman's Superweld pencil, which has been developed to meet the demands of Rolls Royce's drawing offices, where they appear to need pencils which are tough and longlasting, and which will produce a uniform line dense enough to produce good prints by any of the usual methods. Whether R.R. draughtsmen use pencils as prototype ICBM's I do not know, but these new types certainly stand being thrown on the floor and other maltreatment, and also produce a good crisp line. The makers say this is due to molecular graphite control, which I take to mean that the leads are uniform and without the grit and other oddments one finds in cheaper pencils. These new ones are good, and have the further advantage that the various grades, from 6H to 2B, have different coloured ends, so that they are easily identified. (*L. & C. Hardtmuth (Great Britain) Ltd., Koh-I-Noor Factory, Chard, Somerset.*)



Cork tiles

A new range of cork tiles known as Chingford has now been on the market for about a month. They are made from granulated cork bonded with the natural resins of the cork without any synthetic additions, and have a density of about 35 lb. per cu. ft. Standard size is 12 in. square, but others from 6 in. square to 36 in. by 12 in. can be cut, and thicknesses are ¼, $\frac{5}{16}$ and ⅜ in., though thicker tiles can be supplied if necessary. The tiles, which are produced in light, medium and dark colours, are normally cut with square edges, but anything thicker than ¼ in. can be supplied tongued and grooved. (*Cork Manufacturing Co. Ltd., Langite Works, South Chingford, London, E.4.*)

Bath and shower

Allied Ironfounders have recently introduced a small bath and shower fitting (the "Caprice") which measures 3 ft. square, with a splayed front. The tray is about 11 in. deep, and can be used for bathing children, and it is also long enough diagonally to be used as a sitting bath. The unit is holed for a drain and chain stay, but not for taps or overflow, and there are no panels, as fittings of this kind are usually installed in a tiled surround. All the standard colour finishes are available. (*Allied Ironfounders Ltd., 28 Brook Street, London, W.1.*)

Light fittings

The illustration above right shows Falk's new Athena fitting, which has been specially designed for schools, as it has the required angle of cut-off and meets the requirements of statutory instrument 473/1954 issued by the Ministry of Education. The fitting is a satin opal glass unit to take 150 or 200 watt lamps, and can be used as a ceiling fitting or as the pendant illustrated. Prices vary from 30s. to £2, to which must be added 22½ per cent. purchase tax. (*Falk, Stadelmann & Co. Ltd., 91 Farringdon Road, London, E.C.2.*)

Above left, the two types of Spur shelving. Left, the Caprice shower fitting. Above, the Athena school lighting fitting.

New Refrigerator

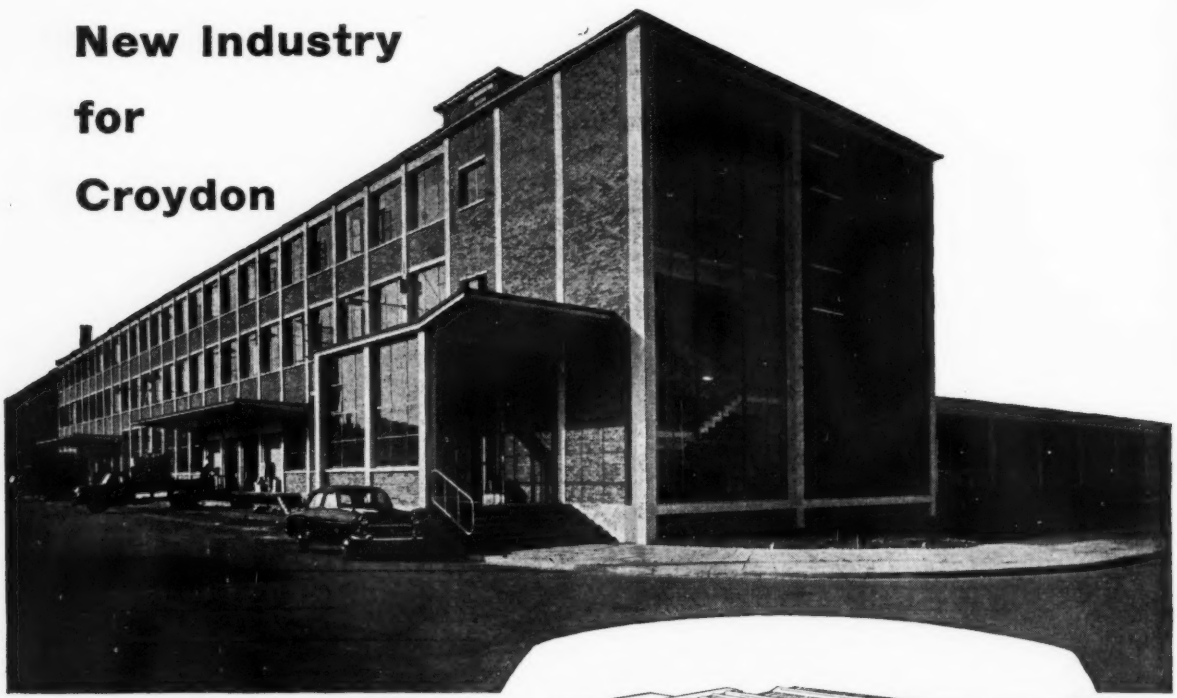
The L24 electrically operated refrigerator is the latest addition to the Electrolux range, and has a shelf area of 5 sq. ft. with a capacity of 2·4 cu. ft. This model has an ice compartment designed to hold standard size frozen food packets, and racks in the door to take eggs and bottles. Like all Electrolux models, this is of the absorption type and is completely silent. Price, including purchase tax, is £63. (*Electrolux Ltd., 153/5 Regent Street, London, W.1.*)

Gas convector heater

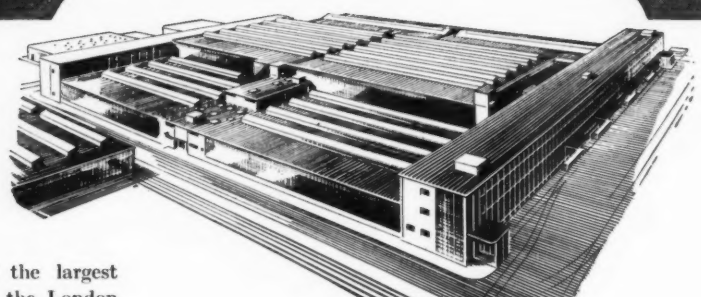
Radiation's new model 460 convector heater is designed to provide full heating, with two air changes per hour, in rooms up to 1,750 cu. ft., though this figure will vary a great deal according to window area and room aspect. The gas rating is 7,500 B.Th.U.s per hour and the dimensions of the heater are 26 in. by 18¼ in. with a depth of 5¼ in. (*Radiation Ltd., 7 Stratford Place, London, W.1.*).

Radiation model 460 convector.

New Industry for Croydon



Philips Croydon Works Limited



THIS EXTENSIVE BUILDING—one of the largest industrial structures to be erected in the London area was constructed in 2½ years by Richard Costain Limited and recently handed over to Philips Croydon Works Limited. The contract for the main building, which measures 630 ft. by 565 ft. and covers an area of more than 8 acres, was awarded on the result of the first six months' work when 150,000 square feet of floor space was handed over. In all, the building provides more than 600,000 square feet of warehousing, administrative and production space.

A particular study was made of day lighting, using the principle of roof monitors to give a northern aspect in the main with a percentage of south light, so that an overall standard of fifty lumens at bench level is attained in manufacturing areas.

The contract also included the construction of roads and ancillary buildings.

The architects: Wallis Gilbert and Partners, F/F.R.I.B.A.; and the Quantity Surveyors are Thornton-Firkin and Partners.

Richard
COSTAIN
Limited

Building & Civil Engineering Contractors

111 WESTMINSTER BRIDGE ROAD, LONDON S.E.1
TELEPHONE: WATERLOO 4977

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technical section

INFORMATION CENTRE

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

4.83 planning: urban and rural

URBAN REDEVELOPMENT

Cities in Flood—The problems of Urban Growth. Peter Self (Faber 21s.)

This book examines one of the basic questions in Town Planning—how to deal with the problems that are brought about by the overgrowth of great cities. The problem of the overgrown city is world-wide, so any serious study of a matter of such fundamental importance is bound to be of interest to town planners. Mr. Self, however, has aimed at a wider public and in this he has succeeded very well. His book is confined to British cities and British conditions, but in less than 200 pages it provides a masterly analysis of the state of planning in this country and suggests possible solutions to a number of our current difficulties in a way which will stimulate interest in planners and laymen alike. Although the author is not a professional planner he is obviously well informed on both the theory and practice of the subject. The advantage of this detachment has been used to the full; it has, for example, enabled him to discuss controversial questions with far greater clarity than is normally the case, while his own specialized knowledge of administration gives added weight to proposals for the reform of our present planning machinery.

The first section of the book describes the nature of the conurbations themselves —the 4 per cent of the total area of England and Wales that now contains 40 per cent of its population and appears to be absorbing more people each year—and reviews briefly the human, economic and physical problems that are created by this congestion. The effects of the various "solutions"—peripheral expansion, high density redevelopment and the planned dispersal of overspill are next examined in some detail with a number of useful examples. Mr. Self is highly critical of high density development as a general solution on economic and human grounds (though he is careful to point out the value of mixed development in certain cases) and comes out strongly in favour of planned dispersal to new communities on the lines envisaged by the New Town and Town Development Acts. In his view at least one million families will have to be accommodated in this way during the next 20 years, two-thirds of them in new towns.

Anticipating one of the major objections that inevitably arise to proposals on so large a scale, he then considers the question of agricultural land and devotes a chapter to refuting the claims of the preservationists, which he dismisses as unjustified and, in fact, opposed to the real interests of the countryside. As he sees it the major difficulty in planning dispersal of population from the great cities is not shortage of land but the need to disperse employment as well. The chapter entitled "Jobs on the Move" provides a concise review of the attempts made to implement the findings of the Barlow Commission and the reasons for our failure to influence industrial location on anything like the scale required.

Although it appears to be rather detached from the main argument, his discussion of compensation and betterment is an excellent exposition of this exceedingly complex subject; and, for the professional planner, is probably one of the most useful parts of the book. Mr. Self concludes that as neither the 1947 nor the 1954 Acts have succeeded in providing planning with a rational financial basis, further reforms are inevitable and foresees the re-introduction of some means of collecting "betterment" as the logical next step. Several suggestions are put forward for ways in which this might be done—a modified form of development charge, the rating of site values or a special tax on landowners generally. The same section also deals with the thorny question of the public acquisition of land. Here, it is argued, the need for reform is urgent, for if comprehensive redevelopment in the blighted areas and new planned development for overspill are to become realities, something must be done to break down the public hostility which makes local authorities unwilling to consider buying land for these purposes on anything like the scale required.

In conclusion the reasons for the failure of post-war planning in Britain to live up to its early promise are described with almost brutal clarity, together with the steps that are needed to recapture some of the original driving force and rehabilitate planning in the public mind. Many of the proposals made are not new. The need for most of them has in fact been recognized by planners for some time, but they are set out in such a way as to make a powerful impression on anyone reading them for the first time. This book makes so many sensible points—and makes them so well—that it is hard to be critical except in matters of detail which would be out of place in a general review. Two important reservations, however, need to be made. Firstly, it is by no means so certain that the agricultural objections to the large-scale land use changes advocated can be dismissed as finally or as completely as the author suggests. Granted, on occasion too much may have been made of this point in the past, but the facts are very complex and by no means all of them are known. Until they are it would be unwise to assume—as is implied—that wholesale changes can be made everywhere with impunity. The second follows from this and relates to the form of the new developments themselves. The densities put forward as accepted standards are absurdly low. We are told that the nation can afford to house all its families at twelve or even ten to the acre and anything more than a "very modest" increase in density is an unjustified depression of housing standards. Here the uncritical reader could be led badly astray. Even if ample reserves of suitable building land were available (and in practice this is never likely to be the case) there could be no justification whatever for organized sprawl on this scale, for it violates one of the main lessons planners have learned during the past ten years. We now know that if we are setting out to create a new community we must provide dwellings suited to the needs of all sections of the population that is to live there. In practice this means building several different kinds of dwellings—not simply family houses. If this is done it is demonstrably possible to provide every family with all the space it needs at quite high densities for a reasonable cost. Apart from cutting out the waste of building rooms that will never be needed, this system has the advantage of making the place look and feel like a community as well—not only to visiting architects but to the people who actually live there.

Notwithstanding these faults *Cities in Flood* remains one of the most useful reviews to be produced for some time. It deserves to be widely read and discussed by everyone interested in or connected with planning, not only for the good ideas it contains—and there are plenty of these—but for the clear and concise way in which it makes the case for a positive planning policy and the nature of the complex problems that have to be overcome.

11.43 materials: general

EFFLORESCENCE

Efflorescence and Staining of Brickwork. B. Butterworth. (The Brick Bulletin, Vol. 3, No. 5.)

An eight-page article on an old, but very tiresome nuisance. This is about as good a description of the whole subject as can be found anywhere. The nature and appearance of efflorescence is well described and there follow notes on the origin of the salts, salts in the bricks, salts in mortars and descriptions of tests for liability to efflorescence. There is an interesting page or so on why efflorescence is a baffling problem and finally useful notes on prevention and treatment. It is worth noting that the author states that there is no chemical treatment that can be recommended to neutralize or destroy efflorescence and that surface treatments aimed at suppressing evaporation, are more likely to be harmful than otherwise. This is an authoritative statement which should be accepted in preference to the various curious remedies which are still apt to be confidently recommended by the "practical man on the site."

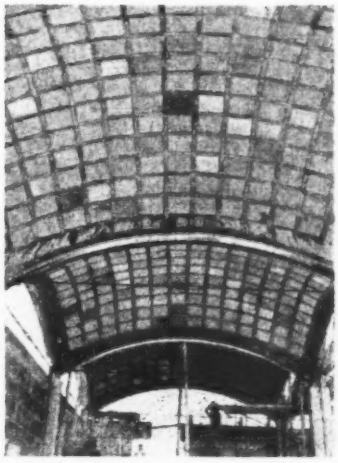
technical section

SITE PRECASTING OF SMALL SQUARE DOMES

Twelve 24-*ft. square shell concrete "domes" have been used to roof a super-market at New Canaan, Connecticut. The photographs on this page and on page* 441 *show how the shells were precast on the site and lifted into place by cranes. The geometrical layout of each shell consists of an arc of* 24-*ft. span and* 3-*ft.* 3-*in. rise translated over an identical arc at right angles to it. The resultant surface is not part of the surface of a sphere, and is far easier to shutter. Casting was carried out in freezing weather, and a portable shelter was constructed over the casting area (below).* 16-*in. square slabs of fibrous insulation,* $2\frac{1}{2}$ *in.*

technical section

SITE PRECASTING OF SMALL SQUARE DOMES continued



thick, formed permanent shuttering for part of the shell; the 3-in. wide ribs left between these slabs are not structurally necessary, but are a convenient solution to the problem of fitting square slabs into a doubly curved surface. The shells themselves are 1½ in. thick and are reinforced with 2-in. square steel mesh with additional bar reinforcement across the corners. Boundary stresses are taken by arches cast in with the shell, 6 in. wide and varying in depth from 1 ft. at the crown to 1 ft. 6 in. at their ends. The thrust of these arches was resisted by temporary tie rods until the shells were placed in position when use was made of permanent tie rods attached to the columns. The shells were originally scheduled to be lifted by one crane, but two were found to give greater control (above left). The weight of each shell is 13½ tons. The underside of each shell is left undecorated (top right); the top surface is weatherproofed with three coats of acrylic plastic paint. Drainage is arranged down the centre of each column. A gap has been left between adjacent shells to emphasise their structural independence (above right). This is bridged with corrugated resin-bonded glass fibre sheeting.

technical section

22 SOUND INSULATION AND ACOUSTICS

sound insulation of office partitions

The increase in traffic, the use of noisy office machines and the development of lightweight curtain walls and demountable partitions, have all made the problem of noise in offices immeasurably more acute. This week the JOURNAL's Specialist Editor (13) for Sound Insulation and Acoustics provides a means of assessing the amount of noise which will come into an office from the street, the influence this will exert on the passage of noise within the office building, the insulation values which must be realised by partitions to produce reasonable quiet, and how to realise them.

The division of lettable office space by dry construction, and possibly demountable partitions, is becoming increasingly common. This practice has been known to lead to dissatisfaction in a number of cases because the sound insulation provided has not been adequate. There seems to be little realization that because a demountable office partition may provide a perfectly acceptable wall between two offices in one set of circumstances it will not necessarily be satisfactory in other circumstances.

One of the purposes of a partition is to provide a certain degree of privacy and freedom from noise interference for the occupants of the room. Now if it is possible for the occupants of a room to hear and understand a person talking in the adjoining office he will obviously not feel that he is enjoying any great degree of privacy, because he realizes that his voice carries just as well in the opposite direction. However, it is not usually necessary to provide such good insulation that nothing at all can be heard through the wall. It may be necessary merely to ensure that anything heard is unintelligible. Whether weak speech sounds are intelligible or not, or indeed whether they are heard at all or not, depends *very much* on the amount of background noise present at the listening location. Background noise can mean either traffic noise from outside the building, or noise made by the occupants of the office (typing, phoning, etc.) or both. The amount of background noise will, of course, vary from site to site, and even from one time of day to another. Moreover, that part of the noise which is caused by traffic will be considerably affected by temperature and climatic conditions in that windows will be opened or closed as these conditions vary.

When the background noise is high, sounds coming from the adjoining rooms are not so easily heard or understood. Therefore a certain partition which provides adequate sound insulation when the windows on to a busy street are open, or during the traffic rush hour, may well be inadequate when the windows are closed, or when traffic is reduced late in the evening. Similarly, a partition may be quite satisfactory on the side of a building facing a street, whereas on the other side which may face into a quiet court, the same partition will be inadequate. Broadly, the less the background noise and the less the amount of sound absorbing material (such as carpets, furniture, acoustic tiles, etc.) in the rooms, the higher the actual insulation of the partition must be to attain a given degree of privacy.

It remains for the architect to decide what the minimum requirements are, and to ensure that these are met. There can be little doubt that a maximum degree of insulation is to be most desired. Unfortunately, the cost increases proportionately with the insulation, at any rate for any demountable or dry-built construction. Irrespective of cost (and it is obvious that other factors influence the decision as to whether partitions are chosen in lieu of traditional builders' work walls), it must be remembered that partitions cannot compete in sound insulation with traditional plastered masonry walls. The reason for this is principally that the traditional constructions weigh far more than any practical demountable partition system and the insulation of a wall is directly proportional to its weight.

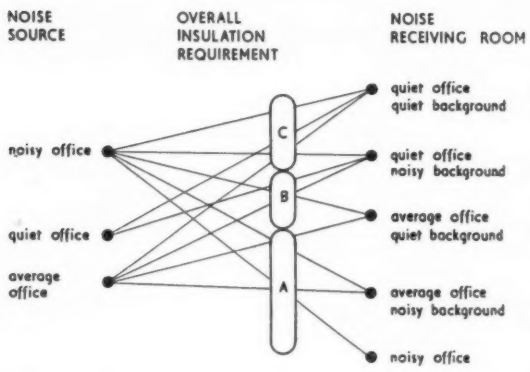
The following table of average insulation values illustrates this point.

TABLE 1: OBTAINABILITY BY DEMOUNTABLE PARTITIONS OF SOUND INSULATION VALUES GIVEN BY HEAVY CONSTRUCTION

Construction	*Average sound insulation* (100-3200 c/s) *dB*	*Demountable unit partitions*
9-in. brickwork—plastered	50	—
4½-in. ,, ,,	45	Probably impracticable
3-in. clinker block plastered both sides	40	
2-in. clinker or 2½-in. hollow clay block, plastered both sides	35	Probable upper limit of a well designed system
Lath and plaster (3 coat) both sides 4-in. studs		
⅜-in. plasterboard with skim coat on both sides of 4-in. studs	30	
⅜-in. plasterboard with skim coat of plaster on one side of timber	25	Average value for glazed units
½-in. insulating board on one or both sides of timber studs	20	

To determine the required sound insulation between two rooms, one may estimate the degree of privacy *normally* expected and relate this to the background

technical section



KEY TO INSULATION REQUIREMENT
A Not less than 20 dB.
B. Not less than 30 dB.
C. Not less than 40 dB, demountable partitions not suitable.
DEFINITIONS
Quiet office: accommodation for executive or administrative purposes needing high degree of privacy including board rooms, interview rooms or rooms for senior personnel.
Average office: accommodation for general clerical staff, equipped with typewriters and for a few of the quieter types of accounting machine.
Noisy office: accommodation for typists' pools or rooms for large numbers of accounting, addressograph machines, etc., etc. An acoustic ceiling should always be used in these rooms.
Background noise conditions: quiet refers to rural, suburban or city sites well away from traffic. Noisy refers to city sites where offices face on to busy streets.

Fig. 1. Sound insulation nomogram

noise conditions in nomogram, Fig. 1, the use of which is self explanatory. It will be seen that for a number of purposes, *e.g.* when the source of sound is an average office and the "receiving room" is a quiet office on a quiet site, demountable partitions are *unsuitable* because they cannot provide the required average insulation of 40 dB. However, for a number of other cases, partitions can confidently be used.

Factors which influence background noise

It has been shown that the background noise affects the degree of insulation necessary to obtain subjective privacy, and that the insulation required will be less when the background noise is high. Traffic noise penetrating into the building is, from this point of view, an advantage, but it is obvious that it can also cause considerable distraction and annoyance. There is evidence to show that a certain amount of noise is tolerable, but it remains to decide what this amount is and whether the architect can bring it under control by appropriate design. The factors which affect the noise are the actual noise level in the street and the overall insulation provided by the wall (including windows) facing on to the street. When offices do not face on to busy streets (defined as those with continous traffic, *i.e.* there are usually several vehicles passing at one time) but on to either a quiet street, square or close, or an internal well or garden, then the noise levels are not usually sufficient inside offices even when windows are open either to cause annoyance or to increase the effective insulation of partitions. When offices face on to busy streets it is assessed that intolerable disturbance from traffic noise will be general in most offices, particularly "quiet offices" (see Fig. 1) when windows are open, and the distance from the curb to the face of the building is anything less than about 150 feet (if the windows are in a wall at right angles to the street this distance can be halved). This distance requirement will very often not be met and either the worst case, that is a building directly on the back line of the footpath, say only 15 ft. from the curb, or some intermediate condition will more often apply. The overall insulation of a wall with windows is very largely controlled by the insulation of the windows. This in turn, depends on:

(*a*) whether the windows have opening lights, because even though they are closed, there is a considerable loss of insulation due to the residual cracks.

(*b*) the weight of the glass *if* they are sealed fixed lights.

(*c*) whether they are double or single.

As a broad general guide (it is difficult to be more precise without entering into very great detail) the table, page 445, can be used to determine the noise ratings. The building is about 15 feet from a busy road as defined above, and the offices face on to the street. It is assumed that the specified windows comprise 50 per cent., or more, of the total wall area. The remainder of the area is assumed to have an insulation of not less than 45 dB. The broad specification of the windows is as follows:

(*A*) Single windows in wood or metal frames, glazed with up to 32-oz. glass and with some well-fitting opening lights, closed.

(*B*) Single windows as above but without opening lights, all glass sealed into frames.

(*C*) Single windows as above but ¼-in. plate glass all fixed and sealed.

(*D*) Double windows in wood or metal frames, glazed with up to 32-oz. glass, space between glass not less than 8 inches, some well-fitting opening lights, sound absorbents in the reveals between the windows.

(*E*) Double windows all as above but with all fixed lights in outer window and well-fitting and properly sealed opening lights in inner window—openable for cleaning purposes only.

It will be noted that no mention has been made of "noisy" offices as defined in Fig. 1. This is because the noise generated by the operations in these offices

technical section

can usually be relied upon to " drown " any incoming traffic noise, which thus becomes unimportant.
If the window area is considerably less than one-half of the total wall area (for example, only one-quarter)

TABLE 2: CONDITIONS PROVIDED IN AVERAGE AND QUIET OFFICES FACING ON TO BUSY STREET BY FIVE WINDOW TYPES

Office type	*Window type*	*Traffic noise rating in office*	*Background noise rating for partition insulation assessment*
Average	A	Unsatisfactory	Noisy
	B	Satisfactory	Noisy
	C	,,	Noisy
	D	,,	Quiet
	E	,,	Quiet
Quiet	A	Unsatisfactory	Noisy
	B	,,	Noisy
	C	,,	Noisy
	D	Satisfactory	Noisy
	E	,,	Quiet

then the overall insulation will be somewhat higher and the ratings in the above table might be adjusted one step upwards.
Similarly, if the building is appreciably more than 15 ft. from the road but not as much as 150 ft., a similar adjustment of the ratings may be allowable.

Factors which influence insulation of partitions

Although the sound insulation of typical partitions can be shown in Table I (page 442), a warning must be given about factors which may reduce the actual insulation far below the values quoted. The values given refer to an entire partition, of average size, without doors or other areas of lower insulation value (such as that where a continuous radiator or pipe casing passes through a partition).
It is essential to remember that the higher the sound insulation performance of a partition, the more important it becomes to ensure the absence of sound leakage. For example, take a partition of about 16 ft. length by 9 ft. high and assume that it is built in the normal way with one end against a plastered wall, the top against a plastered beam or concrete ceiling and resting on a wood block floor. The typical unevenness of these abutting surfaces may give a crack at the junction of an average of $\frac{1}{32}$-in. wide. That is to say it will be nothing in some places and may be up to $\frac{1}{16}$-in. or more in others. This is *not* considered to be an exaggeration of the conditions found in practice. Now the calculated overall insulation between two rooms with partitions of average insulation as shown in column A is given in column B, below.

INFLUENCE OF CRACKS ON SOUND INSULATION OF PARTITIONS

A *Average insulation of partition (dB)*	B *Overall insulation allowing for cracks as described (dB)*
20	19·5
25	23·5
30	27·0
35	29·0
40	29·5
45	30·0

It is seen that whereas for partitions of low insulation (20 dB) the cracks made very little difference, as partition insulation goes up the overall value becomes more and more controlled by the leakage through the cracks, and even at 30 dB the loss is quite serious.
Similarly, a normal door (closed) in the same typical partition will reduce the insulation somewhat as follows:

INFLUENCE OF A DOOR ON SOUND INSULATION OF PARTITIONS

A *Average insulation of partition (dB)*	B *Average overall insulation allowing for a door (dB)*
20	19
25	22
30	23·5
35	24·5
40	24·5
45	24·5

The sound insulation requirements quoted above refer, of course, to the overall insulation value (columns B) and if partitions are to give satisfaction for even a minority of the requirements noted, cracks and doors must somehow be avoided.
It is quite obvious from the above that a partition not running to the full height of the room will give little or no sound insulation, and no promise that such a partition will provide appreciable insulation should be made. Such partitions should be regarded as merely space-defining in function.

DOORS: If access is required through a partition between two offices and the insulation must still be made high, as, for example, between a senior executive's office and that of his secretary, the best solution is to provide two doors and a cut-off lobby (see Fig. 2). Two standard hollow core doors with the cracks adequately sealed and in conjunction with the cut-off lobby (or " sound lock ") can be expected to give about 35 dB insulation. The sealing of the cracks can be done by strips of felt, sponge rubber or plastic applied to the door stops, but this is effective only if the door presses hard against this material all round. If the door subsequently warps, this seal is liable to become ineffective. An alternative, which allows for door warping without loss of seal is the conventional springy phosphor bronze draught strip.
The sound lock should be as large, and contain as much sound-absorbent material as possible. An absor-

technical section

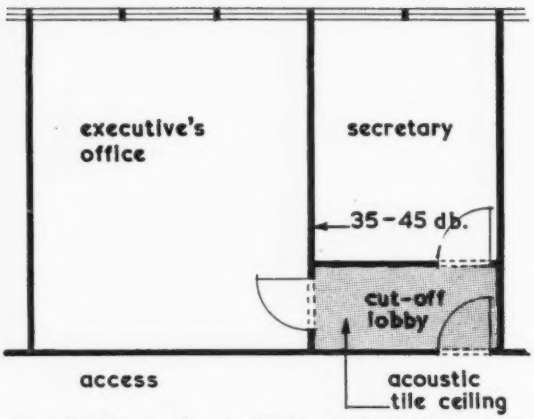
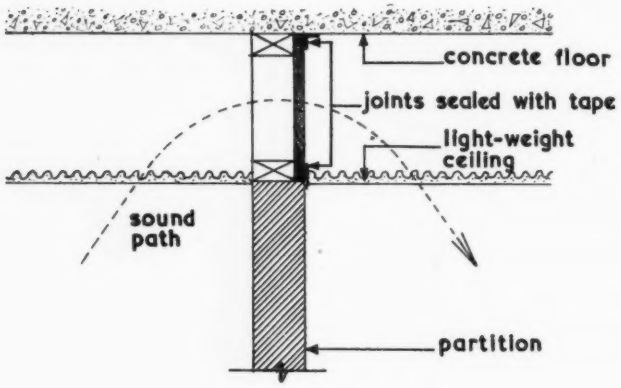


Fig. 2. The use of a cut-off lobby to obtain sufficient sound insulation where this is critical.

bent ceiling is essential and the floor can be carpeted with advantage.

If this arrangement is not possible, then a single 2-in. thick solid timber door with a good seal round the insulation edges will just give 30 dB insulation, and therefore will bring about no appreciable reduction in sound insulation of most demountable partitions.

Fig. 3. The sound stop above a partition in a suspended ceiling.



CEILINGS: Another source of sound leakage leading to severe loss of overall insulation between offices is the path over the top of partitions where they are taken up to suspended ceilings. The degree of loss depends, of course, on the type of ceiling and partition. Again, it is the partitions of higher insulation (25 and 30 dB) which are most likely to be affected. If the ceiling is a traditional lath and plaster one, there will be no appreciable loss of insulation because the two thicknesses of plaster through which the sound must travel to pass over the partition have a total weight of at least 10 lb. per sq. ft. and a total insulation at least as great as that of the partition.

When a lightweight insulation board (or acoustic tile) ceiling, or even more when a perforated plate and rock wool ceiling, such as certain metal tiles, or heated ceilings are used, then a loss of insulation will occur unless either the partition is extended up through the ceiling to the underside of the concrete slab or a special "sound stop" is erected above the ceiling on the line of the partition (see Fig. 3). The degree of loss likely is well illustrated by the following actual measurement. The partition consisted of demountable panels without glazing, and the ceiling was a heated perforated metal one.

	Overall insulation	
	No sound stop above ceiling	*With sound stop above ceiling*
100–3,200 c/s	18 dB	27 dB

The same kind of loss can occur where partitions abut on to continuous radiator or pipe casings at outer walls.

The "sound stop" need not, in fact, be constructed exactly as the partition because although the insulation through the ceiling is not as high as through the partition, nevertheless it has some value. A single layer of plaster board on some form of framework is usually sufficient provided joints are sealed either with tape or by stopping with a plastic material.

When an office floor with a continuous suspended ceiling of low insulation is designed for subsequent division, or there is the possibility of partitions being erected in any of a number of different positions, it would seem essential to build in sound stops at all these positions above the ceiling, if reasonably high insulation between offices is to be attained.

The Architects' Journal Library of Information Sheets 637. Editor: Cotterell Butler, A.R.I.B.A.

ARTIFICIAL LIGHTING CALCULATIONS: THE LUMEN METHOD: 1

This Sheet describes the lumen method of calculation for artificial lighting installations and *must* be read in conjunction with Sheets 34.B2 and 34.B3.

General

The main function of many artificial lighting installations is to provide a maintained general level of illumination. The level required for any particular room interior will depend upon its purpose, or, more precisely, the intricacy of the visual tasks to be carried out by its occupants. The Code of the Illuminating Engineering Society gives a comprehensive list of suitable levels for different types of buildings, occupations and special activities. The most frequently used method of calculation for designing such general lighting installations is that known as the lumen method. This gives sufficiently accurate results for most circumstances with the use of tables and a relatively simple formula. It has been derived from the results of research by Harrison and Anderson in the U.S.A., who found experimentally the relationship between the distribution of light from different types of light fitting, their mounting height and the size and shape of room interiors.

The basic idea behind the lumen method is that the light given off by the lamps will be distributed evenly over the working plane. This can be expressed in the form:

$$\frac{\text{lumens given off by the lamps}}{\text{area of working plane in sq. ft.}} = \text{illumination level in lumens per sq. ft.}$$

or as a formula: $\frac{L}{A} = I$

Coefficient of Utilisation

In actual practice only a proportion of the light emitted by the lamps will reach the working plane. Some will be absorbed by the fittings and also by the surfaces of the room interior, depending upon their size, shape and reflection factors. In this and Sheet 34.B2, tables are provided whereby the proportion of light given off by the lamps which actually reaches the working plane can be determined for a wide variety of fittings and interiors. This proportion, expressed as a ratio of the total light output of the lamps, is known as the coefficient of utilisation. This coefficient U, which will be always less than 1·0, can be inserted in the original formula so that it reads:

$$I = \frac{L \times U}{A}$$

The tables provided on these Sheets allow the coefficient of utilisation for any particular interior, and for most significant types of fitting, to be read off in two simple steps.

Step 1: The room index should be found from Table 1. Where the precise dimensions of a particular interior are not given, the nearest dimension should be taken. Where one or more dimensions of the interior are larger than those given in the table, all three, width, length and height, should be divided by a common factor such as 2 or 5, to reduce them to those given in the table. Where there is doubt as to which category the installation fits into, the classification in Table 2 (given on Sheet 34.B2) should be consulted.

Step 2: The appropriate type of fitting should be selected in Table 2, and the coefficient of utilisation read off from the room index and the reflection factors of the interior. Reflection factors should be average: for instance, in estimating for the walls, allowance should be made for dark fittings and windows (unless they are to be covered by light curtains or blinds). For simplicity, the reflection factor of the floor has been omitted from Table 2, and is assumed to be approximately 12 per cent. Darker floors will reduce the level of illumination, but this will not be significant within the accuracy of this method of calculation. Lighter floors, however, will increase the level of illumination, and an allowance of 10 per cent. may be made where their reflection factor is 40 per cent. or more.

TABLE 1. ROOM INDEXES

Direct*		Mounting height of fittings above working plane													
Indirect†		Ceiling height above working plane													
Room width	Room length	4′ 0″	5′ 0″	6′ 0″	7′ 0″	8′ 0″	10′ 0″	12′ 0″	14′ 0″	16′ 0″	20′ 0″	24′ 0″	30′ 0″	40′ 0″	50′ 0″	60′ 0″
6′ 8″	10′ 0″	C	B	A	A											
	13′ 4″	C	B	B	A											
	16′ 8″	C	C	B	A	A										
	20′ 0″	D	C	B	B	A										
	23′ 4″	D	C	B	B	A										
	30′ 0″	D	C	C	B	A	A									
	40′ 0″	E	D	C	B	B	A									
10′ 0″	10′ 0″	D	C	B	A											
	13′ 4″	E	D	C	B	A										
	16′ 8″	E	D	C	B	B	A									
	20′ 0″	E	D	C	B	B	A									
	23′ 4″	F	E	D	C	B	B	A								
	30′ 0″	F	E	D	C	B	B	A								
	40′ 0″	F	E	E	D	C	B	A	A							
	50′ 0″	F	E	E	D	C	B	B	A							

34.B1 ARTIFICIAL LIGHTING CALCULATIONS: THE LUMEN METHOD: 1

TABLE 1. ROOM INDEXES (*continued*)

Direct*		Mounting height of fittings above working plane														
Indirect†		Ceiling height above working plane														
Room width	Room length	4′ 0″	5′ 0″	6′ 0″	7′ 0″	8′ 0″	10′ 0″	12′ 0″	14′ 0″	16′ 0″	20′ 0″	24′ 0″	30′ 0″	40′ 0″	50′ 0″	60′ 0″
13′ 4″	13′ 4″ 16′ 8″ 20′ 0″ 23′ 4″ 30′ 0″ 40′ 0″ 50′ 0″ 60′ 0″ 80′ 0″ 100′ 0″	E F F G G G G H H	D E E F F F G G	C D D E E F F F F	C C D D E E E E E	B C C C D D D E E	A B B C C C D D	A A A B B B B C C	A A A B B B B B	A A B B	A A					
16′ 8″	16′ 8″ 20′ 0″ 23′ 4″ 30′ 0″ 40′ 0″ 50′ 0″ 60′ 0″ 80′ 0″ 100′ 0″	F G G H H H H H H	E F F G G G G H	E E F F F F F G	D D E E F F F F F	C D D E E E E E F	B C C D D D D E E	A B B C C C D D D	A A A B B C C C D	A B B B B	A A A A B	A A A				
20′ 0″	20′ 0″ 23′ 4″ 30′ 0″ 40′ 0″ 50′ 0″ 60′ 0″ 80′ 0″ 100′ 0″ 120′ 0″	G G H H H H H H H	F F G G G G G G G	E E F F F G G G G	E E E F F F F F F	D D E E F F F F F	C C D E E E E E E	B B C C D D D E E	A B B C C D D D D	A A A B B B C C C	A A A B B B B	A A B	A			
23′ 4″	23′ 4″ 30′ 0″ 40′ 0″ 50′ 0″ 60′ 0″ 80′ 0″ 100′ 0″ 120′ 0″	H H H H H H H H	G G H H H H H H	F F G G G G G G	E E F F F F F F	E E E F F F F F	D D E E E F F F	C C D D E E E E	B B C C D D E E	B B B C C D D	A A B B B B C	A A A A A B B	A A			
30′ 0″	30′ 0″ 40′ 0″ 50′ 0″ 60′ 0″ 80′ 0″ 100′ 0″ 120′ 0″ 150′ 0″	I I I I I I I I	H H H H H H H H	G G H H H H H H	F G G G H H H H	F F G G G G G G	E E F F F F F F	D E E E F F F F	C D D D E E E E	C C C D E E	B C C C C D D	A B B B B B C C	A A A A A B B	A A		
40′ 0″	40′ 0″ 50′ 0″ 60′ 0″ 80′ 0″ 100′ 0″ 120′ 0″ 150′ 0″	J J J J J J J	I I I I I I I	H I I I I I I	H H H H H H H	G H H H H H H	F F G G G G G	E E F F F G G	E E E F F F F	D D E E F F	C C D D E E	B B C C D D D	A B B B C C C	A A A A A B	A A A	
50′ 0″	50′ 0″ 60′ 0″ 80′ 0″ 100′ 0″ 120′ 0″ 150′ 0″	J J J J J J	J J J J J J	I I I I I I	I I I I I I	H H H H H H	G G H H H H	F F G G G G	F F F G G G	E E F F F	D D E E E F	C C D D E E	B B C C D D	A A B B B B	A A A A A A	
60′ 0″	60′ 0″ 80′ 0″ 100′ 0″ 120′ 0″ 150′ 0″ 200′ 0″	J J J J J J	J J J J J J	J J J J J J	I J J J J J	I I I I I I	H H H H H H	G G H H H H	F G G G H H	F F F G G	E E E F F F	D E E E E F	C C D D D E	B B C C C C	A A B B B B	A A A A
80′ 0″	80′ 0″ 100′ 0″ 150′ 0″ 200′ 0″	J J J J	J J J J	J J J J	J J J J	J J J J	I I I I	H I I I	H H H H	G H H H	F F G G	E F F F	D E E E	C C D D	B B C C	A A B B
100′ 0″	100′ 0″ 150′ 0″ 200′ 0″	J J J	J J J	J J J	J J J	J J J	J J J	I I I	I I I	H H H	G H H	F G G	E F F	D E E	C D D	B C C

* Installations which are direct, principally direct or generally diffusing.
† Installations which are indirect or principally indirect.

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ARTIFICIAL LIGHTING CALCULATIONS: THE LUMEN METHOD: 2

This Sheet is a continuation of Sheet 34.B1 and *must* be read in conjunction with it and Sheet 34.B3. The three Sheets describe the lumen method of calculation for artificial lighting installations.

Maintenance Factor

Apart from the factors already mentioned on Sheet 34.B1 which will influence the level of illumination given by any installation, some allowance must be made for the loss of light through the deposit of dirt and dust on the lamps and fittings in the course of time. It may often be difficult to assess how thoroughly and often they are going to be cleaned when the building is occupied, and therefore the choice of a suitable maintenance factor is usually a matter of common sense and experience. Typical maintenance factors (which, like the coefficient of utilisation, are always less than 1·0) are given as follows:

Good: clean atmosphere, perhaps with filtered air, frequent cleaning of accessible fittings, M (maintenance factor) = 0·9.

Average: normal clean atmosphere, fittings reasonably accessible, cleaning about every 3 months, M=0·8.

Poor: dirty atmosphere, infrequent cleaning, fittings rather inaccessible, M = 0·7 or less.

This factor can be inserted in the formula so that it becomes:

$$I = \frac{L \times U \times M}{A}$$

where I = level of illumination in lumens per sq. ft.
L = light output of lamps in lumens
U = coefficient of utilisation
M = maintenance factor
A = area of the working plane in sq. ft.

This is the basic formula for the lumen method.

Lumens per Lamp

It is important that the figure chosen for the lumen output of the lamps selected for the installation should be the average maintained throughout their life. These are given in Table 4 on Sheet 34.B3. The initial output may be anything from 10 per cent. to 20 per cent. higher, depending on the type of lamp. It is important to realise in addition that this average output may be altered in practice by other factors besides that of the ageing of the lamps. Fluorescent tubes, for instance, give off less light at high temperatures, and this factor must be studied in designing installations associated with ceiling heating systems. Again, tungsten lamps will give off considerably less light with only a slight drop in the voltage of the supply. It is important, therefore, to see that tungsten lamps used are correctly rated for the supply.

Evenness of Illumination

The levels given by the lumen method are average and the fittings should be suitably spaced to ensure even illumination. The maximum desirable spacing expressed as a ratio of the mounting height is given against the typical fittings in Table 2. Where, for small rooms, the result of the calculation shows that only one or two fittings are required, the method may not give a reliable indication of the levels actually achieved, because of uneven distribution. The method assumes that the interior is unobstructed above the working plane. Where, in fact, there are obstructions, such as big factory machines or tall library shelves, it is advisable to take the index of a small room from Table 1 on Sheet 34.B1, to allow for the consequent loss of light.

Application in Practice

Probably the most common problem in practice is finding the number of fittings required. This may be carried out as follows:

1. Knowing the purpose for which the room interior is to be used, the general level of illumination required is found (I = lumens per sq. ft.) from Table 4 on Sheet 34.B3.
2. The type of fitting is selected, and the size and type of lamp and the average maintained output of the lamps (l = lumens per lamp) is found from Table 3.
3. The coefficient of utilisation (U) is found from Tables 1 and 2.
4. A suitable maintenance factor (M) is selected.
5. The figures determined are then inserted in the following formula to find the number of fittings required (N), where A is the area of the working plane in sq. ft.

$$I = \frac{l \times N \times U \times M}{A}$$

or

$$N = \frac{I \times A}{l \times U \times M}$$

If the number of fittings is known and it is required to find the lumen output of lamps, then the following formula may be used.

$$l = \frac{I \times A}{N \times U \times M}$$

The formula can, of course, be adjusted for different purposes, as required.

Further Information

The lumen method can, after brief experience, be conveniently and rapidly used for calculating artificial lighting installations. It must be emphasised, however, that there are other factors which determine good lighting design, particularly the need for avoiding uncomfortable glare. These factors are discussed in the Code of the Illuminating Engineering Society, and also in BRS Digests Nos. 70 and 81.

34.B2 ARTIFICIAL LIGHTING CALCULATIONS: THE LUMEN METHOD: 2

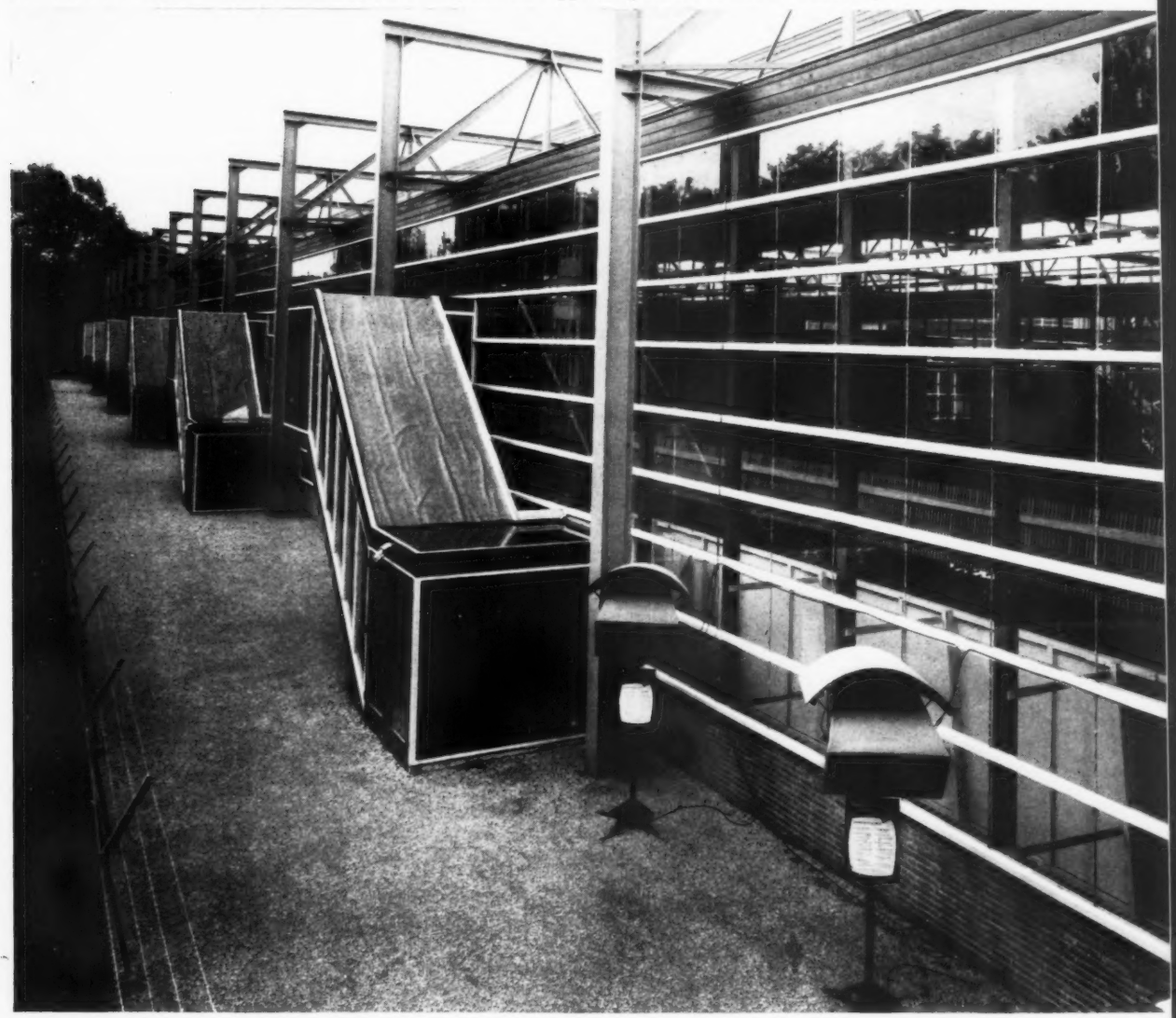
TABLE 2. COEFFICIENTS OF UTILISATION

Classification of Installation	Light Distribution		Average Reflection Factors									Typical Fittings	Preferred maximum spacing as ratio of mounting height above working plane
			Ceiling	70%			50%			30%			
			Walls	50%	30%	10%	50%	30%	10%	30%	10%		
	Down	Up	Room Index										
Direct	70%	—	A	0·33	0·28	0·25	0·32	0·28	0·24	0·27	0·24	*a* Industrial trough reflector fluorescent (single lamp)	1·4
			B	0·41	0·36	0·33	0·40	0·36	0·33	0·36	0·33		
			C	0·44	0·40	0·38	0·43	0·41	0·38	0·40	0·38		
			D	0·47	0·44	0·42	0·46	0·44	0·41	0·43	0·41		
			E	0·50	0·47	0·45	0·49	0·46	0·44	0·46	0·44	*b* Dispersive reflector tungsten, sodium and mercury	1·4
			F	0·54	0·51	0·49	0·53	0·50	0·48	0·48	0·48		
			G	0·58	0·55	0·52	0·57	0·55	0·53	0·54	0·53		
			H	0·60	0·58	0·55	0·59	0·57	0·55	0·56	0·55		
			I	0·62	0·60	0·58	0·61	0·60	0·57	0·58	0·57		
			J	0·64	0·61	0·60	0·63	0·61	0·60	0·60	0·59		
Direct	60%	—	A	0·29	0·25	0·21	0·29	0·25	0·21	0·24	0·21	*a* Industrial trough reflector fluorescent (twin lamp)	1·4
			B	0·35	0·31	0·29	0·35	0·32	0·29	0·32	0·30		
			C	0·38	0·35	0·34	0·38	0·35	0·33	0·35	0·33		
			D	0·41	0·38	0·37	0·41	0·38	0·36	0·38	0·36		
			E	0·44	0·41	0·40	0·44	0·41	0·39	0·41	0·39	*b* High bay and concentrating reflectors, tungsten, sodium and mercury	1·0
			F	0·47	0·44	0·43	0·47	0·44	0·42	0·44	0·42		
			G	0·50	0·47	0·46	0·50	0·47	0·45	0·47	0·45		
			H	0·52	0·50	0·49	0·52	0·50	0·48	0·50	0·48		
			I	0·55	0·53	0·51	0·54	0·52	0·50	0·53	0·51		
			J	0·57	0·55	0·53	0·56	0·54	0·52	0·54	0·52	*c* recessed louvred fluorescent (single lamp)	1·2
Direct	50%	—	A	0·29	0·27	0·26	0·28	0·27	0·26	0·27	0·26	*a* recessed louvred fluorescent (twin lamp)	1·2
			B	0·34	0·33	0·32	0·33	0·32	0·31	0·31	0·31		
			C	0·37	0·36	0·36	0·36	0·35	0·35	0·35	0·34		
			D	0·39	0·39	0·38	0·38	0·37	0·37	0·37	0·36		
			E	0·41	0·40	0·39	0·40	0·39	0·38	0·39	0·38		
			F	0·43	0·42	0·41	0·42	0·41	0·40	0·41	0·40		
			G	0·45	0·44	0·43	0·44	0·43	0·42	0·43	0·42	*b* recessed louvred tungsten	1·0
			H	0·46	0·45	0·44	0·45	0·44	0·43	0·43	0·42		
			I	0·47	0·46	0·45	0·46	0·45	0·44	0·44	0·43		
			J	0·48	0·47	0·46	0·47	0·46	0·45	0·44	0·43		
Semi-direct	55%	15%	A	0·28	0·24	0·22	0·26	0·23	0·21	0·23	0·20	*a* fluorescent, open top, diffusing sides, louvred bottom	1·2
			B	0·33	0·30	0·28	0·33	0·29	0·28	0·29	0·27		
			C	0·37	0·34	0·32	0·36	0·33	0·31	0·32	0·30		
			D	0·40	0·37	0·34	0·38	0·35	0·33	0·34	0·33		
			E	0·43	0·40	0·37	0·40	0·37	0·35	0·37	0·35		
			F	0·46	0·44	0·41	0·43	0·41	0·39	0·39	0·37		
			G	0·50	0·46	0·44	0·47	0·44	0·42	0·40	0·41	*b* tungsten, open top, diffusing sides, louvred bottom	1·2
			H	0·52	0·49	0·46	0·48	0·46	0·44	0·42	0·42		
			I	0·54	0·51	0·49	0·50	0·48	0·46	0·45	0·44		
			J	0·56	0·53	0·51	0·52	0·49	0·47	0·47	0·45		
Semi-direct	60%	25%	A	0·29	0·23	0·19	0·26	0·21	0·19	0·19	0·17	*a* batten fluorescent	1·3
			B	0·36	0·30	0·26	0·33	0·28	0·25	0·26	0·23	*b* tungsten, open top, diffusing sides, open bottom	1·3
			C	0·40	0·34	0·31	0·38	0·33	0·29	0·30	0·26		
			D	0·45	0·39	0·35	0·40	0·37	0·33	0·33	0·30		
			E	0·49	0·43	0·39	0·45	0·40	0·35	0·36	0·33		
			F	0·53	0·48	0·44	0·50	0·45	0·41	0·40	0·37		
			G	0·58	0·52	0·47	0·54	0·49	0·45	0·45	0·41		
			H	0·62	0·57	0·51	0·56	0·51	0·47	0·47	0·44		
			I	0·66	0·61	0·56	0·59	0·54	0·51	0·50	0·49		
			J	0·69	0·64	0·59	0·62	0·59	0·55	0·53	0·51		
Generally diffusing	45%	35%	A	0·24	0·20	0·17	0·21	0·17	0·15	0·16	0·14	tungsten and fluorescent, with lamp enclosed in diffusing envelope	1·3
			B	0·30	0·25	0·22	0·26	0·22	0·19	0·20	0·18		
			C	0·34	0·29	0·25	0·30	0·26	0·23	0·23	0·21		
			D	0·37	0·32	0·29	0·33	0·29	0·26	0·26	0·23		
			E	0·40	0·34	0·32	0·36	0·32	0·29	0·28	0·26		
			F	0·44	0·40	0·36	0·39	0·35	0·32	0·32	0·29		
			G	0·47	0·43	0·39	0·43	0·38	0·35	0·35	0·32		
			H	0·51	0·47	0·42	0·45	0·40	0·37	0·37	0·35		
			I	0·54	0·50	0·46	0·48	0·43	0·40	0·39	0·37		
			J	0·57	0·53	0·49	0·50	0·45	0·43	0·41	0·39		
Indirect	—	40%	A	0·08	0·06	0·05	0·05	0·04	0·03	0·02	0·02	lamps, tungsten or fluorescent, set in coves or cornices, and throwing light on to ceiling only	—
			B	0·10	0·08	0·07	0·07	0·06	0·05	0·03	0·03		
			C	0·12	0·10	0·08	0·08	0·06	0·05	0·04	0·03		
			D	0·14	0·12	0·10	0·09	0·07	0·07	0·05	0·04		
			E	0·15	0·13	0·11	0·10	0·08	0·08	0·05	0·05		
			F	0·16	0·15	0·13	0·11	0·10	0·09	0·06	0·05		
			G	0·18	0·16	0·15	0·12	0·11	0·10	0·07	0·06		
			H	0·19	0·17	0·16	0·13	0·12	0·11	0·07	0·06		
			I	0·21	0·20	0·18	0·14	0·13	0·12	0·08	0·07		
			J	0·23	0·21	0·20	0·15	0·14	0·13	0·09	0·08		
Overall ceiling systems	50%	—	A	0·22	0·19	0·18						*a* fluorescent tubes behind overall metal louvres, 45° cut-off	—
			B	0·25	0·22	0·20						*b* for plastic diffusing louvres increase coefficient by 10%	
			C	0·29	0·25	0·23							
			D	0·31	0·28	0·26							
			E	0·33	0·30	0·28							
			F	0·35	0·32	0·31							
			G	0·37	0·34	0·33							
			H	0·38	0·36	0·35							
			I	0·40	0·37	0·37							
			J	0·41	0·38	0·38							

working detail

WINDOW WALL: EXHIBITION HALL IN ROTTERDAM

J. H. van den Broek and J. B. Bakema, architects (material supplied by R. Watts and R. Padovan)

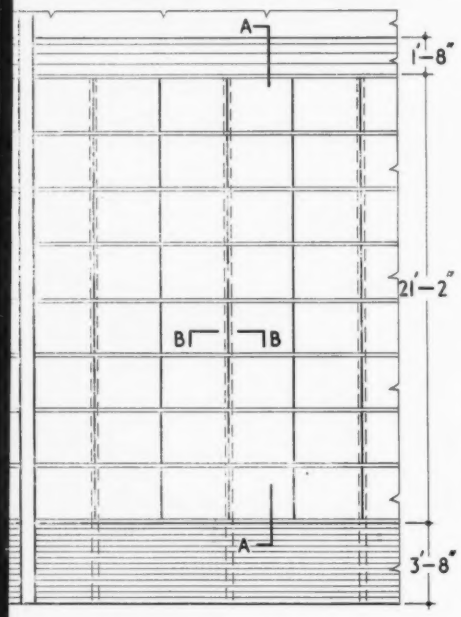


This most ingenious version of a glazed wall effects a complete visual divorce between the mullions, formed by r.s.j's lying some 5 in. behind the glass line, and the transoms which are formed by continuous lines of 4-in. by 3-in. timber stiffened by m.s. angles. The vertical divisions between the sheets of glass are covered by the useful expedient of steel-cored lead cames.

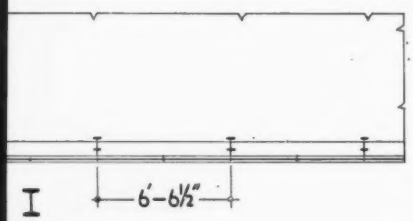
working detail

WINDOW WALL: EXHIBITION HALL IN ROTTERDAM

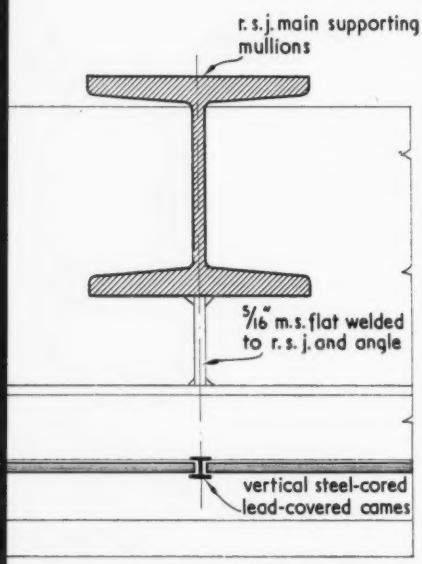
J. H. van den Broek and J. B. Bakema, architects (material supplied by R. Watts and R. Padovan)



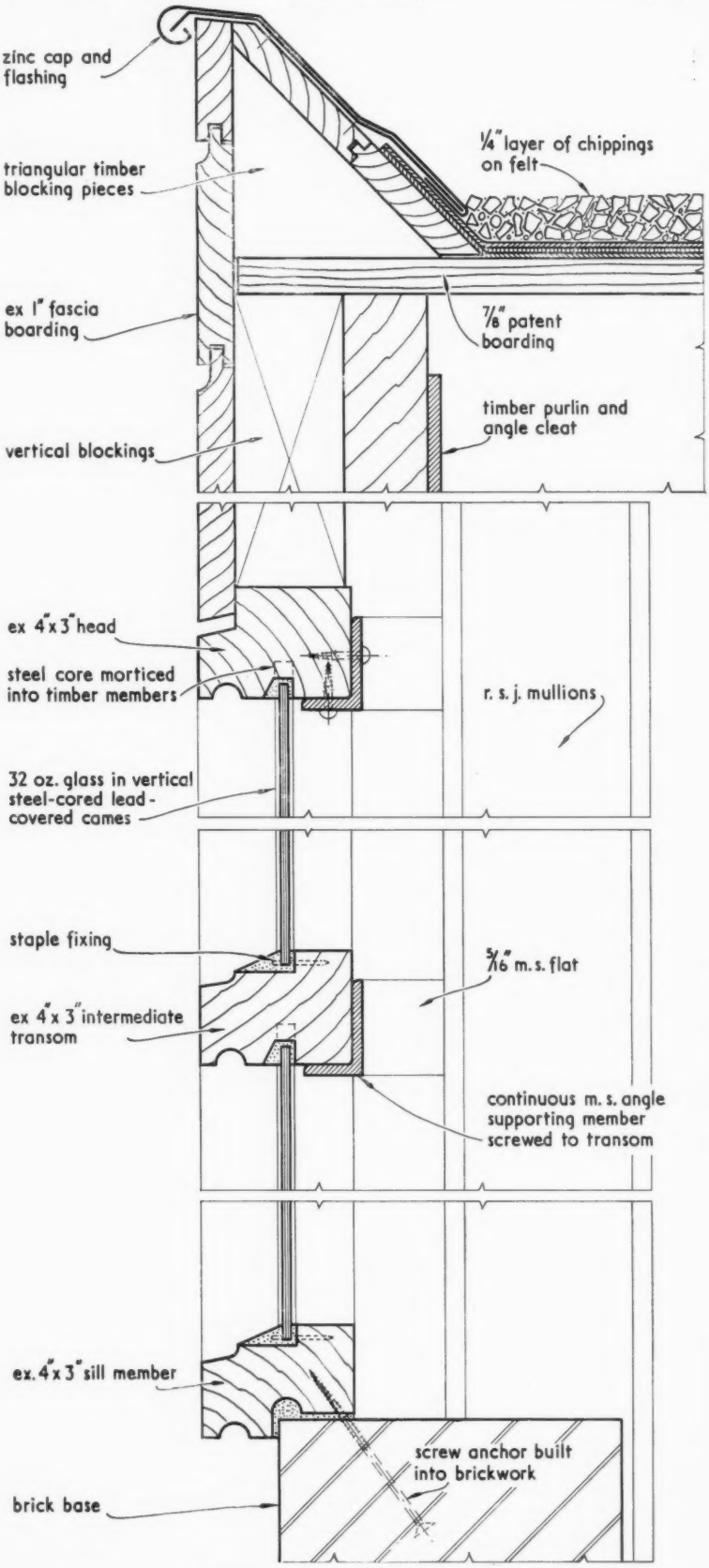
ELEVATION. scale 1/8" = 1'-0"



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



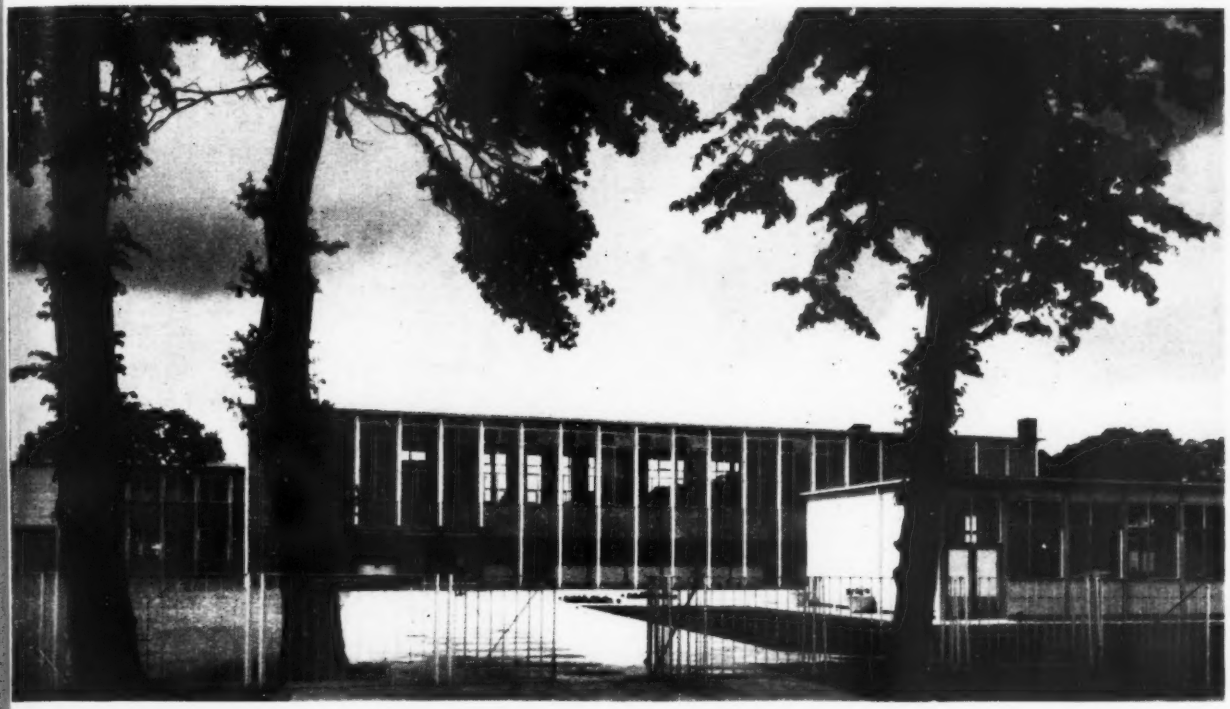
PLAN AT B–B. scale ¼ full size



SECTION A–A. scale ¼ full size

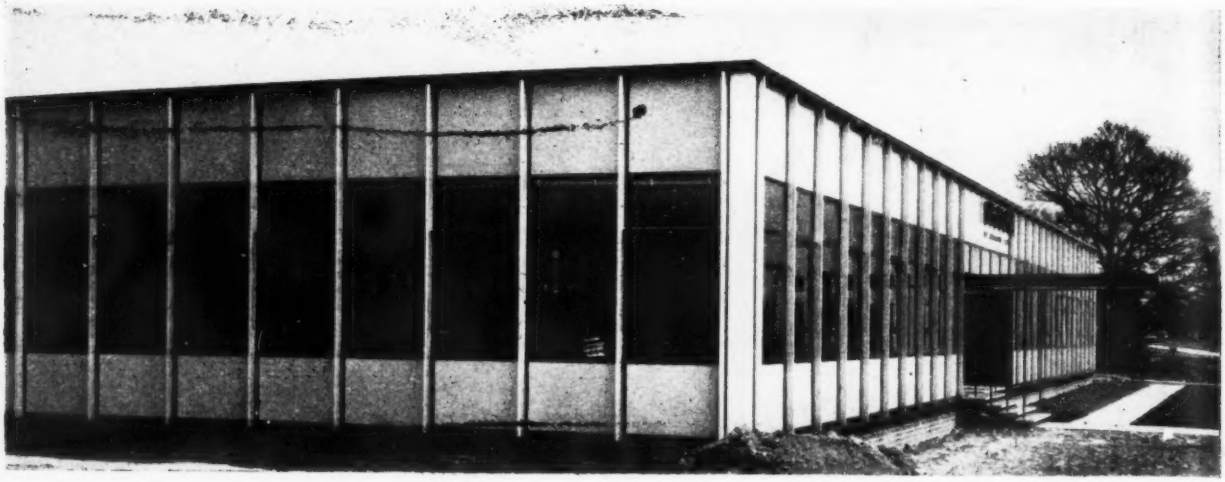
note: figured dimensions in feet and inches are approximate

LANGLEY GRAMMAR SCHOOL, BUCKINGHAMSHIRE



Langley Grammar School, Bucks, is planned so that the central block (assembly hall, cloakroom, dining room and kitchen) can be segregated from the laboratories, classrooms and gymnasium in the wings. It is constructed in the "Intergrid" prestressed concrete system. Architect: F. B. Pooley, Buckinghamshire County Architect, Rex Peadon, assistant county architect, Ken Bartlett, assistant architect. General Contractors, Gilbert-Ash, Ltd.

OFFICE AND WAREHOUSE, CRAWLEY



The front elevation, above, and the rear elevation of a new office and warehouse at Crawley for Upjohn of England Ltd. Architects, Russell Diplock Associates (architect in charge, S. Grabowski), Structural Engineers, R. L. Bourqui and Partners, Quantity Surveyors, C. William O'L. Markham and Partners, General Contractors, John Laing and Son Ltd. The office block provides 14,300 sq. ft. of accommodation in one large open space, with executive offices on the perimeter, and no corridors.

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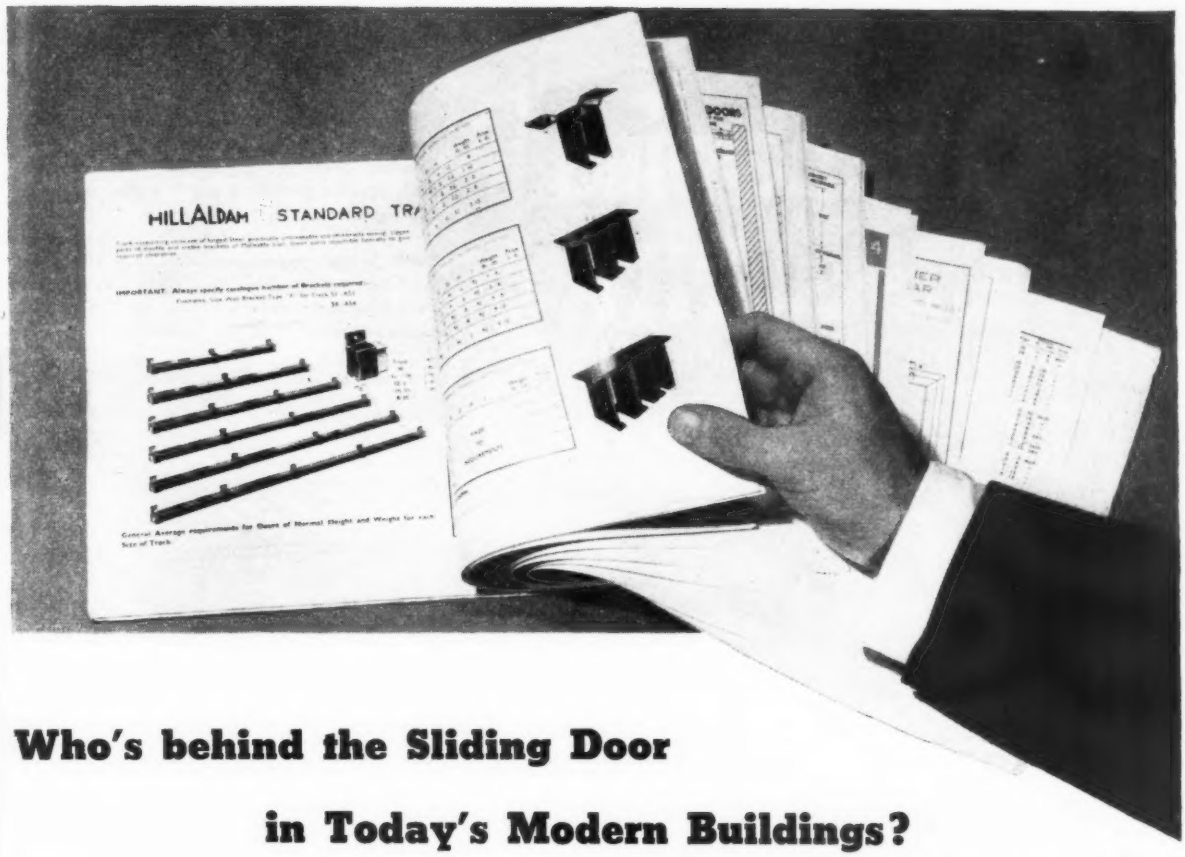

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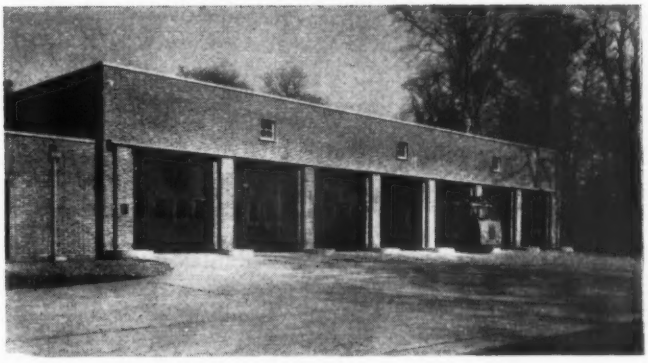
The best way to get inside information about doors that slide is to send for our book. This is no scrawny pamphlet, but a thick and helpful volume. It provides the key to any door problem likely to worry you. It shows joinery and steelwork details, weights to be carried, allowances for adjustments, scale drawings of tracks, trolleys, guides and a host of other useful information.



Above we illustrate part of Reigate Fire Station. Here, where the doors must open smartly at a touch, some seven sets of our QUIKADOR were installed.

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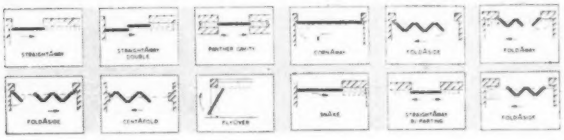
FOR EVERY DOOR THAT SLIDES



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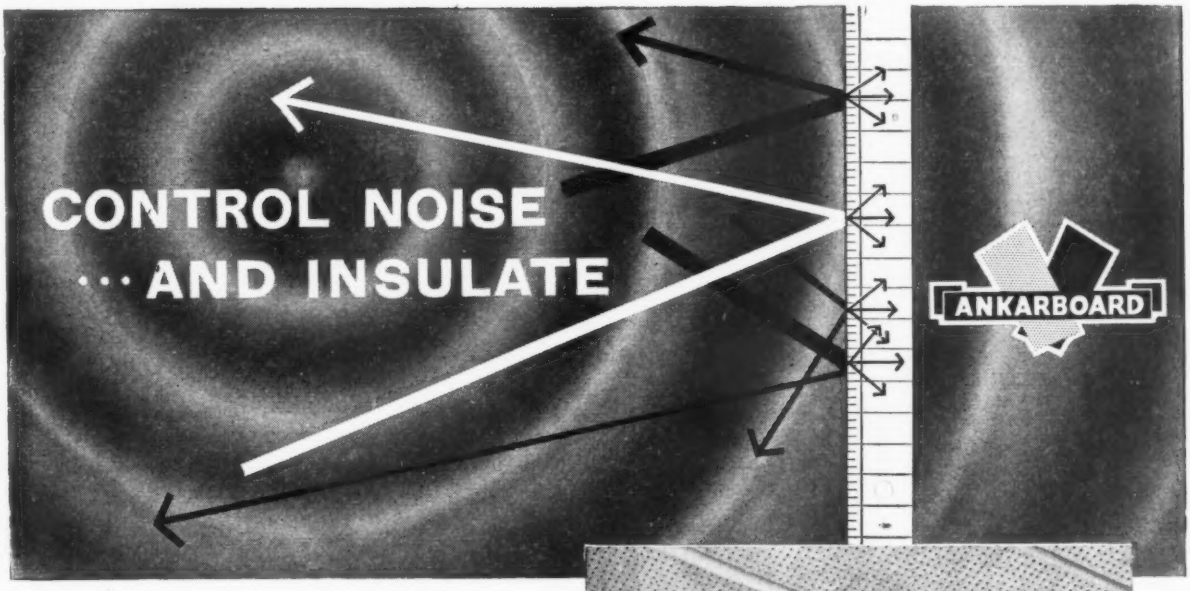

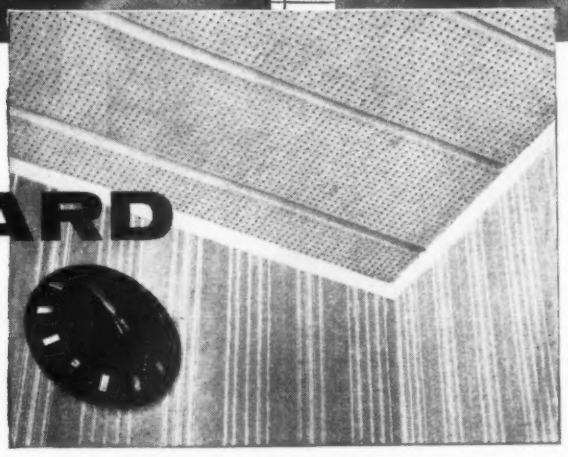

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In the factory, the office or the home, ANKARBOARD baffles noise, improves acoustics—and enhances appearances. The perforated boards are specially prepared with grooved and ship-lapped joints for easy fixing. Can be supplied with a coating of fire retardant Albi-R. for *extra* safety.

ACOUSTIC BOARDS ½″ or ¾″ thick, are available in 12″ or 16″ widths and in lengths up to approx. 16′. (Also available, unperforated, as insulating "longboards").

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PERFORATIONS FOR BOARDS AND TILES 4 m.m. holes at 15 m.m. centres. Depth of holes is arranged for maximum acoustic effect whilst corner holes are bored to half thickness only to ensure a good grip when tiles are screwed or nailed to fixing grounds.

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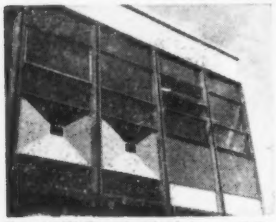
Smee's

Curtain Walls
Roman and Gothic
Shepton Mallet

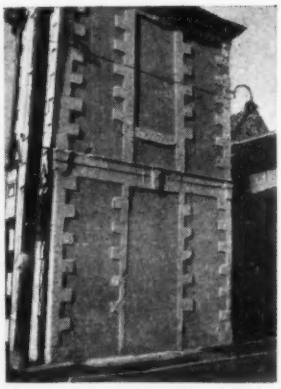
September Architectural Review

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



Curtain Walling detail of the new B E A terminal off Cromwell Road, Kensington.

Brawne will contribute a full scale study of the potentialities and perils, scope, materials and methods of this fully industrialised



House in the lower town Shepton Mallet

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*, and a narrative of the building activities at *Strawberry Hill* of Frances Waldegrave, recounted from original sources by Osbert Wyndham Hewett. September *Townscape* features will deal with *Shepton Mallet*, whose multi-level town-centre will be discussed by Gordon Cullen.

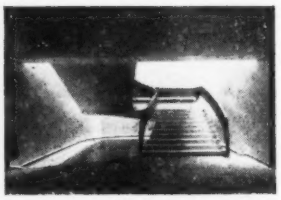
Universities
Staircase
Arcadia

October Architectural Review

Vexed by conflicting interests and lack of comprehension of the issues at stake, the design of *Universities* has become a prob-

3 D shop lettering in Dublin.

lem that excites passion and prejudice, rather than constructive thinking. In the October number of the Review, Professor Pevsner and the Hon. Lionel Brett will attempt to put the problem back on a realistic basis in a special feature covering both the historical growth of *universities* and their present needs, emphasising the diversity of concepts, both in organization and architecture that the term embraces. Two articles in the same issue will deal with problems of architectural lettering; Nicolete Gray contributing a study of *Lettering in Three Dimensions* and *Skill*, surveying the design of *Fascia*



Staircase at the MEA store, Stockholm.

Boards. Also in *Skill* will be an illustrated description of Arne Rudberger's stunning staircase for the MEA department store in Stockholm, and other recent structures to be illustrated will include a small house by Sir Hugh Casson on the South Coast, and another well-designed adjunct to a department store—G. A. Jellicoe's roof garden on top of Harvey's at Guildford. Two historical features will deal with developments in the first quarter of the present century: Ian Nairn's delayed study of Hampstead Garden Suburb is now expanded into a larger study of *Arcadia* as a place to dwell in, and Reyner Banham will investigate the implications of recent publications on the position of *Mondriaan* both as a pioneer of modern design, and as a model to be set up for emulation by architects in the future.

Smithsons
Building Exhibition
ONNO

November Architectural Review

The controversial Smithsons will make their first appearance as contributors to the Review in November. with an illustrated study of the Shape of the Community, in which they set against the exhausted diagrams of CIAM planning their vision of a more humane type of ciry. For non-visionaries—and for visionaries too—*Skill* will provide a full coverage of the Building Exhibition from the technical point of view, as well as an *Interiors* treatment of G. A. Jellicoe's restaurant and shopping floors at Harvey's of Guildford, whose roof-garden was dealt with in the October Review. Visionary qualities, spurred by hard practical necessities, illuminate Kenneth Browne's proposals for applying the ONNO traffic-directing technique to Park Lane and west Mayfair. Also in *Miscellany*, Ian Nairn will describe a giant waterwheel—a little-known triumph of the *Functional Tradition* in the Isle of Man, and the study of the functional tradition will be carried further by Brian Spiller's article on Georgian Breweries. Buildings described in this issue will include the new Bowater Factories by Farmer and Dark, whose cladding provides a practical follow-up demonstration of patent-glazing techniques, and Rangoon University and Technical Institute, by Raglan Squire and Partners, extensively illustrated in colour. Professor

Entrance to the Library of the new Rangoon University. Architects, Raglan Squire and Partners.

Pevsner reviews Tschudi Madsen's important book on the Origins of Art Nouveau, whose character is summed up in the title *Beautiful and, if need be, useful*, and Dr. S. Lang will provide a note on Architectural Visitors to Padua, based upon a register kept by the university there, in which practically every English architect and amateur of note signed his name when passing through. Regular features such as the *Counter-Attack bureau* will continue, and Kenneth Browne will contribute a frontispiece-drawing—this time a trailer to the coverage of the TUC building which will appear in the December issue.

Water wheel at Laxey, Isle of Man.

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.

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THE CORPORATION OF GLASGOW
ARCHITECTURAL AND PLANNING DEPARTMENT
ASSISTANT ARCHITECTS
ASSISTANT QUANTITY SURVEYORS

Vacancies exist for a number of Assistants as above, minimum qualification Intermediate examination of the appropriate professional body. Salary scale £595—£1,180 with placing according to age, experience and qualifications.

Form of application may be obtained from the Principal Administrative Officer, 20 Trongate, Glasgow, C.1

A. G. JURY,
City Architect and Planning Officer.
7141

LONDON COUNTY COUNCIL
ARCHITECT'S DEPARTMENT

Vacancies for ARCHITECTS and SURVEYING ASSISTANTS in the Building Regulations Division as follows:—

(*a*) For surveys of existing premises and consideration of proposals for alterations and new construction in the Theatres Section, and;

(*b*) for building control work in connection with applications under the London Building Acts and bye-laws as regards compliance with the Council's construction and means of escape standards.

Salaries up to £817 (under review) with starting rates according to qualifications and experience.

Application form and particulars from the Architect (Ref. AR/EK/47/57), The County Hall, S.E.1. (1610). 7377

CAERNARVONSHIRE COUNTY COUNCIL
APPOINTMENT OF COUNTY ARCHITECT

Applications invited for the post of COUNTY ARCHITECT at a salary of £1,845 rising by four annual increments of £55 and one of £50 to £2,115. (This scale is at present under review.) Successful candidate will commence in the scale in accordance with his qualifications and experience. Knowledge of Welsh desirable.

Candidates must be Registered Architects and Fellows or Associates of the Royal Institute of British Architects, with considerable local government experience particularly in the design and construction of educational buildings, public buildings and houses, in handling of contracts and in technical administration. Further particulars and application form from the undersigned. Closing date 19th October.

J. E. OWEN-JONES,
Clerk of the County Council.

County Offices, Caernarvon.
11th September, 1957. 7550

ARCHITECTURAL ASSISTANTS
Required by
MINISTRY OF WORKS

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

Salary range £550 (age 21) to £870 p.a., London (slightly less elsewhere).

5-day week. 3½ weeks' annual leave initially. Starting pay according to age, qualifications and experience. Good prospects of promotion, with salaries of £1,030 p.a. and above.

Opportunities for permanent posts leading to pensions (non-contributory).

Interviews at Regional Offices, where possible. Applicants should be of Inter. R.I.B.A. standard. State age, training and experience to Chief Architect, Ministry of Works (A), Abell House, John Islip Street, S.W.1. 7484

BASILDON DEVELOPMENT CORPORATION
DEPARTMENT OF ARCHITECTURE AND PLANNING

Applications are invited for the following posts:—

(*a*) ARCHITECT, Grade A.P.T. VIII/IX (£1,100—£1,405).

(*b*) ASSISTANT ARCHITECT / PLANNER, Grades III, V, or VI (£656—£1,107), according to experience.

(*a*) To lead a Housing Group. Outstanding opportunity for Architect with flair for design of contemporary houses and large layouts, as well as experience at all stages of contract management.

(*b*) To have experience in the implementation of a Master Plan and ability in detailed planning of Housing and Industrial Development.

All applicants to be A.R.I.B.A. Post (*b*) A.M.T.P.I. also.

All appointments superannuable and subject to medical examination.

Housing available for renting.

Applications on the special form (obtainable from the Chief Architect) to the General Manager, Basildon Development Corporation, Gifford House, Basildon, Essex, endorsed with the relevant appointment by Friday, 27th September, 1957. 7448

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 £695 at age 26 to £1,030 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, Professional & Executive 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. 7404

COUNTY BOROUGH OF SOUTHEND-ON-SEA
BOROUGH ARCHITECT'S DEPARTMENT

Applications are invited for the following posts:—

Three posts of ASSISTANT ARCHITECTS. Salary scale £750, by annual increments of £40 to £1,030.

ARCHITECTURAL ASSISTANT. Salary scale: £575, by annual increments of £30 to £725.

Three posts of ASSISTANT QUANTITY SURVEYORS. Salary scale: £750, by annual increments of £40 to £1,030.

QUANTITY SURVEYING ASSISTANT. Salary scale: £575, by annual increments of £30 to £725.

Candidates must be suitably qualified and experienced. Housing accommodation may be provided for the senior appointments.

The appointments will be subject to the provisions of the Local Government Superannuation Acts and the National Joint Council's Scheme of Conditions of Service so far as adopted by the Council. Medical examination.

Applications, stating age, qualifications and experience, with the names of two referees, should be submitted to the Borough Architect, 30, Alexandra Street, Southend-on-Sea, forthwith.

Canvassing will disqualify. Any candidate who is related to a member or officer of the Council is required to disclose the fact.

ARCHIBALD GLEN, *Town Clerk.*
7469

URBAN DISTRICT COUNCIL OF BASILDON
ASSISTANT ARCHITECT
(Special Grade £750 to £1,030 per annum)

Applications are invited from qualified and experienced Architects for the above established post in the Engineer and Surveyor's Department. The commencing salary will be fixed according to experience and where appropriate within the upper half of the salary scale. Housing accommodation will be considered.

The Urban District has a population of approximately 65,000, covers 27,000 acres and includes the New Town area and two townships designated as Expanded Towns. Rapid development will provide an increasing variety of interesting works.

Full particulars and application forms from and returnable to Mr. S. A. Wadsworth, A.M.I.C.E., A.M.I.Mun.E., Council Offices, High Street, Billericay, Essex.

Closing date 30th September, 1957. 7482

BRITISH RAILWAYS: EASTERN REGION
MODERNIZATION PLAN

Applications are invited for the position of ASSISTANT ARCHITECT in the office of the Architect, Eastern Region at King's Cross Station. Salary range £916-£956. Applicants must be members of the R.I.B.A. with ability in contemporary design and some years practical experience. The successful applicants will be engaged on varied and interesting work and will be given opportunities for freedom in design and site supervision. Five-day week. Concessionary rail travel.

Apply in writing giving full particulars as to age, education and experience, previous positions held and any special qualifications possessed to Chief Civil Engineer, British Railways, Eastern Region, King's Cross Station, London, N.1. 7494

BOROUGH OF FINCHLEY.
ARCHITECTURAL ASSISTANTS
HOUSING AND TOWN PLANNING DEPARTMENT

Salaries within the Special Scale and within A.P.T. Grade I, under the Revised Scale of Salaries, plus London weighting, according to qualifications and experience. Subject to satisfactory service anticipated duration of the appointments will be 2/3 years.

Special Scale: £750 × £40 to £1,030. R.I.B.A. Final Examination or equivalent required and at least 5 years' experience, including work on local authority housing. Experience in design of multi-storey flats is highly desirable.

APT GRADE I: £575 × £30 to £725. R.I.B.A. Intermediate Examination required and practical office experience of local authority housing.

The National Scheme of Conditions of Service and the Local Government Superannuation Acts apply and medical examination required.

Applications stating age, full particulars of qualifications and experience and accompanied by copies of two testimonials (or the names of two referees) to the Borough Housing and Town Planning Officer, The Avenue, Finchley, N.3, by not later than first post on Wednesday, the 25th September, 1957.

R. M. FRANKLIN,
Town Clerk.

Municipal Offices, N.3. 7492

CHESTERFIELD RURAL DISTRICT COUNCIL invite applications for the appointment of ASSISTANT QUANTITY SURVEYOR. The appointment offers excellent experience in a district with a population of 93,000 and which is rapidly developing both residentially and industrially.

Candidates must have passed the Inter or Final Examination of R.I.C.S. or Final Examination of I.Q.S. Salary scale will be determined by reference to the qualifications and experience held by the successful candidate, as follows:—

Inter R.I.C.S.—A.P.T.I (£575-£725)
Final I.Q.S.—A.P.T.II (£725—£845)
Final R.I.C.S.—Special Grade (£750-£1,030)

The Council are prepared to assist with housing accommodation.

Application forms may be obtained from the Council's Engineer, Mr. J. B. Wikeley, M.Eng., M.I.C.E., M.I.Mun.E., Barrister at Law, Rural Council House, Saltergate, Chesterfield, and they should be returned to the Clerk of the Council by the 27th September, 1957.

H. O. HAWKINS,
Clerk.
7498

ROYAL TECHNICAL COLLEGE OF EAST AFRICA (NAIROBI)
(incorporating the Gandhi Memorial Academy)

Applications are invited for the post of LECTURER IN THE DEPARTMENT OF ARCHITECTURE. The person appointed will be expected to take up his duties by January, 1958. Applicants must be Members of the R.I.B.A. and preferably hold a degree or diploma of a recognised School of Architecture. They must also have suitable experience in Architectural practice.

Courses are given to students expecting to take the Intermediate Examination of the R.I.B.A. and later the Final Examination.

Salary Scale:
£1,215 × £41 to £1,297 × £48 to £1,489 × £55 to £1,709.

Appointment is offered for two years in the first instance. Accommodation at low rental or allowance in lieu. Free passages on appointment, termination and overseas leave (every three years). Free medical attention. Person appointed will be expected to join the College Pension Scheme but contributions under Teachers' Superannuation Act or to former F.S.S.U. policies may be continued if desired.

Further information from the Secretary, Council for Overseas Colleges of Arts, Science and Technology, 1 Woburn Square, London, W.C.1.

Closing date for applications (6 copies), 30th September, 1957. 7496

LANCASHIRE COUNTY COUNCIL.
COUNTY ARCHITECT'S DEPARTMENT

Vacancies exist for the following permanent appointments:—

1. SENIOR ASSISTANT ARCHITECT, commencing salary within the Scale £1,025—£1,175.

2. ASSISTANT ARCHITECTS, commencing salary within the Scale £750—£1,030.

3. SENIOR ASSISTANT QUANTITY SURVEYORS, commencing salary within the Scale £1,025—£1,175. Applicants must have had a wide experience in the preparation of Bills of Quantities for major projects of all types and be able to take charge from taking-off to settlement of final accounts.

4. ASSISTANT QUANTITY SURVEYOR, commencing salary within the Scale £750—£1,030.

Experience of Local Government work is not essential for these posts. Commencing salaries will be according to experience.

Application forms, obtainable from the County Architect, G. Noel Hill, F.R.I.B.A., M.T.P.I., P.O. Box 26, County Hall, Preston, to be returned by the 30th September, 1957, quoting Ref: A/AJ. 7495

BOROUGH OF WALTHAMSTOW
BOROUGH ARCHITECT, ENGINEER & SURVEYOR'S DEPARTMENT
APPOINTMENT OF DEPUTY BOROUGH ARCHITECT

Applications are invited from suitably qualified architects for the appointment of Deputy Borough Architect at a salary on Scale C of the Joint Negotiating Committee, £1,295 to £1,515 per annum. The commencing salary to be fixed within this range according to qualifications and experience.

Applicants should have had experience in Local Authority work and in the administration of a department. Experience in town planning and re-development of built-up areas will be an advantage.

Applications, stating age, qualifications and experience, together with the names of two referees, should be sent to the Town Clerk endorsed Deputy Borough Architect not later than noon, 5th October 1957.

G. A. BLAKELEY,
Town Clerk,

Town Hall, Walthamstow, E.17.
6th September, 1957. 7528

LONDON COUNTY COUNCIL
ARCHITECT'S DEPARTMENT

Selections for appointment are now being made from ARCHITECTS who have passed their Final examinations this summer. Starting salaries up to £676 16s. a year in scale £606 5s. to £817 (under review).

Vacancies also for ARCHITECTS of experience at starting salaries up to £1,036 (under review).

Full programme of houses, flats, schools and many other interesting buildings.

Application forms and full particulars from the Architect (Ref. AR/EK/46/57), The County Hall, S.E.1. (1609). 7378

COUNTY BOROUGH OF GATESHEAD

Applications are invited from qualified and experienced persons for the following appointments which are subject to N.J.C. conditions:—

SENIOR ASSISTANT ARCHITECTS—A.P.T. IV (£1,025—£1,175). Applicants must be Registered Architects and should be Associate Members of the Royal Institute of British Architects. They should have had good experience in the design and construction of Public Buildings, Schools and/or Municipal Housing Schemes.

ASSISTANT ARCHITECTS—SPECIAL SCALE (£750—£1,030). Applicants must have passed Part I & II of the Final Examination of the Royal Institute of British Architects or must be Registered Architects. Previous experience with a Local Authority would be an advantage.

All above posts pensionable, subject to medical examination and one month's notice on either side.

FAVOURABLE CONSIDERATION WILL BE GIVEN TO THE PROVISION OF HOUSING ACCOMMODATION IN CERTAIN CASES, ON A RENTAL BASIS.

Applications, on forms obtainable from the Borough Surveyor, Swinburne Street, Gateshead, 8, must be returned to him within 10 days of this advertisement.

C. D. JACKSON,
Town Clerk,

Town Hall, Gateshead, 8.
September, 1957. 7527

PADDINGTON BOROUGH COUNCIL

(1) QUANTITY SURVEYOR (A.P.T. IV: £1,055—£1,205).

(2) ASSISTANT ARCHITECT (A.P.T. III: £875—£1,055).

(3) ASSISTANT QUANTITY SURVEYOR (A.P.T. III: £875—£1,055).

For (1), A.R.I.C.S. essential with experience in all branches of building work particularly housing (quote A.349).

For (2), A.R.I.B.A. candidates preferred with experience in design and supervision of building works and knowledge of local authority requirements (quote A.350). (Revised advertisement).

For (3), inter-R.I.C.S. is essential, with good experience up to final account stage (quote A.351). (Revised advertisement).

Commencing salaries will be according to qualifications and experience.

Applications stating age, qualifications, experience, present and past appointments, names and addresses of two referees should be made by the 30th September, 1957.

W. H. BENTLEY,
Town Clerk.

Town Hall, Paddington Green, W.2. 7526

BOROUGH OF LARNE

The Larne Borough Council invite applications for the undermentioned temporary appointment:—

ASSISTANT ARCHITECT

Commencing salary on Scale £814 × £35 to £994 p.a., according to qualifications and experience.

Candidates must be A.R.I.B.A., and an additional qualification in planning would be an advantage.

The appointment offers good opportunity for a young architect to gain experience in the various branches of municipal architectural and planning work, and is limited, in the first instance, to 5 years from April 1st., 1957.

The appointment will be subject to the provisions of the Local Government (Superannuation) Act (N.I.) 1950.

Consideration will be given to provision of housing accommodation if necessary.

Applications, giving date of birth, full particulars of qualifications and experience, together with two recent testimonials, should be lodged with the undersigned not later than Tuesday, 1st October, 1957.

ROBERT LYTTLE,
Town Clerk.

Gardenmore House, Larne, Co. Antrim.
9th September, 1957. 7525

WESTMORLAND COUNTY COUNCIL
COUNTY ARCHITECT'S DEPARTMENT

Applications are invited for the superannuable appointment of:

SENIOR ASSISTANT ARCHITECT, GRADE IV (£727—£907).

Candidates must be associates of the R.I.B.A. with knowledge of modern school design and construction. Local authority experience an advantage.

Applications stating age, technical training, qualifications, experience, previous and present appointments with salary, and two referees, to County Architect, County Hall, Kendal, by Monday, 30th September, 1957. 7531

STAFFORDSHIRE COUNTY COUNCIL
COUNTY ARCHITECT'S DEPARTMENT

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

A.P.T. III £656—£784 3s.
A.P.T. IV £727 15s.—£907 3s.

Applicants for Grade IV should be Associates of the R.I.B.A.

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 Wednesday 25th September, 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.

County Buildings, Stafford.
11th September, 1957. 7533

HORNCHURCH URBAN DISTRICT COUNCIL
APPOINTMENT OF ARCHITECTURAL ASSISTANT, GRADE A.P.T. II
(£725—£845).

Applications are invited for the appointment of an Architectural Assistant, Grade A.P.T. II (£725—£845). Applicants should have passed the Intermediate Examination of the Royal Institute of British Architects, or its equivalent, at one of the recognised schools of Architecture and have worked in an Architect's office for a period of at least 2 years. They should be able to prepare working drawings, etc. from preliminary sketches.

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

Housing accommodation will be provided if required.

Application forms may be obtained from this office, and completed forms should be returned not later than Saturday, the 28th September, 1957.

P. L. COX,
Clerk of the Council.

Council Offices, Billet Lane, Hornchurch.
9th September, 1957. 7534

BOROUGH OF MACCLESFIELD
BOROUGH ARCHITECT'S DEPARTMENT
APPOINTMENT OF QUANTITY SURVEYOR.

Applications are invited for the appointment of Quantity Surveyor at a salary in accordance with qualifications and A.P.T. Scales (not exceeding Grade IV). This salary is subject to the recent award of the National Joint Council.

The Council would be prepared to assist with housing accommodation if required.

Applications stating age, training, qualifications, previous and present appointments with copies of two testimonials to reach me not later than Wednesday, 25th September, 1957.

WALTER ISAAC,
Town Clerk.

Town Hall,
Macclesfield. 7499

AMENDED ADVERTISEMENT
CITY AND COUNTY OF NEWCASTLE-UPON-TYNE
CITY ARCHITECT'S DEPARTMENT

The City Architect will be pleased to receive applications from suitably qualified persons for the following Architectural Vacancies on the revised salary scales applicable from the 1st September, 1957, subject to confirmation by the City Council.

(*a*) PRINCIPAL ASSISTANT ARCHITECTS (General, Housing or Re-Housing Sections) A.P.T. Division Grade IV (£1,025—£1,175 per annum).

(*b*) SENIOR ASSISTANT ARCHITECT (Education Section) A.P.T. Division Grade IV (£1,025—£1,175 per annum).

(*c*) SENIOR ASSISTANT ARCHITECTS (General, Housing, Re-Housing or Education Sections) A.P.T. Division Grade III (£845—£1,025 per annum).

(*d*) ASSISTANT ARCHITECTS (General, Re-Housing or Education Sections) A.P.T. Division Grade II (£725—£845 per annum).

The above posts will be subject to the Provisions of the Local Government Superannuation Acts, 1937-1953, and to one month's notice on either side. The successful candidates will be required to pass a medical examination.

Further particulars and Forms of Application may be obtained from George Kenyon, A.R.I.B.A., A.M.T.P.I., City Architect, 18, Cloth Market, Newcastle-upon-Tyne, 1. Applicants must state the position applied for when requesting particulars.

Closing date for receipt of completed applications: Saturday, 5th October, 1957.

JOHN ATKINSON,
Town Clerk.

Town Hall, Newcastle-upon-Tyne, 1.
11th September, 1957. 7532

BOROUGH OF TAMWORTH
ENGINEERING ASSISTANT

Applications are invited for the above appointment in the Borough Engineer and Surveyor's Department. Salary, A.P.T. Grade I. Applicants should have had a good general experience in a Municipal Engineer's office (housing experience would be an advantage). Preference will be given to applicants who have passed the Intermediate Examination of the Institution of Municipal Engineers or hold an equivalent qualification. Housing accommodation available if required. Applications stating age, qualifications and experience, together with names of two referees should reach the undersigned not later than 28th September, 1957. Canvassing, directly or indirectly, will disqualify.

HENRY WOOD,
Town Clerk.

Municipal Offices, Tamworth, Staffs.
10th September, 1957. 7552

BRITISH RAILWAYS
JUNIOR BUILDING SURVEYOR REQUIRED

Preference given to applicants who have had experience in Building Construction and preparation of specifications and supervision of maintenance work for estate property.

Salary based on scale—maximum, present £731 per annum.

Certain free and reduced rail facilities will be granted.

Apply in writing to:—
District Estate Surveyor,
British Transport Commission,
Western Region, Central Chambers,
1, Penarth Road, Cardiff. 7493

WORCESTERSHIRE COUNTY COUNCIL
COUNTY ARCHITECT'S DEPARTMENT
AMENDED ADVERTISEMENT

Applications are invited for the following posts:—

(1) QUALIFIED ASSISTANT ARCHITECT, Special Grade (£750—£1,030).

(2) ASSISTANT ARCHITECT, Grade A.P.T. III (£845—£1,025).

Application forms and further particulars should be obtained from L. C. Lomas, F.R.I.B.A., County Architect, 14, Castle Street, Worcester, not later than 25th September, 1957. (X104) 7485

BOROUGH OF WIMBLEDON

ARCHITECTURAL ASSISTANT, Grade A.P.T.III, £845 to £1,025, plus London weighting. Form of Application from Borough Engineer and Surveyor, Town Hall, Wimbledon, S.W.19 by 28th September, 1957.

Canvassing disqualifies. 7497

COVENTRY CORPORATION require qualified ARCHITECTS, new Special Grade, £750×£40—£1,030. Appointments within Grade according to experience and present salary, if appropriate.

Housing Accommodation in approved cases; interest free loan for removal expenses.

Details and application forms from City Architect, Bull Yard, Coventry, returnable within 10 days of publication. 7500

BOROUGH OF PRESTWICH
APPOINTMENT OF ARCHITECTURAL ASSISTANT.

Applications are invited for the above appointment. Salary within £750—£1,030 per annum. Housing accommodation available.

Full details of appointment and application forms may be obtained from the office of the Borough Engineer and should be returned to me not later than 27th September, 1957.

C. A. CROSS,
Town Clerk.

Town Hall, Prestwich, Lancashire.
9th September, 1957. 7501

AMENDED ADVERTISEMENT
HOLLAND COUNTY COUNCIL.
LINCOLNSHIRE
COUNTY ARCHITECT'S DEPARTMENT

Applications are invited for the following permanent appointments:—

(*a*) ARCHITECTURAL ASSISTANT. Salary Grade A.P.T. II, £725—£845 p.a.

(*b*) QUANTITY SURVEYING ASSISTANT, Salary Grade A.P.T. II, £725—£845 p.a.

(*c*) QUANTITY SURVEYING ASSISTANT, Salary Grade A.P.T. I, £575—£725 p.a.

The appointments will be subject to the provisions of the Local Government Superannuation Acts, the N.J.C. Scheme of Conditions of Service and a medical examination.

Applications, on forms provided by the undersigned, should be returned by the 7th October, 1957.

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

County Hall,
Boston, Lincs. 7563

BOROUGH OF MALDEN AND COOMBE

Applications are invited for the following appointments:—

(*a*) SENIOR ARCHITECTURAL ASSISTANT. Grade "Special." Salary £750—£1,030 per annum, plus London "weighting."

(*b*) JUNIOR ARCHITECTURAL ASSISTANT. Grade A.P.T. II. Salary £725—£845 per annum, plus London "weighting," from persons possessing the necessary qualifications and experience.

Forms of application obtainable from John Apse, A.M.I.C.E., Borough Engineer, should be returned endorsed by not dater than 5th October, 1957.

HAROLD E. BARRETT,
Town Clerk.

Municipal Offices, New Malden, Surrey. 7549

COUNTY BOROUGH OF HUDDERSFIELD
BOROUGH ARCHITECT AND PLANNING OFFICER'S DEPARTMENT

Applications are invited for the following posts:—

(1) ASSISTANT ARCHITECT (new Grade A.P. & T. V, £1,175—£1,325).

(2) CHIEF QUANTITY SURVEYOR (new Grade A.P. & T. V, £1,175—£1,325).

For post (1) preference will be given to Associates of the Royal Institute of British Architects. The Corporation have a varied programme of building work, comprising Schools, Housing, Ambulance Station, Fire Station, Old People's Homes, and a scheme of Central Area Re-development which includes Bus Station, High Flats, Shops and Offices. The post is not administrative and the successful applicant will be required to prepare sketch designs, working drawings and perspectives.

For post (2) preference will be given to Associates of the Royal Institute of Chartered Surveyors. Applicants are expected to be experienced in all branches of Quantity Surveyor's work and able to supervise the Quantity Surveying Section of the Department.

The posts are subject to the National Scheme of Conditions of Service, as adopted by the Council, and to medical examination.

Housing accommodation will be provided, if required.

Applications, with the names of two referees, should reach the Borough Architect and Planning Officer, High Street Buildings, Huddersfield, not later than 7th October, 1957.

HARRY BANN,
Town Clerk.

Town Hall, Huddersfield.
September, 1957. 7564

CITY OF OXFORD

PLANNING ASSISTANT required in City Architect and Planning Officer's Department; salary within the range £750—£1,030 per annum according to experience and qualifications (minimum required A.M.T.P.I., additional qualifications would be an advantage). Housing accommodation provided.

For further details and application form (to be returned by 12th October) apply to City Architect and Planning Officer, Town Hall, Oxford.

HARRY PLOWMAN,
Town Clerk.

Town Hall, Oxford. 7535

Architectural Appointments Vacant

4 lines or under, 9s. 6d.; each additional line, 2s. 0d. Box Number, including forwarding replies, 2s. extra.

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. 6531

CO-OPERATIVE WHOLESALE SOCIETY, LTD. ARCHITECT'S DEPARTMENT, BIRMINGHAM

APPLICATIONS are invited for the following appointments in the above Branch Office undertaking interesting and varied commercial and industrial projects:—

(*a*) ASSISTANT QUANTITY SURVEYOR, with good experience in the preparation of Bills of Quantities, measuring and adjusting variations and estimating under supervision (salary range £550 to £820 per annum).

(*b*) ASSISTANT ARCHITECT, capable of preparing working drawings from preliminary details (salary range £550 to £820 per annum).

There is a 5-day week in operation, and the 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. 7073

ARCHITECTS.—SENIOR ARCHITECTURAL ASSISTANTS required immediately for a wide variety of work. Salary range £800—£1,000 per annum (according to experience and qualifications). Superannuation Scheme.—Application should be made in writing to Kenneth F. Masson, A.R.I.B.A., Chief Architect, S.C.W.S., Ltd., 76, Morrison Street, Glasgow, C.5. 7179

ASSISTANT wanted for small city office. Must be interested in good design and detailing and willing to take responsibility. Salary £600 to £750 according to ability. Telephone Central 5766 or write Box 7489.

PRIVATE Architects Office, Charing Cross, requires senior and intermediate ASSISTANTS. Varied type of work. Good salaries commensurate with experience. Five day week. Write Box 7491. Telephone WHItehall 7926.

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

SENIOR and JUNIOR ASSISTANTS required for busy office in the North-East. Ability and a sense of responsibility are the essential qualities. Good starting salaries are offered, and progress will depend on performance. Pension scheme and bonus scheme are both operated.—Box 7412.

SENIOR ARCHITECTURAL ASSISTANT required for responsible post in well-known private practice. London office. 5-day week. Varied work.—Box 7380.

SENIOR ASSISTANT required in busy West End office. Interesting commercial work, and must be prepared to take responsibility.—Please write, giving details of experience, etc., Box 7462.

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

ARCHITECTURAL ASSISTANTS for University and Hospital work. Good salary, dependent on experience. Non-contributory Pension Scheme in being after probationary period. Three weeks' holiday a year, and five-day week.—Reply, stating age, experience, etc., to Thomas Worthington & Sons, 178, Oxford Road, Manchester, 13. 7476

JUNIOR ARCHITECTURAL ASSISTANT required, with previous office experience. Must be a quick and accurate draughtsman and have a sound knowledge of building construction. 5-day week.—Hugh Macintosh & Partners, 35, High Street, Croydon. 7385

ARCHITECTURAL ASSISTANT required immediately for London Brewery. Must be good Draughtsman with sound knowledge of construction. Superannuation scheme. Please reply giving details of experience and training with salary required to Box 7351.

ARCHITECTURAL ASSISTANT required, Intermediate to Final standard, with office experience, for small busy practice. L.V. No Sats.—Shaw & Lloyd, F.R.I.B.A., 74, Gt. Russell Street, W.C.1. Museum 9695. 7406

JUNIOR ARCHITECTURAL ASSISTANTS required. 5-day week. Factory and office buildings. Minimum 3 years' experience.—Write full particulars, R. H. Gallannaugh, L.R.I.B.A., 54, Queen Anne Street, London, W.1. 7411

DRAUGHTSMAN, with architectural experience, required in Drawing Office of Company specialising in Sound Conditioning. Ample scope for personal initiative.—Write, giving full details, to Hermeseal Acoustics, Ltd., 4, Park Lane, London, W.1. 7466

F. W. WOOLWORTH & CO., LTD., Architect's Department, Kensington District Office. Applications are invited for the following appointment:—

ARCHITECTURAL ASSISTANT of Intermediate R.I.B.A. standard, capable of carrying out surveys, preparing sketch schemes, working drawings and details.

The appointment is permanent and pensionable. Five-day week. Dining room facilities. Application, stating age, experience, qualification and salary, to District Architect, F. W. Woolworth & Co., Ltd., 26/40, Kensington High Street, London, W.8. 7461

ARCHITECTURAL DRAUGHTSMAN required to work in London for exhibition and showroom work. Must be neat, accurate and quick, with good knowledge of construction. Salary by arrangement. The post is not permanent or pensionable. Applications should be made to Sven M. Sternfeldt, L.R.I.B.A., Pilkington Brothers Limited, Glass Manufacturers, 29/30, St. James's Street, London, S.W.1. WHI. 6002. 7455

JUNIOR ASSISTANT required immediately in busy W.C. London practice. Interesting and varied work. Reply fully, age, experience and salary. Box 7437.

ARCHITECTURAL ASSISTANT required, salary range £550 to £650. Varied work, five-day week. Write, stating age, training, experience, present salary. All interview expenses paid.—G. de C. Fraser, Son & Gearey, Chartered Architects, 27, Dale Street, Liverpool, 2. 7446

ARCHITECTURAL ASSISTANTS required for work on Licensed premises, including interior decoration. Write stating age, experience and salary required to The Secretary, Benskin's Watford Brewery Ltd., P.O. Box 105, Watford, Herts. 7123

SENIOR ARCHITECTURAL ASSISTANT required in Architect's Department of London Brewery Company. Must be good draughtsman.—Write, stating age, qualifications, experience, salary required, Box 7502.

SENIOR ASSISTANT required at once for responsible position in busy private practice in South Kensington area. Experience in Factory work an asset. Salary £900—£1,000. Five-day week.—Write to Box 7503.

ASSISTANT ARCHITECT, qualified and able to take senior position with responsibility. Pension scheme. Salary according to experience.—Hellberg & Harris, 13, Queen Victoria Road, Coventry. 7504

ARCHITECTURAL ASSISTANTS required.—Write, giving full details of experience, etc., to Clayton, Black & Petch, 25, Landport Terrace, Portsmouth. 7505

ARCHITECTURAL ASSISTANTS, Intermediate standard, required in Plymouth Office.—Apply, giving particulars of experience, age, and salary required, Box 7521.

NORTH Lancashire Architect requires ASSISTANT. Splendid opportunity with prospects for keen, capable young man, of Final, or near Final, standard. Varied and interesting types of work in pleasant office; every encouragement given to man of initiative and integrity. Salary in £750 bracket, according to experience.—Full particulars to Box 7520.

SCHWEPPES Architect's Department requires an ASSISTANT, R.I.B.A. Intermediate standard, for interesting and varied work throughout the U.K. Applicants must be resourceful and able to work with minimum supervision. Five-day week, canteen, pension scheme.—Write, stating age, previous experience, salary required, to the Personnel Manager, Schweppes House, 1-6, Connaught Place, London, W.2. 7519

BROWN, MOULIN AND ANTRUM require SENIOR ASSISTANTS for Hospital programme.—Apply 42, Russell Square, London, W.C.1. Telephone: Langham 7065. 7518

PLAYNE & LACEY have vacancies for TWO ARCHITECTURAL ASSISTANTS, one qualified and one Intermediate standard.—Please ring WHI. 2552 or reply in writing to 19, Queen Anne's Gate, S.W.1. 7515

ARCHITECTURAL ASSISTANTS of all grades wanted for Hospital, Housing or School work in general practice (10 miles from London on Central Line). Five-day week and pension scheme; salary according to capability.—Write, giving age and full details of training and/or experience, to Messrs. Tooley & Foster, Chartered Architects, Buckhurst Hill, Essex. 7514

SENIOR and JUNIOR STAFF required for varied contemporary practice.—Apply in writing, stating salary and experience, to H. A. Halpern, A.R.I.B.A., 193, Nelson Road, Gillingham, Kent. 7513

ASSISTANT required, Intermediate to Final standard, in Kingston and Dorking areas of Surrey. Varied practice.—Apply in writing, stating age, experience, and salary required, Box 7512.

COVENTRY.—ASSISTANT SITE ARCHITECT required. Intermediate standard. Work in office on large Public Building Site.—Details of training and salary required to Herbert, Son & Sawday, 18, Friar Lane, Leicester. 7511

GEORGE WIMPEY & CO., LTD.

THE Architect's Department seek SENIOR and INTERMEDIATE ASSISTANTS, with ability to apply their knowledge to new construction techniques covering Multi-storey Flats, House, Offices and Industrial Buildings for contracts throughout the U.K.

Appointments are at Head Office, Hammersmith, on a permanent basis, with a 5-day week.

For applicants interested in work in the Midlands, our Regional Office at Birmingham has similar appointments open for Architectural Staff (excepting 5-day week).

Salaries according to qualifications and experience, and, subject to satisfactory service, there is a Pension Scheme available.

Applicants should write, giving particulars, to E. V. Collins, A.R.I.B.A., Chief Architect, 27, Hammersmith Grove, London, W.6. 7517

KUWAIT

AMERICAN oil company seeks energetic men for architectural and civil engineering work in connection with construction of new base, preparation working drawings and details, experience of land surveying advantage, preference given to applicants having held previous overseas post either civil or military, consideration given to all applicants qualified or unqualified: salary £1,500 p.a. with free food and single accommodation, 18 month tours, generous leave, etc. Apply quoting AJ.63/40/41 to O.T.S., 5 Welldon Crescent, Harrow, Middlesex 7560

ARCHITECT'S Department of Ind Coope & Allsopp, Ltd., Brewers, Burton-on-Trent, have vacancies for SENIOR and INTERMEDIATE ASSISTANTS in their Head Office at Burton-on-Trent. Applicants for the Senior positions should be Associate Members of the R.I.B.A., and it would be an advantage if they are interested and have experience in interior decoration and furnishing. Commencing salary would be according to qualifications and experience. A 5-day week is in operation. Housing accommodation available, if essential.

Particulars of training, experience, past and present appointments, qualifications, age, and whether married or single, together with copies of testimonials and salary required, should be forwarded to the Chief Architect, Ind Coope & Allsopp, Ltd., Burton-on-Trent. 7516

ARCHITECTURAL ASSISTANT required for interesting work of an industrial and commercial nature. Inter. standard. Salary in accordance with experience and qualifications.—Apply Box 7547.

ARCHITECTS' ASSISTANTS required. R.I.A.S. Pension Scheme in operation.—Applications, stating age, particulars of experience and salary required, to Wylie, Shanks & Underwood, Chartered Architects, 12, Clairmont Gardens, Glasgow, C.3. 7546

ARCHITECTURAL ASSISTANTS, Intermediate and Final standard, required for Coventry and London offices. Excellent opportunities in varied practice covering wide area. Good salaries, closely related to capabilities and reviewed annually. Pension Scheme available. Five-day week. Travelling expenses to applicants selected for interview.—W. S. Hattrell & Partners, 1, Queens Road, Coventry—60668, and 14, Hanover Square, London, W.1. Mayfair 4992. 7545

JUNIOR ARCHITECTURAL ASSISTANT required in Architect's Dept. of Consulting Engineers. Superannuation Scheme. Salary up to £500, depending on experience.—Apply Personnel Dept., Sir Bruce White, Wolfe Barry & Partners, 1, Lygon Place, Grosvenor Gardens, London, S.W.1. Tel.: SLOane 0431. 7543

ARTHUR SWIFT & PARTNERS require ARCHITECTURAL ASSISTANTS. Salary range £650 to £900 p.a., plus luncheon vouchers and bonus. Varied work with good prospects.—Apply, 21, Upper Grosvenor Street, W.1. Telephone MAYfair 2114-6. 7565

BIRMINGHAM.—James A. Roberts, Chartered Architect, Chanelle House, 86, New Street, Birmingham, 2, MID. 4315-6, requires Intermediate to Final standard ASSISTANTS for interesting large scale projects. 7566

MAX LOCK AND PARTNERS require a capable ASSISTANT, of Intermediate-Final standard, with minimum 3-years' office experience, to work on interesting and varied schemes.—Reply in writing to 109, Gt. Russell Street, W.C.1, stating age and experience. Salary by arrangement. 7567

ARCHITECTURAL ASSISTANT required in Engineer's Office of large Brewery Company in East Midlands area. Work comprises general maintenance, alterations and extensions of industrial buildings. State age, experience and qualifications. Apply Box 7568.

JUNIOR ARCHITECTURAL ASSISTANT required in Architectural Dept. at Reading. Applications, marked "confidential," stating age, experience, and salary required, should be addressed to R. E. Southall, A.R.I.B.A., H. & G. Simonds, Ltd., The Brewery, Reading. 7570

SHELL-MEX AND B.P., LTD., require for their London Office an ARCHITECTURAL DRAUGHTSMAN, for work on various commercial projects. Applicants should be quick and accurate draughtsmen, and should have a sound knowledge of building construction. Salary according to experience. Excellent working conditions, staff restaurant, sports club, etc.—Apply in writing, giving full details of age, qualifications and experience, to the Staff Manager (Ref. 29/109), Shell-Mex House, Strand, W.C.2. 7569

ARCHITECTS, with large programme of Multiple Store Reconstruction and Shopfitting, require (*a*) SENIOR ARCHITECTURAL ASSISTANT, with good office experience, and (*b*) SHOPFITTING DESIGNER DRAUGHTSMAN, experienced in first-class work. Commencing salaries £750—£900, according to experience.—Stephenson, Gillis & Partners, 2, Saville Chambers, North Street, Newcastle upon Tyne. 7544

FRY, DREW, DRAKE & LASDUN require experienced qualified ASSISTANTS for interesting work in England and Overseas immediately. 5-day week.—Apply 63, Gloucester Place, London, W.1. 7541

ARCHITECT required immediately by Bank in Manchester. Permanent position. Applicants should state age, experience, salary required, and when available. Box 7540.

EXPERIENCED ARCHITECTURAL ASSISTANTS required for contemporary office. Salary according to experience.—C. H. Elsom, 10, Lower Grosvenor Place, S.W.1. VIC. 4304. 7538

ARCHITECT'S SENIOR ASSISTANT immediately required in City Architect's Office. Salary £1,150 to £1,200 per annum, luncheon vouchers. Five-day week.—Box 7536.

MANCHESTER.—ASSISTANT required, Intermediate standard. Small, progressive, congenial office. Varied contemporary work.—Please write Box 7537, giving full particulars and salary required.

ARCHITECTURAL ASSISTANT, Intermediate Standard, required Plymouth—5-day week. Roseveare, M.Inst.R.A., Sherwell House, Tavistock Road, Plymouth. 7561

JUNIOR and SENIOR ARCHITECTURAL ASSISTANTS required for interesting work in expanding contemporary office.—Box 7539.

NEW ZEALAND ARCHITECTURAL PRACTICE, mainly engaged commercial and industrial work, requires:—
(*a*) ASSISTANT ARCHITECT with A.R.I.B.A., salary range £900 to £1,000, or
(*b*) ARCHITECTURAL ASSISTANT, with at least 7 years' sound office experience, salary range £700 to £800.
Prefer single man but would consider married. Salary rate applicable influenced by ability and qualifications, being commencing salary subject good increases according progress. Splendid opportunity for enterprising, capable men. Minimum 2 years' assured engagement, applicant's passage provided, subject some minor conditions.—Apply airmail, with snapshot, and personal and experience details, plus small recent working drawing, to Gray Young, Morton & Calder, P.O. Box 2692, Wellington, N.Z. 7542

HORSLEY, SMITH & CO., LTD., have two vacancies in North and South England for well educated men under 35, with qualifications in Building Construction, as SPECIALIST CONSULTANTS in Dry Rot and Wood Worm identification and eradication (after necessary training). Keen interest in subject and willingness to travel essential. Car provided. Staff Pension Scheme.—Apply in writing to Horsley, Smith & Co. (Hayes), Ltd., Dawley Road, Hayes, Middlesex, stating age, experience and salary required. 7556

W. H. WATKINS, GRAY & PARTNERS require ASSISTANTS for interesting hospital work. Pension scheme in operation.—Write or 'phone, 57, Catherine Place, S.W.1. VICtoria 7761. 7555

ARCHITECTURAL ASSISTANT required, private office, 80 miles London. Good prospects.—Full details to Box 7554.

L. D. TOMLINSON & PARTNERS require ONE SENIOR ASSISTANT of Final standard, and TWO ASSISTANTS of Intermediate standard. Salary by arrangement.—Apply Quadrant Arcade, Romford. 7553

ASSISTANTS required in the Architect's Department of the Appleby-Frodingham Steel Company for work on expansion and development projects embracing office, amenity, laboratory and various classes of industrial buildings.
Applicants should be competent draughtsmen, with a sound knowledge of modern buildings' techniques and services.
The positions are permanent for suitable applicants, and a pension scheme is in operation.
Applications, giving age, experience and salary required, should be made in writing to the Employment Officer, Appleby-Frodingham Steel Company, Scunthorpe, Lincs. 7551

Architectural Appointments Wanted

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

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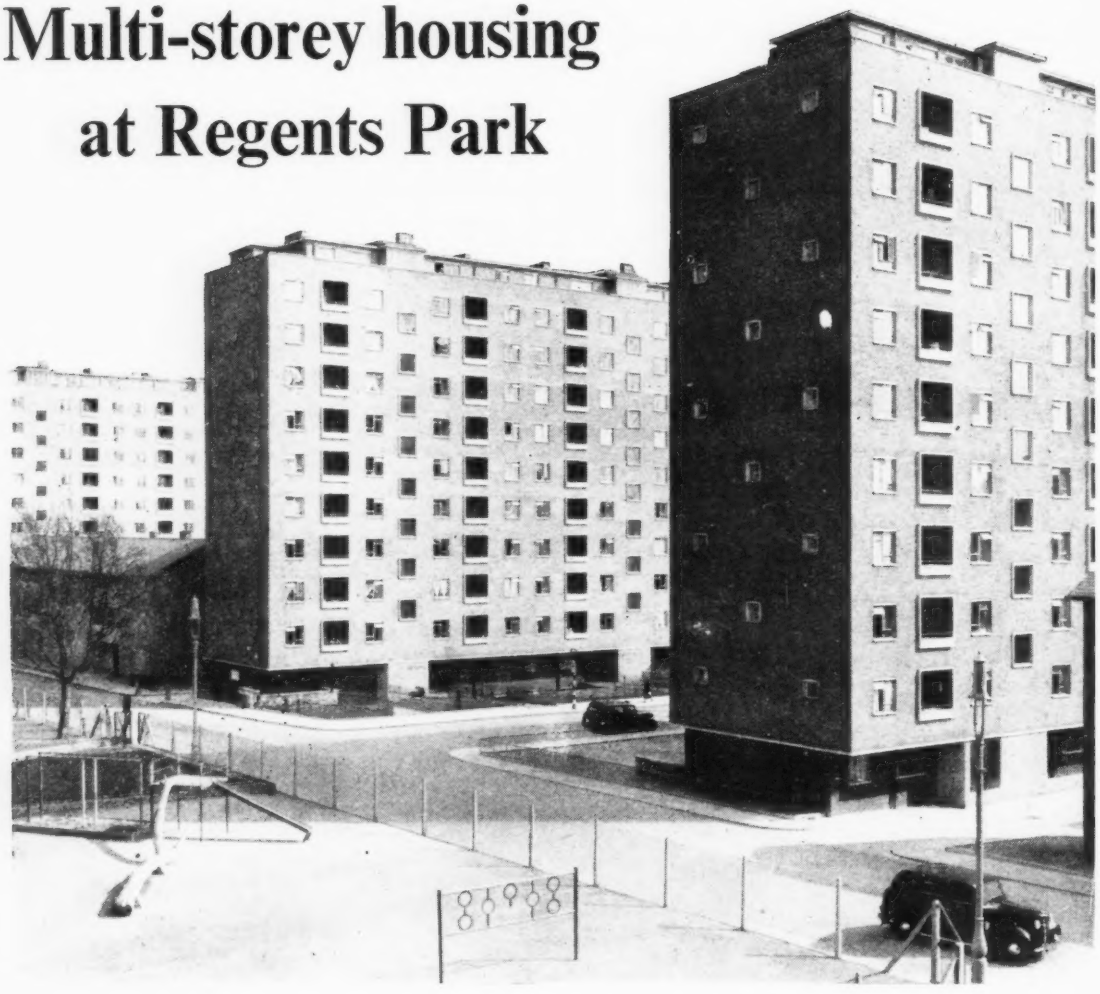

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