THE ARCHITECTS' JOURNAL

No. 3127] [VOL. 121

THE ARCHITECTURAL PRESS

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Price 1s. 0d.

Registered as a Newspaper.

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

IGE	Institution of Gas Engineers. 17, Grosvenor Crescent, S.W.1. Sloane 8266
IHVE	Institution of Heating and Ventilating Engineers. 49, Cadogan Square. Sloane 1601/3158
IIBDID	Incorporated Institute of British Decorators and Interior Designers. Drayton House, Gordon Street, W.C.1. Euston 2450
ILA	Institute of Landscape Architects. 12, Gower Street, W.C.1. Museum 1783
I of Arb	Institute of Arbitrators. 35/37, Hastings House, 10, Norfolk Street, Strand, W.C.2. Temple Bar 4071
IOB	Institute of Builders. 48, Bedford Square, W.C.1. Museum 7197/5176
IQS	Institute of Quantity Surveyors, 98, Gloucester Place, W.1. Welbeck 1859
IR	Institute of Refrigeration. Dalmeny House, Monument Street, E.C.3. Avenue 6851
IRA	Institute of Registered Architects. 47, Victoria Street, S.W.1. Abbey 6172
ISE	Institution of Structural Engineers. 11, Upper Belgrave Street, S.W.1. Sloane 7128
LDA	Lead Development Association. Eagle House, Jermyn Street, S.W.1. Whitehall 7264/4175
LMBA	London Master Builders' Association. 47, Bedford Square, W.C.1. Museum 3891
LSPC	Lead Sheet and Pipe Council. Eagle House, Jermyn Street, S.W.1. Whitehall 7264/4175
MARS	Modern Architectural Research Group (English Branch of CIAM). Secretary: Trevor Dannatt, 6, Fitzroy Square, W.1. Euston 7171
MOA	Ministry of Agriculture and Fisheries. 55, Whitehall, S.W.1. Whitehall 3400
MOE	Ministry of Education. Curzon Street House, Curzon Street, W.1. Mayfair 9400
MOH	Ministry of Health. 23, Savile Row, W.1. Regent 8411
MOHLG	Ministry of Housing and Local Government. Whitehall, S.W.1. Whitehall 4300
MOLNS	Ministry of Labour and National Service. 8, St. James' Square, S.W.1. Whitehall 6200
MOS	Ministry of Supply. Shell Mex House, Victoria Embankment, W.C. Gerrard 6933
MOT	Ministry of Transport. Berkeley Square House, Berkeley Square, W.1. Mayfair 9494
MOW	Ministry of Works. Lambeth Bridge House, S.E.1. Reliance 7611
NAMMC	Natural Asphalte Mine-Owners and Manufacturers Council. 94-98, Petty France, S.W.1. Abbey 1010
NAS	National Association of Shopfitters. 9, Victoria Street, S.W.1. Abbey 4813
NBR	National Buildings Record. 31, Chester Terrace, Regent's Park, N.W.1. Welbeck 0619
NCBMP	National Council of Building Material Producers. 10 Storey's Gate, S.W.1. Abbey 5111
NFBTE	National Federation of Building Trades Employers. 82, New Cavendish Street, W.1. Langham 4041/4054
NFBTO	National Federation of Building Trades Operatives. Federal House, Cedars Road, Clapham, S.W.4. Macaulay 4451
NFHS	National Federation of Housing Societies. 13, Suffolk St., S.W.1. Whitehall 1693
NHBRC	National House Builders Registration Council. 82, New Cavendish Street, W.1. Langham 4341
NPL	National Physical Laboratory. Head Office, Teddington. Molesey 1380
NSA	National Sawmilling Association. 14, New Bridge Street, E.C.4. City 1476
NSAS	National Smoke Abatement Society. Chandos House, Buckingham Gate, S.W.1. Abbey 1359
NT	National Trust for Places of Historic Interest or Natural Beauty. 42, Queen Anne's Gate, S.W.1. Whitehall 0211
PEP	Political and Economic Planning. 16, Queen Anne's Gate, S.W.1. Whitehall 7245
RCA	Reinforced Concrete Association. 94, Petty France, S.W.1. Abbey 4504
RIAS	Royal Incorporation of Architects in Scotland. 15, Rutland Square, Edinburgh. Fountainbridge 7631
RIBA	Royal Institute of British Architects. 66, Portland Place, W.1. Langham 5721
RICS	Royal Institution of Chartered Surveyors. 12, Great George St., S.W.1. Whitehall 5322/9242
RFAC	Royal Fine Art Commission. 22A, Queen Anne's Gate, S.W.1. Whitehall 3935
RS	Royal Society. Burlington House, Piccadilly, W.1. Regent 3335
RSA	Royal Society of Arts. 6, John Adam Street, W.C.2. Trafalgar 2366
RSI	Royal Sanitary Institute. 90, Buckingham Palace Road, S.W.1. Sloane 5134
RIB	Rural Industries Bureau. 35, Camp Road, Wimbledon, S.W.19. Wimbledon 5101
SBPM	Society of British Paint Manufacturers. Grosvenor Gardens House, Grosvenor Gardens, S.W.1. Victoria 2186
SCR	Society for Cultural Relations with the USSR. 14, Kensington Square, London, W.8. Western 1571
SE	Society of Engineers. 17, Victoria Street, Westminster, S.W.1. Abbey 7244
SFMA	School Furniture Manufacturers' Association. 30, Cornhill, London, E.C.3. Mansion House 3921
SIA	Structural Insulation Association. 32, Queen Anne Street, W.1. Langham 7616
SNHTPC	Scottish National Housing. Town Planning Council. Hon. Sec., Robert Pollock, Town Clerk, Rutherglen.
SPAB	Society for the Protection of Ancient Buildings. 55, Great Ormond Street, W.C.1. Holborn 2646
TCPA	Town and Country Planning Association. 28, King Street, Covent Garden, W.C.2. Temple Bar 5006
TDA	Timber Development Association. 21, College Hill, E.C.4. City 4771
TPI	Town Planning Institute. 18, Ashley Place, S.W.1. Victoria 8815
TTF	Timber Trades Federation. 75, Cannon Street, E.C.4. City 5051
WDC	War Damage Commission. 6, Carlton House Terrace, S.W.1. Whitehall 4341
ZDA	Zinc Development Association. Lincoln House, Turl Street, Oxford. Oxford 47988

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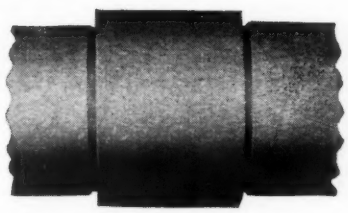

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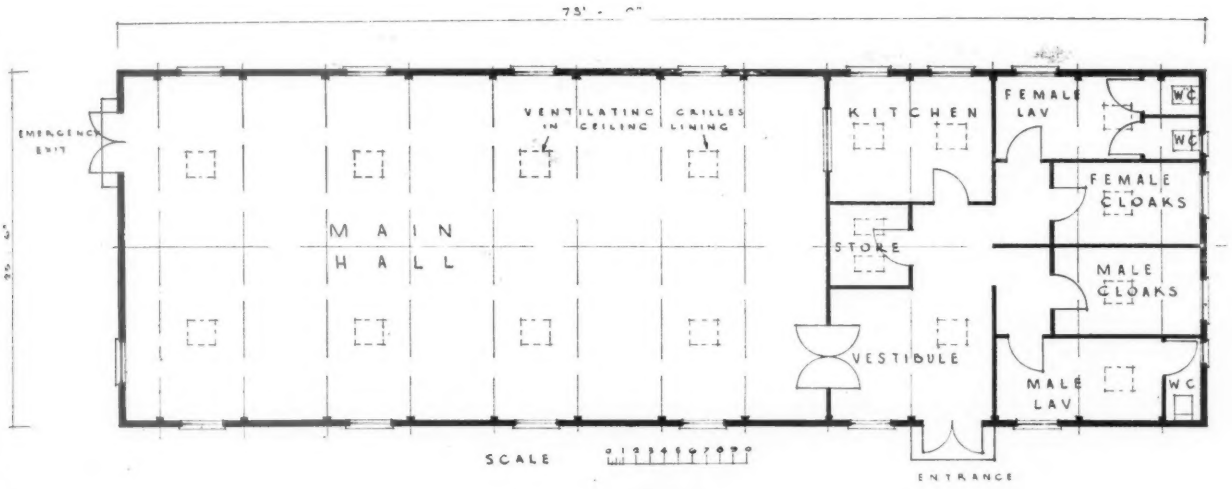
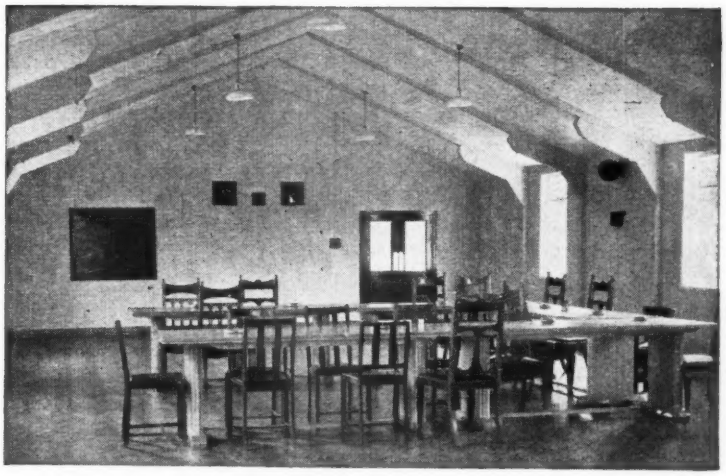
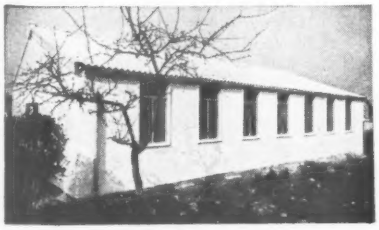
Internal Finishings by MESSRS. BISS & MOYLE, Builders and Contractors, Yeovil.



The Nurses' Recreation Room illustrates one of the many purposes efficiently fulfilled by this rapid and economical system of construction for single storey work. The clean, practical, dry-built structure was erected by one of the Woolaway building teams in ten working days (excluding the internal finishings).

The building is well lit, well insulated and keenly priced. Overall dimensions are 78ft. long, 25ft. 6in. wide and 8ft. 6in. to eaves.





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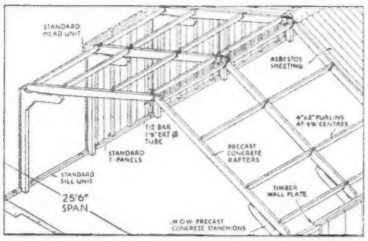

British Patents Nos. 636,686, 631,227 and 679,510. Patents granted and pending in many countries overseas

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PATENT GLAZING

Interior View of Factory

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The thermal insulating and other special properties of double patent glazing enabled the Architects to air-condition the factory and thus achieve the most advantageous working conditions both for the process and the operatives.

Architects: William Holford & Partners, Liverpool & London

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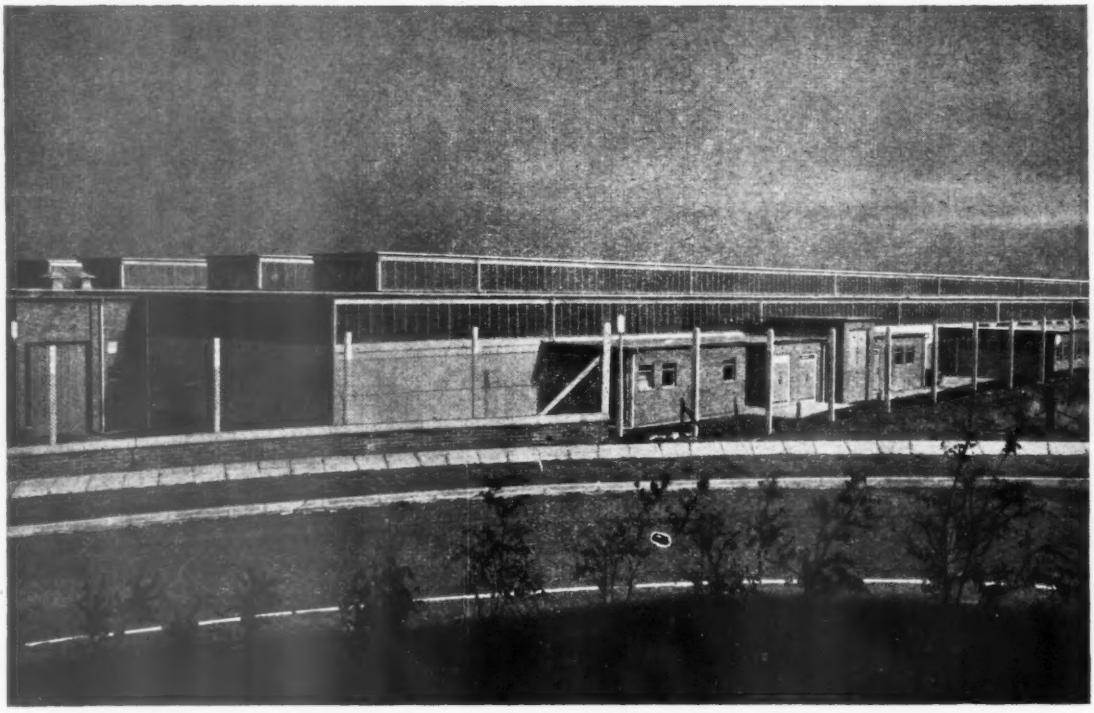

External View of the Factory

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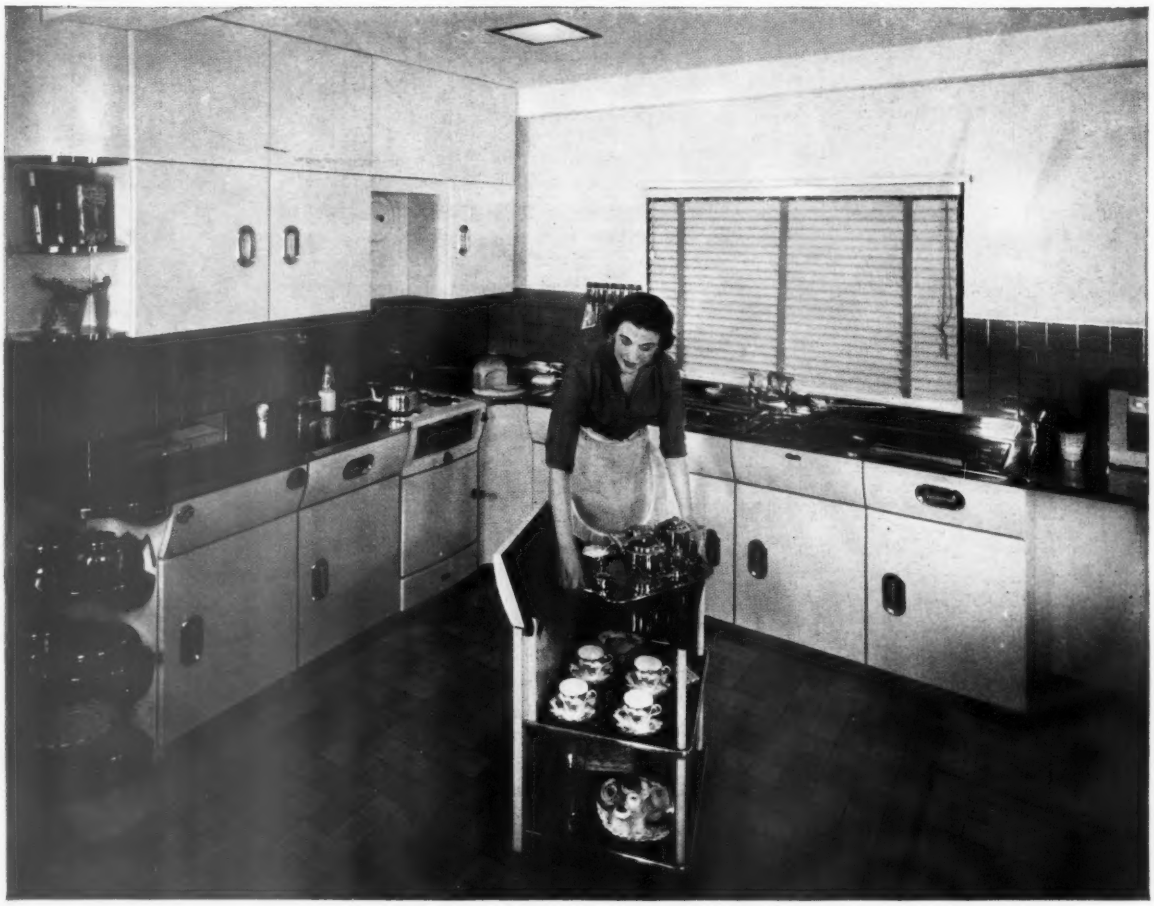

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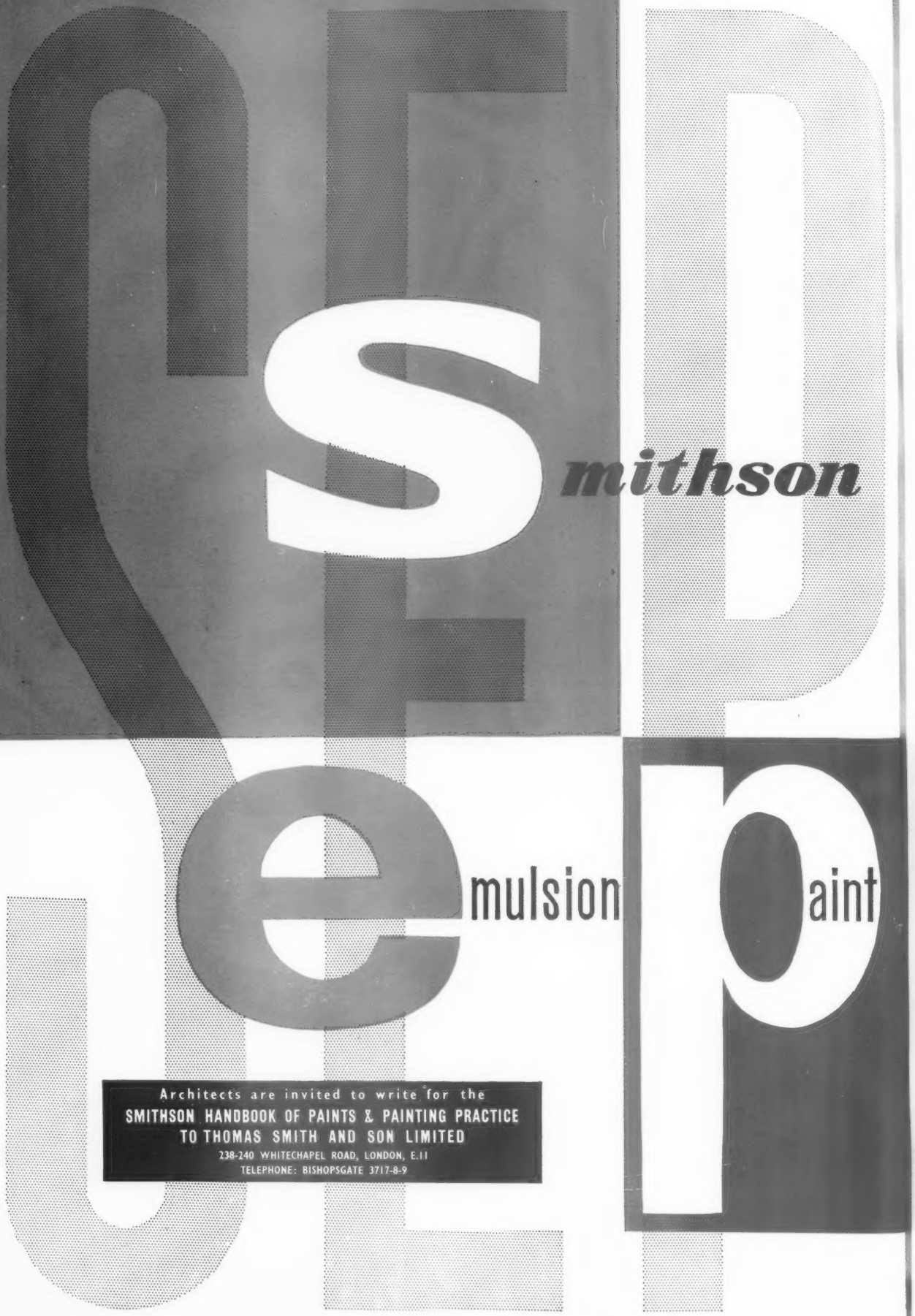

Photo : Staff canteen of the National City Bank of New York, London, E.C.2.

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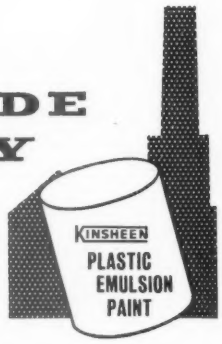
INSIDE STORY



IF THREE MEN . . .

Rather like an arithmetical problem set to torment small boys, we recently gave three tins of paint to three painters and told them to paint three long panels with a view to finding out how far they got within a specific time. The man painting the left hand panel was given a gloss paint. The man on the right was given a flat oil paint. The man in the centre was using KINSHEEN Plastic Emulsion Paint. This perfectly authentic picture speaks for itself. The wonderful covering power and ease of application are just two of the more notable advantages of KINSHEEN, and if you care to write for literature we should be pleased to acquaint you with the very many others.

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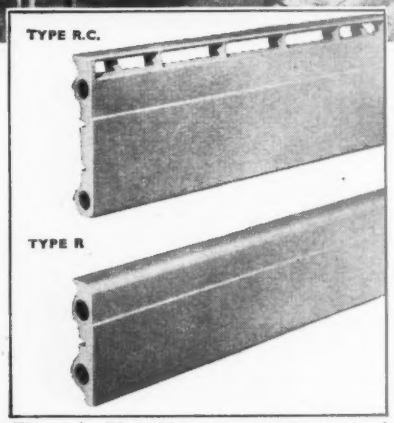
The Crane skirting heating system

Z.1



The main illustration shows both types of Crane Skirting Heating installed. The 9″ type 'RC' is particularly suitable for use under large windows with low sills. Also for public buildings such as libraries and art galleries, etc. Manufactured in 2′ lengths only. The 6″ type 'R'—for flats and houses—is also manufactured in 2′ lengths. On walls where heating is not required, matching wood skirting can easily be included for continuity. Both types are normally delivered unassembled unless otherwise instructed. Standard pipe connections ¾″—both types. Crane Skirting Heating is primarily designed for inclusion in buildings in the course of construction, but can also be installed in existing property.

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CRANE Cast Iron Skirting Heating is virtually invisible—yet it distributes warmth evenly *to every point in the room!* It simply takes the place of normal wooden skirting, leaving the entire floor space of the room free from obstruction, and can be finished in any colour to fit in with decorative schemes. Here indeed is a heating system that gives unlimited scope for 'free' architectural planning and interior decoration.

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Mean water temp. in heater	160°F				170°F				180°F				190°F			
Room Temp.	55°	60°	65°	70°	55°	60°	65°	70°	55°	60°	65°	70°	55°	60°	65°	70°
6″ high Type R	200	185	175	165	225	210	200	185	250	235	220	205	275	260	250	235
9″ high Type RC	510	470	450	420	570	530	510	470	630	600	570	530	690	660	630	600

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The illustrations above and on left are two examples of ELLARD "Radial" Door Gear fitted to garages on a housing estate. The lower picture shows part of a range of thirty-six garages built in rows one above the other on what was once a hillside. This group of garages adjoins a council housing estate, and provides convenient and moderately priced garage accommodation for tenants. This scheme admirably suits smaller dwelling house estates and offers a profitable return as investment. Specify ELLARD "Radial" Sliding Door Gear for all round excellence of design, moderate cost and prompt delivery.

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ELECTRIC FLOOR WARMING

Floor warming is a very satisfactory form of low temperature radiant heating which offers considerable advantages over other forms of continuous heating in many present-day conditions. It is generally acknowledged that the air temperature necessary for comfort decreases as the proportion of radiant heat increases: the effect is especially noticeable with a heated floor because warm feet and a cool head are very desirable conditions for health and comfort. The proportion of radiant heat emitted by a warmed floor is greater than that obtained from a hot water radiator system and so a lower air temperature will suffice; heat loss through walls and ceilings is accordingly reduced. This saving is enhanced and personal comfort improved by the fact that there is a satisfactory temperature gradient; the air temperature at the ceiling is often less than at floor level (see Fig. 1). In consequence, the excessive air movement characteristic of convection heating is eliminated and with it the tendency for stains to occur on walls and ceilings.

Floor Warming Principles

It is well known that concrete is a 'cold material'; a room with concrete walls, floor and ceiling has to be heated for a long time before it becomes warm. At first, it is impossible to produce conditions of comfort no matter how much the air temperature is raised; but when the concrete has been warmed, the occupants of the room will be comfortable with a comparatively low air temperature.

The time taken to warm the concrete shows that, in addition to its poor insulating properties, concrete has a large capacity for heat. This characteristic is utilised in electric floor warming to enable current to be taken during the night when the reduced load on the power stations enables electricity to be supplied at a lower price. In this way the floor is filled with heat during the night and the building or room is warm first thing in the morning, ready for the day's work. The amount of heat a concrete floor will hold depends basically on its thickness, area and maximum permissible surface temperature. The thickness depends generally on structural requirements; the area is that of the whole room or building and the maximum surface temperature is generally 75° F., although there are cases where 80° F. may not be too hot.

The warm floor will continue to give heat to its surfoundings as long as they are at a lower temperature than its surface; the greater the temperature difference the more rapidly will the stored heat be dissipated. As the temperature of the room approaches that of the floor surface, heat emission diminishes and the floor loses comparatively little heat until the electricity is automatically switched on again.

If the building has adequate thermal capacity, i.e. if it is of really 'solid' construction, it will store enough heat to enable electricity to be taken at night only (usually from 7 p.m. to 7 a.m.), at an 'off-peak' rate where this is available. If it is not possible to obtain all the heating requirements of a building from the floor or floors, the balance can readily be made up with any of the conventional types of heater.

Structural Insulation

As with all methods of warming buildings, good structural insulation will give better results and lower running and installation costs, for the simple reason that the heat losses are lower and so less heat is needed to keep the building warm. In the case of two-storey houses, a warm ground floor usually transmits sufficient heat to the first floor rooms to render only occasional topping up necessary, especially if the first floor ceiling is well insulated. A concrete floor slab resting on the ground should be insulated as shown in Fig. 3, as the heat losses at the edges of the slab may amount to as much as 30% of the total. Continuation of the edge insulation under the heated floor in the form of a perimeter strip about 2 ft. in width is of advantage; the heat loss downwards is at its lowest in the centre of the slab.

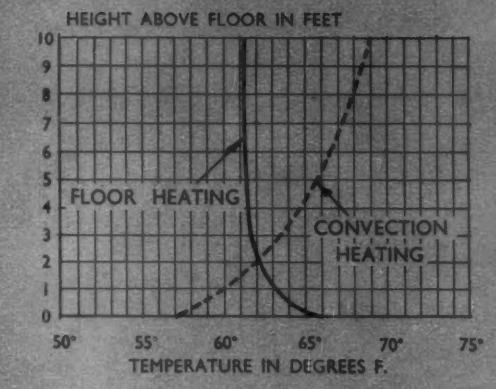

Fig. 1. Room temperatures

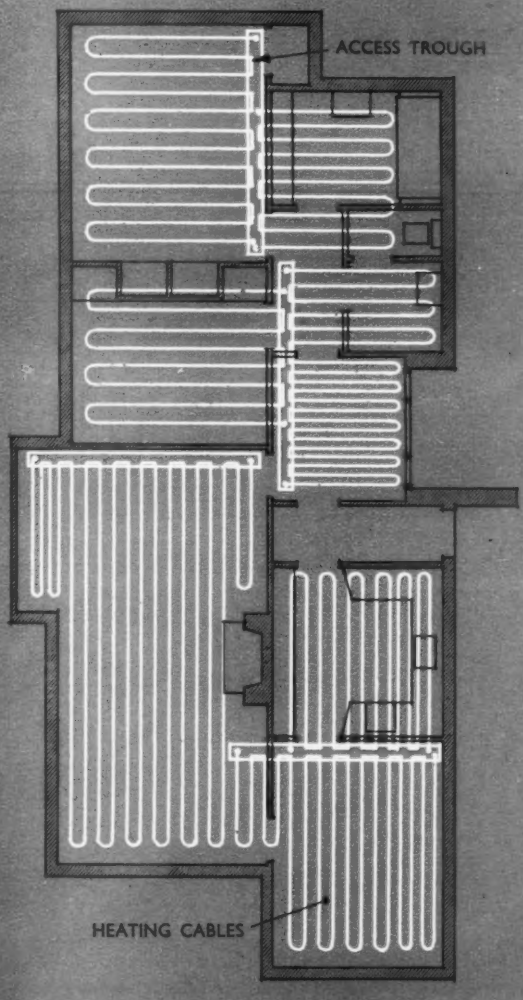

Fig. 2. Layout of heating cables

H.1

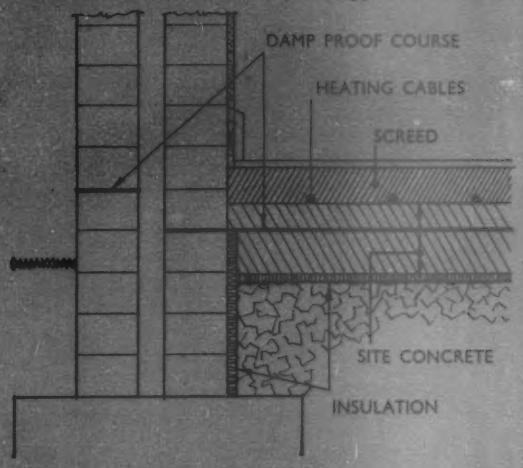

Fig. 3. Position of heating cables Systems B and C

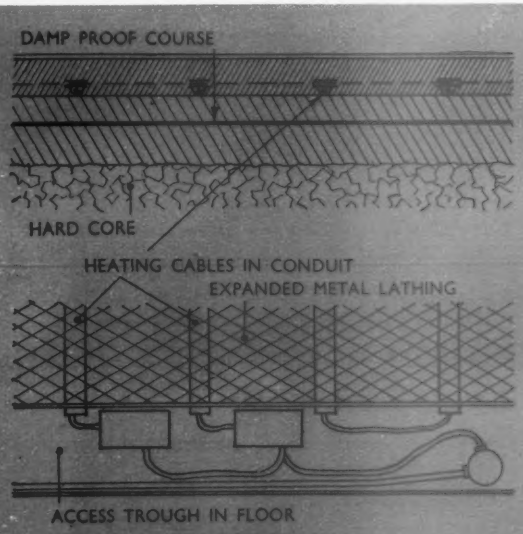

Fig. 4. Heating cables System A

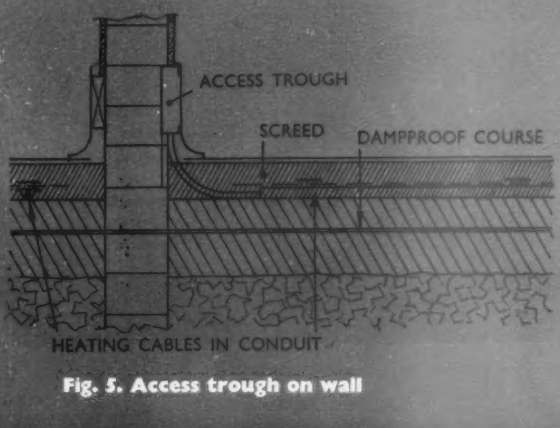

Fig. 5. Access trough on wall

Electric Floor Warming Systems

There are three electric systems in use, the cables (of specially determined resistances to suit the heat output required) are either laid in a conduit of semi-circular section (System A) or simply buried in the concrete. In all cases they are laid on top of the surface concrete and covered by 1½ to 3 inches of dense concrete screed according to the floor finish: see Figs. 3, 4 and 5. System A is a patented one which has been widely used; it works at mains voltage, the cables being drawn into the conduits from shallow troughs (Figs. 2, 4 and 5). When the heating cables are embedded in the screed, two methods can be used; in one (System B) an insulated cable with a metal or plastic sheath working at mains voltage is used; in the other (System C) bare galvanised iron wire is used as the heating element, fed at low voltage from a transformer (Fig. 3).

In all three systems the electrical loading generally varies between 10 and 12½ watts per square foot of floor area to be warmed, according to the usage of the building, its thermal capacity and insulation and the periods when off-peak electricity is taken.

The principal advantages of electric floor warming are: low capital cost of installation and simplification of building due to the elimination of the chimney stack, access for fuel supply, boiler house, fuel store, pipe ducts, etc.: no labour is needed to run the installation, no dirt or dust is produced and no maintenance is required: the walls and floors are completely unobstructed: partition walls can be adjusted after completion without interference with the heating system: internal decorations last much longer: greater comfort conditions are provided: the operating costs are reasonable, especially for buildings which are in continuous use, or are occupied for long periods at a time.

Control of Electric Installations

In small domestic installations, temperature control is by ordinary room thermostats, one to each circuit; unless conditions of usage vary considerably, it is not necessary to have a separately controlled circuit for each room. Further economy in operation may be obtained by fitting manual control switches to each circuit so that the electricity may be switched on or off as required. The control of a large installation is more complex and specialist advice should be obtained; a system of thermostats which take both inside and outside conditions into consideration is usually employed. This is particularly satisfactory where long or continuous usage occurs and it results in reduced running costs.

Drying Out the Structure

As the heating cables are laid at an early period of the construction it is possible to switch on the heat and so begin to dry out the structure as soon as it is roofed in and glazed, the advantages of this gentle heat being quite remarkable. All buildings of normal construction contain large quantities of water which are by this means steadily expelled and not allowed to accumulate. Equilibrium is not usually reached, however, until the end of the first heating season, when the consumption of electricity drops to the level which would be expected from the heat loss calculations and external temperature conditions. The excessive shrinkage of joinery and timber floors often experienced does not occur if the building has been gently dried out as described.

Floor Finishes

Most of the finishes generally used on a solid concrete floor are suitable when electric floor warming is installed: wood strip and blocks should be laid temporarily in place for a few days on the warmed floor so that they may attain the optimum moisture content before laying. Stone, tiles and terrazzo are very suitable, but mastic finishes are not recommended. Rugs and carpets as used in most houses and flats, do not affect the heat output of the floor.

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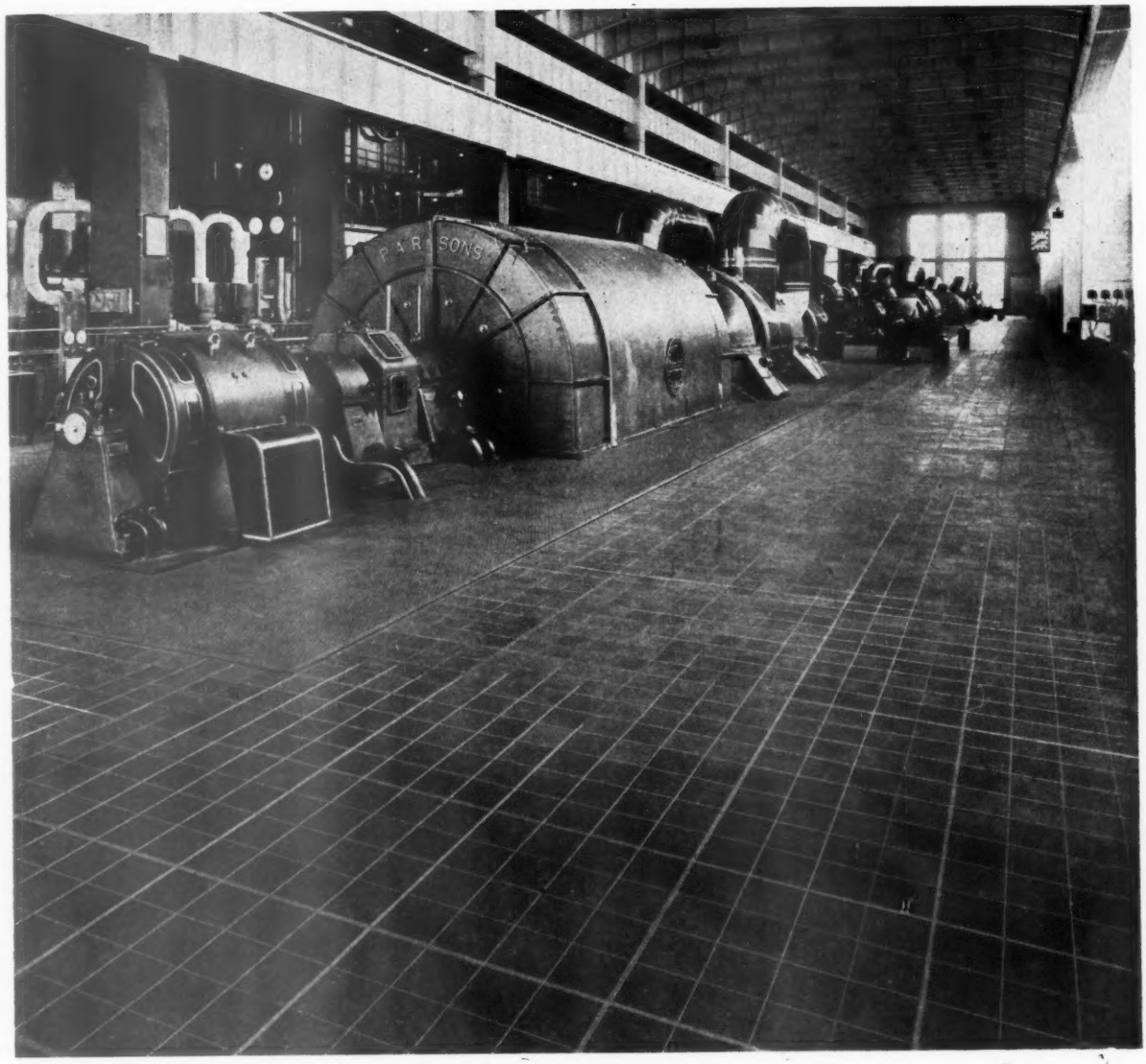

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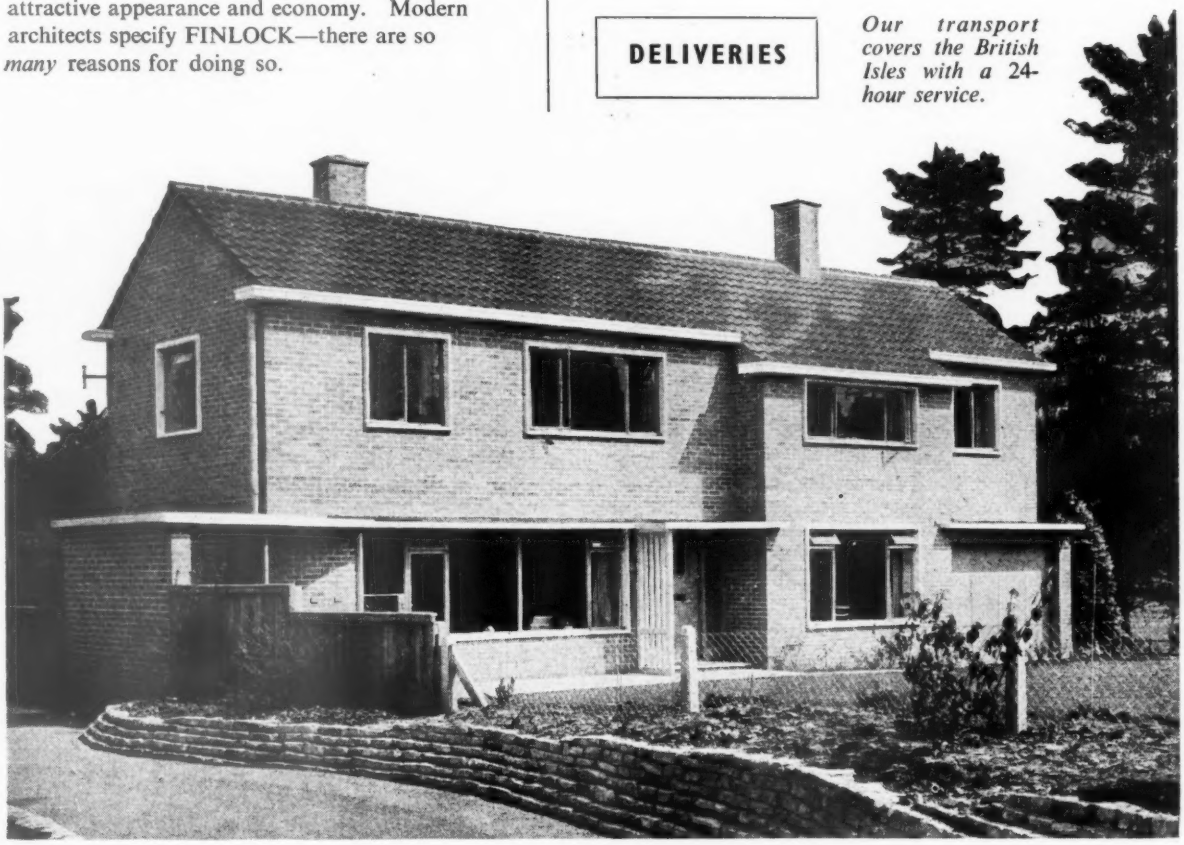

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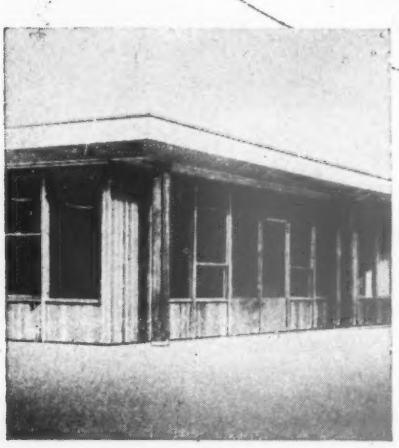

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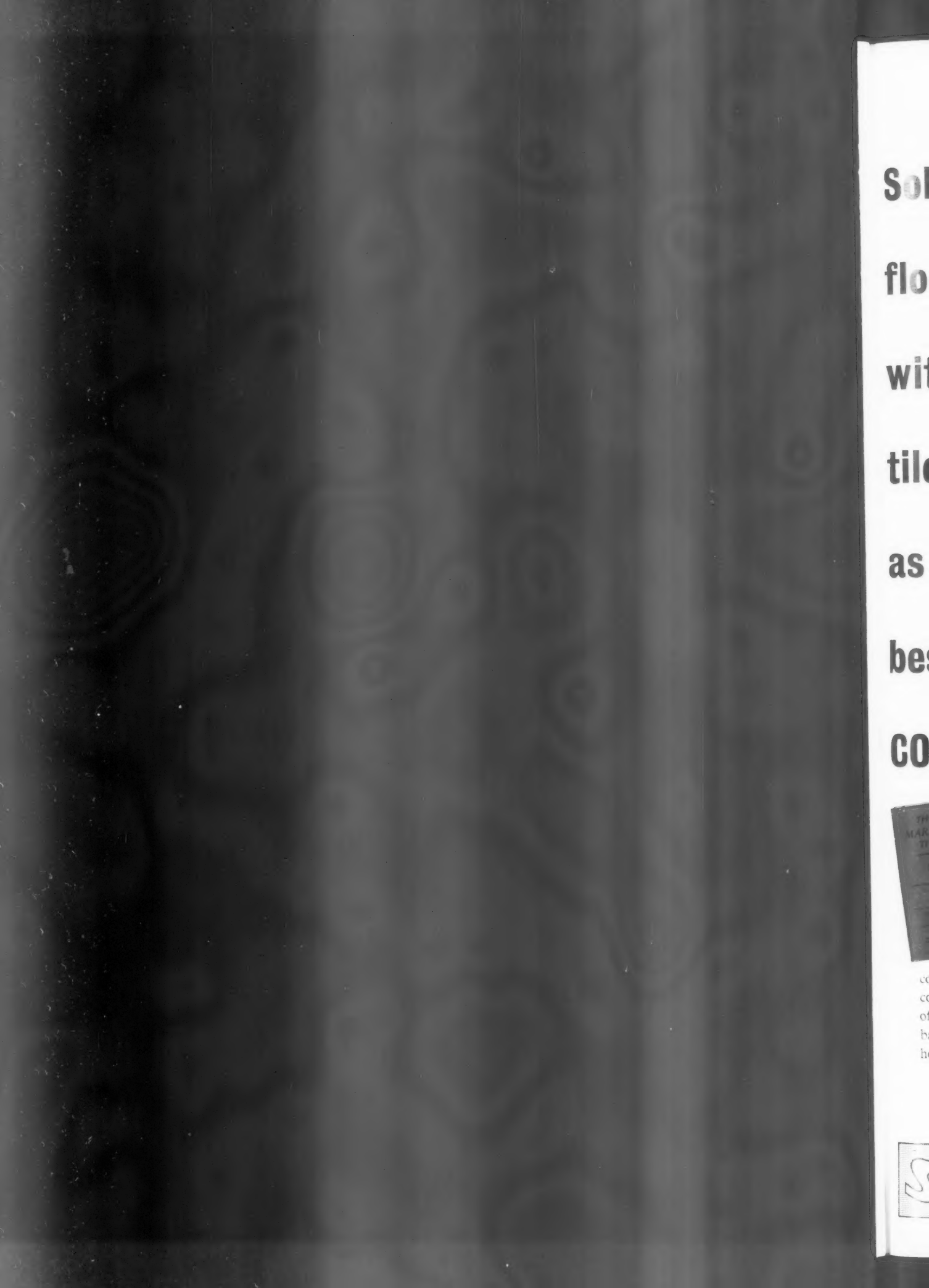

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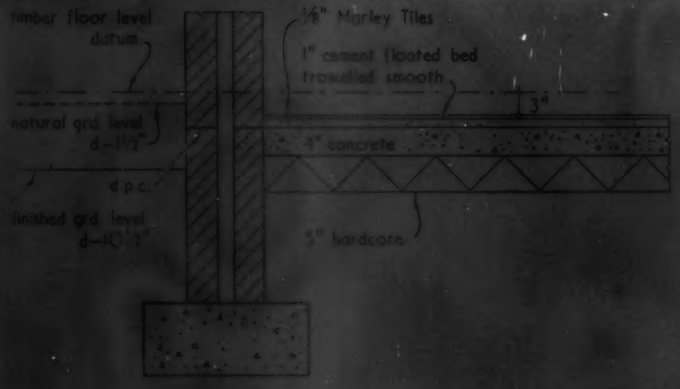
EXAMPLE A For Normal Type of Site

38 yds. sup. Excavate, remove and deposit @ 1/1d.	2	1	2	5 ft. run Form pipe chase @ 1/-	5	0	
9½ yds. cube Excavate to reduce to levels @ 4/9d.	19	0		31 yds. sup. 1" screed @ 4/10d.	7	9	10
3 yds. cube Remove and spread surplus @ 5/-	1	0	0	31 yds. sup. ½" Marley Floor Tiles @ 11/3½d.	17	10	1
31 yds. sup. Hardcore and blinding @ 3/10d.	5	18	10	6 ft. run Galvanised steel bar as step @ 1/10½d.		11	3
31 yds. sup. Concrete bed 4" thick @ 5/10d.	9	0	10				

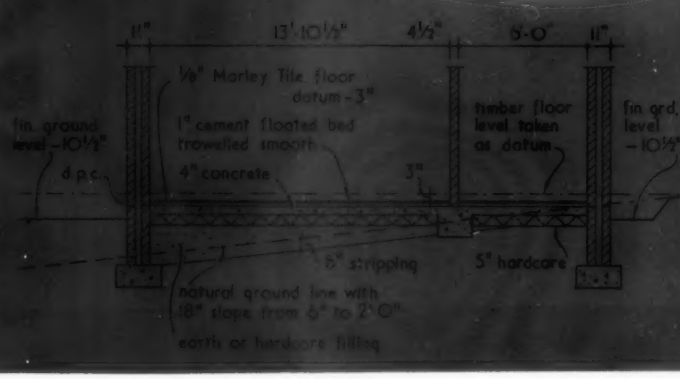
Total for Example A £44 16 0



EXAMPLE C2 For Sloping Site (18" crossfall from front to rear)

38 yds. sup. Excavate, remove and deposit @ 1/1d.	2	1	2	31 yds. sup. 1" screed @ 4/10d.	7	9	10
9½ yds. cube Filling to make up level @ 4/9d.	2	3	11	31 yds. sup. ½" Marley Floor Tiles @ 11/3½d.	17	10	1
31 yds. sup. Hardcore and blinding @ 3/10d.	5	18	10	6 ft. run Galvanised steel bar as step @ 1/10½d.		11	3
31 yds. sup. Concrete bed 4" thick @ 5/10d.	9	0	10	DEDUCT 9½ yds. cube Remove surplus @ 5/-	45	0	11
5 ft. run Form pipe chase @ 1/-	5	0			2	6	3

Total for Example C2 £42 14 8



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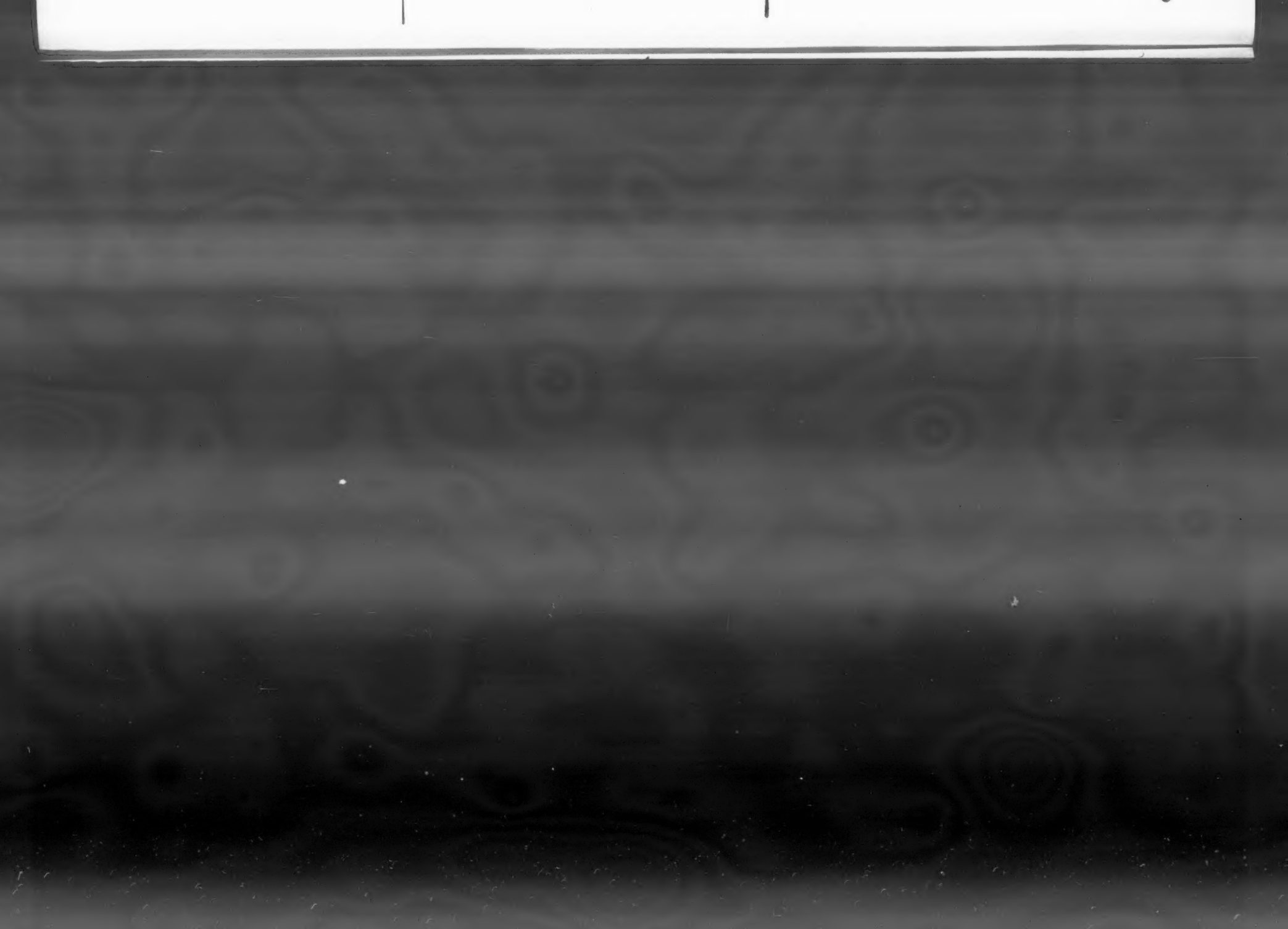

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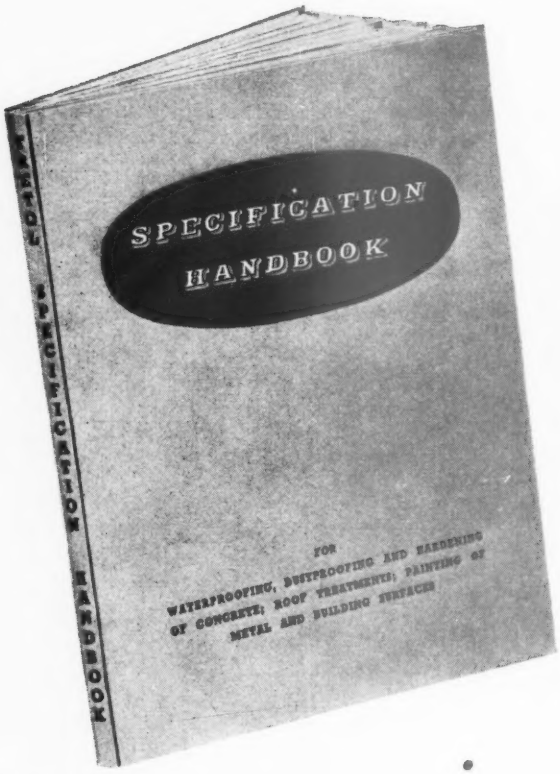

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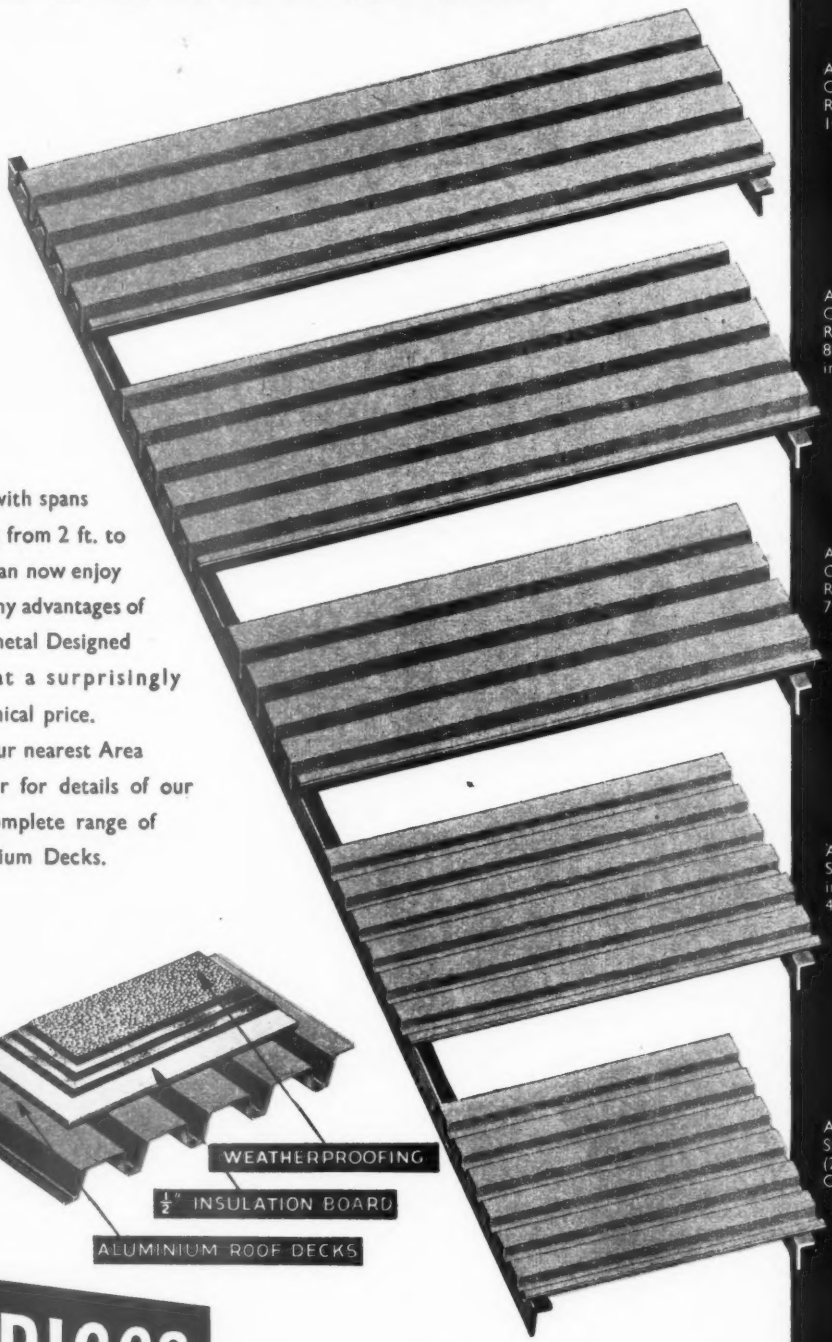

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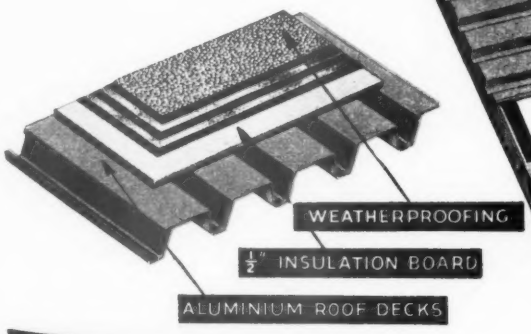

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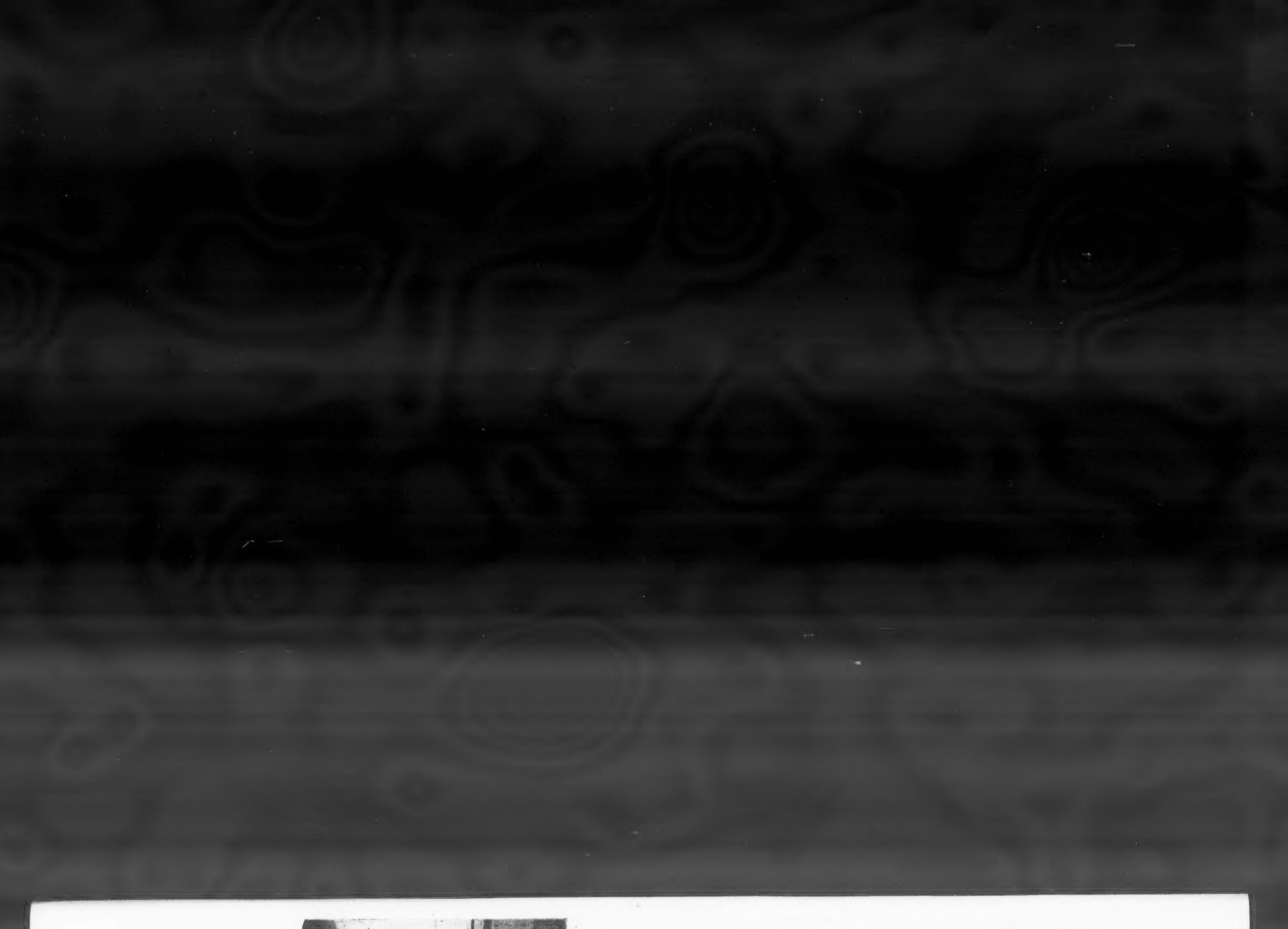


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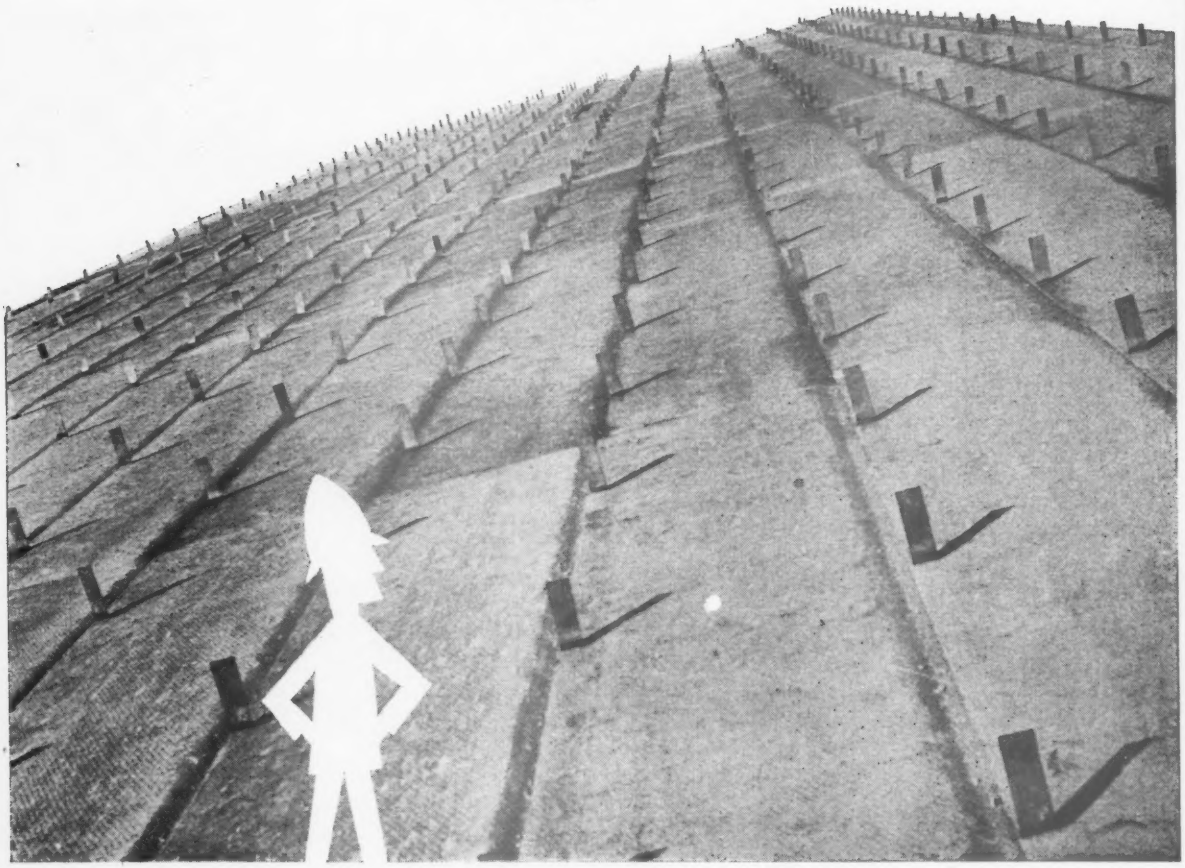

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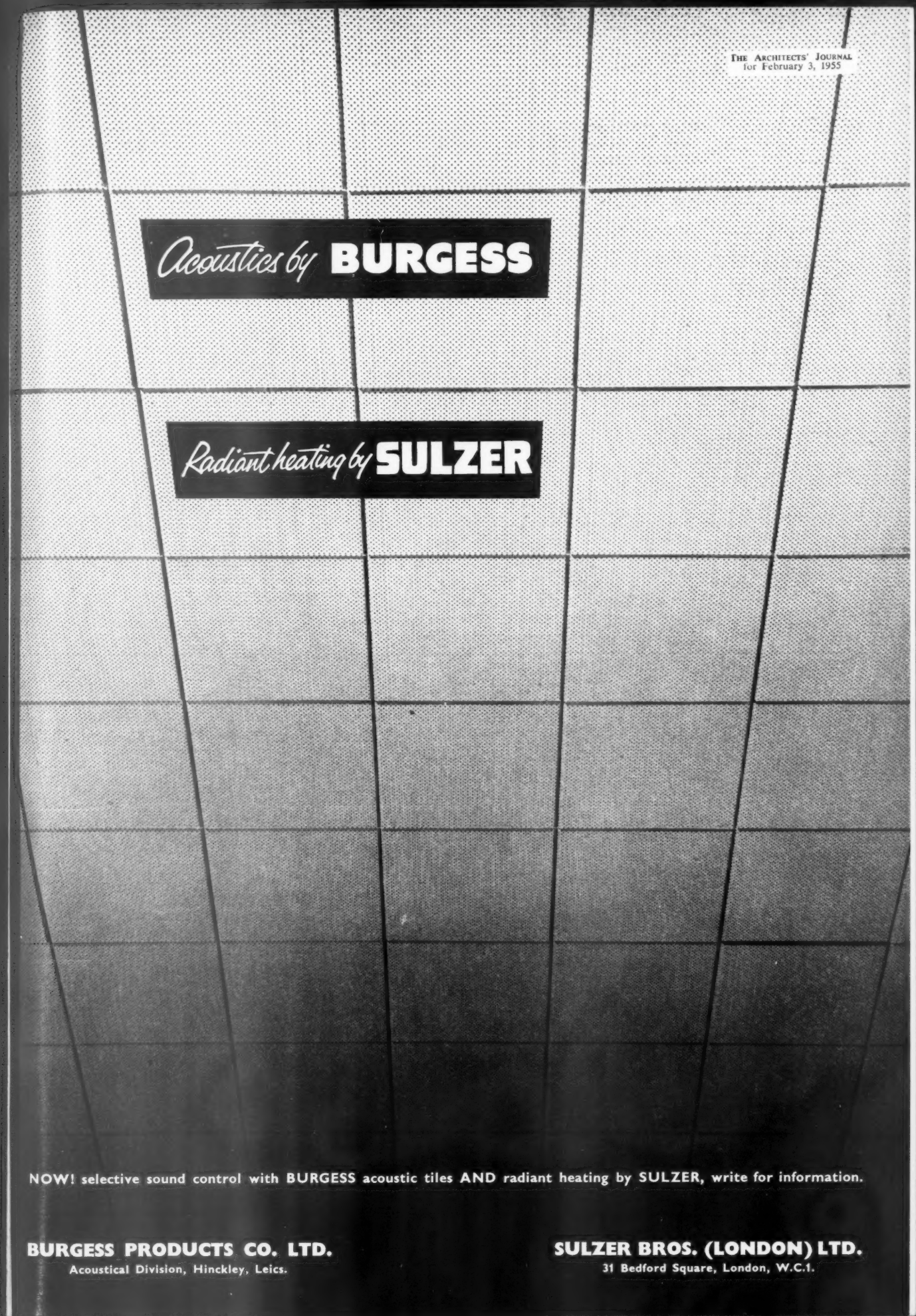

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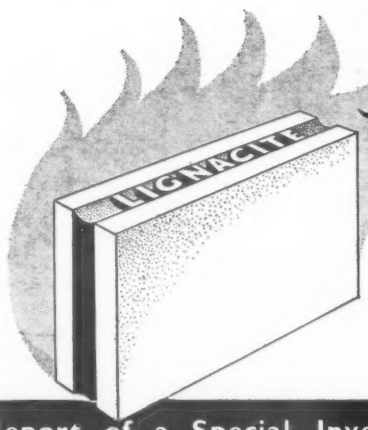


FIRE

..a standard Fire Resistance Test on a wall of Lignacite Blocks

Report of a Special Investigation for Lignacite Ltd., carried out by the DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH AND FIRE OFFICES' COMMITTEE, JOINT FIRE RESEARCH ORGANISATION

The following is an extract from the Report, a complete copy of which will gladly be shown on request.

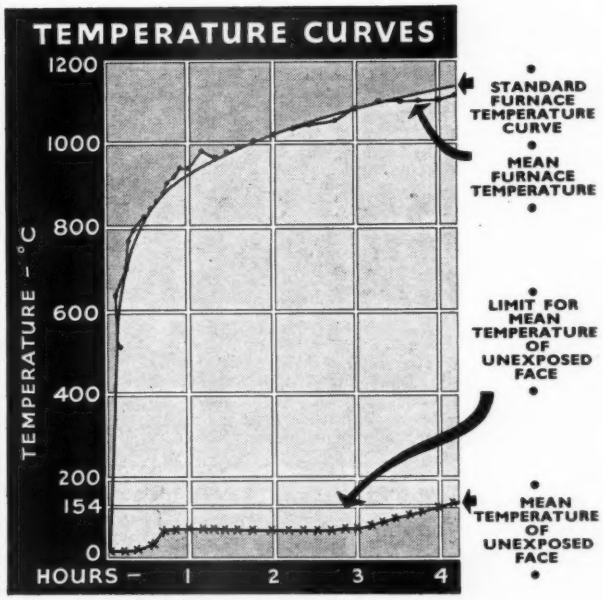
A fire resistance test in accordance with B.S.476: 1953, has been carried out on a non-loadbearing wall of Lignacite precast building blocks nominally 4½in. thick finished on one face with a skim coat of plaster.

The specimen wall satisfied all requirements of B.S.476 for 4 hours 7 minutes. The performance of the partition was judged on the criteria of stability, integrity and insulation defined in the standard.

The duration of the fire test was 4 hours 22 minutes. On the exposed face the plaster remained intact throughout, except for a few small cracks. Steam and vapours were omitted from the unexposed face between 35 minutes and 2 hours 10 minutes from the start of the test but no observable distortion of the wall was observed and no cracks were visible in the blocks or joints at the end of the test.

The limiting rise in temperature (mean) of 139° C. on the unexposed face was reached after 4 hours 7 minutes. Just before the test was stopped, at 4 hours 20 minutes, the temperature rise on the unexposed face was 143° C.

A non-loadbearing wall 10ft. square of Lignacite building blocks nominally 4½in. thick finished on the face exposed to the furnace with a skim coat of plaster as described in this report fulfilled the insulation requirements of B.S. 476: 1953 for 4 hours 7 minutes. The wall maintained its stability and integrity up to 4 hours 22 minutes, when the test was terminated. The Lignacite wall therefore provided fire resistance of the 4-hour grade.



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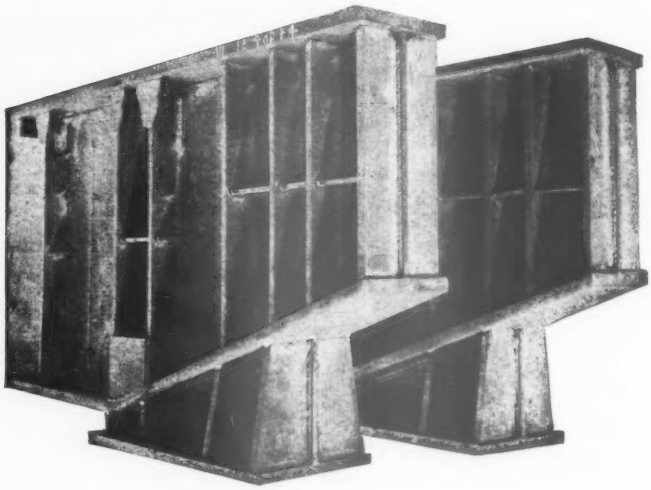

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THE ARCHITECTS' JOURNAL

9, 11 & 13, Queen Anne's Gate, Westminster, London, S.W.1 Whitehall 0611

No. 3127 February 3, 1955 VOL. 121

Subscription rates: by post in the U.K. or abroad, £2 10s. 0d. per annum. Single copies, 1s.; post free, 1s. 3d. Special numbers are included in Subscriptions; single copies 2s., post free 2s. 3d. Back numbers more than 12 months old (when available), double price. Half yearly volumes can be bound complete with index in cloth cases for 25s. 0d.; carriage 1s. extra.

DUTCH TREAT

"Spidermen March Across London," said the newspaper headline, and ASTRAGAL, who has been a little jumpy ever since he went to an exhibition of horror comics, nipped into the AA and lay low for three hours or so, listening to a marathon talk by Mr. Bakema, the Dutch architect. Mr. Bakema broke the record recently set at the AA by Sir Hugh Casson, who—with the help of a number of not-quite-lightning sketches—barely got to Pekin (the subject of his talk) at the end of two and a half hours. But two and a half hours from the entertaining Sir Hugh is one thing, and three hours from Mr. Bakema is—if you follow me—quite another. It says much for the stamina of the younger generation that the AA audience—save for a handful called away by cramp, trains and anxious landladies—sat the speaker out. Mr. Bakema, who spoke informally—with no jacket and little English—took an unconscionable time to put over simple points. However, his own buildings, which he showed on slides in some detail, were interesting enough—in the heavy Dutch idiom—to be worth seeing.

*

When it was all over, ASTRAGAL crept down Tottenham Court Road—soon to be touched by dawn's rosy (as somebody once said) finger, with two thoughts uppermost in his mind. The first thought was that Mr. Bakema is almost certainly a leading member of that now rather tired, over-loquacious guild of international modernists known as CIAM, on whose advice (or the advice of its MARS branch) he was invited to this country. The second thought was one of relief at the news—in the "Final Night" edition—that "Employers Ban Spidermen's Overtime," and the subsequent discovery that the Spidermen were human enough to be asking—like building operatives—for more money.

OPERATIVES AT WORK . . .

As a result of the building operatives' latest demands for an increase—they want another fourpence an hour—the employers have taken the opportunity of suggesting that there should, perhaps, be a greater difference between craftsmen's and labourers' rates. This sounds very sensible. Before the war the labourers' wage was only three-quarters the size of the craftsmen's, but now the craftsman gets only 10 per cent. more.

The result is that there is less incentive for young men to become skilled, and the present shortage of apprentices will probably lead to a shortage of men in the supervisory grades, who are normally recruited from craftsmen. It is all very sad, but the fact is that building has now reached a stage at which the craftsman is less necessary. How many bricklayer apprentices, for instance, will ever have to do more than lay the simplest bonding to reveals? How many painters will do more than spray door trim and skirtings? Do you *really* have to learn for five years before you can cut and bend copper pipe and wave a casual blowlamp at a capillary joint? In spite of the unions we shall sooner or later descend to intermediate grades, called "wallers" or "brush-hands," or something of the sort, and the few true craftsmen will be used only for restoring Guildhalls and Parliaments and building head offices for banks.

. . . AND EMPLOYERS AT PLAY

One of the most distinguished union members in the country waved his membership card on high at the NFBTE's dinner last week, and spoke of the increasing value of trade unions in Britain. The speaker was Sir Winston Churchill, who was, of course, a delight to listen to, as his audience indicated—after two false starts—with the usual trite song. Sir Winston was preceded by G. W. Grosvenor, the retiring president of the NFBTE, who—very thoughtfully—played down his own well-known Churchillian manner of speaking, in proposing the health of HM Government and the principal guest. Although Harvey G. Frost, the new president, who followed Sir Winston, modestly described himself

as an anti-climax, he proposed the health of the guests at greater length than was strictly necessary. And in his response, Charles Bowyer—president of the RICS, played—and waited for—laughs all the way.

*

Incidentally, it was quite a change to hear no mention of architects during the evening—although there were references to that all-embracing term "the building team." But I am forgetting: we did get one mention—in a mild joke from David Nixon, who appeared in the inevitable cabaret.

WHAT A YOUNG MAN SHOULD KNOW

Not that architects need to worry about lack of publicity nowadays. If your face doesn't get into a breakfast-cereal advertisement because you are the architect-husband of a well-known personality (like who-was-it?), you stand a good chance of bursting into print somewhere if you simply design an unconventional house. ("She's oh-so-cosy in her glass-walled dream house.") Yet another paper—the *Woman's Sketch*, which is, as your wife will tell you, a supplement to Wednesday's *Daily Sketch*—has begun to flirt with the daring idea that architects are capable of building houses fit for readers to live in. It recently featured a Basil Spence ("soft-voiced Scot") design as the first of its shape-of-homes-to-come series. Marion Slater, in a high-pressure write-up, managed to dispose of the planning in three postage-stamped sized paragraphs, and devoted all the rest of her half-page feature to discussing finishes and equipment. In this she followed the general tendency of most popular-Press writing on architecture. Young architects who hope to get on should take note that their job is not to create gracious volumes on the scale of man, to balance solid and void, and to understand the nature of materials; their job is to specify a better sink and a hot-plate in the serving hatch.

*

And while we are still hot from the Press' remarks may I remind you that the *Liverpool Daily Post*, being a faintly old-fashioned provincial paper, still employs architects to write about architecture (nearly as bad as the BBC employing students of ethics to talk about ethics). It gave Philip Dod a four-column airing on *Let us Build Houses with More Imagination* on the same day as the piece referred to above appeared in the *Daily Sketch*. Mr. Dod acquitted himself very creditably, putting the architect's point of view nicely among the vitreous enamel and the need to avoid dusty corners, contrasting his faintly brutalist front elevation against the side elevation of a spec-builder's semi-det, all drainpipes and awkward windows. But here he pulled off a piece of special pleading of which architects may well be proud, for the afore-mentioned side elevation was labelled "*Front* elevation of a typical house . . ." and the ensuing rhetorical question "Which is the front door?" became a real stumper.

*An advertisement from a Swiss Newspaper. See "Pl*y*r* Please Copy."*

PL*Y*R* PLEASE COPY

Before we leave the subject of architects in the public eye you may care to look at the picture on this page. A friend in Haifa sent this advertisement from a Swiss paper and translates it thus: Who put up this bold building in Marseilles? A Swiss, Le Corbusier. This is the height to which the creative Helvetic spirit can rise—in France. Let us, while smoking a Gxulxise, consider the implications of this . . .

*

And while we in England consider the heights to which the ad.-man's ingenuity and irrelevance can rise—in Switzerland . . . has anyone a match?

UNORTHODOX FILMING

Architect-made films don't exactly grow on trees, so this column was delighted to be smuggled in to a recent showing of three films by Charles Eames, the brilliant young Californian architect who is best known over here for his steel and plastic chairs, but also has a couple of ingenious houses and a lot of other design work to his credit. These particular films were not about architecture, though he is understood to have been filming Bavarian baroque while in Europe recently.

*

One film was of his famous collection of toys from all over the world, strung together as a street parade with suitable music. The result is as hard and glossy and pretty as a newly-painted toy soldier, and would probably get Eames a job in Hollywood any time he wants it. Another was a too-long, but rather hypnotic, study of soap suds trickling and sloshing across the back yard as it was being washed down, making flexible organic patterns as they flowed round obstacles and through the link-net fencing. A bit arty, ASTRAGAL thought, while wishing he had the wit to make such a film in his own basement area.

*

The big feature was tougher going—an attempt at a fairly elementary study of communication theory, which is clearly a very important subject, though one gets very tired of having it rammed down one's throat by technological one-up-men. It is the kind of film one needs to see twice in order to be sure one has understood what it is getting at, but it would be no strain to see it again, for the visual imagery which Eames has used to punch his points across is a constant delight to the eye and a stimulation to the mind.

Germany Rebuilds

In an article on page 164 John Gloag says that the reconstruction of many cities in Germany, which he visited last November, "is too patchy and has been carried out piecemeal, and not with any broad vision." Something similar may one day be said about the city of London, where opportunities for comprehensive development are being cold-shouldered. But in spite of the absence of planning in Germany, that country has put up many fine individual buildings since the war. Here, for instance, is Gero Karrer's new block of offices in Stuttgart—a city which, as Mr. Gloag points out in his article, is in a muddle because of planning delays, sentimental attachment to ruins of buildings of dubious architectural value and an appalling traffic problem. It may be small consolation that buildings such as this rise from the muddle, but it is the sort of consolation that we would be grateful for in our capital city, where individuality is suppressed and where unco-ordinated buildings will probably be undistinguished as well.

STAR-GAZERS' SANCTUARY

All dome-fanciers will have applauded the recent announcement that Madame Tussaud's have been granted the necessary import permits to bring over from Germany the machinery and optical tackle to set up a planetarium. It has long been held a blot on Britain's escutcheon that we have not got a permanent one here—though ASTRAGAL cannot quite see why—and though this presumably indicates that the Island race just don't care what makes the solar system go round, such shrewd business men as the directors of Tussaud's must consider that sufficient demand now exists.

*

It will, of course, be the widest screen in town, since a true planetarium is an uninterrupted hemisphere with the audience inside it (and possibly half-reclining), and this should pose some interesting architectural problems—the sort, indeed, that might justify an open competition, and certainly requires a pretty geodesic space frame in the Buckminster Fuller manner. Nothing seems to be known about the proposed site, but ASTRAGAL has a sentimental spot in his heart for the place where the old Coliseum—a nearly hemispherical panorama—once stood, between Albany Street and Regent's Park, and no more than a deep-throw-in-from-boundary from Madame herself.

THE PLAIN MEN'S GUIDE

There are now several guides on the market for the benefit of the man who wishes to build his own home. The latest, Houses of To-day* by Colin Penn is as good as any. Its hundred odd illustrations show a catholic outlook on design, and its text is a genuine effort to supply useful and practical information as to what is involved in the employment of an architect, what you get for your money and what you don't get.

*

It is a pity that photographs and plans of the same house often get widely separated in the book. It is a pity, too, that a clear statement was not made that the best architects cannot afford to design private houses of real merit at a fee in any way remotely resembling the RIBA scale—which the book prints in full.

ASTRAGAL

*Batsford.

The Editors

PRIZES AND STUDENTSHIPS

"IS it not more satisfying, in the end, to design a door knob which is to be made," writes Vernon Gibberd in a letter on page 160, "than a Council of Industrial Design building which is not?" We are in complete agreement with this statement which arises from criticism made in the frontispiece caption of the JOURNAL of January 13 of the programmes set for some of the RIBA Prizes and Studentships. It emphasises one of the greatest dangers besetting all architectural schools and the system of external studies organized by the RIBA: that of making designs on paper an end in itself.

Our criticism of the competition programmes was based on the fact that they artificially separated construction from design. This is no new fault—it has been the chief sin of the profession—on and off—for centuries, as many pretty but structurally unsound buildings remain to tell us. In the past, too, a tradition of technically competent building craftsmen saved many an architect's reputation. Today, however, there is no such easy escape, save for the casual and complacent designer using traditional construction. It is therefore all the more important that the students' curriculum is devised so that the "$\frac{1}{8}$ scale design drawings" type of exercise does not become an end in itself or the chief way of selecting the "best students." It is regrettably true that the chief prize-winning students of the 'twenties and 'thirties are far from being the most eminent designers of today.

Mr. Gibberd is, of course, also right when he states that the small step which we suggested should be taken by the RIBA of ensuring that competitors design to the limit of their responsibilities as architects—including services, structure and finishes—has serious implications. It presents only two possible courses: either the design programmes should be limited to very simple types of buildings, or, alternatively, and rather more realistically, the student should be allowed to have outside specialist advice.

This last suggestion would, as Mr. Gibberd points out, make nonsense of the *en loge* part of the competition—a competition technique which, from the jury's point of view, can in any event be very unsatisfactory. However, a possible solution would be to leave it to the discretion of the architectural schools to include these competitions in their curricula, and to select their own entries for submission to the RIBA. By this method the student would always have, whether a prize-winner or not, something for his portfolio, and the quality of the specialist consultant advice (whose names could accompany the student's) would help to indicate the quality of the school staffs (and that of any engineering and other students who could be called in and named as consultants).

It only remains to make the competitions for the design of real buildings—as done at the Birmingham School—for the prize to be worth winning, and the losers would be compensated by having had an essay in live practice procedure.

This is the second article by the JOURNAL *Guest Editors (Costs) for* 1955 *(N. Stanley Farrow,* M.B.E.; *A. W. Cleeve Barr,* A.R.I.B.A.; *James Nisbet,* A.R.I.C.S.; *Ivan Tomlin,* A.I.B.E.; *E. F. L. Brech,* B.A., B.SC.(ECON.), M.I.L.A.). *Their first article, which appeared last week, began the story of an office block, and this week it is brought to a conclusion. The story, and of course the characters in it, are fictional, but the happenings could be true, for it is intended as an illustration of the cost problem in present-day building.*

THE COST OF BUILDING:

THE OFFICE BUILDING

Aubrey Basildon-Jones, architect.

Herbert Gross, client.

Bill Price, quantity surveyor.

The situation as we left it was this: in early November the architect (Basildon-Jones) presents his design to the client (Mr. Gross) with a cube estimate of £47,800 and it is, by and large, approved. There follows the working drawing stage—troubled by some belated changes in the structural and the heating systems, due to the rather late appointment of the specialist contractors. Meanwhile the quantity surveyor (Bill Price) who is also pressed for time, takes off from such drawings as are available. The client had hoped for work to begin on the site in mid-February, but it is March before the documents arrive (without warning) at the tenderers' offices. Here the bills are found wanting in some respects; foundations and a number of provisional and p.c. sums leave estimators a little in the dark. Nor do the fourteen days allowed for tendering give much chance for keen sub-contract quotations. The successful tenderer arrives at a figure of £55,050, and this the architect has some difficulty in reconciling with his cube estimate when he meets the directors of Mr. Gross's company.

Apart from comments that we made on points of procedure (that the quantity surveyor should have been appointed at the sketch design stage; that the

Sidney Boxall, builder.

builder had too little time to tender and so forth), our main criticism was directed at the recognized pattern that our characters were following. For it is a pattern in which comparative investigation of the economy of the building has virtually no place.

MID-APRIL: When we left Basildon-Jones last week, he was returning to his office from the board meeting at which the tenders had been opened. He was trying to resolve all that had been said into some coherent pattern in his mind, but the prime need was clear enough; the cost represented by the lowest tender had to be cut by some £5,000. Back in his office Basildon-Jones writes to Boxall (builder) telling him that, subject to confirmation, his tender had been accepted, with certain amendments to bring the contract sum down to £50,000 or thereabouts.

In the next scene Bill Price and Basildon-Jones draw up stools to a drawing board on which is spread a copy of the bill, Price's abstract sheets and the drawings. "The contingencies," says Price, "were not particularly generous, but we could reduce them from £1,000 to £500." Basildon-Jones does not demur and from this they go on to reconsider the provisional and p.c. sums. Next they search through the bill for items that seem amenable to change or even complete omission. Cigarette butts pile up in the ash trays and when Bill Price finally leaves the office they have a list of reductions which read as follows:

	£
Contingencies	500
Cheaper facings	300
Reduce ironmongery p.c.	50
Omit mural painting	300
Emulsion in lieu of oil paint	50
Omit suspended ceilings	740
Reduce lighting fittings p.c.	100
Reduce floor finishings p.c.	400
Reduce hardcore thickness	100
Reduce size of road kerb	40
Tarmac in lieu of concrete road	150
Fair face brickwork in lieu of plaster	200
Softwood in lieu of hardwood skirtings	100
Reduce p.c. for sanitary fittings	50
Clinker block in lieu of moveable partitioning	725
Reduce plumbing p.c.	100
Reduce area of terrazzo	250
Omit double glazing	175
Omit art. stone canopy	100
Total:	£4,430

COMMENT: *True to the company's budget, these two have succeeded in bringing down the lowest tender to £50,620, and in theory at least this is the cost of the building when built. It is likely that neither Basildon-Jones nor Bill Price really thinks so, but what more can they do at this stage without re-designing the job? The truth surely is that it is now too late to make fundamental changes in the economy of the building. In any case they have no figures which express that economy—no figures to show what proportion of the total cost each part of the building claims. To illustrate what we mean, here is a cost analysis (admittedly hypothetical, but possible) of another, more or less comparable building.*

	s. d.
Preliminaries, insurances	8/0.5
Contingencies	2/1.3
Work below ground floor level	7/1.2
External walls and facings, internal partitions	4/5.0
Fittings	1/0.2
Roof construction	10/4.2
Rooflights	2/0.7
Windows	1/2.5
Internal and external doors	2/3.0
Glazier	0/3.3
W. C. cubicles	0/3.3
Ironmongery	0/4.9
Floor finishes	3/1.0
Wall finishes	0/6.4
Ceiling finishes	1/2.5
Decorations	0/8.3
Kitchen equipment	2/9.3
Plumbing (external)	1/2.4
Plumbing (internal)	1/0.0
Sanitary fittings	0/7.5
Gas installation	0/1.9
Electrical installation	4/7.0
Heating and H.W. installation	5/2.6
Drainage	2/1.6
External works	3/9.2
Total floor area: 12,409 *f.s. Shillings per sq. ft. floor area*	66/9.2

We shall have much to say in future articles about this kind of cost distribution based on elements, not least on its use during the design stage of buildings. For the moment we give it in order to throw light on this particular dilemma in the story. For example, B.-J. and Price have omitted some plastering, but in our comparable building, of the £3 6s. 9d. per ft. sup. all the wall plastering claims only 6½d. Likewise, ironmongery accounts for only 4¾d., sanitary fittings for 7½d. and decorations for 8¼d.—all these items are but small proportions of the total. Plainly reductions would have been far better made on the more costly elements of the building, except that such reductions call for more radical changes in design for which mid-April is too late.

EARLY MAY: The position now is this: Mr. Gross, the client, is impatient to see work going on at the site, the contract sum is agreed at £50,620, but Basildon-Jones cannot get the contract documents in order straight away, so to placate Mr. Gross a foreman's hut and a signboard

are hastily put up by Sidney Boxall, the builder. Basildon-Jones has sent Boxall a complete set of eighth scales and one or two details which are partially out of date, and do not agree entirely with the bill of quantities. Some of the amendments are listed in a long letter to Boxall which also instructs him to start.

While excavation begins on the site, one assistant in Basildon-Jones's office plods on with the detailing, finding it necessary to make further alterations from the original drawings. Meanwhile Bill Price, feeling that his part of the work is virtually over, is busy for other architects. There is now a short lull in which nothing much happens—except for Boxall, who is having to rush, in order to prepare for the job ahead. As things are, the foreman he wants for the job is not free, so for the time being he puts in a sub-foreman.

COMMENT: *Boxall is used to this sort of thing.*

A telephone call from Boxall to Basildon-Jones ends the lull: can he come and look at the excavation as soon as possible? Refreshed and prompt Basildon-Jones arrives at the site. He is respectfully shown that the digging has revealed what appears to be made-up ground (at nearly eight feet where the drawings show column bases founded at 4 ft. 6 in.). Basildon-Jones affects a cheeriness that he does not feel and various solutions are discussed, including piling, but this—he is told—would delay the job by at least eight weeks. After a while it is decided that they should go down further to see what there is, and the architect drives off with the promise that he will get in touch with the local surveyor. We need tell no more about the foundation problem except to report that it was solved without recourse to piles, and that the first substantial variation was incurred.

EARLY JULY: Now the job seems to be getting along, for stanchions show against the skyline and, it being Summer, the site has become a quagmire. It is not long, however, before a shortage of 8 in. × 4 in. r.s.j.'s causes delay in the steel erection. Boxall tends to disclaim responsibility because the steel contractor is a nominated one, so Basildon-Jones telephones the man himself. It is explained to him that the hurry in starting had given no time for steel to be ordered in advance but that the joists can be obtained ex London stocks. "Of course," says the sub-contractor, "it will cost you more that way." Basildon-Jones hesitates, wondering whether the extra steel cost would be less than the cost of delay incurred by waiting, but in the end he consents.

END OF JULY: At this point the emphasis abruptly changes to the brickwork. At several places in the building steel beams rest on brick walls, and these are not keeping pace with the steel for lack of bricklayers. It is to be expected, therefore, that some of the erectors are taken off the site and temporarily transferred to another job. Basildon-Jones is not particularly interested in the reasons for the shortage of bricklayers—he gathers that it has something to do with a bonusing scheme that has gone wrong and has caused discontent. "But that," as he says to Price at a club dinner that evening, "is Boxall's affair—not mine." It was this and the steel trouble earlier in the month that rendered the progress chart—prepared at the end of May—so out of date that from now on it will be ignored. Except that the completion date marked on it, January 31, is still hoped for by Basildon-Jones. Up to now, Basildon-Jones's site visits have been infrequent, so Boxall at last asks him if he will come down more often so they can settle the discrepancies between drawings and bill that arise from time to time. "It makes it difficult having no clerk of works," he said, "and you can't do much over the telephone."

COMMENT: *It seems that Basildon-Jones is not sufficiently involved with the building of the office block. The bonusing dispute is not strictly his affair, but so far as it affects progress he should be concerned with it. More frequent and regular site meetings are needed.*

EARLY SEPTEMBER: One bright sunny day, Basildon-Jones and his assistant, are to be seen, with Boxall and the foreman, watching the concreting of floors and the casing of steelwork. Three barrow men are trundling their loads from the 10/7 mixer along plank runs to the hoist and from there the barrows are shot up to the floors and deposited. To the assistant, an assiduous reader of the AJ Technical Section, it seemed an inefficient process and he suggests the use of a tower crane. Boxall listens and smiles indulgently, saying that such a crane would be quite uneconomical for a job of this size. "You see," he goes on, "cranes cost a great deal of money, and if they are to earn their keep and pay for themselves, they must be occupied all the time." The assistant knows little about builders' costs, so he listens keenly, but he still feels that building operations could be more efficient than those he is watching.

MID-OCTOBER: At about this time the heating contractor makes his appearance on the site, and men are to be seen hacking holes and chases for the pipes. It might be mentioned here that Mr. Gross's suggestion for oil firing and ceiling panels has not been investigated, for Basildon-Jones has been too pressed for time.

Basildon-Jones's assistant, whose visits are not now so welcome, asks the foreman if it would not have been easier to cast in the holes during concreting. "Well," says the foreman, "it might; but in the first place we had no drawings to show where the pipes were going, and in the second place, we are used to doing it this way. And while we are on the subject," he goes on, wishing to press his advantage, "what are you going to do about the pipes and conduits where the false ceilings have been left out—let them show?" At this the assistant scratches his head and hurries back to the office, for this problem had occurred to none of them.

At this point it might be discreet to leave them to worry it out, while we review the situation as it has developed so far.

COMMENT: *To begin with, the foundation problem is an obvious one. If Basildon-Jones had made trial holes before designing his building, the trouble would have been avoided and the tenders would have been more truly competitive. Boxall, of course, is glad he priced this item high. The steel shortage delay in early July was shortened, but at a price. We expected Boxall to disclaim responsibility because the sub-contractor was nominated by the architect, but under the terms of the contract, which by then had been signed, Boxall is really responsible.*

"*.... to be seen hacking holes and chases for pipes.*"

The bricklayer-steel-erector hold up at the end of July is a difficult one to judge. It might have been wiser for Basildon-Jones to keep the steel frame quite separate from the brickwork, but he is not a rigorous purist, and in any case there are too many factors involved for us to pronounce decisively. At any rate it is clear that Boxall's organizing was defective. By mismanaging the bonusing scheme he upset morale among the men and the consequence was that steel erecting became in effect two separate operations, which is likely to be more costly than one continuous operation.

The abandonment of the progress chart is, we feel, symbolic of the whole job, for it betokens the hand-to-mouth procedure. Lack of preparation at the start of the contract, the discrepancies in architects' instructions, the infrequency of site meetings and the exchange between Basildon-Jones's assistant and the foreman over the pipes and conduits add up to a lack of co-ordination which means, inevitably, a waste of man hours. Because it is the custom for building contracts to run in this way, this waste is reflected in tenders and particularly in final accounts.

In the light of this, the assistant's interest in efficiency seems a little ironic. He was very likely right that the concreting is not very efficient—but it is naïve to suggest a tower crane as the answer to every problem. Organization is the key, not particular items of plant.

Before going back to the story we should mention the heating installation. First of all the oil-firing and ceiling-panel system suggested by Mr. Gross should have been investigated, and its capital and running costs should have been compared with other systems and balanced against the cost of thermal insulation. We must admit that Mr. Gross might not have been so interested in this aspect, for the income tax situation does not encourage low running costs. As for the foreman's remark about cutting holes and chases, he was—unhappily—quite right. Incidentally his comeback about the omission of false ceilings means an addition to the cost for pipe casing.

END OF NOVEMBER: The completion date put in the contract is now drawing near. Boxall claims for an extension of time, quoting delays which have occurred so far, including those caused through discrepancies between drawings and the bill, and between later and earlier drawings.

JANUARY OF FOLLOWING YEAR: By this time the carcassing is substantially complete and the finishing trades are holding the field. During the summer Mr. Gross has had one or two surprises as rooms have taken shape in a way he had not been able to imagine from the earlier drawings. Hence some "aesthetic" battles between he and Basildon-Jones have now proved to be groundless, and other new disagreements arise. He asks for one or two changes but is told they are not possible because it would upset the continuity of the work. He does not press, for his real concern is to get the building finished. Whenever he meets Basildon-Jones he says "April?"

On his visits, Basildon-Jones seems always to find that some difficulty is preventing someone from getting on. There is the time when the plumbers are idle for lack of sanitary

fittings that have not been ordered in time. This in turn holds up the tile fixers and the making good of the plastering. Then there is confusion over the terrazzo on staircase walls. This, you will remember, was reduced in area when Basildon-Jones and Bill Price were cutting down the cost, but the amendment has failed to get into the foreman's instructions on the site. The error would not have been noticed had not Boxall been dilatory in getting the terrazzo men on the site, and so the question has been raised in Basildon-Jones's office. The whole of the winter has been marred by misunderstandings and delays of this kind, and the weather has not helped.

FEBRUARY: February makes its mark with the floor finish crisis. It begins when the foreman notices that the drawings and the bill do not agree with each other, and he therefore asks for confirmation from Basildon-Jones's office. But the previous April seems very far away to Basildon-Jones. In the meantime there has been a national advertising campaign for a new plastic finish, and to walk about in the shell of the building presents the problem in a new light.

Thus mastic is changed to plastic sheet, involving additional screed and a cove at the skirting. Hardwood strip on battens, in the board rooms, becomes softwood, for a carpet, on battens on acoustic quilt. This is more serious, for the screed is already laid and the only solution means a small step-up at the doorways and amendments to the doors and frames. These changes are achieved not without frustration and brusque telephone conversations between Basildon-Jones's office and Boxall and the sub-contractors. The delay amounts to three weeks and Bill Price has not been informed. The financial situation of the contract has become rather obscure—some variations have been agreed and included in interim certificates; others, more contentious, have been held over until the final account is settled.

> COMMENT: *We need hardly enlarge on the moral of the happenings of January and February, except to point out the implication that attempts at proper organization by one party would have been frustrated without co-operation of the others.*

APRIL: The Spring weather seems, as it always does, to lighten everyone's burden, and the choosing of ironmongery seems a pleasurable task. So far this item has been represented by a provisional sum—at first proposed by Basildon-Jones and later altered by him and by Price together. "There is a long delay on some ironmongery these days, you know," says Boxall, so Basildon-Jones calls forthwith for catalogues and spends what proves a rather discouraging afternoon flipping through them. He jots down some choices, makes a sketch for a special fitting for the main entrance doors and hands these to an assistant to work up into a schedule. This takes some time; meanwhile on the site, nails and string continue to serve their purpose. The quotations which come back to the suppliers add up to some fifteen per cent more than the reduced p.c. sum. This is bad enough; it is the delivery times that provide the shock. Sixteen weeks for the special main entrance furniture, ten weeks for most of the internal door handles and eight weeks for certain of the window fittings that are to be specially modified to suit the joinery detailing. The schedule is revised and the suppliers hustled by Basildon-Jones in his best professional tone of voice, but still it seems that opening day will find some of the doors held by nails and string.

JULY: Now it is the decorators who take the stage. Amidst odd electricians, plumbers and carpenters all busy tying up the loose ends of their work, the painters pursue their frantic pace. Here and there are patches of colour mixed up to Basildon-Jones's samples and put on for his approval. For as he says to Bill Price one day: "You can't really choose colours in advance, without seeing them in situ." If then at the end of the job there are a dozen or so odd amounts of unusable paint left over, the painting sub-contractor will have allowed for them in his price.

AUGUST: Mr. Gross's hoped-for finishing date has long passed, and it seems that someone must pronounce a day in a firm voice or the job will go on indefinitely. August 20 is the day fixed—fifteen months almost to a day since work began. In the week or so before there is a frantic scurry round to be ready for the ceremonial opening, and when the 20th dawns there are still pre-occupied groups to be found in out of the way places, struggling to finish. But at least Mr. Gross and his co-directors are in a mood of mutual congratulation, and Basildon-Jones, advising on the placing of flags, goes about with a quiet sense of achievement. Boxall is pleased that they are pleased and in the back of his mind hopes they will view his claims in the same spirit when the time comes.

> COMMENT: *Yes, opening days will always be days of anxious pleasure, when discontents are for the time being submerged. The ironmongery delay may mean that business is flourishing but it also is symptomatic of a weakness in the architect's situation, namely that he is not sufficiently in touch with trade conditions. This is a difficulty that does not affect other kinds of designer who work within their particular industry. But this second half of the contract is the kind of situation that provides architects, builders and quantity surveyors with endless material for buck-passing when they are disposed to argue about it. Boxall could blame Basildon-Jones for the floor-finish crisis and claim for the delay. Basildon-Jones, on the defensive, might reply that adherence to a pre-arranged plan would prevent use of what he considered a better material. He could tax Boxall for not passing the revised instruction for the terrazzo to his foreman. Boxall could perhaps counter with a demand that the bill and the drawings should be up to date and consistent when he receives them, and so it could go on with similar fruitless exchanges about the ironmongery and the decorating.*
>
> *But this kind of contest is a barren pursuit, serving only to rehabilitate one party's self-esteem at the expense of the other's. The real need is for co-operative understanding by everyone, including the client—for to agree to the necessary time for adequate preparation he must know what is involved. If Basildon-Jones had been able to show Mr. Gross figures comparing the economy of the well-prepared with the ill-prepared contract—to show, that is, what (in the long run) could be saved both in time and money by less haste at the beginning—things might have gone rather differently. Our point is that to blame the client may be partly justified, but it does not absolve his technical advisors or the contractors.*

SEPTEMBER: Now begins the defects liability period. We may jump ahead a little and report that no really serious defects appear; there are only plaster cracks, some minor wood shrinkage and the odd mechanical defect that calls only for the tightening of a screw. For although the process

of building has been long, troubled and not very efficient, the quality of the finished work is above average.

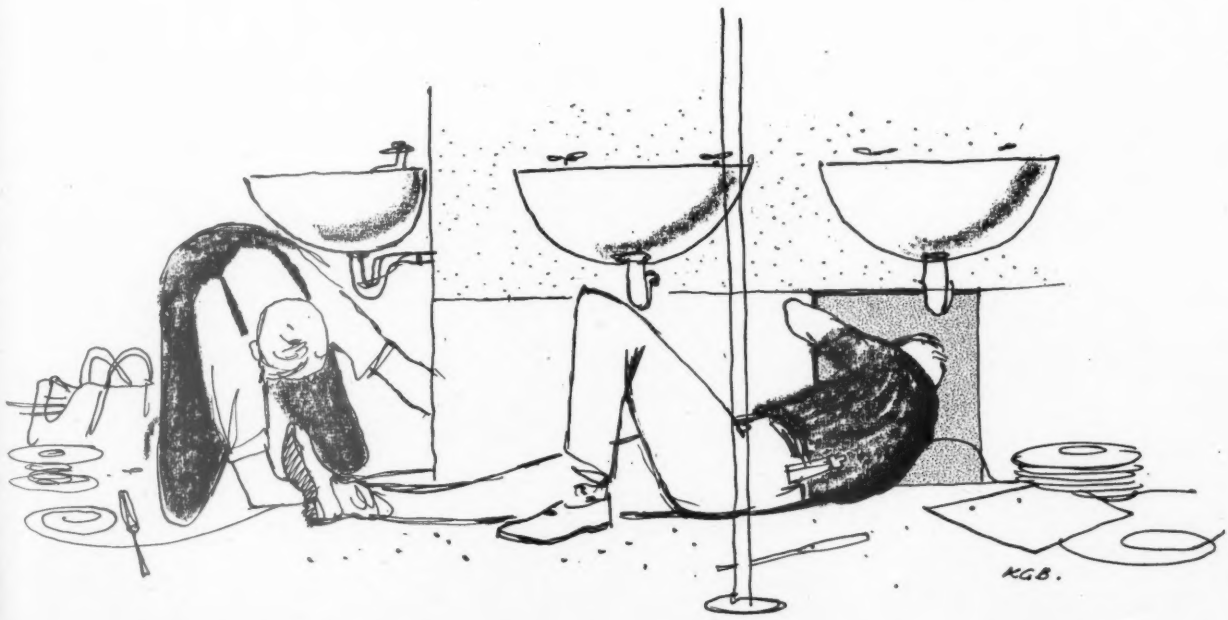
OCTOBER: Since August, Mr. Gross has been asking what the final cost of the building will be. Basildon-Jones has consequently asked Bill Price, and he, while in the middle of doing someone else's final account, has promised to get down to it as soon as possible. The truth is that both he and Basildon-Jones feel that spiritually the job is over and are reluctant to plunge back into the confused and troubled events of its building. Basildon-Jones's main concern now is a visual one for he has got the *Architectural Review* interested in publishing the job and, for him, this is a long-nourished ambition. When Price at last takes down the files and begins to recapture the story he soon realizes that it would be much easier if Boxall were to submit an account for him to check, for he is certain there were more variations than those of which he has record.

NOVEMBER: Boxall now begins, with his surveyor, to go through the figures. This takes some time, for he has kept no systematic records and has therefore to search back through his books and files. But he has made notes of all the variations.

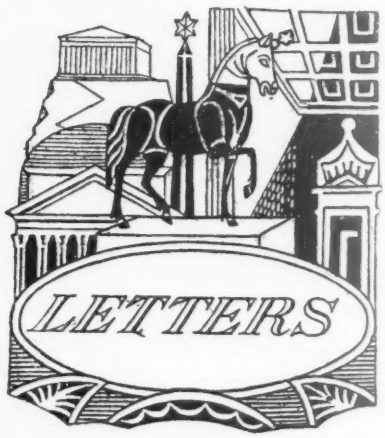
DECEMBER: At last the fatal envelope drops through Bill Price's letter plate. On opening it he runs his eye rapidly down to the total at the bottom, and here he gets a shock, for the extra on the whole contract sum amounts to £5,510 and makes a grand total of £56,130. He rings Basildon-Jones, who looks troubled for the rest of the day. We will not weary the reader with a complete final account, but will merely mention one or two items: the contingencies sum of £500 (reduced from £1,000) has been more than swallowed up by the foundations. The £750 saved by the omission of the false ceilings has been reduced by some £200 for pipe casings that had been forgotten. Extra work entailed by change in the floor finish specification amounts to £250. There is, apart from these specific items, a general claim for time with many items quoted: the substitution of clinker block for demountable partitions; delays due to the foundations, the steel erectors and the weather, and to the sub-contractors nominated by the architect. Delays due to the contractor are not mentioned. There is a claim under the fluctuations clause for both wages and materials increases totalling some £2,500. Basildon-Jones at once gets in touch with Bill Price.

TWELVE MONTHS AFTER PRACTICAL COMPLETION: It is now some two years and three months since work on the site began. There have been several meetings and much correspondence between Price, Boxall and Basildon-Jones. Some of the work has been re-measured—for instance the foundations—and its value agreed by all parties. But there remains an amount of some £1,200 over which neither side will give in. Once or twice relations have reached breaking point, but have not yet collapsed into complete enmity. It seems that the figure finally to be paid (we cannot say agreed) will be between £53,900 and £55,150 but just what it will be has yet to be decided.

COMMENT: *We must apologise for not giving our story a happy ending, but it is not a really unhappy one, for our characters have gone through this before, and no doubt will go through it again. It is part of a recognized and, by and large, an accepted pattern. Perhaps this is the saddest thing of all. We have no doubt that other Boxalls will be doing jobs for other Basildon-Joness in the future, and that the contracts will proceed in the same way again, less pleasurable and more costly than they need be. Is there any reason why they, why we, cannot do better?*



"*. . . . in out of the way places struggling to finish.*"



Vernon Gibberd, Student R.I.B.A.

F. P. Tindall,
County Planning Officer, East Lothian.

R. G. Hollis, A.R.I.B.A.

Competitions : "Do the Job Properly"

SIR,—As the author of the design you published on January 13 to illustrate your opinions on the form of RIBA competitions, I would like to express my own views on this difficult subject.

I would like to mention, first of all, an important part of the programme which you omitted, and which I think considerably affects the present form of competition, namely the preliminary one-day sketch design by which the final dozen or so candidates are selected. These candidates are then asked to continue their drawings to approximately the stage required for final tests and many live architectural competitions. Admirable as it might well be for a candidate to carry through his scheme as far as full working drawings as you suggest, it would hardly be a small step for the RIBA to take, but would require a complete overhauling of the present system. The one-day sketch design would become nonsense, and it must be remembered that candidates are not permitted to make any alterations from the basic form of it, neither could they be expected to continue with it without specialist aid. Indeed it would be best, as we are often reminded, to bring in the consultants at sketch design stage!

However, supposing some satisfactory method of short listing or selecting candidates could be found (and I am ready to admit weakness in the one-day esquisse system) how many of them would be willing to undertake the considerable labour involved in a building of this size, with no hope of it ever being erected and only a one in twelve chance of victory?

What are the alternatives? It would be ideal, of course, if the RIBA could persuade an actual client to provide a scheme which would be built to the winning design for each competition. But this is unlikely and a little unreal.

Or, though I am not much in favour of restricting student designs, something could be done to reduce the inevitable battle of presentations—the amusing but irrelevant ways in which candidates reveal or conceal their architecture—by bringing the conditions into line with those of competitions for actual projects. And extra sheets of structural analysis, finishes schedules and services diagrams could be added, though for my part, I found that the very fact that no personal assistance was allowed, made me more convincingly worried about structure and more than usually curious about what might happen to the drains, than in the general run of school programmes.

No, if one is going to do some detailed analysis one might as well do the whole thing properly, and I agree without hesitation that schemes carried through full working drawing are more convincing and on all counts improved, but I hold that their basic conception remains unaltered. But surely it is better, for candidates who are approaching, or who have just passed their finals, to spend a relatively short time on a competition and enjoy it for what it is, and then settle down to the real business of architecture which is to provide the drawings for live buildings.

Is it not more satisfying in the end to design a door knob which is to be made, than a Council of Industrial Design building which is not?

VERNON GIBBERD.

London.

[The matter referred to in this letter is discussed in this week's leading article on page 153.—ED.]

Street Lighting : In an 18th Century Street

SIR,—I enclose a photograph showing the street lighting scheme at Haddington, which I think might interest you.

Haddington is the finest example of eighteenth century Burghal Architecture in Scotland and has been zoned as an area of Great Architectural Interest. This enabled the County Planning Authority to take the initiative in the matter of lighting which was considered by the Town Council, the South East Scotland Electricity Board, and the National Trust for Scotland as a matter of civic design.

The High Street, shown in the photograph, is an enclosed place 600 ft. long and 70-80 ft. wide. The new lighting consists of vertical wall-mounted fluorescent lanterns, each housing three 80 watt hot cathode fluorescent tubes. They are spaced about 80 ft. apart and are mounted 21 ft. above pavement level.

As distinct from conventional street lighting where the practice is to brighten the road surface in order that objects may be seen in silhouette, the effect of this lighting enables objects to be seen naturally by shape and colour rather than two-dimensionally. Where they have been concentrated round the Town House they give a very pleasant diffused flood lighting effect. By daylight they are quite inconspicuous and they cost no more to instal than columns and lanterns, and represent a good saving on maintenance.

This type of lighting seems to merit wider publicity, not only because it is an advance in street lighting technique, but because it would solve similar problems in many small market towns.

F. P. TINDALL

Haddington.

[See picture below.—EDS.]

Personal Aesthetics : or The Art of Giving In

SIR,—I have read the opinions expressed in your JOURNAL of January 20, in the article "Men of the Year."

I could not help noticing that these admirable men seemed to share a taciturn but nevertheless stubborn support for the Ivory Tower of personal aesthetics.

It has always appeared to me that personal aesthetics have been used by architects (and other artists) in the past, as a device to bamboozle opposition, and to make the task of getting one's own way a more easy affair. One can imagine this worked admirably under certain circumstances, and similar methods have been and, in fact, still are being used in many skilled trades and professions, where an atmosphere of mystery ensures good sales.

We should, however, remember that nowadays owing to the advance of education, the one thing the public dislikes is any hint of being bamboozled, inadvertently or otherwise.

It does therefore seem to me that it is high time that we should individually examine all that great part of our personal aesthetics which might be described as "Mumbo Jumbo."

The need to get one's own way is not the prerogative of the architect, and the present-day client, especially the committee client, would (for obvious reasons) appear to find it even more important to get *his* wishes expressed.

If it is true that the greatest need is that life should be pleasant—and philosophy teaches that this may be achieved by giving—then might not our profession find it a greater and more beneficial contribution, to develop a more generous public relationship, based on the art of "giving in"?

R. G. HOLLIS.

London.

Street lighting in Haddington. See letter above.

ABT

A Reply to the RIBA

The ABT makes the following comment about the RIBA's attitude on the subject of trade unionism:—

"The RIBA letter on the representation of salaried members, having been commented on in the technical press,* can be considered to be public property. The ABT therefore feels free to make known its views.

"It is a source of satisfaction that the RIBA and the ABT have improved their already cordial relations by the manner in which full and friendly discussions have been conducted. Furthermore, the RIBA has now clearly stated that it cannot act as a trade union. We have always said this, but it is obviously an advantage to have the issue clarified by the RIBA itself.

"The RIBA letter says 'A union exclusive to architects would be too weak numerically to compete with the existing. . . multilateral organizations.' We agree. But most of these organizations attempt, unlike the ABT, to bring together members who have little in common. Such organizations do not, and cannot satisfy architects.

"As for the ABT, we can point to a number of positive gains on behalf of architects during the last few years. If such achievements result when the ABT works alone, how much more could be expected from an enlarged ABT, working with the recognition and backing of the RIBA?

"Fifty per cent of the membership replied to the RIBA questionnaire—an exceptionally high proportion for an enquiry of this kind. Of these, sixty-three per cent expressed themselves as willing to join a union. It is not surprising that there is bitter disappointment with the recent letter, for the RIBA has not answered the clear demand of a large proportion of the membership but suggests only the perpetuation of the *status quo*.

"Architects still need a strong trade union. The ABT is in existence and has had invaluable years of experience. Its constitution is democratic and adaptable to change. Given widespread support it can become fully effective."

RIBA

Symposium on High Flats

The speakers and subjects at the Symposium on High Flats to be held by the RIBA on February 15 are: Opening address by the Minister of Housing and Local Government, the Right Hon. Duncan Sandys, M.P.; H. J. Whitfield [*A*], Principal Housing Architect to the LCC (The principles of mixed development, the ratio of tall to low buildings, densities and the effect of forms of heating); Dr. R. Bradbury [*F*], City Architect and Director of Housing, Liverpool (Aspects of American experience and its application to this country); Frederick Gibberd [*F*] (High flats in medium sized towns and suburban areas); Miss Margaret Willis (Sociological implications; tenants' viewpoint); Major R. A. Jensen [*F*], Director of Housing and Borough Architect, Paddington (High flats and higher densities in Europe and the metropolis); A. G. Sheppard Fidler [*F*], City Architect, Birmingham (Architectural problems involved with high flats in urban reconstruction); K. Lack [*A*] (Fire protection in and design of high flats); A. W. Cleeve Barr [*A*], Senior Architect (Development) Architect's Department, LCC (Effect on design of services and building techniques); Felix Samuely, M.I.C.E., M.I.STRUCT.E., and Peter Dunican, A.M.I.STRUCT.E., of Ove Arup & Partners (Principles of structural design, framing, cladding and foundations); J. R. Mitchell, of Wates Ltd. (Problems of erection and site organization; use of mechanical equipment; collaboration between architect, engineer, contractor, etc.); Dr. J. C. Weston, of BRS (Economics of multi-storey flat design).

Concluding the afternoon session, J. H. Forshaw [*F*], Chief Architect to the Ministry of Housing and Local Government and to the Ministry of Health, will give a critical summary of previous papers and discussions. The chairman is Dr. J. Leslie Martin [*F*], Architect to the London County Council.

Admission is by ticket only at 10s. 6d. each which covers morning coffee, buffet lunch and tea. Early application is advisable.

BBC

Pevsner to give Reith Lectures

Professor Nikolaus Pevsner has accepted the BBC's invitation to broadcast the Reith lectures in 1955. He has chosen as his sub-

Arthur Ling is leaving the LCC this month to take over Donald Gibson's job as city architect for Coventry. Mr. Ling, who is at present Senior Planning Officer (under Dr. J. L. Martin, Architect to the Council), was chosen for the Coventry job from a short list of five people. They were all interviewed by a "travelling circus" of sub-committee-men in their own offices. There is another post vacant because Mr. Ling is leaving London—that of assistant lecturer at the Department of Town Planning University of London.

* See JOURNAL, January 13, page 35.

ject "The Englishness of English Art and Architecture." The lectures will be broadcast in the Home Service in the autumn. As their subject has visual appeal it is expected that they will be accompanied by related programmes in the television service.

Professor Pevsner proposes in his lectures to attempt an answer to the question: "Are there national characteristics in English art and architecture and, if so, what are they?" He will examine the distinctions between English art and that of England's closest neighbours in the UK, and, going farther afield, will compare art in England with art on the Continent and in America. He believes that certain qualities can be established as specifically English. This may well prove helpful in the situation today, in the fine arts as well as in architecture, design and planning.

Professor Pevsner is particularly well qualified to speak on the subject he has chosen. He is Slade Professor of Fine Art at Cambridge University and Head of the Department of Art History at Birkbeck College, London University. He is also joint editor of the *Architectural Review*. In his earlier years in Germany, where he was born, he was on the staff of the Dresden Gallery and lecturer at Goettingen University, where he specialized in the history of Art in Great Britain. He is at present engaged on the formidable task of compiling an architectural inventory of the buildings of Britain. Under this title eleven volumes have so far been published. He is editor of the King Penguins and the Pelican History of Art, this being the first comprehensive work of its kind. His best known book is "An outline of European architecture."

The lectures are named after Lord Reith, the first Director General of the BBC, and are now established as an annual event in broadcasting. The first Reith lecture was by Bertrand Russell in 1948, his subject being "Authority and the Individual." Subsequent lectures have been by Robert Birley, Professor J. Z. Young on "Doubt and Certainty in Science," Lord Radcliffe on "The Problem of Power," A. J. Toynbee on "The World and the West," J. R. Oppenheimer on "Science and the Common Understanding," and last year, Sir Oliver Franks on "Britain and the Tide of World Affairs." This series by Professor Pevsner will therefore be the first subject closely connected with architecture.

BIRMINGHAM

A Course on Prefabrication in Building

A residential course on "Prefabrication in Building," from February 14 to 18, is being organized by the Birmingham School of Architecture, with the co-operation of George Trevelyan, at Attingham Park (the Shropshire Adult College), near Shrewsbury. The lecturers will include:—

Leo De Syllas, Architects' Co-Partnership; Ken Evans, Herts County Architects' Department; H. Johnson, builder; Maurice Lee, of the Architects' Department, MOE; Bruce Martin, I/C Modular Co-ordination, British Standards Institution; S. Johnson Marshall, Chief Architect, MOE; David Medd, of the Architects' Department, MOE; S. Morrison, consultant architect for the Derwent System.

Several manufacturing firms will be represented. The course will include visits to prefabricated schools in the Midlands. Messrs. Hills (West Bromwich) have taken a leading part in sponsoring this part of the course.

The established systems of prefabrication will be examined and the evolution of designs and their applications will be discussed.

A full report will, it is hoped, be published.

BC

Lectures on Teamwork in Building

Six lectures on "Teamwork in the Industry" will be given at the Building Centre, 26, Store Street, W.C.1, this month. James C. Kennedy, A.R.I.B.A., will be assisted by guest speakers. The following is the programme:—February 14, *The Job and the Importance of a Good Start;* February 16, *The Experts Have Their Say* (guest speaker, A. Hedley Richmond, F.I.L.A.); February 17, *Facts and Figures* (guest speaker, E. L. Galloway, A.R.I.C.S.); February 21, *Further Preparations* (guest speaker, J. W. J. Leslie, M.I.E.E., M.CON.E.); February 23, *Now For The Site Work* (guest speaker, A. E. le Fort, Clerk of Works); February 24, *Was It A Good Job?*

GOLF

Annual Dinner

The annual dinner of the RIBA Golfing Society was held at the Dorchester Hotel on January 21.

Sir Giles Gilbert Scott, President of the Society, responded to the toast of the Society which was proposed by V. V. Tatlock, Captain of The Building Alliance Golfing Society. Eric Firmin was unable to take the chair, and in his place F. T. Smith, 1955 captain of the Society, proposed the toast of the Guests. G. D. Walford, the honorary secretary of the Chartered Surveyors Golfing Society, replied.

Stephen Statham, of Sydney Clough, Son & Partners, honorary secretary of the Society, will be glad to hear from golfing architects and will be glad to enrol new members for the coming season.

DIARY

Canaletto and Guardi. Lecture by F. Watson. At the Courtauld Institute, 20, Portman Square, W.1. 5.30 p.m. Admission 2s. FEBRUARY 8

"Open Forum—Improvements and Conversions." J. E. Beddoe, of the MOHLG, and Felix Walter, F.R.I.B.A. Chairman: Lady Pepler, member of the LCC. At the HC, 13, Suffolk Street, S.W.1. 6 p.m. FEBRUARY 8

Colt Canadian Cedarwood Shingles. Film by W. H. Colt & Co. Ltd., at the BC, 26, Store Street, W.C.1. 12.45 p.m. FEBRUARY 9

English Villas and Venetian Decorators. Illustrated lecture by F. Watson. At the V & A Museum Lecture Theatre, Exhibition Road, S.W.7. 6.15 p.m. FEBRUARY 9

Structural Prestressing. Talk by Felix Samuely. At the ISE, 11, Upper Belgrave Street, S.W.1. 5.55 p.m. FEBRUARY 10

Symposium on High Flats. Introduced by Duncan Sandys, Minister of Health and Local Government. Chairman: Dr. J. L. Martin (architect to the LCC). At the RIBA, 66, Portland Place, W.1. 10 a.m. FEBRUARY 15

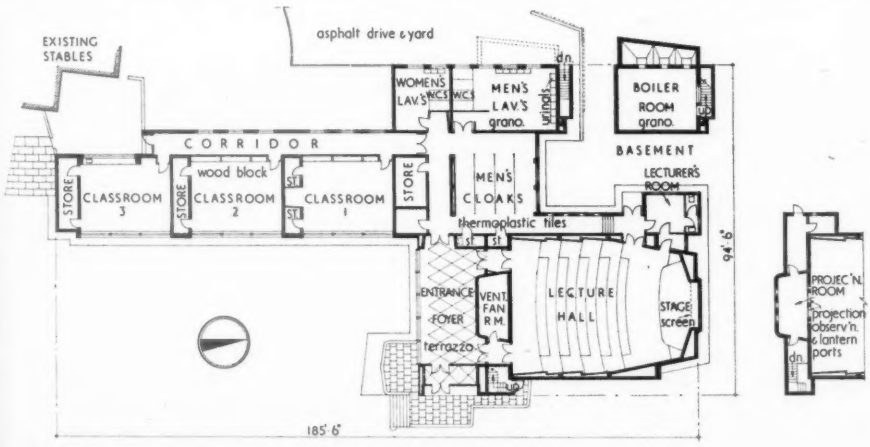
Some Reinforced Concrete Structures in Italy. Lecture by Professor P. L. Nervi. Arranged by the ISE, CCA and RCA. At the Central Hall, Westminster, S.W.1. 6 p.m. Tickets from the CCA, 52, Grosvenor Gardens, S.W.1. FEBRUARY 24

DETECTIVE TRAINING SCH

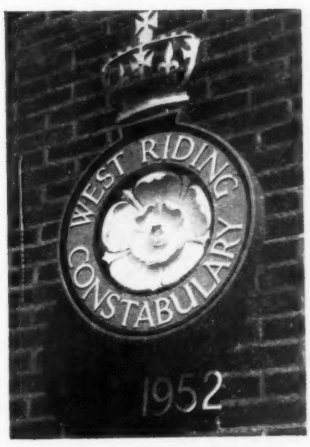
The Detective Training School for the West Riding Constabulary at Bishopgarth, Westfield Road, Wakefield, was designed by Hubert Bennett, County Architect for the West Riding. The photographs on this page show: top, the lecture theatre; above, the entrance hall, and below, the west facade of the lecture theatre block. On the opposite page: the top photograph shows the south facade of the lecture hall, with the classroom wing on the left; bottom right, the crest by W. T. C. Walker, is made of wrought iron with a gilded crown and heraldic colours. The training school serves as an instructional centre in crime detection methods for both home and overseas police forces. The new buildings form an extension to the original accommodation in a building which was formerly

SCHOOL, BISHOPGARTH, WAKEFIELD, YORKSHIRE

a palace of the Bishops of Wakefield. The function of the extension is to provide a large auditorium for lectures, demonstrations, films and lantern slide display, plus three smaller lecture rooms or classrooms for specialist work. A large amount of storage space was also required for equipment and exhibits. The auditorium seats 175 students and the classrooms 25. The large entrance hall is intended to provide relaxation for students between sessions and has an attractive outlook over the orchard and garden of the old palace. As the building was designed at the time of the steel shortage, all walls are of load-bearing brickwork faced with 2-in. thick local straw-colour bricks. The exterior wall of the projection room, at first floor level, is built of sawn stone from the Huddersfield district. The reveals of the main entrance doors are of Hoptonwood stone. The auditorium roof is of steel decking on lattice steel girders, and elsewhere roofs are of in situ *reinforced concrete T beams. Classroom floors are finished with muhuhu wood blocks; thermoplastic tiles are used elsewhere. In the lecture theatre, the rear wall is lined with acoustic tiles, and there is a round reflecting canopy (over the stage) of hardboard on a timber frame. Heating is by a low pressure hot water system, except in the entrance hall, where floor coils are used. The contract price was £27,300, including all site work, roads and garden work. Cost per cub. ft., 3s. and per ft. sq., 61s. 9d. The deputy county architect is W. T. C. Walker; the senior assistant is Jan M. Hindle. The structural engineer was G. Mundy and the heating engineer, T. E. Cunningham. The general contractors were M. J. Gleeson Ltd. For sub-contractors* *see page* 182.



Basement, ground and first floor plans [Scale: $\frac{1}{16}$" = 1' 0"]



"In Britain we cannot be sufficiently thankful for having a Town and Country Planning Act." That was the chief impression John Gloag brought back from Germany, which he visited last November. He explains why in the first part of this article, in which he also criticizes the Germans' poor quality of materials and finishes and praises the country's "many fine individual buildings" and the intelligent reconstruction of old buildings (such as St. Katherine's, Frankfurt: left). In the second part of the article (on page 168) Mr. Gloag has something to say about current building practice in Germany which, he discovered, is disliked by a great many architects.

GERMAN RE-BUILDING

John Gloag

1. THE CONTEMPORARY SCENE

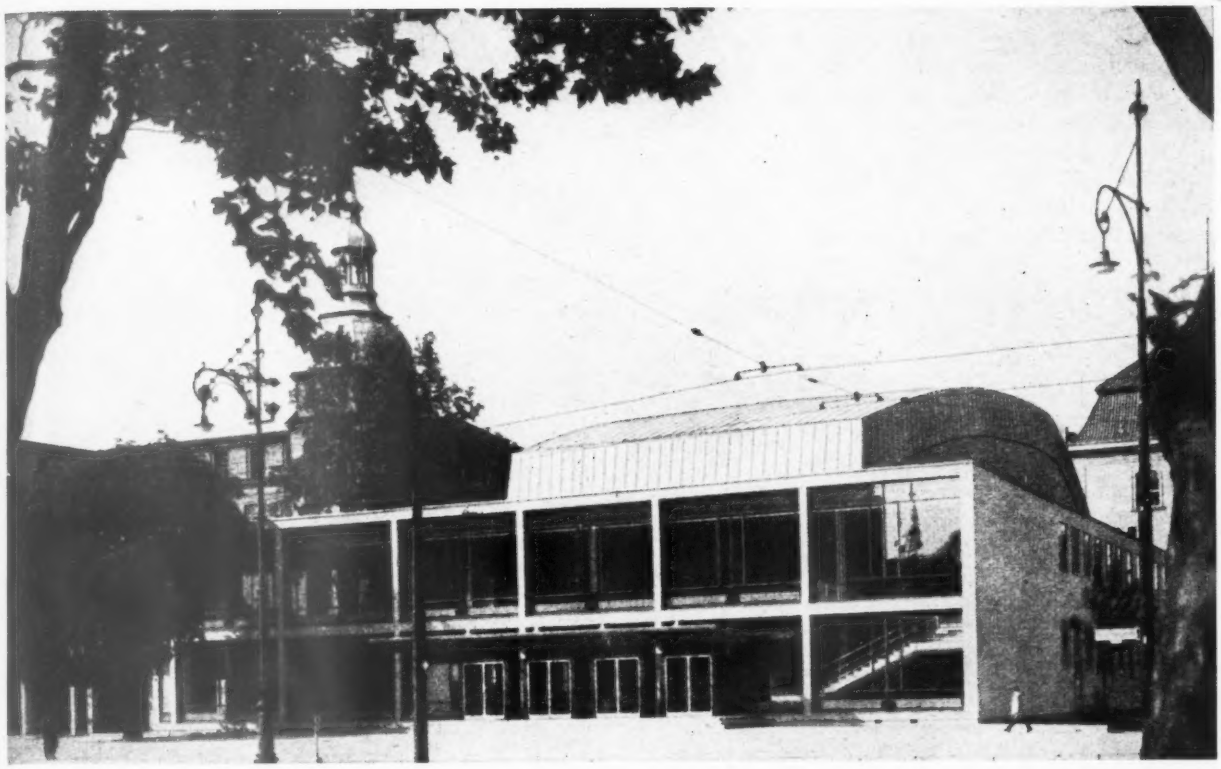
When I went to Germany in October, 1938, just after the Munich agreement, building was everywhere proceeding with an arrogant and buoyant confidence. The Third Reich was looking forward to a thousand years of German ascendancy—grandiose plans for Berlin and other cities were being put into operation. Everywhere, housing schemes were being erected to conform with the traditional standards of picturesque cosiness which were officially approved by Hitler. Little now remains. The chief monument of the Hitler regime is the autobahn—everywhere these great motor roads slice their way across the countryside with the same purposeful air of Roman roads. After two weeks in Germany in November, spent in visiting housing schemes, schools, individual buildings, and inspecting city plans and talking to German architects, architectural students and planning authorities, I have come back with a mixed bag of impressions, of which the chief is that in Britain we cannot be sufficiently thankful for having a Town and Country Planning Act, even if we occasionally dishonour and disregard its provisions.

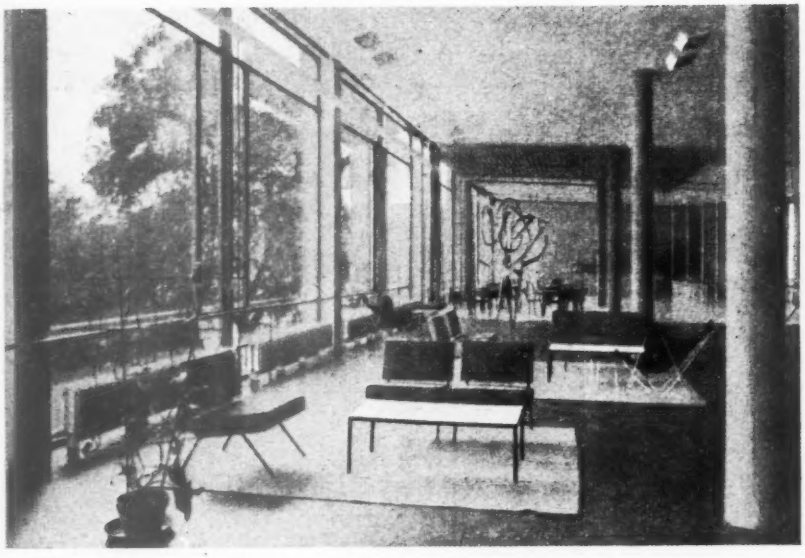
With few exceptions, the cities I visited in Germany were totally destitute of powers which would enable them to put comprehensive town planning schemes into effect. Although this has hampered, and in some cases nullified, planning, the Germans have, nevertheless, pushed ahead with their programme of rebuilding in spite of the handicaps of a constant stream of fresh population flowing in from Eastern Germany, and a shortage of materials, and the problem of getting rid of wreckage and rubble on a scale that was hardly approached anywhere in England, as a result of war damage. With great ingenuity they have used nearly everything to help them with materials, and to help them to dispose, in a productive way, of rubble. In cities like Hanover and Berlin, they have, for example, created huge stadia, and in Berlin artificial hills have been made and planned as public parks in many of the bombed sites. Rubble has been pounded up, and brick chips have been used as an ingredient called ziegelsplitt for making cement. Ziegelsplitt is screened to various grades, the finest being used for cement, the coarsest for concrete.

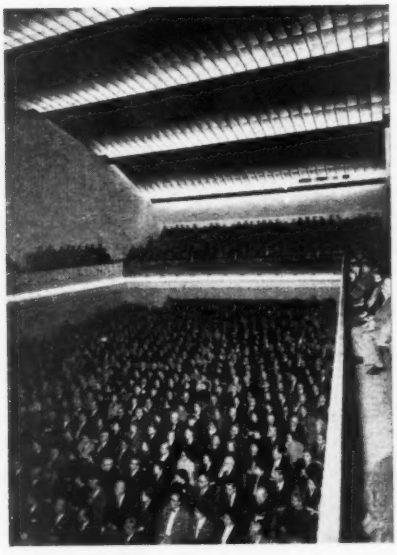
But although German technicians have been inventive in their use of odds and ends for building materials, both the structure and finish of many of the new residential blocks in most cities are defective. The material is porous, and the general finish poor. There are, of course, exceptions to this, but German architects are working not only with defective materials and against time, but they are working too against public opinion. There is an even greater resistance to the appearance of contemporary architecture in Germany than there is in England. The flat roof is detested, and in many cities, architects, against their will, but acting under orders from the local authorities, have been compelled to use pitched roofs with pantiles. Hitler's propaganda about "the art of the Left" has apparently left an indelible scar upon the taste of what used to be one of the most architecturally progressive nations in Europe.

But despite this, there are many fine individual buildings, of outstanding character and of enduring beauty. For example, the new Konzertsaal, in Hardenberg Strasse, Berlin, exhibits the most economical and refined use of contemporary materials. I had the luck to be taken over it by its architect, Paul Baumgarten, who told me something of the difficulties he had had in getting acceptance for the design, and I learned too that it has provoked far more acrimonious controversy in Berlin than the LCC's Festival Hall on the South Bank has in London. Another building of outstanding quality, the Silcher School in Stuttgart by Professor Guenter Wilhelm, has also provoked local controversy. It is a superb group of buildings, in which various materials are used in new and rather unusual ways, notably corrugated asbestos.

Stuttgart suffers particularly from a lack of powers to redesign the city. An excellent plan exists, but it is unlikely that it will ever be put into operation. Immediately after the war, in many German cities, people started to put up any kind of shack in which they could live, and as very







" The new Konzertsaal, in Hardenberg strasse, Berlin," writes John Gloag, " exhibits the most economical and refined use of contemporary materials." The architect, Paul Baumgarten, told Mr. Gloag that the concert hall provoked acrimonious controversy in Berlin.

many families had moved into the little garden sheds on their allotments when their homes were destroyed, these primitive shelters were enlarged, and it was impossible for any authority to turn people out. The idea of having prefabricated houses as a stopgap was largely rejected in Germany, so there was no interim period in which the housing problem was relieved. In Stuttgart people were allowed to rebuild their own homes, anyhow, out of any materials, on the existing sites. A law was passed, limiting the occupation of those temporarily re-built homes to five years; but in a wave of the wrong sort of individualism, which is part of the reaction against Hitler's totalitarian state, the inhabitants of Stuttgart refuse to vacate their homes, now the five years are up, and the city plan is therefore indefinitely delayed. The city has an appalling traffic problem, because the authorities think that they are committed to trams, and as those trams are single-decked, they can cope only with passenger traffic by having always one and generally two trailers. The ruins of historical buildings, some of them of dubious architectural value, cannot be cleared away because of local sentiment; and there are two parties, supported by different sections of the Press, those who would

make a clean sweep of old buildings to give the planning authorities a chance to solve the traffic problem completely, and those who want a new plan, but want the old buildings kept too. The only 'buses in the city are single-decked, and when, in discussing the city plan and the traffic problem with the local authorities, I asked why they didn't have double-decked 'buses, I was told that the hilly nature of the city, and the steepness of the streets ruled out the double-decked vehicle. Well, there are very steep streets in Stuttgart, but they are no steeper than many of the streets in Sheffield, for example, up which double-decked trams and 'buses ascend with untroubled speed. It was a long time before I could get to the real difficulty of putting the plan into operation, because in Germany everything has to be explained—as one German Professor said to me, "It is a defect in our education, perhaps, but in explaining anything we always like to go back to Adam and Eve." But it always came back to this one basic fact—the local authorities have no powers to acquire property compulsorily, with proper compensation, so that no plan can be enforced.

Frankfurt was an exception to this. The city government, which was incidentally, a Socialist government, passed a Reconstruction law which gave them powers of compulsory purchase. This law operated throughout the State of Hessen, and apparently, it is the only law in any part of Germany that is comparable to our Town and Country Planning Act. Consequently, Frankfurt is far ahead of any other German city that I visited in its reconstruction plans, and the authorities have been extremely courageous and intelligent about what they have preserved and reconstructed in the way of historic buildings, and what they have decided to eliminate. They have cleared away the old city, and kept only a few of the old buildings. For the ground acquired for re-building, normal prices were paid to the original owners, and those owners were afterwards given the opportunity of buying back their original plots, with the new buildings on them, and they were allowed to form syndicates so that they could share in the buying of these buildings. With the money they got from this re-sale of the sites, the government then financed the next area for development. Many residential blocks were built by private societies, but for every flat let at a controlled rent, a 70 per cent. subsidy from the government was received. Frankfurt and the State of Hessen generally are therefore in a much happier position and have made far more progress than other localities in reconstruction. This also applied to Darmstadt where re-building is far advanced, and is being done in a comprehensive way. In the other cities I visited, Hamburg, Hanover, Berlin, Munich, Stuttgart, and Dusseldorf, reconstruction was patchy and had been carried out piece-meal, and not with any broad vision. This is not to say that vision was lacking—only the *powers* which alone could make the vision of good planners effective. In Germany, men with vision are continually obstructed by what H. G. Wells so aptly described as "the common fool."

At Frankfurt, says John Gloag, "the authorities have been extremely courageous and intelligent about what they have preserved and reconstructed . . . and what they have decided to eliminate." The top picture shows a large area of new buildings; the photograph on the right is of Goethe's house after restoration, and the photograph on the extreme right, taken in the heart of mediaeval Frankfurt, shows some rebuilt gables which are a compromise between reconstruction and new building.

GERMAN RE-BUILDING

2. HOW IT IS ORGANIZED

German architects work direct with innumerable small firms that carry out different jobs in building. There are no general contractors in Germany, no quantity surveyors, no Bill of Quantities is got out, and the architect delegates the considerable task of co-ordinating all the different trades involved in a job to a specialist whom he employs as a member of his permanent staff, and is called a supervisor. This supervisor, who is rather more than a Clerk of the Works, spends most of his time on a job when it is in progress, and reports back to the office periodically, and makes suggestions for modifications or additions or changes in technique, as the job progresses. There are two schools of thought about the advantages of this system, the school that accepts it provisionally, but would very much like to shift the co-ordinating work on to the shoulders of somebody comparable to a general contractor; the other school —which appears to be very much in the minority—believes that the system gives the architect a closer and more understanding grasp of materials and new techniques, and enables him to change his design as he goes along, if he feels like it.

The disadvantages seem to English eyes to be considerable. For example, at the Silcher School at Stuttgart, Professor Guenter Wilhelm told me that a hundred and ten different firms were engaged for the different jobs, and the architect had to deal separately with all those individual firms. The co-ordination of trades on any job is pretty difficult, and the erection of a big building in Germany, wastes an enormous amount of the architect's time, which he might be giving to more creative work, for he is deeply enmeshed in administrative details, and in the thousand and one queries that occur when small, individual trades are all working together, without the guiding hand of a building firm which will assume overall responsibility.

While I am not claiming that I can give an adequate cross-section of German architectural opinion, I did find that about seven architects out of ten, young, middle-aged, eager experimenters and old-established practitioners, were dead against the system. It was one which made it extremely difficult to supply detailed or indeed any estimates for the completion of a job; and while this vague guessing, or lack of guessing, might satisfy city and state authorities who had allocated a lump sum for some project, it would not satisfy private clients—industrialists and business organizations and people who wanted to build their own private houses. Well-established architects whose reputations are secure, can, of course, make dictatorial demands upon their potential clients; but even so, the system, from an economic point of view, is extremely untidy, leads to a lot of mistakes, and necessitates the employment by the architect of several highly paid, extremely competent supervisors who, in other countries, would be remunerated by the builder or the contractor. This increases the overheads of an architect's office, depletes his own personal profit, and inflicts on his staff an uncreative specialist, who may be helpful but could often be an obstructive nuisance.

The absence of a Bill of Quantities, and a general vagueness about what materials are going to be used and where, give a haphazard air to a great deal of German building; but this is possibly an aftermath of war reconstruction, and buildings where industrial materials like steel and aluminium are used are estimated for in far greater detail than other types. The character and availability of certain materials affect this free point of view—this looseness in handling a job; for so many of the materials are makeshift, temporary things, and one material is abundant, for Germany is a wood-producing country and timber is used far more lavishly than in England, and is far cheaper. Where a great deal of work is being done with timber both inside and outside a building, there is less obligation to produce exact details; for new ideas can quickly be executed in wood, mistakes can be covered up and rectified, and a margin of waste permitted that would be impossible with other and more costly materials.

It is not the practice of German architects to provide detailed drawings for their jobs. General plans and elevations are produced, to a fairly large scale, and from those the different trades interpret their particular parts, guided by the supervisor on the job, who, if some individual firm cannot understand what the architect is getting at, is usually able to interpret (or thinks he can interpret) his chief's intentions.

So far, I have dealt only with the disadvantages—the minority view which was in favour of the system, stressed the immense advantages of freedom that it conferred on the architect. Freedom to change his mind, freedom to make new decisions as the building was going up, unbound by exact drawings (which, I was assured, were never expected by a client, nor would they be understood by that rather unimportant character), and absolute liberty to incorporate any last-moment thoughts, or to make any bold experiments that did not occur to the architect when the plans were made. As for estimates—one or two of the older men I talked to swept those aside as being quite unworthy of discussion. If a client was too mean to name a certain sum and let the architect work to it, or if he thought they had exceeded it, then that was not the sort of client they cared to waste time on. I have not exaggerated this rather arrogant attitude, but I do repeat that it represented a minority view, and was expressed only by a few men with rather big reputations and plenty of work in their offices.

Although I cross-questioned nearly every architect I met about this system of direct control over the different building trades, I have probably over-simplified the answers. But one point was made very strongly by one of the advocates of the system; and it was this: "How can an architect avoid becoming lazy and content to accept existing techniques and materials, if he isn't constantly given an opportunity to improve his building as he puts it up, and, compelled by his method of working, to study afresh every trade on every job?" There, as they say, the matter rests. But I should hate to be an industrialist in Germany who wanted to put up a new factory, and had to tell his Board of Directors that the ultimate cost must be left vague, because it was not the custom to give an estimate.

MAISONETTES

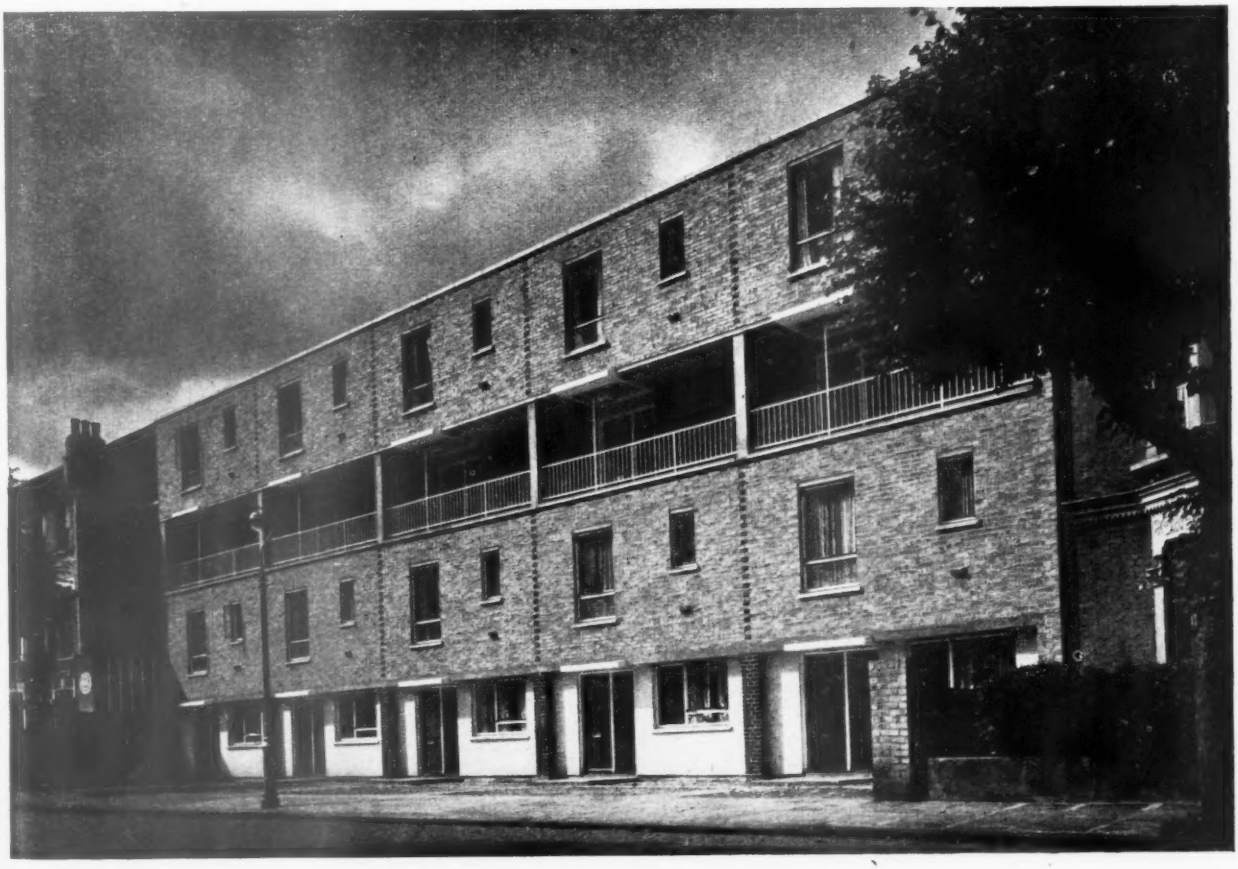
in MELROSE TERRACE, HAMMERSMITH, LONDON, W.12

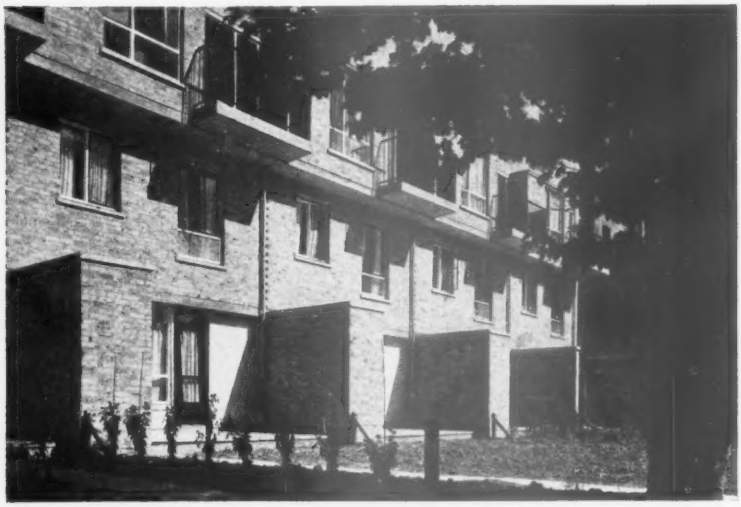
designed by NEVILLE CONDER

chief assistant architect DENNIS BERRY

This block of ten maisonettes, which replaces a terrace of bombed Victorian houses, was built by the Borough of Hammersmith Direct Labour Organisation (Borough Engineer, John E. Scrase; Building Manager, E. North). Each of the maisonettes is designed for four persons. The upper maisonettes have two double bedrooms and the lower maisonettes one double and two single bedrooms. Each maisonette has a private garden at the rear of the block.

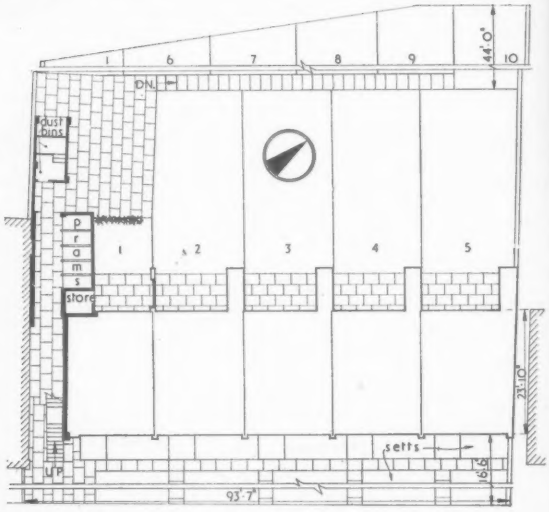
The facade facing Melrose Terrace from the east.

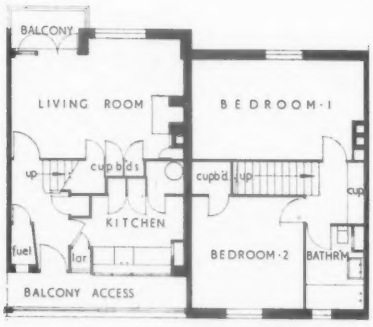




Above, part of the garden facade from the north. Above right, the stairs at south corner of the block, leading to the upper maisonettes. The lettering is white on a red ground and an olive-green surround. Steel framing is black and white.

Site plan





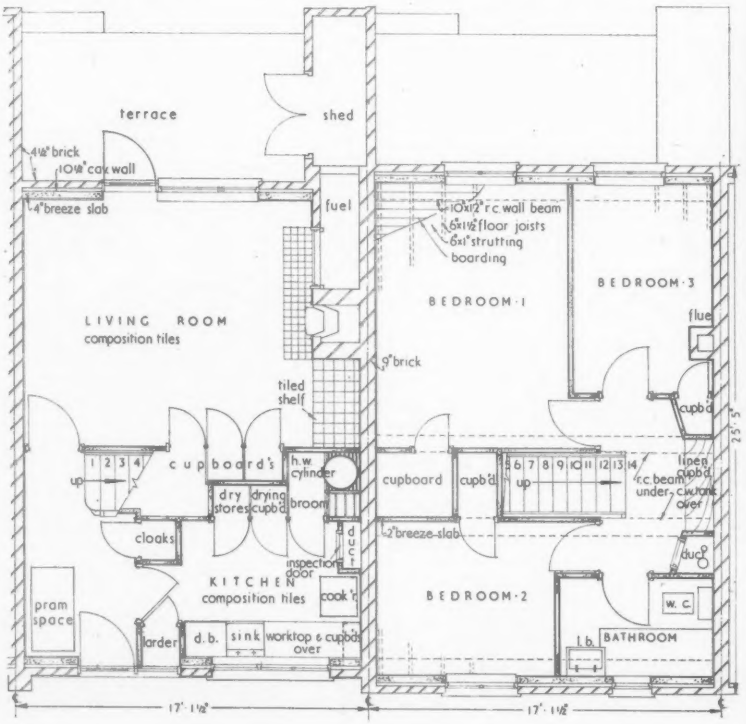
Typical second and third floor plans [Scale : $\frac{1}{16}$" = 1' 0"]

MAISONETTES

in MELROSE TERRACE, LONDON, W.12
designed by NEVILLE CONDER

PLAN.—The lower maisonettes incorporate the space equivalent to the access gallery on the second floor. This allows a different placing of the staircases and the provision of two single bedrooms instead of the second double bedroom. Space for prams is provided within lower maisonettes, and in an outbuilding to the west of the block, for the upper maisonettes.

CONSTRUCTION.—The building has brick load-bearing walls. The loads of the front and back walls are transferred by reinforced concrete beams, at each storey height, to the cross walls, which alone



Typical ground and first floor plans [Scale : $\frac{1}{8}$" = 1' 0"]

Part of t'e rear facade from the west. Right foreground, a corner of the pram stores provided for the upper maisonettes.

MAISONETTES

in MELROSE TERRACE, LONDON, W.12

designed by NEVILLE CONDER

are taken down to foundation level. The cross walls are of 9-in. fletton brickwork, edged with engineering bricks, which are bonded through the external cavity walls to provide a tie and to define the frontages of the separate pairs of maisonettes. The ground floor, second floor and roof are of concrete and the intermediate floors are of timber.

FINISHES.—The facing bricks are London stocks and the internal skins of cavity walls and all partitions are of breeze blocks. Concrete floors are finished in grey or buff coloured thermoplastic tiles.

SERVICES.—The equipment in each maisonette includes a gas-ignited slow-burning grate, with back boilers, gas drying-cupboard units and electric immersion-heaters.

The flats were built by the Hammersmith Direct Labour Organisation. For sub-contractors see page 182.

Extreme left, the second floor access gallery. The thickening of the third floor concrete slab at each upper maisonette front door provides a projection corresponding to the hood over each ground floor front door. By this means, the ten maisonettes are defined clearly on the road facade. Left, staircase leading to this gallery. Below, the north-west facade, which faces private gardens.

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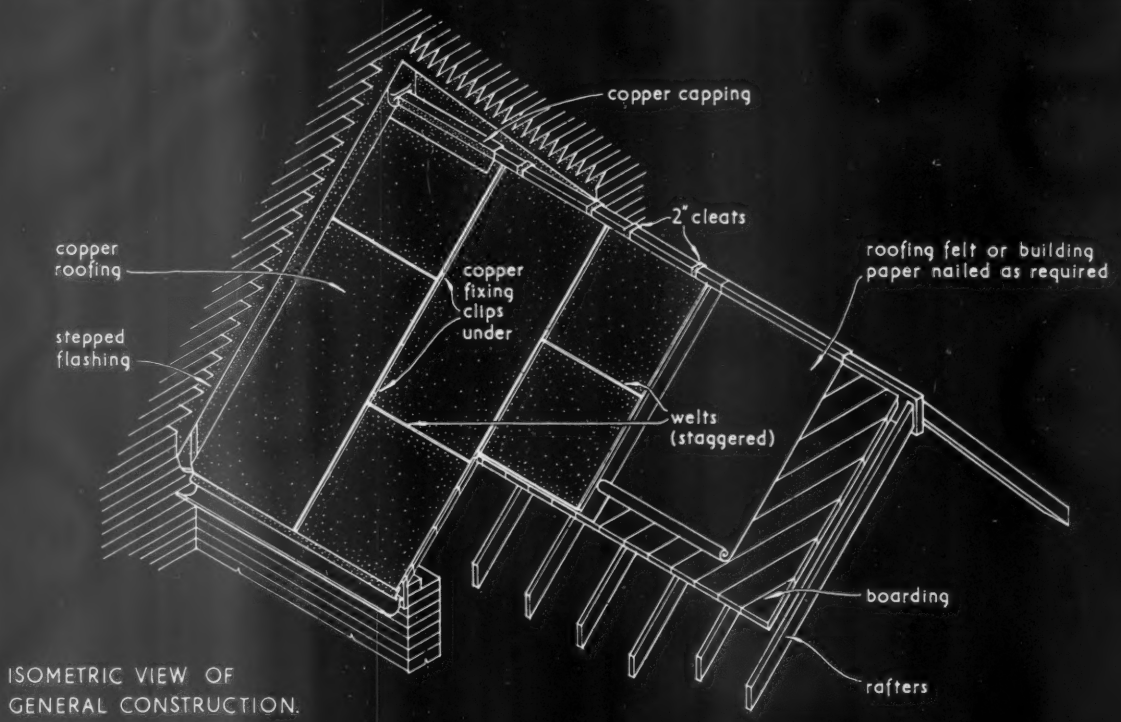
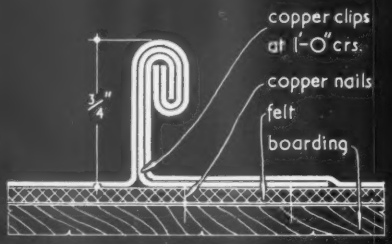


ISOMETRIC VIEW OF GENERAL CONSTRUCTION.

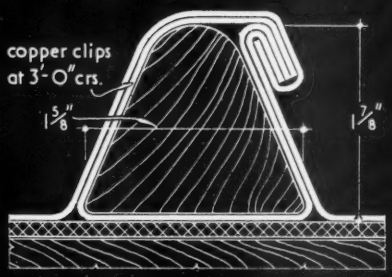
DOUBLE-LOCK CROSS WELT.

SINGLE-LOCK CROSS WELT.

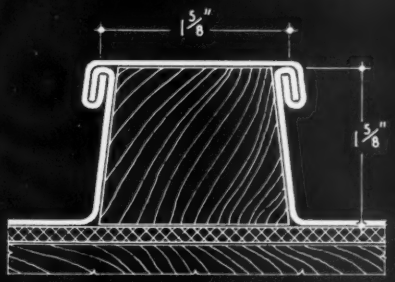
HORIZONTAL JOINTS.



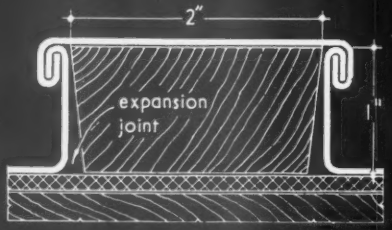
STANDING SEAM.



CONICAL ROLL.

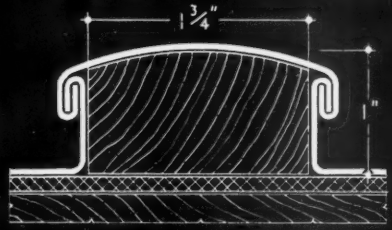


SQUARE ROLL.

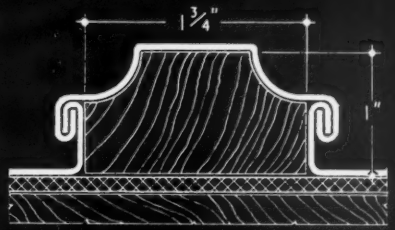


UNDERCUT.

VERTICAL JOINTS.



ROUND-TOP ROLL.



ORNAMENTAL ROLL.

CONSTRUCTION OF TRADITIONAL COPPER ROOFING. Manufacturer: G. A. Harvey and Co. (London) Ltd.

10.E1 CONSTRUCTION OF TRADITIONAL COPPER ROOFING

This Sheet describes traditional methods of copper roofing. It sets out the general design and construction and illustrates the accepted types of roll, seam and welt.

Material

Copper roofs do not need painting or other protection against corrosion. When exposed to the atmosphere, the metal begins to darken according to the amount and nature of the impurities deposited on its surface. This oxidizing process is the first step in the formation of a natural protective patina which slowly develops during a period of from ten to twenty years into a highly-protective pale green covering composed predominantly of a basic sulphate of copper.

Type and weight: The type of copper sheet normally used is hot-rolled, and it is important that only the softest available tempers should be used. If cold-rolled sheet is used it should be of annealed temper. Manipulation during laying and vibration in the building tend to harden the metal, and use of the softer tempers allows for this hardening to take place. The following table gives the weight, gauge and covering capacity of suitable sheets.

Gauge	Weight per sq. ft.	Gross covering capacity per lb.
24 S.W.G.	16·4 oz.	0·978 sq. ft.
23 S.W.G.	17·9 oz.	0·896 sq. ft.

Construction Generally

Pitch: The minimum fall for copper-covered roofs is 2 in. in 10 ft. The actual steepness of the pitch is immaterial, as copper has a high elasticity and may safely be applied to vertical surfaces without fear of creep. The expansion factor cannot be disregarded entirely, however, and the design of the joints should be such that slight movement is permitted.

Copper sheets: Both 23 and 24 gauge hot-rolled sheets are obtainable in any length up to 12 ft., but the basic price is the cost per pound for sheets of an area not exceeding 14 sq. ft. (*e.g.*, 5 ft. 3 in. by 2 ft. 8 in. or 4 ft. by 3 ft. 6 in.) and of thickness of not less than 24 S.W.G.: copper sheet less than 15 in. wide is known as strip, and is priced differently. These limits have been evolved to suit the most satisfactory use of traditional copper work, and automatically restrict the spacing of horizontal and vertical joints. The material itself may be used in larger sizes, but in these cases special precautions must be taken for avoiding the effects of expansion and wind lift.

Felt or building paper: The most suitable felt for use as an underlay both on timber and concrete structures is type 2B impregnated flax felt (brown) generally known as inodorous felt No. 1, 50 lb. per roll, butt-jointed and fixed by copper nailing.

Horizontal joints: Two types of horizontal welted joint are practicable. The double-lock cross welt and the single-lock welt. The single-lock welt should only be used on vertical or sloping work where the pitch is not less than 60°. Where the roof has a pitch of less than 15°, drips 2½ in. deep should be made at intervals of 10 ft. maximum.

Vertical joints: There are two accepted methods of making the vertical joints—the standing seam method and the wood roll. The standing seam is generally considered suitable for roofs of any considerable pitch and flat roofs not subject to traffic, and is in the form of a double-lock welt left standing proud of the general surface of the roof. It requires approximately 2 in. of the two adjoining sheets for its formation. The wood roll system is recommended on flat or nearly flat roofs where traffic is to be expected. The conical-shaped roll is the most common and requires 5 in. of the two adjoining copper sheets for its formation. It is finished with a welt slightly on one side of the apex.

Both systems are designed to give adequate water-lock and to provide expansion joints for the movements of the copper under temperature changes. The manufacturer generally uses brass countersunk screws for fixing vertical wood rolls, but it is important that if any iron nails are used they should be well punched to avoid the possibility of electrolytic action between the copper and the iron. For this reason, also, the nails used for attaching the cut copper clips to the boarding should always be of copper (1¼ in. long, parallel-sided type being recommended) with the usual flat, unshouldered head. The copper clips in conjunction with the welt of the vertical joint are the means by which the sheeting is attached to the roof. They are usually ¾ in. wide by the length demanded by the particular type of vertical joint used. For the standing seam joint they should be spaced at not more than 1 ft. 3 in. centres and for any type of wood roll, not more than 1 ft. 6 in. centres.

Applications

Timber roofs: These should be ¾ in. or 1 in. close-boarded and the copper should be laid over an undercoating of felt or paper.

Concrete roofs: Ballast concrete flat roofs should be screeded to falls and covered with roofing felt. The surface of breeze concrete should be given a coat of asphalt paint if not screeded with cement. Provision for the fixing of the wood rolls may take the form of proprietary fixing plugs let into the concrete and set in cement, or wood fixing blocks or battens for nails or screws. When the standing seam method of jointing is used, the copper clips may be spaded and grouted with cement in holes prepared in the concrete at 12 in. centres.

Further Information

The manufacturers also supply and fix zinc roofing to B.S. 849 : 1939. For full details see 10.J1, 10.J2 and subsequent Sheets.

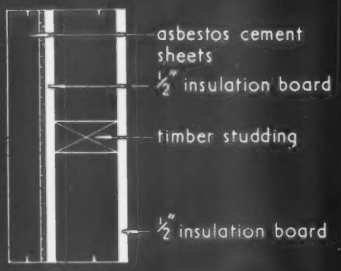
Compiled from information supplied by:

G. A. Harvey & Co. (London) Ltd.

Head Office : Greenwich Metal Works, London, S.E.7.
Telephone : Greenwich 3232 (22 lines).
Telegrams : Cheaper, Wol, London.
London Office : 58, Victoria Street, S.W.1.
Telephone : Victoria 4963.

THERMAL INSULATION | WALLS

The Architects' Journal Library of Information Sheets 506. Editor: Cotterell Butler, A.R.I.B.A.



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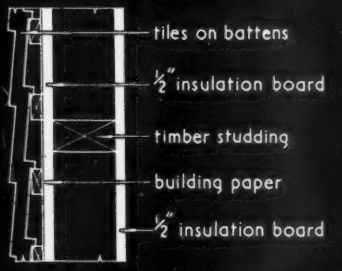

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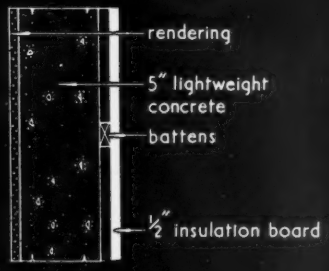

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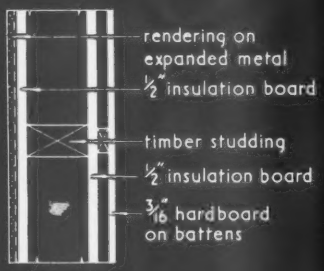

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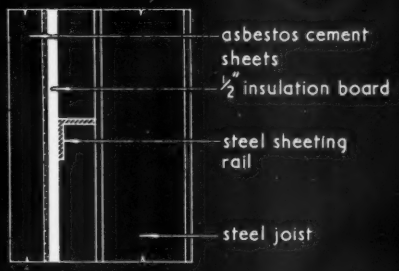

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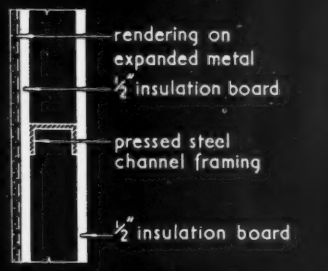

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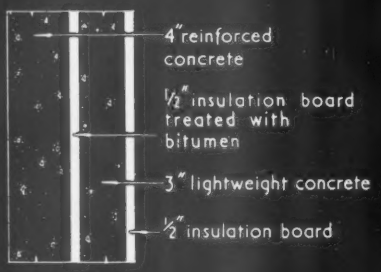
LIGHTWEIGHT TIMBER, CONCRETE AND STEEL CONSTRUCTIONS.



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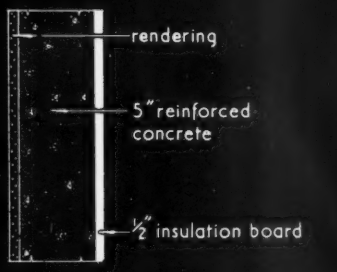

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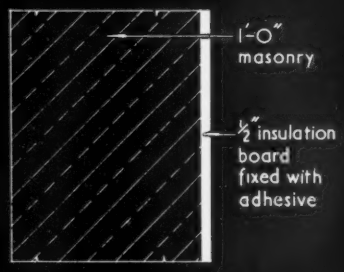

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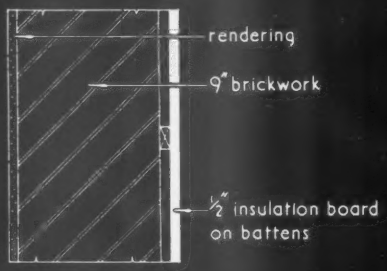
CONCRETE AND MASONRY CONSTRUCTIONS.



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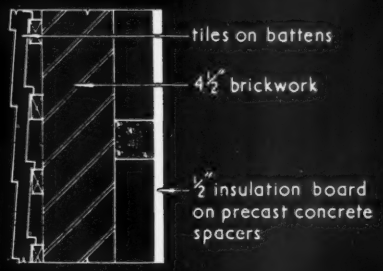

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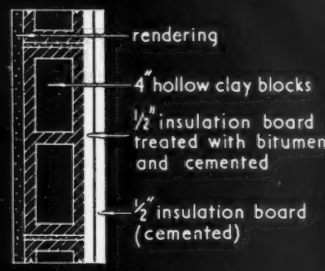


U = 0·20

BRICK AND HOLLOW BLOCK CONSTRUCTIONS.

LLOYD BOARDS: COMPARATIVE EFFICIENCIES OF INSULATED WALLS.

Manufacturer: Bowaters Building Boards Ltd.

28.D1 LLOYD BOARDS: COMPARATIVE EFFICIENCIES OF INSULATED WALLS

This Sheet illustrates a range of insulated external walls and gives their calculated thermal transmittance values based on conductivities as set out in *The Computation of Heat Requirements for Buildings* published by The Institution of Heating and Ventilating Engineers.

The values (U) are expressed in B.Th.U./sq. ft./hr./°F. temperature difference.

Compiled from information supplied by :

Bowaters Building Boards Limited.

Address : Bowater House, Stratton Street, London, W.1.

Telephone : Grosvenor 4161.

TECHNICAL SECTION

At a lunch given to the Press, L. J. Holloway, the new president of the LMBA, said that his main concern was with efficiency in the conduct of building operations. In the course of his talk and of the questioning which followed he gave prominence to three things : the new LMBA scheme for the training of managerial grade students (a predominantly industry-based training); the development of incentive schemes, and co-operation from architects in the matter of prompt instructions. In this last connection he regretted the custom of sending bills for tender without prior warning or consultation, and warmly supported the idea of architect-builder collaboration over constructional design and preparation for building operations. The architect, he suggested, did not regard building sufficiently from a business point of view; consequently there was a danger that leadership might pass to the surveyor or to the builder-employed architect. But Mr. Holloway made clear his belief that it was the architect who should lead. We agree with Mr. Holloway, but it is evident that leadership depends upon architects equipping themselves with some kind of *economic* technical knowledge—and this is an educational matter which we hope the McMorran Committee has before them.

20 CONSTRUCTION: COMPLETE STRUCTURES

site organization and design at Trinity Road flats, Wandsworth

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

Many architects confess that they find it difficult to concern themselves with matters of site organization because—as they say—it seldom bears directly on "design." This week we publish an account of the construction of some eleven storey blocks of flats for the LCC, where the use of a tower crane by the contractors was allowed to exert its due influence on design detail.

A remarkable venture in flat building now going on in Wandsworth, is very much in the public eye, for the blocks are eleven storeys high. A tower crane is employed and the site adjoins the main line through Clapham Junction.

Plans of the scheme have aroused considerable interest for they mark a notable departure from the customary English solution to the flat problem of long blocks, one flat deep.

In this article, however, we are concerned only with the structure and the methods by which it is being put up, for these exhibit an economy—a mutual adaptation of ends and means—that suggests an industrial, as

Fig. 1. General view of block from ground level showing staging for hoist.

distinct from a craft, approach to building. It has been looked upon and is being carried out, as a *production* job. Elegance of finished building is matched by elegance of process.

DESIGN AND CONSTRUCTIONAL METHOD

The Trinity Road scheme, the second of the major LCC schemes in the Wandsworth area, in which 100 ft. high square point blocks constitute the greater part of the scheme, was won by the contractors, Wates Ltd., on the basis of a normal lump sum tender submitted in competition with ten other contractors. The design of the tall blocks had been worked out by the architects and the engineers (Ove Arup and Partners) to provide the maximum flexibility in construction whether built by conventional methods or by the use of a tower crane. The working drawings, specification and bills of quantities were based on in-situ concrete internal structural walls and floors, with in-situ columns and beam framing for the perimeter walls with brick-cavity-clinker external wall infilling. After winning the tender the contractors, who had had considerable previous experience of working with the LCC on in-situ concrete multi-storey flat construction, stated their intention of using a tower crane and made certain proposals for precasting a considerable proportion of the concrete work (see Fig. 3). Their proposals were studied by the architects and engineers, and as a result of several weeks of close collaboration the structural details were revised and a scheme was worked out to make the fullest possible use of the crane in the erection of the job. The ideas which emerged from this were all directed towards straightforwardness and speed of work on the site, an aim greatly facilitated by the ease and flexibility of hoisting over the whole plan area that a tower crane allows. Principal items in the scheme were:

Stairflights and horizontal members—beams and lintels—to be precast, to simplify shuttering which is the costly element in concreting work.

Wall shutters to be made up in large timber panels, standardized so far as possible and to be transported about of course, by the crane.

Use of the crane, and the precasting rendered outside scaffolding unnecessary, and to avoid its use for the external cavity walling, a system of cradles suspended from the roof was adopted. Bricks and blocks for the external walling and internal partitions were to be stacked on the structural floors as these went up.

To examine the proposals more clearly the contractors made a model of part of a block. This was used to work out the sequence of operations to show the precasting, and proved of great value in instructing the men on the site.

PROGRAMME

Site operations were planned to a target of one complete storey per week (structure only) —a not unambitious aim for four flats, two stairwells and two lift wells on a gross floor area of 3,400 ft. sup. When the gang of men got into their stride and the sequence of operations was well established, on the second block of flats, this target was cut down to five days. One notable consequence of using a tower crane is that the labour force on the site for the concrete structure only is quite small—averaging 25 men, with a smaller proportion of labourers to tradesmen than is customary.

The plan has been to keep work on one pair of flats about a day ahead of the other pair. This evens out work for the crane and avoids excessive duplication of shutters. The order is this:

First day:
Flats A: Vertical reinforcement and wall shuttering fixed, concreting completed.
Flats B: Floor slab concreted.

Second day:
Flats A: Wall shutters struck; bricks and blocks being stacked on floor; precast beams hoisted and placed.
Flats B: Vertical reinforcement and wall shuttering fixed; concreting completed.

Third day:
Flats A: The loading of bricks and blocks, and placing of precast beams continues.
Flats B: Wall shutters struck; bricks and blocks being stacked on floor; precast beams being hoisted and placed.

Fourth day:
Flats A: Props and shutters fixed for next

Fig. 2.

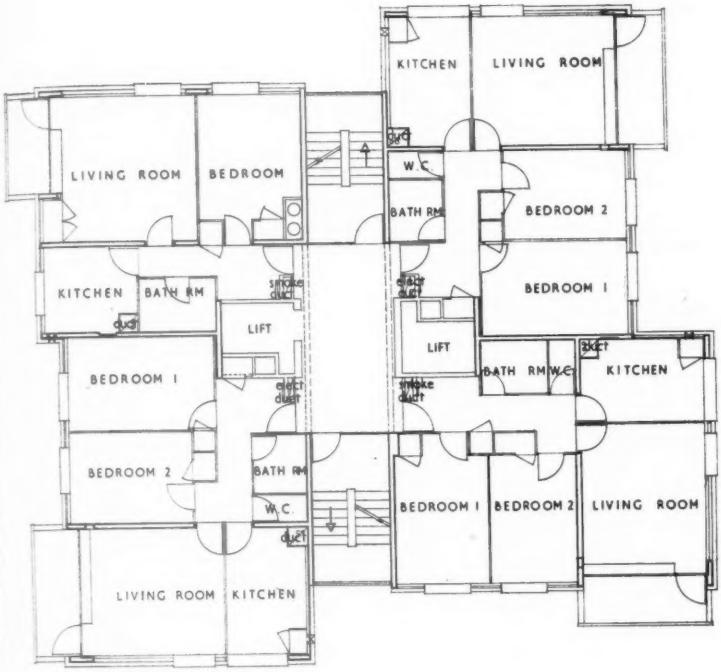
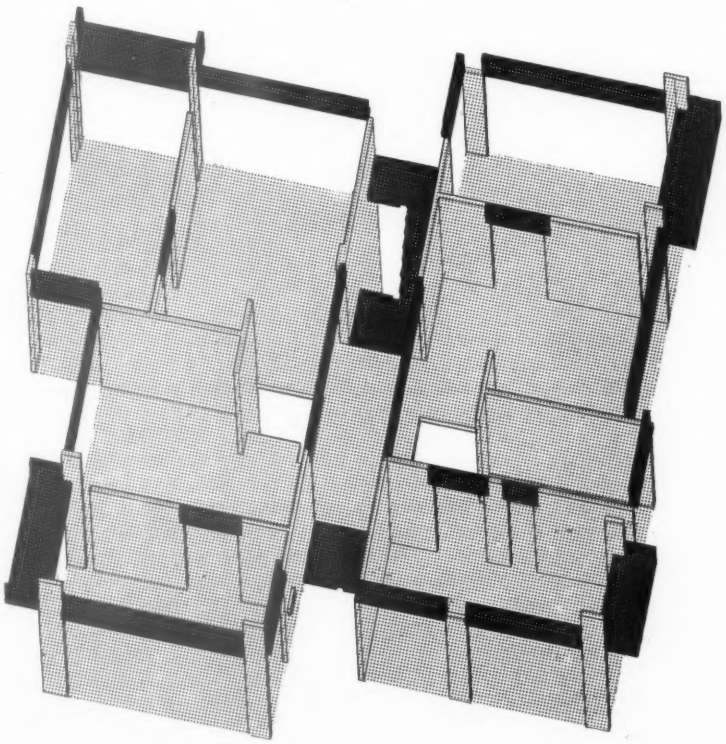


Fig. 2. Typical floor plan, scale $\frac{1}{16}$" to 1 ft.

Fig. 3. Axonometric drawing of a typical floor showing the division of the concrete structure as between precast units (dark tint) and in situ work (light tint).



floor slab; precast balconies hoisted and placed; floor reinforcement fixed.
Flats B: The loading of bricks and blocks and the placing of precast beams continues.

Fifth day:
Flats A: Concreting of the floor slab.
Flats B: Props and shutters fixed for the next floor slab; precast balconies hoisted and placed; floor reinforcement fixed.

Sixth day:
Flats A: The process begins again.
A time and progress chart, prepared from that actually on the job, shows the number of hours taken by each operation and the way in which they overlap (Fig. 4). It will be noted that there are few spaces when the crane is not in action, and this is a point of particular significance when an item of such high capital cost has to pay for itself in labour saved.
To fill in the picture of what goes on in the day-to-day work, we give below some of the more notable circumstantial details of site operations:

WALLS

It is usual to provide transverse links in the reinforcement—indeed it is a byelaw requirement, although in this building they are necessary for structural reasons only on the lower floors. But links are laborious to fix and tend to impede consolidation during the pouring, so the solution here at the request of the contractors was to make the reinforcement in the form of welded "ladders"—the rungs acting as links. To ensure correct position and stability during pouring, small concrete spacers are used, notched for the vertical bars and with their ends bearing against the shutters. The shutters are full height (8 ft.) and on the average 12 ft. long, although the longest is 16 ft. They are of 18 mm. phenolic bonded ply on 3 in. by 2 in. framing at 21 in. cc. with three rows of waling, the upper being a 7 in. by 3 in., wide enough to make a working platform. With some remedial work to framing they are good for 50 re-uses at least. It will be seen from the progress chart that erection of all the wall shutters for one pair of flats takes one day, and striking them takes two hours.
For the bonding in of walls and partitions it is common practice to cast in galvanized metal ties during concreting, but here a simpler method has been found. Splayed sponge rubber blocks have been screwed to the shutters and these form a dovetail slot in the concrete from which the shutter can be withdrawn—with a tug. The slots act as masonry slots—accommodating a metal tie put in when the brickwork is being built.

FLOORS

The floor shutters are of 18 mm. (AX 100) ply in sizes 8 ft. by 4 ft. These rest on steel telescopic centers which in turn bear on timber plates supported by adjustable steel props. The timber plates are built of three members like a flitch beam, the two outer ones forming shoulders supporting telescopic centers and shutters so that these can be withdrawn without disturbing the props. The

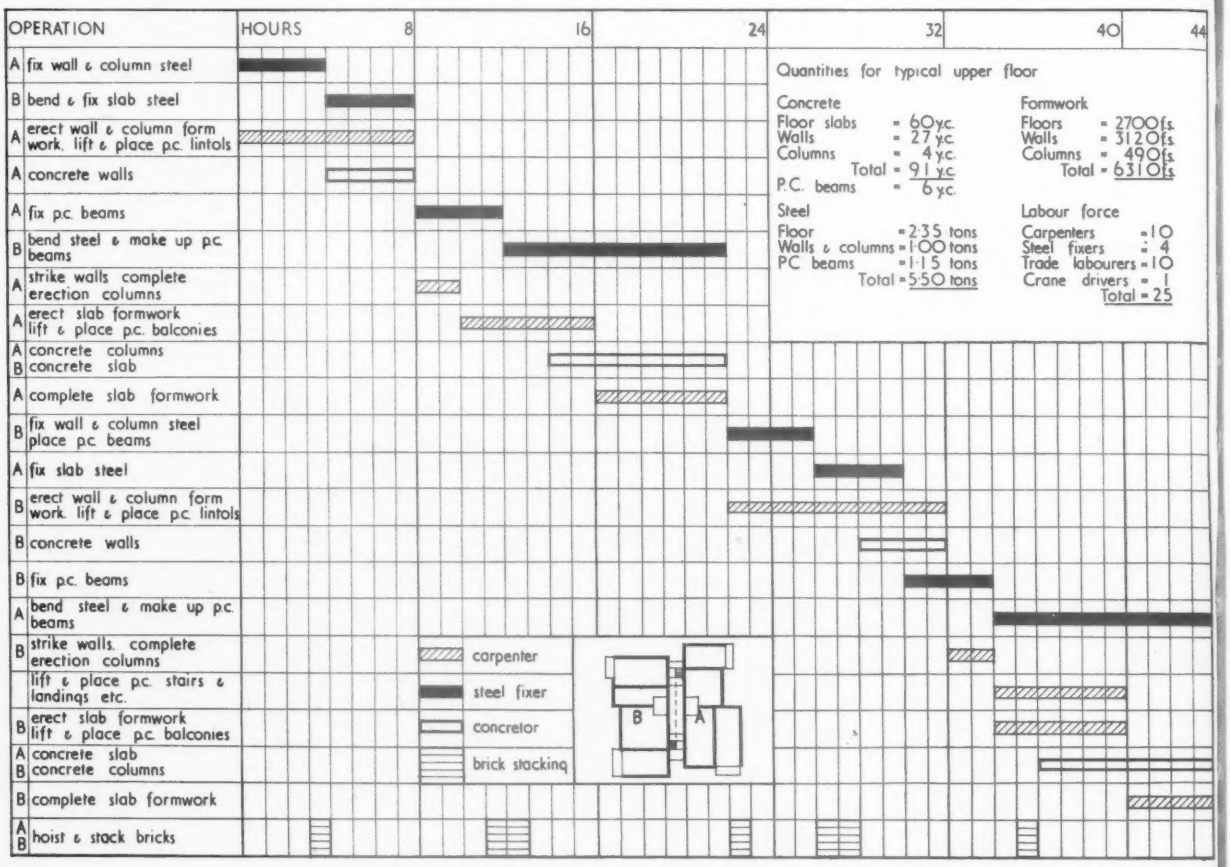


Fig. 4. Time and Progress schedule. The inset diagram shows the division of the plan into two parts, A and B, for purposes of the site programme.

props continue then to support the slab during its early curing (Fig 8). Those telescopic centers which adjoin structural walls are supported by the walls. This obviates the need for a line of props adjacent to the wall, thus allowing space for the stacking of bricks and blocks where the floor is best able to support them.

We have learned from BRS studies that the preparatory work for any particular operation takes a high proportion of the total time. Setting out would come under this heading, and one characteristic ingenuity on this job which avoids delay is the location of holes in the slab for plumbing stacks, electric points and so forth. The formers are of concrete, cast in a slump test mould with a length of water pipe down the middle. This projects below and fits into a hole drilled in the shutter panel, the panels being reference marked to occur in the same place on each successive floor.

Some 28 re-uses of each shutter are necessary for the completion of one block, an amount that does not exhaust their useful life.

Reinforcement is of round and twisted square section m.s. bar, bending being done on the site.

As much of the steel as possible was prefabricated on the ground and hoisted into position by the crane. Bar centres were also permanently marked on the shutters to reduce further setting out of slab reinforcement.

BEAMS AND LINTELS

These are precast on the site and hoisted into position by the tower crane. The consequences of this procedure are: complex *in situ* shuttering, and in the case of the external edge beams some form of scaffolding or propping for support and access are avoided; the beams and lintels are a better quality product; fewer shutter boxes are needed and the beams when in position form a useful support for the next stage up. There are two minor but useful ingenuities of procedure which should be noted. In the early stages of the job, hooks were cast in edge beams for hoisting, but these tended to produce cracking. The solution to this was to thread a scaffold pole through the projecting stirrups and put the crane hooks round the pole. The second device, designed by the contractors, concerns safety regulations which require that a rail be provided at each floor. This rail is bolted to the beam *before* hoisting, and in order that the beam shall arrive in its true position and not be tilted sideways by the eccentric weight of the rail, this latter is tied back to the crane cable and so remains upright (Fig. 13).

Details such as this, although not of great significance in themselves, are given attention here for they are symptomatic of the alertness to methods improvement that is characteristic of the job.

Clearly the nodal point of site organization is the tower crane, but its performance characteristics also exert an influence on constructional design. The maximum load of the crane varies according to the reach at which it is working, in fact there is an automatic cut-out which prevents over-load if this is attempted. At 23 ft. the max. load is 60 cwt., at 32 ft. 9 in. it is 39 cwt., and so on. At extreme reach of 65 ft. 6 in. it is only 17 cwt., a load exceeded by some of the edge beams and the precast balconies on the "far" side of the block. To avoid the use of other hoisting methods, these beams have been reduced in section thus leaving some of reinforcement projecting; and the balconies have been precast in two sections which leave a centre section to be cast *in situ* when the floors are cast.

The maximum height of the crane, for use on this job, was 123 ft. under the hook. It moved under its own power from block to block, on track laid from point to point as required.

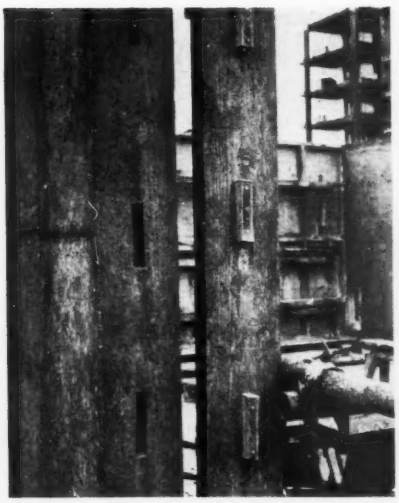


Fig. 5 (top left). Side outlet skip descending on to a wall shutter. Fig. 6 (top centre). Detail of sponge rubber formers. Fig. 7 (top right). A box pallet being hoisted clear after the delivery of a load. Fig. 8 (above left). Underside of floor shuttering showing telescopic centres and adjustable steel props. Fig. 9 (above right). General view of the concreting plant.

STAIRCASES

Like the beams and balconies, the stair flights and landings are precast. This has been done partly because the means for lifting them was available, partly to avoid complex site shuttering and partly to obtain a higher standard of finish. This in addition to the fact that precast products can be of higher quality than *in situ*. To save weight the flights were cast hollow (Fig. 10), and the landings were coffered. A remarkable standard of quality has been attained by the subcontractors who made the stairs, and the contractors have paid due respect by making "reverse" timber stairs to fit on the concrete ones for protection.

For support, p.c. nibs are cast in the walls of the stair wells, and the edges of the floors are rebated. When hoisting, the crane "brothers," which hook in to the flights at top and bottom, are adjusted so that the flight arrives in its true position. The small working clearance between stair components and walls is grouted up when the stairs are set.

CONCRETING PLANT

This forms a minor but very busy and highly organized industry on its own. There is a weigh batching plant fed by a grab crane from the heaps of aggregate. Beside this is a 20-ton bulk cement silo which delivers measured amounts, and both feed a 14/10 mixer with automatic water delivery. The mix used is 1:2:4 with a 4 in. slump, the cube strength at 28 days being an average of 4,360 lb. per sq. in.

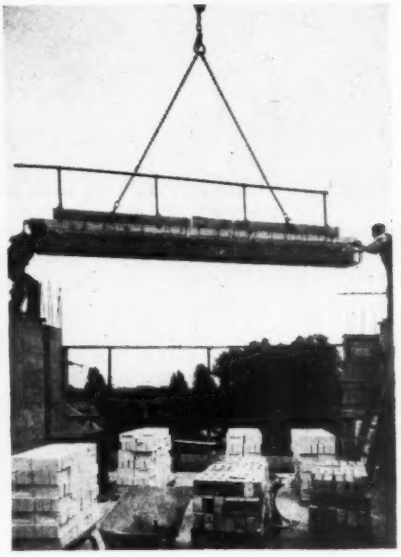
Specially designed concreting skips made in the contractors' own workshops are used on the crane, of 10 ft. cu. capacity—to take the whole mixer drum load. Some skips are of side and some of centre outlet—according to the type of shutter being filled.

BRICKS AND BLOCKS

Although brickwork is one of the cheapest forms of walling we are beginning to realize that an astonishing amount of labour is expended in merely handling bricks. Hence the development of the brick hoist. But on this job there is a tower crane, and to make use of it box pallets are being employed, in which the sides of the box which are attached to the crane, may be released from the bottom, by pulling a lever (Fig. 7).

As the photographs show, the bricks and blocks for the external walling and internal partitions are stacked on each floor as the job goes up. There are in fact some 7,700 facings on each floor. The stacking is done

Fig. 10 (*above*). *Withdrawing cores from a precast stair flight.* *Fig.* 11 (*above right*). *Hoisting a precast stair into position.* *Fig.* 12 (*right*). *Raising a balcony off a shutter.* *Fig.* 13 (*extreme right*). *Lowering an edge beam into position. Note temporary safety rail.*



to plan (there are layout drawings for it in the contractors' office) so that the new floors are not overstressed.

As the site procedure has been designed without at any point requiring the use of scaffolding, it would have spoilt the pattern to introduce it for external walling. Thus a type of suspended cradle is being employed, hung from the roof structure of the block. Bricklaying begins at the bottom, the cradles being raised floor by floor. Having reached the top it then descends again, this time manned by painters who do all the outside painting.

It is perhaps of significance that Wates Ltd. have a New York branch and that special research was undertaken there to establish what the American methods and speeds of building of this sort were and that in setting their targets Wates used their American standards as a yard-stick, and in the outcome this job has shown considerable improvement thereon.

Figs. 14, 15, 16 (*below, left to right*). *Progress of work on May* 6, *May* 20 *and July* 5, 1954.

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.

23.205 heating: ventilation
HEATING

The Organ in Gas Heated Churches. (Federation of Master Organ Builders. Free.)

The popularity of flueless radiant gas heating in churches, and the damage which the thoughtless installation of this type of heating can cause to organs, has led the Federation of Master Organ Builders to issue this brief, useful description of how to minimise the damage.

24.182 lighting
FLICKER FROM FLUORESCENT LAMPS

Flicker Discomfort in Relation to the Lighting of Buildings. J. B. Collins and R. G. Hopkinson. (Transactions of the Illuminating Engineering Society. May, 1954.)

This article describes experimental work on visual discomfort due to flicker in lighting installations—in particular installations employing fluorescent lamps.

Two problems of flicker exist (*a*) that associated with the stroboscopic effect experienced when moving parts are viewed under a discontinuous light source of regular intermittency, and (*b*) the perception of flicker in the light source itself or in the lighted environment. The study concerns itself with (*b*) although reference is made to stroboscopic effects in the notes of the discussion.

The main object of the investigation was to find why complaints of discomfort from flicker were so numerous in face of the generally accepted view that the frequency of the light fluctuation of a discharge lamp is well above that perceptible to the human eye.

The following conclusions were made as a result of the investigation:—

(1) People vary very much in their sensitivity to flicker and small differences in frequency produce large differences in flicker sensation.

(2) Flicker may be more readily seen in a large area of moderate luminance, *e.g.*, a well lighted drawing board, than in a small area of high luminance, *e.g.*, a bare fluorescent lamp.

(3) It can be deduced that the effect of the afterglow of commercially available fluorescent lamps helps to reduce flicker.

(4) Apart from obviously faulty auxiliary gear or lamps the most likely cause of flicker in tubular fluorescent lamp installations fed from a 50 cycle A.C. supply is the presence of a 50 cycle component superimposed on the normal 100 cycle wave-form such as frequently occurs close to the electrodes. The usual practice of screening each end of the lamp a distance of about 2 in. is generally sufficient to eliminate this effect.

(5) Multi-phasing is valuable in reducing the possibility of flicker perception and stroboscopic effects. The "lead-lag" circuit has been shown to have a similar effect to increasing the afterglow of the lamp coating.

The general conclusion was that in a well designed and maintained installation flicker is not likely to be a serious lighting problem and is only likely to affect a small proportion of people.

24.185 lighting
LIGHTING

The Installation of Electricity in Churches. (Central Council for the Care of Churches. 1s., by post 1s. 3d.)

This is a businesslike document which begins with John Betjeman's poem "Too hard and too bright" and John Piper's drawings showing "how not to do it," and, having discussed the general effects to be aimed at, concludes with an excellent list of "conditions to be observed by electrical contractors." This last includes a lucid account of the seven permitted systems of wiring. A "must" for all architects engaged in this class of work.

27.15 furniture and fittings
OFFICE DESKS

Dimensions of Wooden Desks and Tables for Office Use. BS 2513: 1954 (British Standards Institution 2s. 6d.).

Standardizes dimensions and arrangement of desks and tables including drawers. Does not cover quality. If it is worth standardizing an item such as office desks, why is the standard restricted to wood types? Metal office furniture is quite common and surely it would be useful to have all types in the same range—even if not to a modular dimension.

THE INDUSTRY

From the Industry this week Brian Grant reports on a new hood for ventilating cookers, a solid fuel fire grate, a combined electric radiator and towel rail, heating for pavements, a new lighting fitting, new sinks and cupboard latches, and a method of filing drawings.

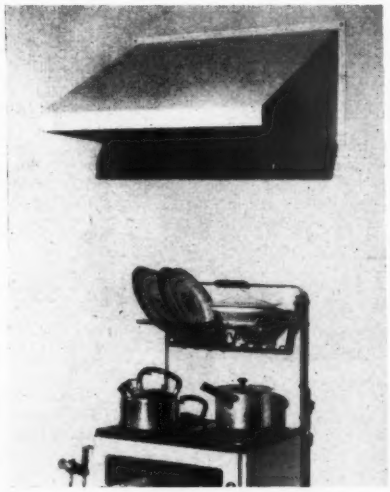
VENTILATING THE COOKER

Messrs. Fenton Byrn have produced a ventilated canopy for fitting above the ordinary domestic cooker to remove grease-laden air and fumes. The canopy is made of 20 gauge rust proofed and stove enamelled steel and is 2 ft. deep by 2 ft. 6 in. wide. In the wall is a 9 in. 35 watt fan which will shift 300 cu. ft./min.: installation is normally on an outside wall, or on conversion jobs the flue from a discarded solid fuel range would be suitable. Price is £15 complete, and larger models are also produced for restaurants and canteens. (*Fenton Byrn & Co. Ltd., Air-Flow Works, Berrylands Road, Surbiton, Surrey.*)

NEW SOLID FUEL GRATE

One of the new designs to be shown by Allied Ironfounders at the Hardware Trades Fair this month is the Lexham fire, which is made in 16 and 18 in. sizes. The design is intended for use with "high class" fireplaces (presumably those designed by architects) and has been kept as simple as possible, with finishes either in dull Berlin black or in vitreous enamel. The 16 in. fire will

A ventilated canopy for the domestic cooker, by Fenton Byrn.



INFORMATION CENTRE INDEX FOR 1954

An alphabetical index covering Information Centre items and special articles published in the Technical Section during the twelve months ended December 31, 1954, is being prepared. Readers who wish to have a copy—it is free of charge—should complete the form below and post it to the Technical Editor, THE ARCHITECTS' JOURNAL, not later than March 7, 1955.

Please send me the Information Centre Index for 1954:

Name .....
(Block letters)

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Address .....
(Block letters)

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AJ 3.2.55

heat a room up to 1,750 cu. ft. and the 18 in. 2,000 cu. ft.: both types are continuous burning and will stay alight all night on coke. (*Allied Ironfounders Ltd., 28, Brook Street, London, W.*1.)

ELECTRIC RADIATORS

The illustration on the right shows a Dimplex oil-filled electric radiator combined with a towel rail. These radiators are made with various loadings and are thermostatically controlled. The makers, by the way, have recently opened a London showroom at 17, Shepherd Street, W.1. (*Dimplex Ltd., Totton, Southampton.*)

HEATING OPEN SPACES

From time to time one hears suggestions that the pavements outside shop windows should be heated and pedestrians thus encouraged to gaze in comfort. So far as one can discover, not very much of it has been done in this country, though one hears of overhead heating and also the heating of the pavement itself, both methods being used abroad. One would assume that a radiant overhead system would be the more economical, and at least one method is already in use here, and is illustrated below. Each heater consists of a refractory block with combustion tunnels and a surface consisting of a multitude of small holes through which a gas/air mixture is pumped, burning at the surface and forming a high temperature radiant. The units each burn about 100 cu. ft. of gas an hour and should be mounted at a height and spacing of 12 or 15 ft. Gas/air mixture is supplied by an electrically driven fan and a mixing valve. Electric ignition can be provided and a single fan unit can supply a number of heaters. (*Radiant Heating Ltd., Radiant Works, Barnsbury Park, London, N.*1.)

LIGHTING FITTINGS

Messrs. Holophane have just introduced a new circular bulkhead fitting (No. F9871) for ceilings or walls. The new fitting is a recessed alternative to the surface mounting type and has a rubber seal to make it proof against dust and moisture. It is designed for use with 100 or 150 watt lamps, and the prismatic cover glass is designed to give a wide lateral light distribution. (*Holophane Ltd., Elverton Street, Westminster, London, S.W.*1.)

KITCHEN EQUIPMENT

There is now a new all metal Easiclene sink unit, Model BBV, selling at £24 10s. 0d. The cabinet is welded steel, rust-proofed and stove enamelled cream, and has sliding doors to the cupboards and, as usual, a drawer under the draining board. Sink and draining board are vitreous enamelled in white, cream or green and dimensions are 42 in. by 21 in. by 36 in. high.

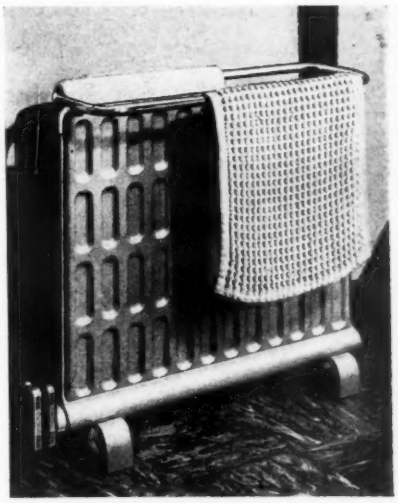
The same firm has also announced a reduction in price of its 2 cu. ft. refrigerators, which are now £54 as against £62. This applies to the electric and to the town and bottled gas models, and the paraffin model is now £46 5s. 8d. as the purchase tax rate is lower. (*Easiclene Porcelain-Enamel (1938) Ltd., Darlaston, South Staffs.*)

CUPBOARD LATCHES

Magnetic cupboard latches have the advantages that they do not rattle and that the door need only be swung shut so that there is no fiddling with turnbuckles or noise from spring catches. The metallurgical composition of permanent magnets has now reached a stage where they really are permanent, so much so that a sample which I myself fitted to a cupboard pre-1939 is still, I'm told, working quite adequately. The Longton magnetic latch, now being produced in this country, sells at 4s. 0d. and is very easy to fix, while a certain amount of shrinkage in the door makes no difference to its working. (*The Longton Engineering Co. Ltd., Liverpool Road, Longton, Preston.*)

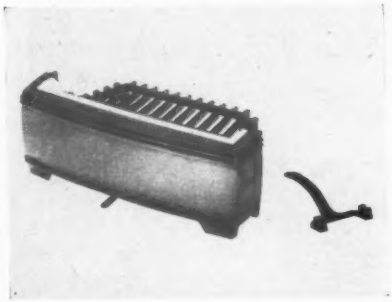
FILING DRAWINGS

It is no doubt true that there are some offices where any drawing can be found when it is wanted, but just how many there are would be difficult to guess. The old plan chest works well enough when all drawings are the same size and titled in the same corner, but tears and folds and odd sizes play havoc with the system. Readers who have been defeated by the problem might well try the Suspendex vertical filing cabinet, in which drawings of any size are hung from a bar at the top, the whole suspension rack sliding forward like the drawer of a filing cabinet. One cabinet with 25 bars will hold from 400 to 450 drawings, any one of which can easily be removed. With the proviso that no system will work unless the user really wants it to, this method of filing seems as good as any, and better than most. (*Norwood Steel Equipment (London) Ltd., 44, Norwood High Street, London, S.E.*27.)



A Dimplex oil-filled electric radiator with towel rail.

Below left, the Holophane bulkhead lighting fitting No. F9871. *Bottom left, the Lexham fire, available in* 16 *in and* 18 *in. sizes. Below right, overhead radiant heating for pavements.*



Readers requiring up-to-date information on building products and services may complete and post this form to the Architects' Journal, 9, 11 and 13, Queen Anne's Gate, S.W.1

ENQUIRY FORM

I am interested in the following advertisements appearing in this issue of "The Architects' Journal." (BLOCK LETTERS, and list in alphabetical order of manufacturers names please.)

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Please ask manufacturers to send further particulars to :—

NAME .....

PROFESSION or TRADE .....

ADDRESS .....

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3.2.55

Buildings Illustrated

West Riding Constabulary Detective Training School at Bishopgarth, Westfield Road, Wakefield, Yorks. (Pages 162-163). Architect: Hubert Bennett, F.R.I.B.A., West Riding County Architect; W. T. C. Walker, A.R.I.B.A., Deputy County Architect; Ian M. Hindle, A.R.I.B.A., senior assistant; structural engineer, G. Mundy; heating engineer, T. E. Cunningham. Quantity Surveyors: Davis, Belfield & Everest. General Contractor: M. J. Gleeson Ltd. Sub-contractors: bricks, Armitage Bros.; structural steel, James Austin & Son; special roofings, Ruberoid Ltd.; glass, Pilkington Bros. Ltd.; woodblock flooring, Hewetson Ltd.; patent flooring, Armstrong Cork Co. Ltd.; central heating, W. A. Church Ltd.; boilers, Ideal Boilers & Radiators Ltd.; electric wiring, H. Smith; electric light fixtures, Hume Atkins Ltd., Troughton & Young Ltd., Merchant Adventurers Ltd., and Sun Electric Co. Ltd.: ventilation, W. A. Church Ltd.; sanitary fittings, Shanks & Co. Ltd.; door furniture, Dryad Ltd., and Wine & Webb Ltd.; casements, Mellowes Metal Window Co. Ltd.: metalwork, Hallamshire Ironcrafts; marble, Hopton Wood Stone Quarries; furniture, Scottish Furniture, Manufacturers, Educational Supply Association Ltd., Dare-Inglis Ltd.; horticultural contractor, Joseph Barraclough.

Maisonettes at 2-6 Melrose Terrace, Hammersmith, London, W.2. (Pages 169-172) for the Hammersmith Borough Council (Borough Engineer, John E. Scrase, B.SC. (ENG.), A.M.I.C.E.); Architect: Neville Conder, A.R.I.B.A., M.S.I.A.; Chief Assistant: Dennis Berry, A.R.I.B.A.; Quantity Surveyors, Horace W. Langdon & Every; General Contractors: Borough of Hammersmith, Direct Labour Organisation. (Building Manager, E. North, M.I.MUN.B.M.) Sub-contractors: asphalt, roofing felt Faldo Asphalte Co. Ltd.; reinforced concrete, Helical Bar Engineering Co. Ltd.; bricks, 2nd London Stocks; cast lead, Stoner & Saunders Ltd.; patent flooring, The Marley Tile Co. Ltd.; waterproofing materials, National Coal Board; grates, Radiation Group Sales Ltd.; gasfitting, North Thames Gas Board; electric wiring, Hartley Electromotives Ltd.; electric light fixtures, Walsall Conduits Ltd., and Oswald Hollman; sanitary fittings, Standard Range & Foundry Co. Ltd.; door furniture James Gibbon Ltd.; casements, The Crittall Manufacturing Co. Ltd.; metalwork, C. Harvey & Co., and Grundy Arnatt Ltd.; joinery, Jayanbee Joinery Ltd.; tiling, Langley London Ltd., and Copy & Co. Ltd.; shrubs and trees, Hammersmith Borough Council; paints, Mander Bros. Ltd.; cement glaze to staircase walls, Robbs Cement Enamel Finishes Ltd.

Announcements

PROFESSIONAL

Messrs. Yeoman and Edwards, Chartered Quantity Surveyors, have moved their offices to 3, Chandos Street, Cavendish Square, W.1., telephone, Langham 9031.

The office of Mr. G. M. Hall, District Surveyor for Wandsworth, has been moved from 5, Mitcham Road, Tooting, to 100, Wandsworth High Street, S.W.18., telephone: Vandyke 4004.

TRADE

Northern Aluminium Co. Ltd. announce that their Birmingham Area Sales Office has removed to offices at 14, Bennetts Hill, Birmingham 2, under the management of Mr. G. A. Vernon. Telephone number, Midland 5236 and telegraphic address, Noralumin Birmingham, remain the same.

Mr. H. Lundy, B.SC., is now in charge of the Technical Service, Oxylene Boram Division, of The Timber Fireproofing Co. Ltd.

CLASSIFIED ADVERTISEMENTS

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

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

Public and Official Announcements

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

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

OFFICE OF THE RECEIVER FOR THE METROPOLITAN POLICE DISTRICT.

Applications are invited for unestablished appointments as LEADING ARCHITECTURAL ASSISTANTS in the Architect and Surveyor's Department. The work is concerned with the design and construction of police dwellings and buildings, and candidates will be required to work in the Westminster area.

Rates of Pay (Men).*—£665 × £20—£725 × £25—£780.

Women.—£580 × £20—£640 × £25—£665.

* The scales quoted are subject to an increase of approximately 3 per cent., while a 45½-hour week is being worked and also to the addition of a Pay Supplement of £25 or £30 per annum, according to the point reached on the scale.

Conditioned hours.—44 per week.

Annual Leave.—24 days.

Application forms from the Chief Architect, Architect and Surveyor's Department, New Scotland Yard, London, S.W.1, marking the envelope "Architectural Assistants." 6005

EAST BARNET URBAN DISTRICT COUNCIL. ENGINEER AND SURVEYOR'S DEPARTMENT.

Applications are invited for the following permanent appointments:—

(i) ASSISTANT ENGINEER. A.P.T., Grade III (£600×£25—£725 per annum, plus London weighting).

(ii) ASSISTANT ARCHITECT. A.P.T., Grade III (£600×£25—£725 per annum, plus London weighting).

The Council will be unable to provide housing accommodation.

Forms of Application and Conditions of Appointment may be obtained from the Engineer and Surveyor, Town Hall, Station Road, New Barnet, Hertfordshire. Completed application forms must be returned by not later than Saturday, 19th February, 1955. 8242

COUNTY BOROUGH OF GREAT YARMOUTH EDUCATION COMMITTEE. SCHOOLS ARCHITECT'S DEPARTMENT.

Applications are invited from Associate Members of the R.I.B.A. to fill the vacancy for a SENIOR ASSISTANT ARCHITECT, within A.P.T., Grade IV (Amended) (£675 to £825).

Candidates should have a knowledge of modern school design and construction.

The appointment is superannuable and subject to the National Conditions of Service, and the appointment will be terminable by one month's notice on either side.

HOUSING ACCOMMODATION will be made available if required.

Canvassing will be deemed a disqualification, and candidates must disclose any relationship to any member or holder of any senior office under the Council. Candidates who fail to do so will be disqualified or, if appointed, liable to dismissal without notice.

Applications, stating age, qualifications, experience, and giving details of present and past appointments, together with the names of two referees, should reach the Schools Architect, 22, Euston Road, Great Yarmouth, by the 12th February, 1955.

D. G. FARROW,
Chief Education Officer.
22, Euston Road, Great Yarmouth. 8243

BOROUGH OF WILLESDEN.

Appointment of ARCHITECTURAL ASSISTANTS:—Grade A.P.T., IV (£675-£825 per annum), Grade A.P.T., III (£600-£725 per annum), plus London weighting.

Applications are invited for the above appointments on the permanent staff of the Borough Engineer and Surveyor's Department from suitably experienced persons, preference being given to Associates of the Royal Institute of British Architects or who hold an equivalent qualification.

The commencing salary in each case will be fixed in accordance with the qualifications and experience of the successful candidates.

The Council is unable to assist with housing.

Full details and forms of application may be obtained from the Borough Engineer and Surveyor, Town Hall, Dyne Road, Kilburn, N.W.6, and should be returned to the undersigned not later than 10 a.m. on Monday, 14th February, 1955.

R. S. FORSTER,
Town Clerk.
Town Hall, Dyne Road, Kilburn, N.W.6.
January, 1955. 8235

CITY OF WINCHESTER. CHIEF ASSISTANT ARCHITECT.

Applications are invited from qualified Architects for the appointment of Chief Assistant Architect in the City Engineer's Department, at a salary at a point *within* new Grade IV of the A.P.T. Division of the National Scales, *i.e.*, £675, rising by annual increments of £30 to £825.

Candidates should be Corporate Members of the Royal Institute of British Architects, and have had previous experience in the design and preparation of plans and details for houses on Municipal Housing Estates, including the supervision of work under contract. The work envisaged will include infilling in redevelopment areas in addition to normal housing estate work.

The appointment is a permanent one, terminable on either side by a month's notice in writing, and the successful candidate will be directly responsible to the City Engineer. Consideration will be given to the provision of housing accommodation.

Applications, stating age, present salary, present and previous appointments, details of training and experience, together with names and addresses of three referees, should reach the undersigned not later than *Friday*, 4th February, 1955.

R. H. McCALL,
Town Clerk.
Guildhall, Winchester.
18th January, 1955. 8223

SOUTH-EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Vacancy for SENIOR ASSISTANT ARCHITECT. Salary rising from at least £915. Applications by 14th February, 1955. Details from Regional Architect, 10, Hallam Street, W.1. 8232

Applications are invited for the post of ARCHITECT Grade II (salary range £600 to £900) at Fenton, Stoke-on-Trent, subject to satisfactory experience, the starting point on the scale will not be below £740 per annum.

Applicants should be A.R.I.B.A.

The office is engaged on a large programme of varied and interesting work of an industrial nature and offers scope for applicant with a progressive outlook.

Applications to the Divisional Establishment Officer, National Coal Board, Himley Hall, Dudley, Worcs. 8370

BOROUGH OF SOLIHULL.

(*a*) LANDSCAPE ARCHITECT (within Grade A.P.T. V. £750 = £30—£900).

(*b*) QUANTITY SURVEYOR (within Grade A.P.T. V. £750×£30—£900).

(*c*) ASSISTANT ARCHITECTS (within Grade A.P.T. IV. £675×£30—£825).

Applications are invited for the above appointments in the Borough Engineer & Surveyor's Department, 90, Station Road, Solihull.

Applicants for appointment (*a*) should be suitably qualified and should preferably have had experience in the layout and development of parks, playing fields and public open spaces.

Applicants for appointment (*b*) should be Associates of the Royal Institute of Chartered Surveyors, and should preferably have had experience of contracts for housing and public buildings. The successful applicant will be in charge of the quantity surveying staff.

Applicants for appointments (*c*) should be Associates of the Royal Institute of British Architects and should preferably have had experience with other Local Authorities.

The appointments will be subject to the provisions of the Local Government Superannuation Act, 1953, to the terms of the National Scheme of Conditions of Service and to one month's notice on either side.

In appropriate cases the Council will endeavour to assist in the provision of housing accommodation.

Applications, giving full details as to age, present position and salary, qualifications and experience, together with the names and addresses of two referees, should be delivered to the Borough Engineer and Surveyor at the above address not later than Tuesday, February 15th, 1955.

W. MAURICE MELL,
Town Clerk. 8295

COUNTY BOROUGH OF HALIFAX BOROUGH ENGINEER'S DEPARTMENT. APPOINTMENT OF QUANTITY SURVEYOR.

Applications are invited for the above appointment at a salary in accordance with Grade A.P.T. V/VI (£750—£1,000). The commencing salary will be fixed within this range after regard has been had to the qualifications and experience of the successful applicant.

Housing Accommodation for the successful candidate will be provided if necessary.

The successful candidate will take charge of the Quantity Surveying section of the Borough Engineer's Department and will be responsible for the whole of the Quantity Surveying work entailed on architectural work, including new schools, housing, etc.

Candidates should possess appropriate technical qualifications and will be required to pass a medical examination.

Applications stating age, qualifications, present position, salary and experience accompanied by copies of three recent testimonials, should be appropriately endorsed and delivered to the undersigned not later than 19th February, 1955.

RICHARD DE Z. HALL,
Town Clerk.
Town Hall,
Halifax 8369

PADDINGTON BOROUGH COUNCIL require QUANTITY SURVEYOR'S ASSISTANT, A.P.T., I (£530-£610 inclusive) (£10 p.a. less if under age 26). Candidates should have experience in preparation of estimates, taking-off, working up, abstracting, billing, site measurement, and working up to final account stage. Inter. R.I.C.S. or equivalent preferred. Write age, experience, qualifications, names of three referees, to the undersigned by 12th February, 1955 (quoting A.200).

W. H. BENTLEY,
Town Clerk.
Town Hall, Paddington Green, W.2. 8257

CORPORATION OF THE CITY OF ABERDEEN. TOWN PLANNING DEPARTMENT.

Applications are invited for the following posts:—

(*a*) SENIOR TECHNICAL ASSISTANT—salary scale £767—£892 (from 1st June, 1955: £790—£915).

(*b*) PLANNING ASSISTANT—salary scale £502—£697 (from 1st June, 1955: £515—£715).

Placing in accordance with qualifications and experience.

Further particulars may be obtained from the Director of Town Planning, 5, Bon-Accord Crescent, Aberdeen, by whom applications should be received on or before 14th February, 1955.

J. C. RENNIE,
Town Clerk.
Town House,
Aberdeen. 8199

BOROUGH OF CHATHAM. APPOINTMENT OF TWO ASSISTANT ARCHITECTS.

Applications are invited for the above appointments at salaries in accordance with the New A.P.T. Grade III (commencing at £625 per annum and rising to a maximum yet to be determined by the National Joint Council) of the National Scales of Salaries.

The persons appointed are required for the redevelopment of central areas, and other works offering considerable scope.

Housing Accommodation will be made available if required.

Applications with copies of two testimonials or the names and addresses of two referees should be delivered to the Borough Engineer and Surveyor, Town Hall, Chatham, by Friday, 11th February, 1955.

The appointments will be subject to the National Scheme of Conditions of Service; to the provisions of the Local Government Superannuation Acts and the candidates satisfactorily passing a medical examination. The appointments will be terminable by one month's notice on either side. 8253

COUNTY BOROUGH OF WEST HAM. BOROUGH ARCHITECT AND PLANNING OFFICER'S DEPARTMENT.

Applications invited from men of imagination and initiative for the following established posts:—

(*a*) TWO SENIOR ASSISTANT ARCHITECTS. New A.P.T., Grade IV, £675×£30—£825 p.a.

(*b*) ASSISTANT ARCHITECT. New A.P.T., Grade III, £600×£25—£725 p.a.

(*c*) ARCHITECTURAL ASSISTANT. £540×£20—£600 (salary subject to review).

(*d*) TWO SENIOR ASSISTANTS (PLANNING). New A.P.T., Grade V, £750×£30—£900 p.a.

(*e*) SENIOR ASSISTANT (PLANNING). New A.P.T., Grade IV, £675×£30—£825 p.a., and qualified, as under:—

(*a*) A.R.I.B.A., capable of controlling large Contracts.

(*b*) A.R.I.B.A. or Registered Architect, and able to supervise Contracts.

(*c*) R.I.B.A. Intermediate Exam. standard, with office experience.

(*d*) A.M.T.P.I. and other qualification an advantage. Experience in Planning Administration, Development Plan Work, etc.

(*e*) A.M.T.P.I.

Salaries subject to addition of London allowance.

Application forms (returnable by 15th February, 1955) from Thomas E. North, O.B.E., F.R.I.B.A., Dist.T.P., Borough Architect and Planning Officer, 70, West Ham Lane, Stratford, E.15. 8276

CORBY DEVELOPMENT CORPORATION ASSISTANT ARCHITECTS

Applications are invited from suitably qualified persons for two ASSISTANT ARCHITECTS' appointments in the salary range £650 × £30—£770.

The appointments are required in connection with large scale production projects associated with the development of a New Town. Candidates must have had suitable experience in the designs and execution of large-scale housing and other building works and in the detailed design and construction work of an architect's department.

The successful candidates will be required to pass a medical examination and contribute either to a Superannuation scheme or to an Insurance scheme.

Applications stating age, education, training, qualifications, experience, past and present appointments and salaries, together with the names of two referees must be received by the undersigned not later than 14th February, 1955.

R. F. BROOKS GRUNDY,
General Manager.
Corby Development Corporation,
Spencer House,
Corporation Street,
Corby, Northants. 8327

NORFOLK COUNTY COUNCIL.
ASSISTANT QUANTITY SURVEYOR required: salary A.P.T. Grade III (£600—£25—£725) per annum; experience of taking off and working up, checking final accounts, essential; N.J.C. Service Conditions; post pensionable; medical examination. Applications stating age, experience, qualifications, training, present appointment and salary, and giving names of three referees, to County Architect, 27, Thorpe Road, Norwich, by 11th February. 8290

CITY OF NOTTINGHAM.
ASSISTANT PLANNING OFFICER, GRADE A.P.T., IV (£675-£825).
Applications are invited for the above position in the City Engineer's Department.
Applicants should be Associate Members of the Town Planning Institute, and have had good experience in the office of a Planning Officer to a City or large Borough.
Commencing salary will depend on experience.
Applications on forms to be obtained from R. M. Finch, Esq., O.B.E., M.I.C.E., M.T.P.I., City Engineer and Surveyor, Guildhall, Nottingham Returnable by 19th February, 1955. 8263

MINISTRY OF WORKS.
ARCHITECTURAL ASSISTANTS required for drawing offices in London, Edinburgh and various provincial offices, including Aldermaston, Berks; Harwell, Berks; Nancekuke, Cornwall; Ranskill, Notts; and Bishopton, Renfrew.
Candidates must have had at least three years' architectural training, some experience in an architect's office, and be of Intermediate R.I.B.A. standard.
London salary £442—£695 per annum. Rates elsewhere slightly less. Starting pay according to age and experience. Prospects of promotion and establishment.
State age, full details of training and experience and office desired, to E. Bedford, Esq., C.V.O., A.R.I.B.A., Chief Architect, Ministry of Works, W.G.10/C.A.10(F), Abell House, John Islip Street, London, S.W.1. 8296

PADDINGTON BOROUGH COUNCIL require ARCHITECTURAL ASSISTANT, A.P.T., II (£590-£670 inclusive). Candidates should have Inter. R.I.B.A., and be used to preparing working and detail drawings; be good draughtsmen, and been engaged on and interested in the best contemporary architecture. Write age, qualifications, experience, present and past appointments, and names and addresses of three referees, to the undersigned by 12th February, 1955 (quoting A.201).
W. H. BENTLEY,
Town Clerk.
Town Hall, Paddington Green, W.2. 8258

LONDON COUNTY COUNCIL.
Architects and surveyors required for safety regulations of theatres and special buildings, and for general building regulation work. Salaries up to £892 10s., according to experience. A.R.I.B.A. or A.R.I.C.S. essential. Particulars and application form from Architect (AR/EK/TBR/3), The County Hall, S.E.1. (848) 3487

LONDON COUNTY COUNCIL.
ARCHITECT'S DEPARTMENT.
(a) PLANNING OFFICERS, Grade III (up to £892 10s.).
(b) PLANNING ASSISTANTS (up to £739 10s.).
Professional qualifications: A.R.I.B.A., A.R.I.C.S. and/or A.M.T.P.I., required. Application forms and particulars from Architect (AR/BK/P/4), County Hall, S.E.1. 3420

LONDON COUNTY COUNCIL.
Grade III ENGINEERS (salary up to £892 10s.) and SURVEYING ASSISTANTS (up to £739 10s.) required in District Surveyor's Service. Qualifications: A.R.I.B.A., A.M.I.Str.E., or A.R.I.C.S.; structural knowledge essential. Particulars and application forms from Architect (AR/EK/DS/2), County Hall, S.E.1. (1025). 3511

BOROUGH OF NELSON.
ARCHITECTURAL ASSISTANT.
Applications are invited for the appointment of Architectural Assistant in the office of the Borough Engineer at a salary in accordance with the new A.P.T. Grade II of the National Scales of Salaries (£550—£640 per annum).
The applicants must be Students of the R.I.B.A., and should have experience in housing design, supervision, surveys, specifications and general work.
Applications, giving details of experience and qualifications and endorsed "Architectural Assistant," together with copies of three recent testimonials, to be sent to the undersigned not later than Saturday, 12th February, 1955.
F. W. ROBERTS,
Town Clerk.
Town Hall,
Nelson.
21st January, 1955. 8390

SURREY COUNTY COUNCIL.
Applications invited for following appointments:—
1. ASSISTANT QUANTITY SURVEYOR, Grade IV, £675 × £30—£825 p.a., plus London Weighting. Experienced taking off, site measuring, interim valuations and final accounts, and must have passed final examination of R.I.C.S.
2. ASSISTANT QUANTITY SURVEYOR, Grade III, £600 × £25—£725 p.a., plus London Weighting. Experienced as above but need not have passed Final Examination.
Applications giving full details and present salary, accompanied by copies of three recent testimonials, to County Architect, County Hall, Kingston, by 12th February, 1955. 8367

BOROUGH OF CHORLEY.
APPOINTMENT OF ARCHITECTURAL ASSISTANT.
Applications are invited for the above appointment in the Engineer and Surveyor's Department at a salary in accordance with the National Joint Council's interim decision (£625—£675 per annum), the commencing salary to be within that range according to qualifications and experience. This salary will be subject to review when the new salary grades for special classes are issued by the National Joint Council.
Candidates should have good experience in general architectural work, particularly in the lay-out of estates, design of houses and the carrying through of Building Contracts. Preference will be given to candidates who are Registered Architects or who hold equivalent qualifications.
The appointment which is superannuable is subject to medical assessment and to termination by one month's notice on either side.
Assistance will be given to the successful candidate in the provision of housing accommodation if required.
Applications stating age, training, qualifications and experience, past and present appointments, accompanied by copies of three recent testimonials are to be delivered to the undersigned by the 14th February, 1955.
GEORGE JACKSON,
Town Clerk.
24th January, 1955. 8389

CITY OF NORWICH.
CITY ENGINEER'S DEPARTMENT,
TOWN PLANNING SECTION.
Applications are invited for the appointment of a TOWN PLANNING ASSISTANT in Grade IV of the new A.P.T. division (£675 to £825).
Applicants should be Associate Members of the Town Planning Institute and must have a sound knowledge of town planning and practical experience of development control and in the preparation of schemes for redevelopment areas. Applicants should give full particulars of their training, qualifications and experience and should state their age, present and previous positions giving salaries and dates, and enclose copies of three testimonials.
The appointment is terminable by one month's notice on either side and subject to the provisions of the Local Government Superannuation Act, 1953. The successful candidate, therefore, will be required to pass a medical examination. Relationship of applicant to members of the Council or staff must be declared in the application. Canvassing, directly or indirectly, will be a disqualification.
Applications should be delivered to the City Engineer, City Hall, Norwich, not later than 10 a.m. on Monday, 21st February, 1955, endorsed "Town Planning Assistant."
H. C. ROWLEY, M.I.C.E.,
City Engineer.
City Hall,
Norwich. 8391

URBAN DISTRICT COUNCIL OF COULSDON AND PURLEY.
APPOINTMENT OF SENIOR ARCHITECTURAL ASSISTANT.
Applications are invited for the appointment of a Senior Architectural Assistant in the Engineer and Surveyor's Department.
Salary in accordance with the revised Grade A.P.T., IV (£675 × £30—£825), plus London area weighting. Applicants should be Chartered or Registered Architects, experienced in the preparation and execution of Municipal Housing Schemes by Contract, the Maintenance of Public Buildings, etc. Preference will be given to candidates who have passed the Final Examination of the Royal Institute of British Architects.
The appointment will be subject to Scheme of Conditions of Service, Local Government Superannuation Acts, medical examination and termination by one month's written notice on either side. Applications on forms to be obtained from the Engineer and Surveyor to the Council, at the address stated below, giving age, details of experience, qualifications, etc., accompanied by copies of two recent testimonials, must be submitted to him by not later than first post on Tuesday, 15th February, 1955.
Canvassing in any form will be a disqualification.
ERIC F. J. FELIX,
Clerk of the Council.
Council Offices, Purley, Surrey.
January, 1955. 8341

CARSHALTON URBAN DISTRICT COUNCIL.
TOWN PLANNING ASSISTANT. Engineer and Surveyor's Department. Must hold Final Examination Certificate of the Town Planning Institute and preferably, in addition, either an engineering or architectural qualification. Must also be experienced in the application and administration of the Town and Country Planning Acts. Salary within the range of A.P.T. Grade IV (£675—£825) plus London "Weighting."
The Council cannot provide housing accommodation.
Applications on forms obtainable from the undersigned must be returned with names of three referees not later than the 15th February, 1955.
Canvassing will disqualify.
C. H. DURRANT,
Clerk of the Council.
District Council Offices,
The Grove,
Carshalton, Surrey. 8333

STREET URBAN DISTRICT COUNCIL.
ENGINEER AND SURVEYOR'S DEPARTMENT.
ARCHITECTURAL ASSISTANT.
Applications are invited for the appointment of Architectural Assistant in the office of the Engineer and Surveyor to the Council.
The salary for the appointment will be fixed by the Council according to the qualifications and experience of the applicant within A.P.T., Grade IV (£675-£825).
Preference will be given to candidates who have had experience in the design, preparation of specifications and quantities, the complete supervision of the erection of Council houses and the execution of site works, and who are Registered Architects.
The appointment will be subject to the provisions of the Local Government Superannuation Acts, and will be subject to one month's notice in writing on either side.
The Council will consider the possibility of the provision of housing accommodation for the successful applicant, if married.
Applications, stating age, qualifications, and full particulars of experience, together with copies of three recent testimonials, must reach the undersigned not later than the 8th February, 1955.
H. W. HENSON,
Clerk of the Council.
Council Offices, Street.
25th January, 1955. 8343

BOROUGH OF THORNABY-ON-TEES.
BOROUGH ENGINEER'S DEPARTMENT.
APPOINTMENT OF ARCHITECTURAL ASSISTANT.
Applications are invited for the appointment of an Architectural Assistant, at a salary in accordance with the revised Grade A.P.T., II (£560 × £20 to £640). The appointment will be subject to the Scheme of Conditions of Service, Local Government Superannuation Acts, medical examination, and to one month's written notice on either side.
Preference will be given to candidates who have passed the Intermediate Examination of the R.I.B.A.
Application forms may be obtained from the Borough Engineer, Town Hall, Thornaby-on-Tees, and should be returned to him, in a plain sealed envelope endorsed "Architectural Assistant," not later than 12th February, 1955. Canvassing will disqualify.
A. STOCKWELL,
Town Clerk.
8342

CAMBRIDGESHIRE COUNTY COUNCIL.
Applications are invited for two appointments of ARCHITECTURAL ASSISTANT, Grade A.P.T., II (£560-£640), in the Department of the County Architect.
Applicants should have passed the Royal Institute of British Architects Intermediate Examination, or its equivalent at one of the recognised Schools of Architecture, and have worked in an Architect's office for a period of two years. They should have a good knowledge of construction and details, and be able to prepare drawings from preliminary sketches.
Applications, stating age, qualifications and experience, accompanied by one recent testimonial, and the names and addresses of two referees, should be sent to the Clerk of the County Council, Shire Hall, Cambridge, not later than Thursday, 10th February, 1955.
The appointment will be subject to one month's notice on either side, and to the provisions of the Local Government Superannuation Acts of 1937-1953.
The selected candidates will be required to pass a medical examination.
CHARLES PHYTHIAN,
Clerk of the County Council.
Shire Hall, Cambridge.
21st January, 1955. 8346

OUNDLE AND THRAPSTON RURAL DISTRICT COUNCIL.
ARCHITECTURAL ASSISTANT.
Applications are invited for the appointment of ARCHITECTURAL ASSISTANT in the Architect's Department of the above Authority, at a salary within A.P.T. Grade I (£500—£580) or Grade II (£560—£640) of the National Scale of Salaries. Salary Grade and point of entry will depend on the experience of the successful applicant.
The appointment will be subject to: (*a*) the National Scheme of Conditions of Service, (*b*) the provisions of the Local Government Superannuation Acts, 1937 to 1953, (*c*) a satisfactory medical examination, and (*d*) termination by one month's notice on either side.
Preference will be given to those who have passed the R.I.B.A. Intermediate Examination and with experience in housing.
Housing accommodation will be made available if required.
Applications, endorsed "Architectural Assistant," stating age, qualifications, previous and present appointments, and details of training and experience, accompanied by copies of three recent testimonials, should reach the undersigned not later than Thursday, 24th February, 1955.
H. H. HASSALL,
Clerk of the Council.
Council Offices,
Midland Road,
Thrapston,
Kettering.
21st January, 1955 8309

NORTH RIDING EDUCATION COMMITTEE. Vacancy for ASSISTANT ARCHITECT in the Education Architect's Department. Salary grade on 1st January, 1955, £675 to £825. Candidates, who must be Associate Members of the R.I.B.A., will work on the design of new schools and maintenance of existing schools. Previous experience may be taken into account in fixing commencing salary. Car, travelling and subsistence allowances. Local Government Superannuation Act. Send stamped addressed envelope for form and particulars: closing date for application, 12th February, 1955. Canvassing disqualifies.

F. BARRACLOUGH.

County Hall, Northallerton. 8345

COUNTY BOROUGH OF GREAT YARMOUTH. BOROUGH ENGINEER'S DEPARTMENT.

Applications are invited for the following appointments:—

CHIEF ASSISTANT ARCHITECT. Salary: A.P.T., Grade VI (£825-£1,000). Candidates must be Associate Members of R.I.B.A. Housing accommodation will be available if required. The successful candidate will be required to provide a car, for which an allowance of £90 per annum will be made in accordance with Scale C of the Council's car allowances.

GENERAL ARCHITECTURAL ASSISTANT. Salary within limits of A.P.T., Grade II, dependent upon qualifications. The Council is unable to offer housing accommodation for this appointment.

The posts are subject to one month's notice on either side, to the Local Government Superannuation Acts, and to the passing of a medical examination.

Applications, stating age, qualifications, experience, together with the names of three referees, endorsed with the title of the appointment, must reach me not later than Friday, 18th February, 1955. Canvassing will disqualify, and relationship to any member or senior officer of the Council must be disclosed.

FARRA CONWAY,
Town Clerk.

Town Hall, Great Yarmouth.
26th January, 1955. 8366

STAFFORDSHIRE COUNTY COUNCIL. EDUCATION COMMITTEE.

Applications are invited for appointment of the following staff on the permanent establishment of the County Education Architect's Department.

The Department has a large programme of varied and interesting work. Salaries according to qualifications and experience within the following grades:—

ASSISTANT ARCHITECTS. New Grade IV, £705-£825 per annum; must be Members of the R.I.B.A.

JUNIOR ARCHITECTURAL ASSISTANTS. New Grade II, £560-£640 per annum. Intermediate R.I.B.A. standard.

LAND SURVEYOR. New Grade II, £560-£640 per annum. Minimum standard, Intermediate R.I.C.S., in the Sites and Leases Section.

QUANTITY SURVEYOR. New Grade IV, £705-£835 per annum. Applicants should be qualified R.I.C.S. (Sub-Div. III, Quantities or equivalent).

JUNIOR QUANTITY SURVEYORS. New Grade II, £560—£640 per annum. (Intermediate R.I.C.S. Sub-Div. III, Quantities standard).

Forms of application may be obtained from the County Education Architect, Green Hall, Lichfield Road, Stafford, and should be returned completed by Tuesday, 15th February, 1955.

T. H. EVANS,
Clerk of the County Council.
8334

CAIRO UNIVERSITY. FACULTY OF ENGINEERING.

Applications are invited for the post of PROFESSOR in "TOWN-PLANNING" at the Faculty of Engineering, Cairo University, Giza, Egypt.

Minimum requirements are:—

(1) Ph.D. degree in Town-Planning from a recognised University, or the highest degree in Town-Planning given by that University, or a high qualification in Town-Planning from a recognised institute, which would be considered by that university as equivalent in standard to the above degree.

(2) Adequate practical experience in Town-Planning and important contributions to it.

(3) Applicant must have held the post of assistant Professor (or equivalent) of Town-Planning in a recognised university for at least five years. Applications may be accepted from applicants not fulfilling this condition if they have had long experience of university teaching of the subject, provided all other conditions are fulfilled.

(4) Lectures shall be delivered in English, and candidates should be well acquainted with this language.

(5) The salary offered is within the range £E900 to £E1,500 per annum according to qualifications, plus an expatriation allowance amounting to £E360, plus an extra war bonus amounting to £E75,600 m/m to be granted after three months' service.

The applicant will be on Contract for 2 years, renewable to five years, such contract being terminable on three months' notice being given on either side. A transfer allowance will be paid to the successful candidate if resident in Europe or America.

Applications with full details of academic qualifications, publications, research, teaching experience, should be sent to the Dean of the Faculty of Engineering, Cairo University, Giza, Egypt, not later than the 1st of March, 1955. 8350

STAFFORDSHIRE COUNTY COUNCIL. EDUCATION COMMITTEE.

Applications are invited for the appointment of HEATING ENGINEERING ASSISTANTS. Salary according to qualifications and experience within the new Grades I to IV—£500 to £825 per annum. Experience in design, specifications, installations, etc., for large buildings and schools.

Forms of application can be obtained from the County Education Architect, Green Hall, Lichfield Road, Stafford, and should be returned completed by Tuesday, 15th February, 1955.

T. H. EVANS,
Clerk of the County Council.
8365

STEVENAGE DEVELOPMENT CORPORATION.

Applications are invited for posts as JUNIOR ARCHITECTS on Corporation Salary Grades A.P.T. V, Va or VI (£620—£670, £650—£710 or £695/£760), according to experience.

Candidates should have completed a course at a recognised School of Architecture or have passed the final examination of the R.I.B.A.

Housing accommodation will be available eventually in appropriate cases.

Applications, giving details of experience and names of two referees should be sent to the Chief Administrative Officer, Aston House, near Stevenage, Herts, not later than Monday 14th February, 1955. 8363

EASTERN ELECTRICITY BOARD. CHILTERNS SUB-AREA.

3RD ASSISTANT ENGINEER (CIVIL ENGINEERING AND BUILDINGS.)

Candidates should have had experience in the preparation of quantities, estimates and specifications, and also in the supervision of construction and maintenance by direct or contract labour of all building and civil engineering works including substations, offices, service centres, stores and workshops, etc.

Salary will be in accordance with Class K, Grade II of the National Joint Board Salary Agreement commencing at £755 and future salary and conditions of service will be in accordance with agreements made from time to time by the appropriate negotiating bodies.

The successful candidate will be required to contribute to a superannuation scheme and may be required to undergo a medical examination.

Applications by letter stating age, education, qualifications and experience, with details of present appointment and salary, should be submitted to the Manager, Chilterns Sub-Area, Eastern Electricity Board, Prebend Street, Bedford, within 14 days of the appearance of this advertisement. 8360

DEVON COUNTY COUNCIL.

Applications are invited for the following posts:—

(*a*) DEPUTY COUNTY ARCHITECT (New J.N.C. Scale G).

(*b*) ASSISTANT ARCHITECT (New A.P.T. VII).

(*c*) ASSISTANT ARCHITECT (New A.P.T. V).

(*d*) TWO ASSISTANT ARCHITECTS (New A.P.T. IV).

Candidates for (*a*) should be Fellows or Associates of the Royal Institute of British Architects. Candidates for other posts should be Associates. Experience in administration and in the design of schools is essential for (*a*) and desirable for other posts.

Particulars and application forms (returnable by 28th February, 1955) from the County Architect, 97, Heavitree Road, Exeter. 8324

BASILDON DEVELOPMENT CORPORATION. ESTATES DEPARTMENT. APPOINTMENT OF ASSISTANT BUILDING SURVEYOR.

Applications are invited for the established and superannuable post of Assistant Building Surveyor on the staff of the Chief Estates Officer (Mr. John H. West, F.R.I.C.S.).

Candidates should have passed the Final or Intermediate Examination (Building Sub-Division) of the R.I.C.S. or hold an equivalent qualification, and must be experienced in building surveying, and be capable of preparing drawings, reports and specifications for maintenance and repair work, and minor adaptation works to all classes of buildings. Salary will be within the range of £560 to £610 per annum, point of entry being determined by qualifications and experience.

Housing accommodation will be made available on rent in approved circumstances.

Applications, stating age, education, qualifications, present and previous appointments with salaries, experience in precise terms, and giving the names of two referees, should reach the General Manager, Basildon Development Corporation, Gifford House, Basildon, Essex, by the 14th February, 1955. 8283

MINISTRY OF WORKS.

ARCHITECTURAL ASSISTANTS required for drawing offices in London, Edinburgh and various provincial offices.

Candidates must have had at least three years' architectural training, some experience in an architect's office, and be of Intermediate R.I.B.A. standard. London salary £442—£695 per annum. Rates elsewhere slightly less. Starting pay according to age and experience. Prospects of promotion and permanency.

State age and full details of training and experience to E. Bedford, Esq., C.V.O., A.R.I.B.A., Chief Architect, Ministry of Works, W.G.10/CA. 19, 9, Abell House, John Islip Street, London, S.W.1. 8375

WESTMORLAND COUNTY COUNCIL. COUNTY ARCHITECT'S DEPARTMENT.

Applications are invited for the following superannuable appointments:—

SENIOR ASSISTANT ARCHITECT, Grade IV (£675—£825).

Candidates must be associates of the Royal Institute of British Architects with knowledge of modern school design and construction. Local authority experience an advantage.

ASSISTANT ARCHITECT, Grade III (£600—£725).

Candidates should have good general architectural training and qualifications.

ARCHITECTURAL ASSISTANT, Grade II (£560—£640).

Main qualification wide experience on minor schemes of alterations, adaptations and maintenance works.

Commencing salaries according to experience.

JUNIOR ARCHITECTURAL ASSISTANT, Grade H.G.D. (£275—£475).

Candidates should have completed military training and intend to study and qualify as an architect. Previous experience in Architect's office an advantage.

Commencing salary according to age.

Applications stating age, technical training and qualifications, previous and present appointments and salary, full details of experience and names of two referees to County Architect, County Hall, Kendal, by Monday, 14th February, 1955. 8372

BILLINGHAM URBAN DISTRICT COUNCIL. ARCHITECTURAL ASSISTANT.

Applications are invited, with names and addresses of two referees, by first post on Tuesday, 8th March, 1955, for the post of ARCHITECTURAL ASSISTANT—Salary A.P.T. I (£500—£580), commencing salary according to qualifications and experience.

Experience of housing and willingness to assist with quantity surveying duties an advantage.

Billingham is a rapidly expanding town (population 24,500) building approximately 400 houses per year under contract.

Consideration will be given to housing accommodation.

FRED M. DAWSON,
Clerk of the Council.

Council Offices,
Haverton Hill,
Billingham. 8373

HERTFORDSHIRE COUNTY PLANNING DEPARTMENT.

Vacancy for PLANNING ASSISTANT in the East Herts Divisinal Planning Office, Bayley Hall, Hertford. Salary £560—£640 (A.P.T. II).

Candidates must (*a*) have had previous experience in a Planning Office; (*b*) be competent draughtsmen; and (*c*) have passed the Intermediate examination of the T.P.I., I.C.E., I.Mun.E., R.I.B.A., or R.I.C.S.

Forms of application from the County Planning Officer, County Hall, Hertford. Closing date, 19th February, 1955. 8361

BOROUGH OF WALTHAMSTOW. BOROUGH ARCHITECT, ENGINEER AND SURVEYOR'S DEPARTMENT. SENIOR ASSISTANT ARCHITECTS.

Applications are invited for two appointments on the new A.P.T. Grade V (£780—£930, inclusive of London Weighting), commencing salary according to experience.

Applicants must be Registered Architects.

Applications with names of two references, should be received by the undersigned not later than noon on Monday, 21st February, 1955, endorsed "Senior Assistant Architect."

G. A. BLAKELEY,
Town Clerk.

Town Hall, E.17 8379

Tenders Invited

6 lines or under, 12s. 6d.; each additional line, 2s.

CHAPEL-EN-LE-FRITH RURAL DISTRICT COUNCIL.

Housing 1955 Programme, 1st Instalment

Scheme (*a*) HAYFIELD, Swallowhouse Lane, 28 Houses.

Scheme (*b*) BUXWORTH, Brierley Park, 8 Houses.

Tenders are invited for construction of above houses and of site works at Buxworth.

Bills of Quantities and Form of Tender may be obtained from the Engineer and Surveyor, Council Offices, Hayfield Road, Chapel-en-le-Frith, via Stockport, on payment of a deposit of £3 3s. which will be refunded on receipt of a bona fide tender.

Plans, drawings and conditions of contract may be inspected at the office of the Engineer and Surveyor. Conditions of contract will be those contained in the R.I.B.A. form of Contract where quantities form part of the contract and in addition the General Conditions and Specification for Road and Sewer Works.

Tenders in sealed envelopes endorsed "Housing, Scheme (*a*) and/or (*b*)" to be delivered to the undersigned not later than 26th February, 1955.

The Council do not undertake to accept the lowest or any tender.

L. JAGGER,
Clerk of the Council.

Council Offices,
Hayfield Road,
Chapel-en-le-Frith,
Via Stockport.
26th January, 1955. 8307

Architectural Appointments Vacant

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

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

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

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

ARCHITECTURAL ASSISTANT, intermediate standard required as a personal assistant to a principal in a large general practice in the Home Counties. The appointment will offer opportunity for works in all stages of architecture and in the administration of a private practice. Enthusiasm and ability essential. Box 5063.

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

EXPERIENCED Senior and also Intermediate to Final standard ASSISTANTS required. Applicants to have knowledge of commercial work, including offices and stores, etc. London experience is essential. Box 4890.

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

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

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

A. R.I.B.A., with busy and growing practice in the City, requires young ASSISTANT with several years' experience in Architects' office. Good salary and prospects. Box 8032.

ASSISTANT ARCHITECT, of some years good office experience, and accustomed to site control and responsibility, required for Manchester office. R.I.B.A. qualification desirable. Interesting post, with wide range of work, for man of initiative and capacity. Please give details of education, experience, and salary required, to Harry S. Fairhurst & Son, Chancery Chambers, 55, Brown Street, Manchester, 2. 8166

WELL-KNOWN firm of Birmingham Industrial Architects require qualified or superior Intermediate standard, ASSISTANT for interesting new projects. A cricketer would be especially welcome. Apply, giving qualifications, experience, and salary required, Box 8078.

ARCHITECTURAL ASSISTANTS. — Simon-Carves, Ltd., have two vacancies for ARCHITECTURAL ASSISTANTS interested in reinforced concrete industrial structures. The work offers excellent experience and good scope. A pension fund is in operation. Write, quoting ref. GO68, to Staff and Training Division, Simon-Carves, Ltd., Cheadle Heath, Stockport. 8092

QUANTITY SURVEYOR ASSISTANT required with experience in working up. Salary up to £465 per annum. Applications, stating age, experience, qualifications, and salary required, to be addressed to G. S. Hay, A.R.I.B.A., Chief Architect, Co-operative Wholesale Society, Ltd., 1, Balloon Street, Manchester. 8102

SENIOR and Intermediate standard ASSISTANTS required for busy practice engaged upon a large programme for schools, industrial buildings, offices, etc. Write, giving full particulars of qualifications, experience, and salary required, to Johns and Slater, F./A.R.I.B.A., 32, Foundation Street, Ipswich. 8104

ARCHITECTURAL ASSISTANT required by Midland Firm designing large scale industrial and commercial projects. Good experience of accurate detailing essential. Salary according to ability and experience. Box 8081.

ARCHITECT'S ASSISTANT Final standard, required for busy Leeds office. Good prospects for suitable applicant. Write, giving full particulars and salary required, G. Alan Burnett, 76, Albion Street, Leeds, 1. 8335

CO-OPERATIVE WHOLESALE SOCIETY, LTD., ARCHITECT'S DEPARTMENT, LONDON.
APPLICATIONS are invited from the following:—
(*a*) ASSISTANT ARCHITECTS, of Inter. R.I.B.A. standard.
(*b*) SHOPFITTING DRAUGHTSMAN, with wide experience in store planning and design.
(*c*) WORKER-UP, with experience of commercial/industrial buildings.
The salary range offered for the above appointments is up to £745 per annum, according to age and experience, with prospects of up-grading.
Applications, stating age, experience, qualifications and salary required, to W. J. Reed, F.R.I.B.A., Chief Architect, Co-operative Wholesale Society, Ltd., 99, Leman Street, London, E.1. 8139

ARCHITECTURAL ASSISTANT required. Must be good draughtsman and have sound knowledge of construction. Salary according to experience. Apply with full particulars to Jackson & Jackson, A/L.R.I.B.A., 13, North Street, Ashford, Kent. 8158

ARCHITECTURAL ASSISTANT, Intermediate standard, required immediately for Company Architects' office in Kingston-on-Thames area, dealing with Industrial Buildings. Write, giving details of experience, age, and salary required, E. Hill Aldam & Co., Ltd., Britannic Works, Haslemere Avenue, Earlsfield, S.W.18. 8157

NORFOLK Architect requires ASSISTANT. Intermediate standard; competent Surveyor; car driver. Reply, with particulars of experience and salary required, to Box 8265.

TRAINEE REPRESENTATIVES of good appearance and speech, required by nationally known precast concrete manufacturers in the Guildford, Cheltenham, Northwich and Reading areas. Age 24—32 years. Previous experience as Architectural Assistant or similar an advantage. Must have matriculated or passed school certificate. Current driving licence essential. These posts have good prospects for young men with drive and energy. Apply in writing, giving details of previous employment to the Sales Manager, Surrey Concrete Ltd., Peasmarsh, Nr. Guildford, Surrey. 8250

ARCHITECTS: SENIOR ASSISTANTS required immediately, experienced in commercial/industrial or hospital work. Excellent prospects. Superannuation scheme. S. N. Cooke and Partners, 34, Harborne Road, Birmingham, 15. 8281

GOLLINS, MELVIN, WARD & PARTNERS, 15, Manchester Square, W.1, require competent enthusiastic STAFF for interesting contemporary schemes. Write or telephone Welbeck 9991. 8273

URGENTLY required in busy City office with increasing commitments, ONE ARCHITECTURAL ASSISTANT of intermediate standard and ONE JUNIOR ASSISTANT. Excellent opportunities for candidates with enthusiasm and drive to gain all-round experience in a practice dealing with projects of national and historic interest. Salary range £403—£689 depending on qualifications and past experience. Box 7067.

UNIQUE opportunity for ASSISTANT to private architect in the University City of Bangor, North Wales. The post offers long term prospects for a young man, interested in varied country practice, to establish himself, after a probationary period, as a private practitioner with a fixed basic remuneration derived from Diocesan work. Applicants should be A.R.I.B.A., but consideration will be given to students of Intermediate standard working for R.I.B.A. final exam. Apply in writing, giving particulars of experience and salary required to Box 8222.

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

ARCHITECTURAL ASSISTANTS for practice in E. Midlands City. Office experience and fine draughtsmanship essential. School, shop, office, industrial and domestic work Commencing salary according to ability rather than qualifications. Increased rate for overtime. Part time study facilities. Good holidays. Attractive office. Apply with full particulars to Box 8187.

ARCHITECTURAL ASSISTANT wanted in Exeter. Intermediate standard or thereabouts. Good salary and prospects. Box 8195.

ARCHITECTURAL ASSISTANTS of inter. standard required by multiple company in London. Full experience of surveys, working drawings, detailing and supervision of jobs. 5-day week, canteen facilities. Permanent and pensionable post. Apoly in writing, stating age, qualifications, salary required and experience to Box 8196.

JUNIOR ASSISTANT required immediately, intermediate standard, Hampton district. Write stating experience and salary required. Box 8386.

ASSISTANT (male) required for London Architect. Inter. R.I.B.A. standard, with at least 3 years' office experience. Able to prepare working drawings. Write or telephone for appointment to Walters & Kerr Bate, 14, Gray's Inn Square, London, W.C.1. HOLborn 9850. 8310

SENIOR ARCHITECTURAL ASSISTANT required, with minimum qualification of Intermediate R.I.B.A. Preference will be given to applicants having several years of office experience in the design of industrial buildings and housing. Write, stating age and details of experience and qualifications, to Staff Office, Handley Page, Ltd., Cricklewood, N.W.2. 8240

LONDON Architects and Surveyors require keen, able man, to take charge of Architectural Department. Prospects of Partnership for right man. Reply, stating age, qualifications, experience, and salary required, to Box 8244.

ARCHITECTS' ASSISTANTS required by a large Chain Store organization. Commencing salary £600 to £750 per annum according to experience. Subsidized Staff Canteen. Staff Pension and Life Assurance Scheme. Write, giving details of past experience, age, etc., to Box AJ 104, LPE, 55, St. Martin's Lane, W.C.2. 8388

SENIOR ASSISTANT required by a Cambridge Architect (Dipl. Arch.) in a small practice. Would suit recently qualified school-trained associate or the equivalent wishing to gain first class architectural experience. Cash allowance. State salary required. Box 8387.

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Printed in Great Britain for the Proprietors of "THE ARCHITECTS' JOURNAL" (The Architectural Press Ltd.), 9, 11 and 13, Queen Anne's Gate, Westminster, S.W.1, by HARRISON & SONS LTD., Printers to the late King George VI, London, Hayes (Middx.), and High Wycombe. Editorial illustrations engraved by THE ENGRAVERS' GUILD LTD., Windsor House, 23/26, Cursitor Street, London, E.C.4.