"he Architects' JOURNAL for March 31, 1955 TECTS'



standard

contents

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

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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.

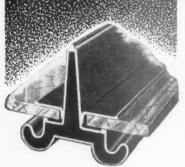
montioned	the word Ecryport is implicit in the address.
IGE IHVE	Institution of Gas Engineers. 17, Grosvenor Crescent, S.W.1. Sloane 8266 Institution of Heating and Ventilating Engineers. 49, Cadogan Square.
IIBDID	Sloane 1601/3158 Incorporated Institute of British Decorators and Interior Designers.
ILA I of Arb	Drayton House, Gordon Street, W.C.1. Euston 2450 Institute of Landscape Architects. 12, Gower Street, W.C.1. Museum 1783 Institute of Arbitrators. 35/37, Hastings House, 10, Norfolk Street, Street W.C.2. Temple Par 4071
IOB IQS IR IRA ISE LDA	Institute of Builders. 48, Bedford Square, W.C.1. Museum 7197/5176 Institute of Quantity Surveyors, 98, Gloucester Place, W.1. Welbeck 1859 Institute of Refrigeration. Dalmeny House, Monument Street, E.C.3. Avenue 6851 Institute of Registered Architects. 47, Victoria Street, S.W.1. Abbey 6172 Lead Development Association. Eagle House, Jermyn Street, S.W.1. Sloane 7128 Lead Development Association. Eagle House, Jermyn Street, S.W.1.
LMBA LSPC	Whitehall 7264/4175 London Master Builders' Association. 47, Bedford Square, W.C.1. Museum 3891 Lead Sheet and Pipe Council. Eagle House, Jermyn Street, S.W.1.
MARS	Whitehall 7264/4175 Modern Architectural Research Group (English Branch of CIAM). Secretary:
MOA MOE MOH MOHLG MOLNS MOS MOT MOW NAMMC	Trevor Dannatt, 6, Fitzroy Square, W.1. Euston 7171 Ministry of Agriculture and Fisheries. 55, Whitehall, S.W.1. Whitehall 3400 Ministry of Education. Curzon Street House, Curzon Street, W.1. Ministry of Health. 23, Savile Row, W.1. Ministry of Housing and Local Government. Whitehall, S.W.1. Ministry of Labour and National Service. 8, St. James' Square, S.W.1. Whitehall 4300 Ministry of Supply. Shell Mex House, Victoria Embankment, W.C. Gerrard 6933 Ministry of Transport. Berkeley Square House, Berkeley Square, W.1. Mayfair 9494 Ministry of Works. Lambeth Bridge House, S.E.1. Reliance 7611 Natural Asphalte Mine Owners and Manufacturers Council. 94/98, Petty France, S.W.1. Abbey 1010
NAS NBR NCBMP NFBTE	National Association of Shopfitters. 9, Victoria Street, S.W.1. Abbey 4813 National Buildings Record. 31, Chester Terrace, Regent's Park, N.W.1. Welbeck 0619 National Council of Building Material Producers. 10 Storey's Gate, S.W.1. Abbey5111 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 NHBRC	National Federation of Housing Societies. 13, Suffolk St., S.W.I. Whitehall 1693 National House Builders Registration Council. 82, New Cavendish Street, W.I. Langham 4341
NPL NSA NSAS	National Physical Laboratory. Head Office, Teddington. Molesey 1380 National Sawmilling Association. 15, New Bridge Street, E.C.4. City 1476 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 RCA RIAS	Political and Economic Planning. Reinforced Concrete Association. Royal Incorporation of Architects in Scotland. 15, Rutland Square, Edinburgh. Fountainbridge 7631
RIBA RICS	Royal Institute of British Architects. 66, Portland Place, W.1. Langham 5721 Royal Institution of Chartered Surveyors. 12, Great George St., S.W.1. Whitehall 5322/9242
RFAC RS RSA RSI RIB SBPM	Royal Fine Art Commission. 22A, Queen Anne's Gate, S.W.1. Whitehall 3935 Royal Society. Burlington House, Piccadilly, W.1. Regent 3335 Royal Society of Arts. 6, John Adam Street, W.C.2. Trafalgar 2366 Royal Sanitary Institute. 90, Buckingham Palace Road, S.W.1. Sloane 5134 Rural Industries Bureau. 35, Camp Road, Wimbledon, S.W.19. Wimbledon 5101 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 SFMA	Society of Engineers. 17, Victoria Street, Westminster, S.W.1. Abbey 7244 School Furniture Manufacturers' Association. 30, Cornhill, London, E.C.3. Mansion House 3921
SIA SNHTPC	Structural Insulation Association. 32, Queen Anne Street, W.1. Langham 7616 Scottish National Housing. Town Planning Council.
SPAB	Hon, Sec., Robert Pollock, Town Clerk, Rutherglen. Society for the Protection of Ancient Buildings. 55, Great Ormond Street, W.C.1. Holborn 2646

Town and Country Planning Association. 28, King Street, Covent Garden, W.C.2.

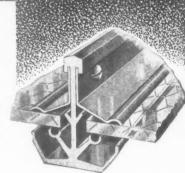
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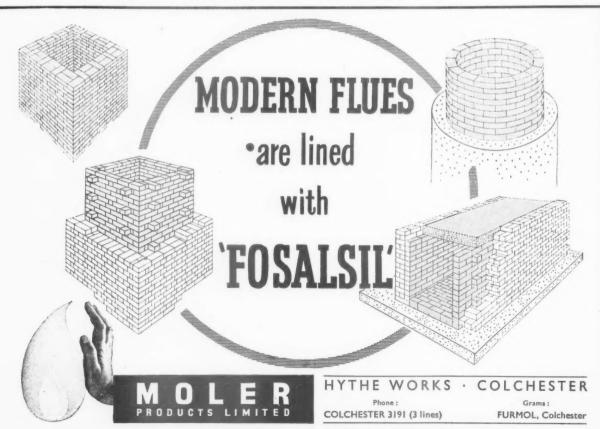


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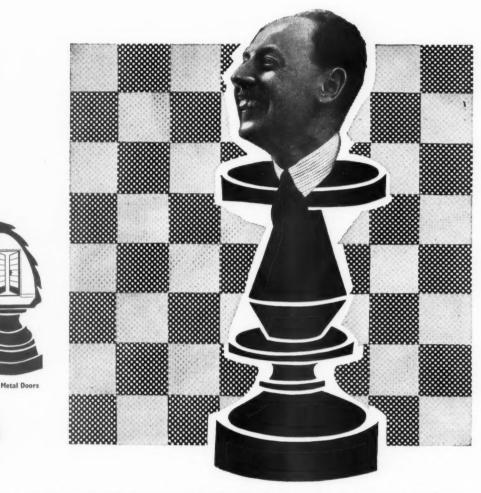




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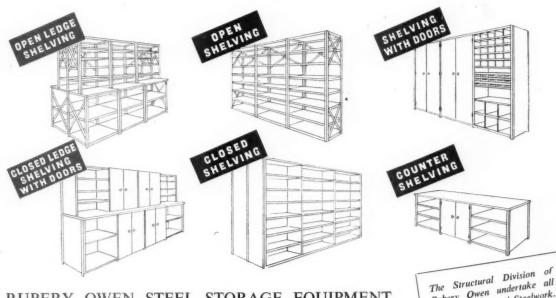
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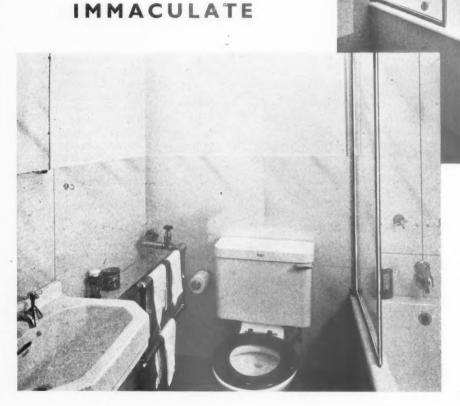
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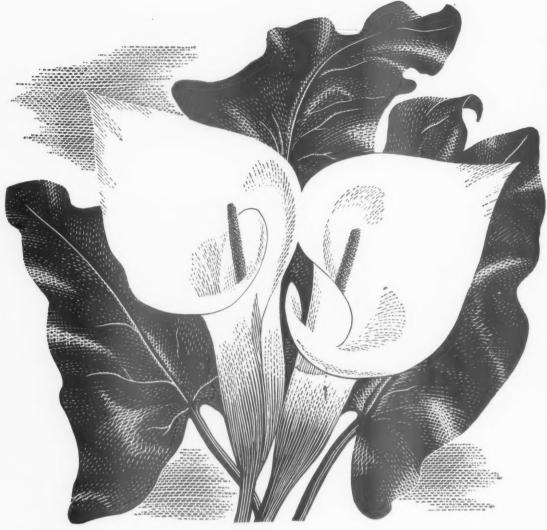
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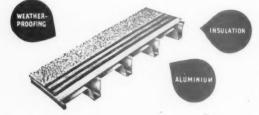
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For the purposes of these notes, the term "commercial" is taken to refer to non-domestic establishments where food is cooked for consumption on the premises, such as hospitals, nursing homes, hotels, boarding houses, clubs, restaurants, cafés, canteens, schools, and colleges. Snack bars and some types of refreshment room, where the food is cooked in the presence of the customer, form a specialised category which will be considered separately.

Apart from the fact that the actual cooking processes are the same as those used in the home, there is no similarity between domestic and commercial kitchens. The equipment used in the latter is not merely larger, it is different. Food preparing machinery replaces hand preparation, and cooking operations such as frying, grilling, baking and steaming, are separated from the cooker or range and carried out by individual appliances designed for the purpose. In a large kitchen such as that shown in Fig. 1, the processes involved and the layout of stores, equipment and service, are organised on factory lines for maximum efficiency and economy; the close and accurate control necessary for all operations is characteristic of electrical appliances.

Sequence of Operations.

The operations involved in the commercial preparation of meals are shown in diagrammatic sequence in Table 1. The raw materials, after being checked and weighed at entry, go to the cold store, vegetable store or dry goods store. From these stores there are three main channels through the kitchen to the tabling (i.e., 'dishing up') and service areas. One channel is for vegetables from the vegetable store, through the vegetable preparation room to the wet cooking equipment (vegetable boilers and steamers) and then to the tabling benches; another channel is for fish-from the cold store (which sometimes has a special compartment for fish) through the fish preparation area to the fish fryer and thence to tabling; the third is for meat and pastry - from the cold and dry goods stores, through the meat and preparation rooms to the dry cooking equipment (ovens, ranges, boiling tables and grillers) and then to tabling In the tabling area the cooked food is transferred to dishes or pans or on to plates for service in the manner required.

The food should flow smoothly through its appropriate channel with as little crossing of other channels as possible. Crossing cannot be entirely avoided, however, as, for example, the steaming oven will be used for puddings as well as vegetables, and the fish will not always be fried. In addition, arrangements must be made for the transport of dirty articles from the dining room or canteen to the wash-up, and for clean crockery and cutlery from there to the service counters: these routes should not cross any of the food preparation and cooking channels in the kitchen.

Ancillary Accommodation.

In addition to the stores, preparation rooms, cooking, tabling, and service areas already mentioned, a manager's office should be provided with glazed walling and should command a good view of the kitchen and the entry for goods. Lavatory and wash-basin accommodation for the staff is now required in an easily accessible position, under the clean food regulations of most authorities, whatever the size of the kitchen or type of establishment. A chef's room, laundry room, dispense room and still room are additional apartments, which are sometimes required in particular classes of business.

Commercial kitchen planning is a matter for an expert kitchen engineer who will be able to lay out the kitchen area as a whole in relation to the ideas of the client and his chef and the functional requirements of the architect. Consultation between all parties concerned should take place before the kitchen area is finalised so that the best use may be made of the space available, and steps taken to increase it if it should turn out to be inadequate.

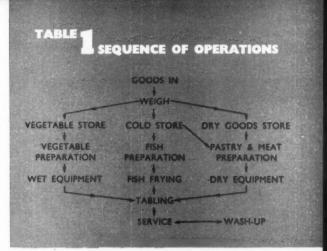


TABLE 2 CANTEEN AND INSTITUTION PRACTICE

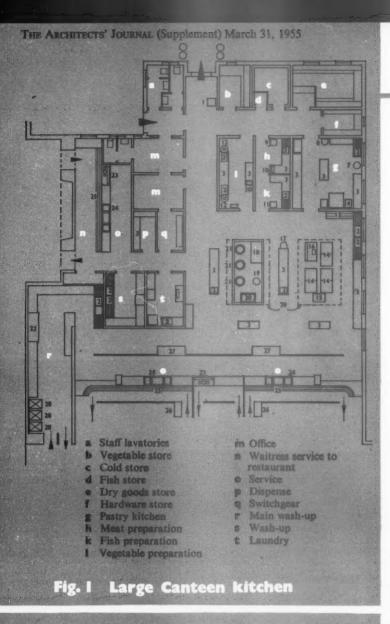
Number of meals	150	250	350	500	750	1000	
Roasting capacity (cu. ft.)	14	21	25	28	42	56	
Steaming capacity (cu. ft.)	6	6	6	12	12	18	
Grilling capacity (sq. ins.)	220	220	220	400	400	400	
Boiling plates (total aq. ins.)	672	700	960	1500	2000	2500	
Boiling pans (or veg. boilers)							
(gals.)	20	30	40	50	70	100	
Stock pots (gals.)		16	16	- 32	32	48	
Fish frying (pans sq. ins.)	400	800	800	1200	1600	2000	
Hot cupboards (ft. run)	4	6	8	12	18	24	
Tea or coffee making (gals.)	10	15	24	30	45	60	
Milk heating (schools) (gals.)	10	12	20	24	36	48	
Hot water storage (sinks) (gals.)	80	100	150	200	250	300	
Refrigeration (cu. ft.)	75	125	175	250	350	500	
Potato peeler (lbs. per charge)	7	14	- 14	28	28	28	
Mixer (quarts)	12	20	30	30	50	80	
Dishwasher (pieces per hr.)	500	750	1000	1000	1500	2000	

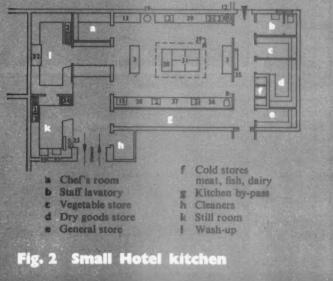
The above table applies only to Canteen, School, Hospital and Institution Kitchens. If potatoes and puddings are both steamed for the same meal, the steaming oven capacity must be doubled.

TABLE 3 SMALL HOTEL PRACTICE

- 1 Double oven range, 4-14 cu. ft. oven capacity, 480 sq. ins. boiling plates.
- 1 Grill, 240 sq. ins. grilling area.
- 1 Hot cupboard with heated top 4 ft. long.
- 1 Water boiler, 5 gallons capacity.
- 1 Refrigerator, 40 cu. ft. capacity.
- 1 Water heater for washing-up, 30 gallons capacity.

These requirements would be suitable for a typical hotel kitchen dealing with 50 persons per meal.





Key to numbers on Figs. I and 2

- 1. Weighing machine. 20
- 2 Sink
- 3. Bench or table.
- 4. Oven tray rack.
- 5. Pastry oven.
- 6. Proving oven.
- 7. Bin.
- 8. Mixer.
- 9. Chopping block.
- 10. Mincer.
- 11. Cutting block.
- 12. Potato peeler.13. Pot rack.
- 14. Range.
- 15. Griller.
- 16. Fish Fryer.
- 17. Slicing machine.
- 18. Steaming oven.
- 19. Stock pot.

- 20. Bain Marie.
- 21. Boiling pans.
- 22. Dish washer.23. Tea & coffee set.
- 24. Service counter.
- 25. Tray rails.26. Tray stand.
- 27. Hot cupboard.
- 28. Trolley.
- 29. Hood over.
- 30. Chipping machine.31. 4-oven chef range.
- 32. Egg boiler.
- 33. Griller toaster.
- 34. Service lift.
- 35. Switch gear.
- 36. Pastry kitchen.
- 37. Fish preparation.
- 38. Meat preparation.
- 39. Veg. preparation.

Approximate Areas Necessary

At the sketch-scheme stage the following figures will be found useful:

Kitchen to deal with	Size				
up to 100 persons	5-6 sq. ft. per persor				
100 - 250 persons	4-5 sq. ft. per persor				
250 - 1000 persons	3-4 sq. ft. per person				
Over 1000 persons	3 sq. ft. per person				

Canteen dining space can be estimated at 8 sq. ft. per person for tables seating 6-8 persons, and 12 sq. ft. for tables seating 4. In restaurants and hotels the space required increases for better class business, and the above figures should be taken as minima in these cases. Staff dining room: 10 sq. ft. per person.

Particular Requirements.

Ample sink accommodation is necessary near the food preparation tables and for dish and pot washing. An electric water heater will be necessary in any kitchen not provided with hot water from a central plant: dish washing machines usually need more hot water than would be used when washing-up by hand. A supply at about 140°F, is used for washing, rinsing being carried out with clean very hot water (at about 180°F.). The heat imparted by the rinsing water is sufficient to dry the crockery quickly on leaving the machine. Some types have built-in electric heaters to boost the temperature of the water to the required degree.

All kitchens require ventilating to remove cooking smells and to maintain a reasonable temperature: artificial ventilation is preferable. Much depends on the site and location of the kitchen, but from 10 to 15 air changes per hour will usually suffice where all the equipment is electrically heated as there is so little waste heat.

Drainage channels should be provided in the floor to serve the wet cooking equipment, and all pipes and conduits should be fixed well clear of wall and ceiling surfaces. Good natural lighting is always desirable, but artificial lighting of high quality is essential.

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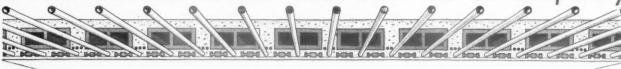
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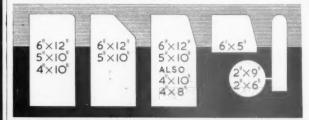
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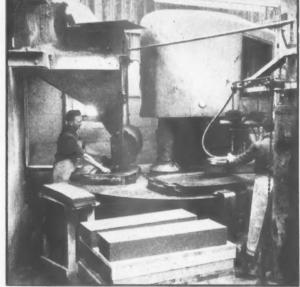
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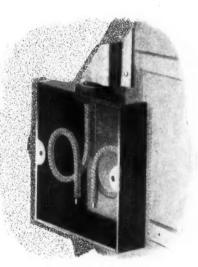
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This illustration shows a steel box with one bushed entry for flexible cable. List No. 9251.



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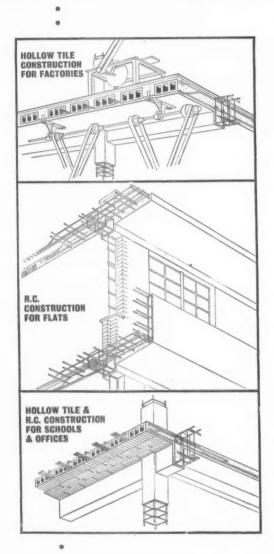
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THE ARCHITECTS' JOURNAL (Supplement) March 31, 1955

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OUR TIME AND

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in that briefcase he's got a second-by-second scheme for that factory we're refitting





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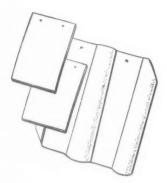
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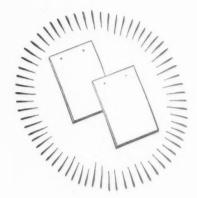
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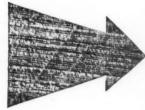
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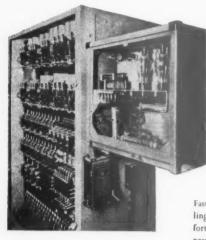
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The main lift controller and electronic control equipment, which can be sited in any convenient position. Right: Factual speed/time curves for this electronically controlled lift Below: Drum mechanism, embodying cams and followers of the control gear,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

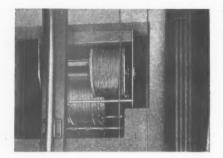
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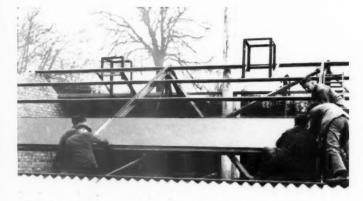
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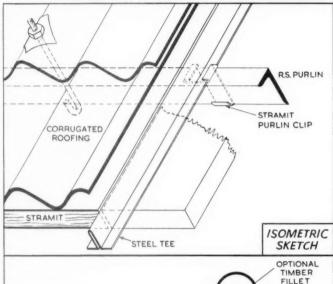
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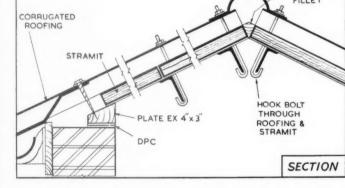
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—the measure of heat-loss through a construction, in B.Th.U's per hour, over one square foot of its area, when the temperature difference between its two sides is 1°F.

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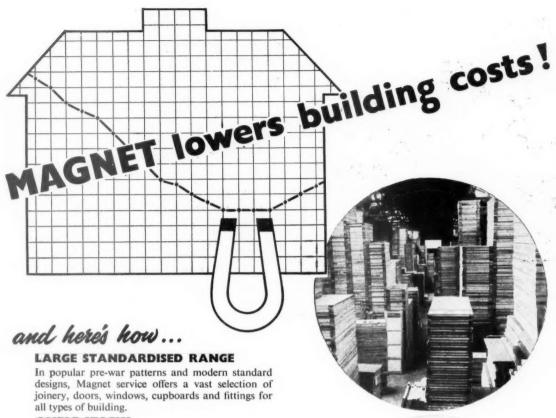
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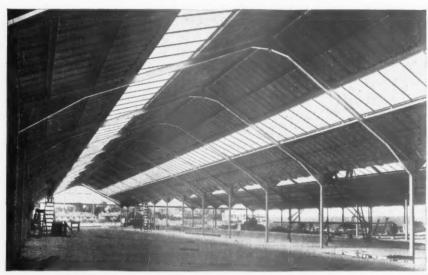
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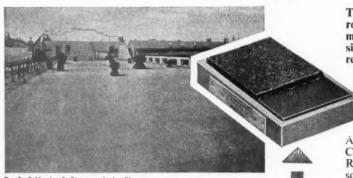
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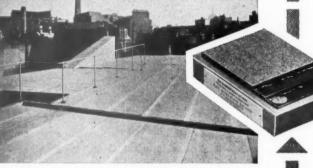
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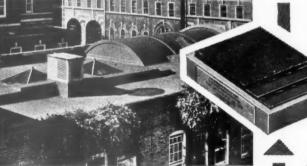
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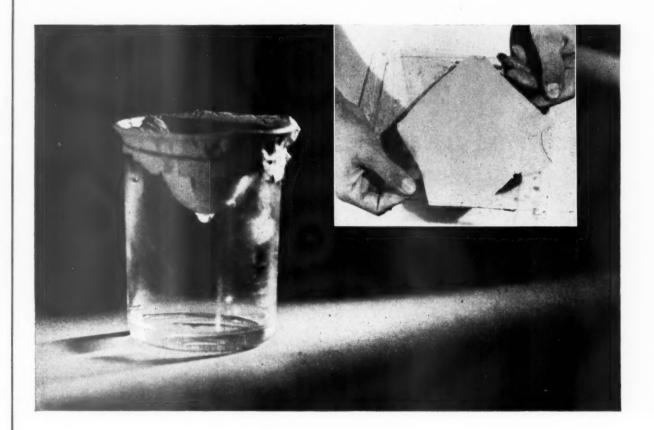
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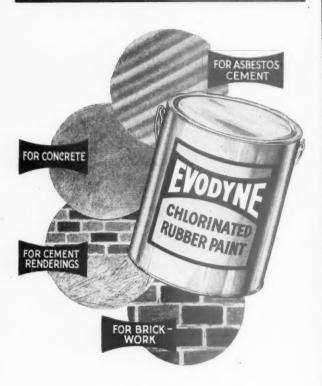


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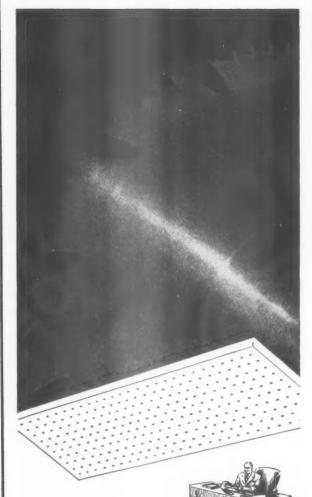


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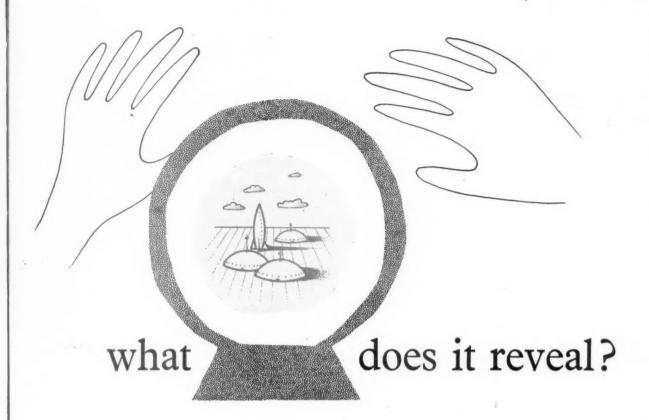


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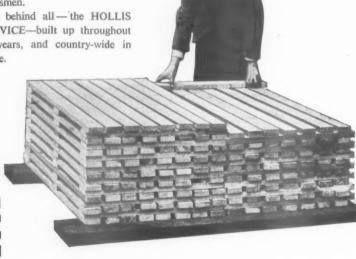
-the key to stability in timber

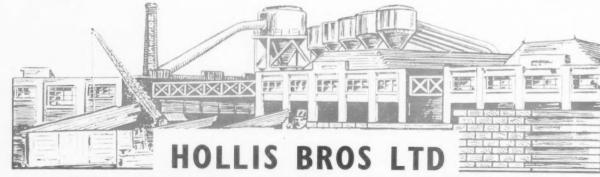
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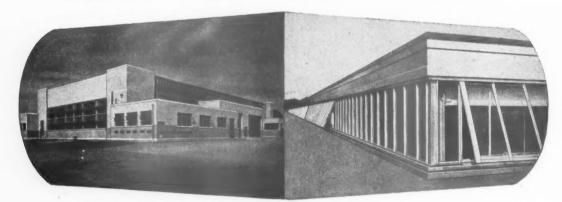
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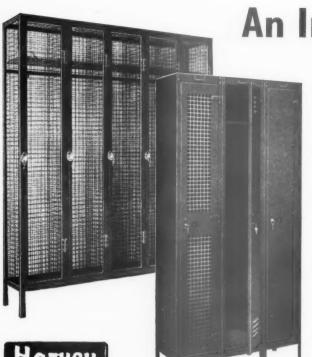
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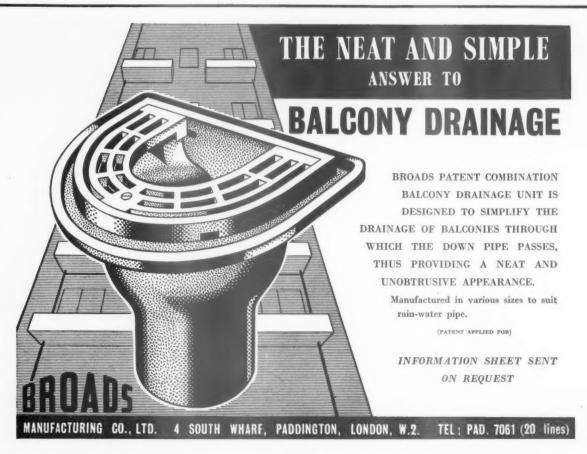
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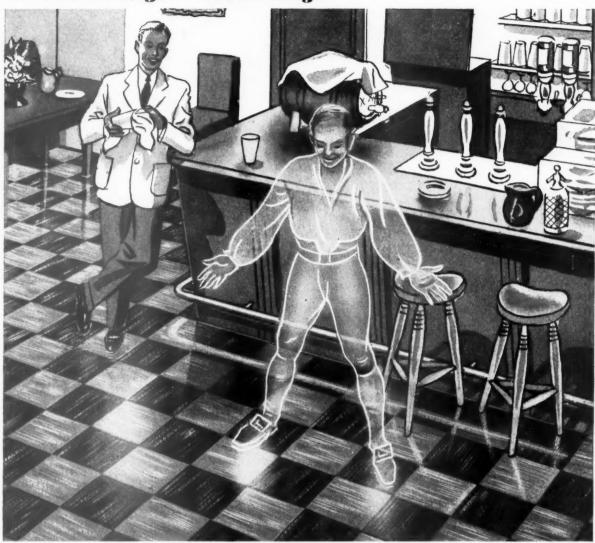
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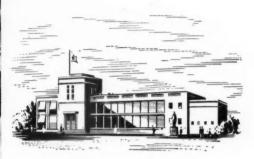
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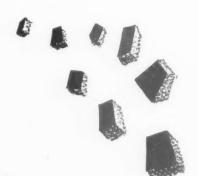
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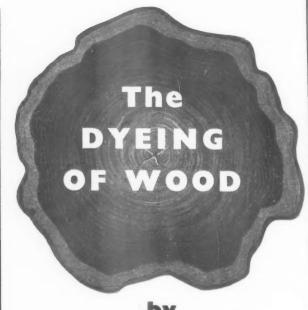


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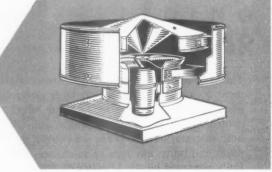
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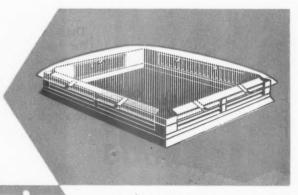


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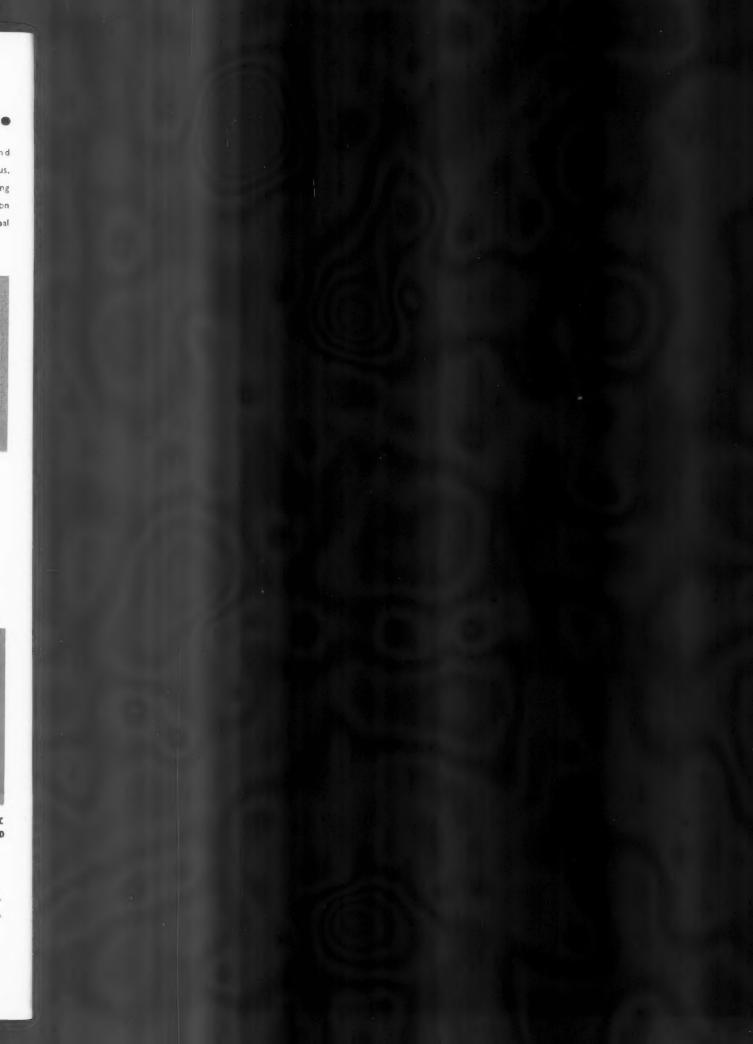


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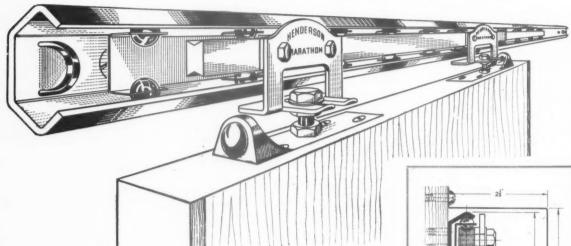
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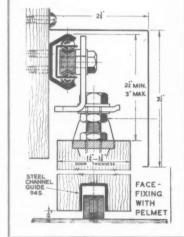


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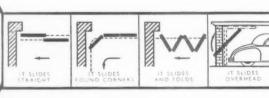
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March 31, 1955 VOL. 121 No. 3135

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BETTER THAN THE FILM

For a recent film "Out of the Clouds" a mock-up of a section of the main concourse of Gibberd's passenger building at London Airport was made at Ealing Studios. As an architectural setting it was somewhat disappointing, but filmgoers can now be reassured that the real thing is very different. Perhaps the film lighting distorted the proportions or perhaps it was simply because the furniture was chosen by the film people, the design of the actual furniture not being then complete.

Anyway, when ASTRAGAL visited the airport a few days ago he, for one, was agreeably impressed by the interiors he saw, in spite of the still unfinished

state of parts of them. The travelling public begins to use the building on April 16-short-haul services only (those that used to be at Northolt); the long-haul services stay in their sheds until a second passenger building is complete in a year or two's time-and from then on, visitors arriving from overseas will be greeted, for the first time since air-travel began, with a display of British furnishings of the highest contemporary standard.

Apart from well-detailed finishes and well-chosen colours and furniture, the most striking thing is the effective use of changes in ceiling height. The great concourse and the agreeably functional customs hall gain appreciably from the relatively confined spaces by which they are approached and linked. The contrast of scale is reinforced by the element of surprise which adds also to the dramatic effect of the views through the great windows of the concourse and, even more, the views over the airfield itself from the windows of the restaurant.

As to the exteriors of the buildings, judgment must be reserved until the scheme is more nearly complete, but ASTRAGAL can report that he did not find the masses of red brick walling as overpowering as he had feared and that he was enchanted by his journey through the tunnel under the runways. He also hopes that the occupation of the new buildings will result in some of the sheds along the Bath Road being cleared away- not simply put to other purposes.

NOT A FOURPENNY ONE

You will remember my reporting that building operatives had asked for

another fourpence an hour. They have now been offered two sets of increases: twopence-halfpenny an hour for craftsmen, and three-halfpence for labourers. In proposing these increases the National Joint Council for the industry has done something very sensible. It is only right that craftsmen should be made to feel that their skill is appreciated. A widening in the difference between craftsmen's and labourers' salaries may attract apprentices-of whom, one hears, there is a dearth.

BREWERY FOR ETHEL M. DELL?

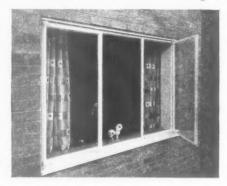
Although censorship still prevents us from reading the original version of Lady Chatterley's Lover, its author, D. H. Lawrence, is now thought respectable enough in his home town of Eastwood, Nottinghamshire, to be commemorated there by a £200,000 memorial hall. And what a respectable hall it will be!—if the country is good enough to raise the money required. It has been designed by Cecil Howitt and Partners in a heavy, solemn slab-happy style which is in amusing contrast to the character of the man whose name it shares.*

When ASTRAGAL had got over the first shock of hearing that "Eastwood is proud of Lawrence "-in the words of the local Rotary Club, and the second shock of discovering the monumental nature of the proposed memorial, he searched his mind for equally inappropriate memorials which could be constructed in the home towns of famous men. He makes the following suggestions to the local authorities concerned: a pre-fab for William Morris; an abattoir for Shaw; a YWCA building for

* See sketch on page 427.

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ASTRAGAL refers below to this portrait of Penguin editors by Kodrigo Moynihan, in the Leicester Galleries. Fourteenth from the left, is Professor Nikolaus Pevsner.

Byron; a milk bar for Dr. Johnson, and any building with an unpunctuated facade for James Joyce. And—joking apart—there is one obvious and appropriate choice for the birthplace of James Barrie. It should run a joint summer school for those whimsical fellows who spread their light-hearted, homely notions across the nation: I refer, of course, to speculative builders.

GROUP PAINTING

The unmistakable figure of Professor Pevsner in a large group painting* in the Leicester Galleries arrested the eye of ASTRAGAL, when he looked in there

As readers will remember, the JOURNAL Editors have frequently asked that speculative builders should be compelled to employ architects. ASTRAGAL is pleased to call the Editors attention to the house shown on the right. Unlike some speculative builders whose work is illustrated in the Daily Mail Book of House Plans, including Berg Estates, whose latest design is shown below—V. G. Estates Ltd. were enlightened enough to employ an architect—A. F. Burke—to design this house.

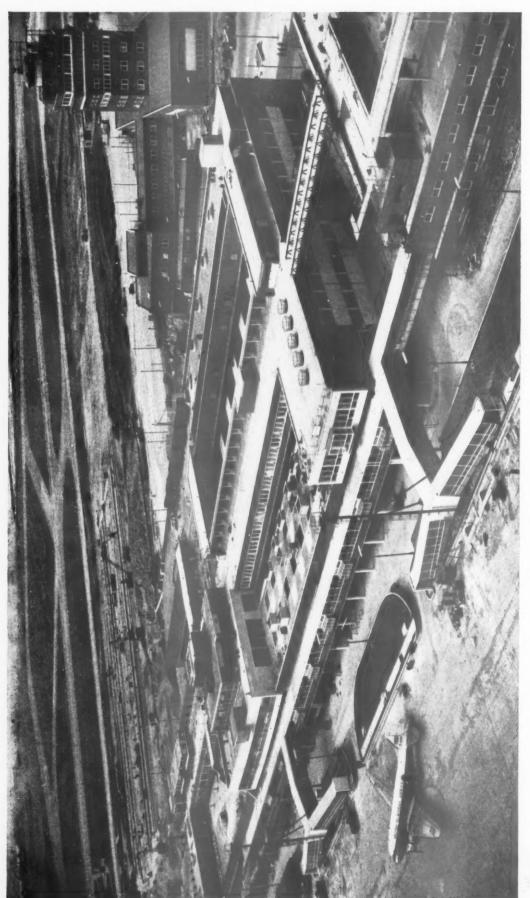


recently. The picture was Rodrigo Moynihan's group portrait of the Editors of Penguin Books—and a very austere lot of grey eminences he makes them look as the work stands at the moment; but the picture appears as yet to be unfinished and no doubt all the figures will eventually have the life and versimilitude of that of Professor Ayer, caught in the act of turning his back on a cup of office tea.

Such portraits are fascinating, unusual and very praiseworthy efforts on the part of any commercial organization, and ought to be more widely used. Several possibilities come to mind. ASTRAGAL would like to see Blank, Blank & Partners, done in oils by Francis Bacon, as a conclave of West African notables screaming in a glass box, or one of the RIBA committees (never mind which one) grouped in imitation of Reynold's portrait of the Dillettante Society, and executed (if that is the word I want) in suitably pale water-colour.

* Reading from left to right in picture above: Dr. E. V. Rieu, Sir Allen Lane, J. E. Morpurgo, R. B. Fishenden, W. E. Williams, Richard Lane, Noel Carrington, waiter, Miss Eunice Frost, A. W. Haslett, A. S. B. Glover, Professor C. A. Mace, Michael Abercrombie, Dr. Nikolaus Pevsner, Dr. Gordon Jacob (with pipe), Professor A. J. Ayer (arm on chair), Miss M. L. Johnson, Miss Eleanor Graham, Professor M. E. L. Mallowan, John Lehmann.





Down to Earth

grass, grey runways and metal aeroplanes." These two parts of the airport building scheme—the south-east face passenger building in the foreground, and the control tower behind it on the right—will be opened to the public on April 17. These buildings, which will be described fully in a later issue, are the subject of an ASTRAGAL note on page 421. Other illustrations will be found on page 431. Visitors coming down to earth at London Airport now see these nearly-completed steel-framed, brick-faced buildings: steel because the architect, Frederick Gibberd, says he will "never use a material just to be clever—and in these buildings steel provided the answer to the functional problems"; brick-faced because "brick is English in character... and has a nice warm brown colour to contrast with the green

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tower behind it on the right—will be opened to the public on April 17. These buildings, which will be described fully in a later issue, are the subject of an ASTRAGAL note on page 421. Other illustrations will be found on page 431.

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PERMUTATIONS OF TASTE

ASTRAGAL was pleased to see that the Daily Mail "Book of House Plans"* contains not only a large number of architect-designed houses, but also an article telling people to make use of an architect if they want a house built.



The book does, of course, contain a range of spec. designs as well. But none of these interested ASTRAGAL nearly so much as the drawings of elevations and details which the Daily Mail printed recently in its day-by-day



"Ideal Home Contest." Every day readers were given four alternatives to choose from-exterior finishes, front doors, staircases, etc. (three examples are given here)-and ASTRAGAL is look-



ing forward to seeing what sort of an Ideal Home the winner produces.

It is odd, isn't it, that the promoters of such a competition can, with the other hand—as it were—encourage people to employ architects?

ASTRAGAL

POINTS FROM THIS ISSUE

London Airport's first new buildings		pages 421, 424 and 431	
Sheffield Housing with internal "streets"		page 428	
William Allen's talk to Modular Society		pages 427 and 430	
Report on Liverpool Church House designs		page 430	

The Editors

MAKING OUR OWN STRAIT-JACKET

HIS month's journal of the TCPA reproduces a recent article from *The Economist* on housing densities which must obviously have pleased editor and garden-city advocate, F. J. Osborn. "Whatever other arguments," wrote The Economist, "there may be for higher housing densities, there is none at all on agricultural or nutritional grounds. To deprive 3,000 families of their kitchen gardens in order to save one medium-sized farm, and to do it in the name of food production, is a strange procedure under any circumstances. In a country where the desire to garden is close to a national passion, and where thousands of agricultural acres still lie beneath thistles, the policy surely verges as closely on madness as any other the Ministries of Agriculture and Housing between them have vet contrived." The argument is strengthened by facts from Ministerial research studies which show that an acre of land containing twelve houses produced foodstuffs of a higher retail value—about £67 10s.—than the yield of an agricultural acre in the same year. Back gardens are even more productive where the housing density is reduced to eight to the acre, but at the MOHLG'S present prescription of eighteen to the acre, gardens become mainly ornamental. It is unfortunately true that one argument frequently used against "prairie-planning" in the New Towns and on the perimeter of urban areas is the need to preserve farmland. It is to be hoped that the fact that the argument has been proved false will not be used as an excuse for neglect of further study of the problem of density.

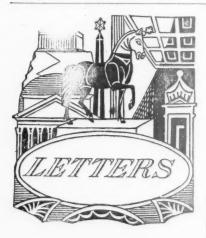
As the cluster of cottages is a welcome oasis in the desert of the farmer's factory land, so is the green park an oasis within the concrete, brick and asphalte desert of the town. Both are oases, both please, because of their qualities of contrast. It is the lack of contrast—the greyness, instead of black and white—which is the visual disaster of suburbia. But can the trend for everlasting suburbia be, in fact, checked? Suburbia is a middle-class creation, the movement of a class—in imitation of the rich—from unhygienic city centres to seats in the country, the distance being dictated by the depth of the individual's purse and the transport facilities available.

The United States surely shows what will occur here if the present trend continues, and the levelling-up of incomes, coupled with the indispensable family car, are the best aids to it: the low-density development of individual houses each in its own plot. It is extremely probable that the ambition of the great majority of young couples starting families both here and in the States, is to have a detached house and a garden-and, of course, a car. Can planning control hold back for long, in a democratic country, the popular mass urge for low-density living? It seems doubtful, when transport facilities are constantly and inevitably being improved.

The MOT, with one eye cocked on the present production-rate of cars in this country, is no doubt slowly becoming aware of the problem in as far as it will affect the nation's road system in ten years time. But how is their policy to be reconciled with an MOHLG policy of cheaper housing through saving on street frontages? Are the MOHLG confident that the standard of living of the million families which have been rehoused, without garages, since the war, can be kept below a car-owning economic level for the sixty years which is the economic life of the houses?

And is the government confident that, within the twenty years in which British Railways are going to be revitalized it is not going to prove cheaper, quicker and more efficientbearing in mind modern advances in telecommunication—to send a few ounces of paper-work to a typist in Ealing than transport 8 stone of awkwardly-shaped maidenhood in and out of the City every day?

While having every sympathy with those who want a room with a (suburban) view, and commiserating even more with those who have realized the visual disaster of a Great Britain of garden suburbs, we must retain some sympathy for the humiliating position, in a few years time, of those inadequate Ministerial planning advisors who, unless they start thinking on radically fresh lines, will soon have immobilized the nation in its own self-made brick and tarmac strait-jacket.



Why be Solemn?

SIR,—May I protest against the finding of the assessor of the Church House, Liver-pool, competition who says of the second design: "it fai's principally in not creating the right atmosphere for its somewhat solemn ecclesiastical purpose"?

Surely a popular misconception. As a Christian I find in my religion the most serene and joyous experiences I know.

G. B. GRAHAM SMITH.

G. B. Graham Smith, Student R.I.B.A.

D. Prys Thomas, A.R.I.B.A.

Ian G. Hampson, Student R.I.B.A.

Peter Gray, Reg. Arch.

G. A. Bendall, General Sales Manager,
Plaster Products, (Greenhithe), Ltd.

Why be Destructive and Dirty?

SIR,—In his report as assessor of the Liver-pool Church House competition, Sir Giles Gilbert Scott states that the planning of the garden in the most advantageous position is important, as Liverpool suffers from a lack open spaces. This is very true, she also suffers, like most cities, from a lack of towers and tower-like buildings on her sky-Whatever the architectural qualities of the existing tower on the site, it is at least a fine mass which aptly closes the axis of Bold Street. To demolish this tower and replace it at some expense with another one hardly more than half its height does not appear very sensible.

I note from Sir Giles's report that he conthat the winner's design relies greatly on the beauty of its . . . 2½-in. rustic brick of a golden brown colour." The second prize winner, however, he condemns on the ground that the Church House "is all-glass, the product of the p wnich would soon lose its pristine freshness and become drab (in the murky atmosphere of Liverpool) unless kept continually washed." I fail to understand his logic. Surely the easiest material to keep clean in a murky atmosphere is glass; windows are usually kept "continually washed." The material which will soonest lose its

pristine freshness in the Liverpool downtown atmosphere is a rustic brick of golden brown colour—a material which, in any case, one would have thought more suited

to suburbia.

D. PRYS THOMAS.

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Memorial Fit for Sons and Mothers?

SIR.—So, yet another lump of neo-Georgian pudding is to be rammed down our unresisting throats. Is it possible that the inhabitants of Eastwood, recently so vocal in their protests against the proposed enlargements of the slag-heaps adjacent to their town, can view with equanimity this proposal? (See opposite page.)

The design for a memorial to D. H. Law-rence, illustrated in the Manchester Guardian, has one redeeming feature: the arterial road, placed so lovingly at its threshold, will effectively limit the number of people who would otherwise view this incoherent jumble at close range.

IAN G. HAMPSON.

Middlesex.

Advertising matter : does it ?

SIR,-No doubt, the JOURNAL is largely dependent for its revenue on the publication of advertisements, and two thirds of its bulk thus exempt from criticism of editorial While appreciating this-as well as the inherent interest of many technical advertisements—I cannot imagine that it should be impossible for the editors of an architectural publication to exercise some influence on the content and design of advertising matter.

In the majority of advertisements, typo-graphy and layout are of a deplorably low standard; in the long run, this will probably hurt your advertisers more than your

readers.

Much more offensive is the prominent much more oftensive is the prominent illustration in your advertising pages of buildings of highly doubtful architectural merit. Your own outlook is not always-clear from your editorial comments on new buildings, but I feel certain that you must be critical of those which loom so large in advertisements in many issues.

It would be gratifying to think that you might impose a financially self-denying censorship on this type of advertisement.

London.

Should Ads Show Prices

SIR,—As your readers will know, the plasterboard industry is engaged in a campaign to try to bring to architects' attention the very great advantages of plasterboard for many purposes, and it would be most helpful, if I could get some indication, on beha'f of my own firm, as to whether in general, your architectural readers would' like always to have prices mentioned in advertisements.

There seems no reason why it should not

be done. Kent.

G. A. BENDELL.

ST. PAUL'S

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Architect for Precinct

Sir William Holford, who—with Dr. Charles Holden—retired recently from his position as consultant for the City of London Corporation, has told the Corporation's Improvements and Town Planning Committee that he "will be honoured to undertake the preparation of a scheme" for St. Paul's precinct. The Committee, which had asked Sir William for his views on this matter, is making its recommendations today to the Court of Common Council.

COURT OF APPEAL

Architects Criticized, "Hand in Glove with Builders"

In his judgment of a case heard recently in the Court of Appeal, Lord Justice Denning criticized a firm of architects.

"The case." he said, "shows a gross breach of duty on the part of the architects. They were employed by the owner of the house to protect her interests. It was their duty to see the builders did their work properly and did not charge too much."

duty to see the builders did their work pro-perly and did not charge too much."

He went on to say: "Instead of doing their plain duty the architects worked hand in glove with the builders. They looked after the builders' interests at the expense of their client. They had a money incen-tive, because they were paid by a percent-age of the costs. The higher the costs the more their fees.
"When this court finds a breach of duty.

"When this court finds a breach of duty they will not allow architects to get a penny of their fees and will make them com-pensate the client for all expenses incurred because of the architects' fault."

A. E. RICHARDSON

"Journal has never seen Building that Grows "

Last week Professor A. E. Richardson, presi-Last week Professor A. E. Richardson, president of the Royal Academy, told an Evening Standard representative that when his projected "Financial Times" building was shown at the Royal Academy last summer "an anguished moan went up from certain aesthetes, including The Architects' Journal." "These people," said Professor Richardson referrite corporative to the critics, "have

-referring, apparently, to his critics-" have

never seen a building that really grows from the ground. They only think of a building from the waist up. They expect shop windows on the ground floor. We are putting shops everywhere in this country. The effect is ruinous."

shops everywhere in this country. The effect is ruinous."

The Evening Standard's representative was given a chance to see Professor Richardson's detail drawings for the "Financial Times" offices. "See here"—said the Professor, as he showed his work—"This cornice is supported by pillars of crystal glass. They'll be floodlit at night, giving the effect of an immense tiara. And look at this magnificent bronze clock over the entrance. I want sculptures round the dial in the grand manner, bronzes in the style of Cellini or Goujon. That's the way to be modern! There's no such thing as originality. Only variation. This building must express Administrative Power. It must be a City Palace—not a factory for clerks!"

Professor Richardson's interview was published in the Evening Standard's series on "Bosses of London."

COMPETITION

Closing Date Reprieve

The closing date for the international competition for a monument to Prince Henry, the Navigator, has been postponed to May 31.

Details of this competition, which is promoted by the Portuguese Government, appeared in last week's Journal.

MODULAR SOCIETY

William Allen's Talk

A correspondent who went, last week, to hear William Allen's talk to the Modular Society, which is published on page 430,

Society, which is published on page 430, writes the following:—
William Allen's lecture made his audience fascinated but apprehensive. As readers will see from the paper, he actually had the effrontery to produce a number pattern for the assembly to get its teeth into. A lot of people present seemed confused by the distinction between a number pattern, which people present seemed confused by the distinction between a number pattern, which this was, and a dimensional pattern, which it wasn't. But they were helped at question time by Bruce Martin, of BSI, who pointed out that if you want modular co-ordination your components must relate to sizes—i.e., dimensions—but that your sizes must also relate to numbers—i.e., to a number pattern, which will ensure that the sizes go together. The discussion, therefore, should have been closed to questions about the relation of components to sizes. It ought to have been confined to the more abstract problem of

confined to the more abstract problem of how to relate the centre lines to one another. As William Allen said, our main concern is to establish the architect's pattern, which must be dominant in any modular building—after which the manufacturers must work to the architect's centre lines. These truths seemed to disturb manufacturers in the audience.

audience.
David Carter, the chairman, said in his summing-up—almost with tears in his eyes—that the Society's one point of difference with William Allen lay in the attitude towards economy. Presumably the Society's idea is that you must first find the dimensions which are likely to prove cheapest in production, and then find a number pattern that will make them modular, whereas Mr. Allen insists that you must first find a number pattern that is going to be suitable—then ber pattern that is going to be suitable—then regulate your dimensions by it and rely on established custom to make the components

ARCUK

A Warning to Unregistered Architects

If an unregistered person prepares and com-pletes an RIBA Form of Contract in which he is named as the architect, and then sends it to his client for signature, he is liable to prosecution.

By unlawfully using the title "architect" he is acting contrary to section 1 of the Architects' Registration Act, 1948.

ARCUK say they have been legally advised

on this matter.

Architect Removed from Register for Five Years

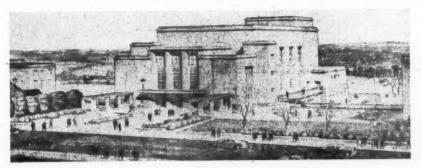
The consulting architect to publishers of a booklet of house plans which offered the possibility of saving the reader "£200 or more in charges for specially drawn up pans and specifications" has been removed from the Register of Architects.

This architect, W. M. Carter, of Richmond, Surrey, was found guilty, by ARCUK, of "conduct disgraceful to him (Continued on 2022 420).

(Continued on page 430)

Third National Factory Equipment Exhibi-tion. At Earls Court, S.W.5. 10 a.m. to 7 p.m. (Saturdays, to 5 p.m.). UNTIL APRIL 2

Presentation of Royal Gold Medal. To John Murray Easton. At the RIBA, 66, Portland Place, W.1. 6 p.m. April 5

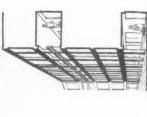


The proposed D. H. Lawrence Memorial Hall, for Eastwood, Nottinghamshire. • ASTRAGAL mentions this project, by Cecil Howitt and Partners, on page 421, and a correspondent writes about it ("Fit for Sons and Mothers?") on page 426.



This model of a redevelopment scheme which has been approved by Sheffield's Housing Committee shows how, as the land falls The city architect, J. L. Womersley, has related the distances between buildings to their height. As they become higher—from three storeys at the extreme south to thirteen storeys at the extreme north—the open spaces become correspondingly larger. An important feature of this centrally-heated scheme is the access to flats from "street decks." These decks (seen in the drawings on the right) are placed on every three floors, within the main building mass. The "ground floors" of maisonettes face on to these streets; beneath each street deck level are flats. The street decks-said to be "ideal places for social intercourse-and for small children's play "-link all buildings, and run out to the ground, either directly, as their levels become "lower" towards from south to north (right to left), more storeys are added to the flats, so that the buildings have a constant horizontal roof-line.



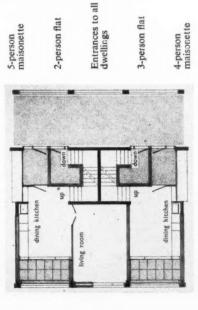


higher ground, or by means of ramps. Naturally by

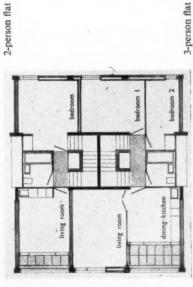
5-person maisonett

tions and elevations 4-person maisonette 5-person maisonette bedroom 1 bedroom 3 bedroom 2 sitting room

Above: plan above deck. Below: deck level



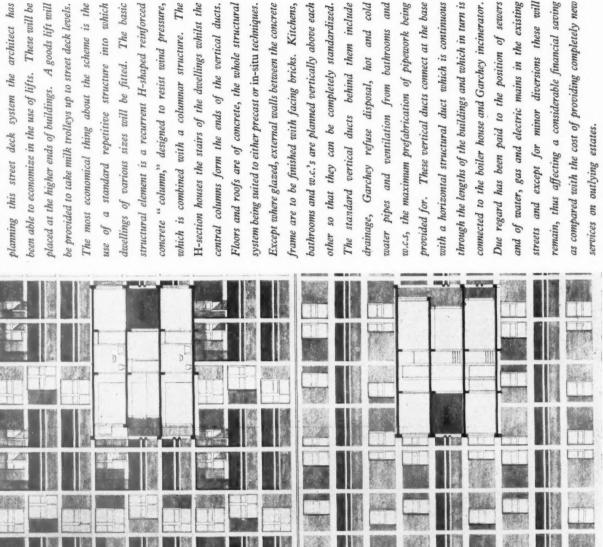
Below: plan below deck



higher ground, or by means of ramps. Naturally by planning this street deck system the architect has been able to economize in the use of lifts. These will be placed at the higher ends of buildings. A goods lift will The most economical thing about the scheme is the use of a standard repetitive structure into which dwellings of various sizes will be fitted. The basic structural element is a recurrent H-shaped reinforced concrete "column," designed to resist wind pressure, which is combined with a columnar structure. The H-section houses the stairs of the dwellings whilst the central columns form the ends of the vertical ducts. Floors and roofs are of concrete, the whole structural system being suited to either precast or in-situ techniques. Except where glazed, external walls between the concrete frame are to be finished with facing bricks. Kitchens, be provided to take milk trolleys up to street deck levels.

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for small children's play "-link all buildings, and run out to the ground, either directly, as their levels become "lower" towards



News—(continued from page 427)

in his capacity as an architect." ARCUK, who have disqualified Mr. Carter from registration for five years, say that he "had published two booklets containing plans of small houses, offering working drawings and specifications, for fees ranging from twelve to fifteen guineas. His name appeared at the back of the booklets as consulting architect to the publishers but in fact he was himself responsible for publication and the so-called Director was his own nominee. "The Committee found him guilty:—
"(1) By reason of the following passage in the booklets: "The Planahome method

"The Committee found him guilty:—
"(1) By reason of the following passage in the booklets: 'The Planahome method of home selection offers you the simple and direct approach which will help you to choose and build your new home and may save you £200 or more in charges for speci-

ally drawn up plans and specifications, not to speak of months of frazzled nerves and the risk of a culminating disappointment.

"Neither of the booklets contained any indication that an architect is required to supervise the erection of a building and approve the materials selected, the purchaser being left to infer that his interests would be fully protected by the working drawing and specifications.

drawing and specifications.

"(2) On the ground that he had publicly advertised himself as an architect by reason of the commendation of his work in the

"(3) On the ground that he had accepted advertisements from building contractors and manufacturers of building materials and was therefore carrying on a business inconsistent and out of keeping with his duties as

In January we published a report given to the Modular Society, by Bruce Martin, on modular co-ordination research carried out by a BSI team. Last week William Allen told the Society about the research done by BRS. His talk is published below.

RESEARCH ON MODU-LAR CO-ORDINATION

By William Allen

At the last meeting of the Society we heard an account by Bruce Martin of the work which his group at the British Standards Institution is doing on our joint study of modular co-ordination, and this is a counterpart paper to describe some of the Building Research Station's side of the work.

I would like to say something about the plan of our programme to begin with, for it is by knowing the course of the work and the milestones it must pass that you can best see where we stand at any moment and in what sort of way things are likely to shape with us.

We are treating this study as a straightforward research and development programme, and this implies a certain pattern of
attack common to scientific work generally.
There is first a period of observation and
study of facts that seem relevant, from which
one eventually tries to infer some law or
principle or hypothesis which relates and
explains them and from which other particular facts can be inferred; and finally
attempts are made to obtain experimental
proof of a sufficient number of the inferred
facts to establish the general validity of the
hypothesis. When this has been done, one
has a sound starting point from which to
embark upon the development work by
which the established principle is given practical application.

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THE OBSERVATION PERIOD

This is only a description of a scientific type of study in general terms, so let me convert it into the more familiar terms of the building industry. First, the observational phase. This, of course, has several sides in our kind of study. One wants to know, for instance, what modules have already been advocated and used, both here and abroad, and what the experience has been of their use and of any planning grids associated with them. Another important matter to know about is the array of dimensions in standardized and other products already used by the industry (Martin spoke of this in his paper), and to what extent they are flexible or are fixed by the nature of the material or manufacture. These are examples only, and various other kinds of information, more or less important, come into the picture.

Then there is the business of the "hypothesis," or general idea, which brings the facts into some systematic relationship. This is the focal point of the problem, for in our present subject it is the question of the module or modules and whatever succession of preferred dimensions it is thought necessary to fix along with them. We have spoken about this in recent months as the "number pattern" because we felt we would need a group of related dimensions, but we did not know what kind of pattern or arrangement they might form.

Finally, having arrived at some arrangement of dimensions that seemed suitable for

(continued on page 433)

On March 17 we illustrated the winning designs in the Church House Competition, which was organized by Liverpool Diocesan Reorganization Committee. These designs, together with 109 other entries, were exhibited last week at the Walker Art Gallery, Liverpool, where they were seen by a Journal representative. His comments are published below.

an architect.'

ENTRIES IN LIVERPOOL'S COMPETITION

"A Deplorable Exhibition of Drawings"

One feared the worst. At the same time one did not dream it would really be as bad as this. The only good that may come out of this deplorable exhibition of drawings in the Walker Art Gallery, Liverpool, is that the RIBA may now be moved to overhaul the competition system. Surely these results must convince the Royal Institute that incalculable harm is being done to our profession, nationally and internationally. Nationally, any intelligent layman may well look at the premiated designs in the Press and wonder at the anarchic philosophies which prevail, presumably, in the offices of the best architects (those who win competitions) of the nineteen-fifties. If this layman visited the exhibition of the 112 submitted designs he would be even more puzzled. This intelligent layman is no fictitious person. Never have the bookshops of England been more full of books on architecture than they are at the present day; these books are sold. The standards associated with Mies, Gropius, Le Corbusier, Alvar Aalto, Rogers and the Milanese School, Wright and so on, are understood and appreciated by quite a large number of non-architects. What are they to make of this show of designs 90 per cent. of which range from Romanesque to the winner's 1935 Neo-Georgian? As for the international reaction (if foreign architects look in the direction of this country nowadays). . .

The fault does not lie with the assessor. He made his honest decision. But this is the third important architectural competition in three years (Dover and Kirkcaldy being the other two) in which the decision has rested entirely with one man, and in each case the results have led to accrimonius and serious reactions. In this particular case it is quite obvious that as Sir Giles was the only assessor, and as his presumed likes and dislikes would affect his decision, the great majority of modern architects did not give a second thought to competing. If they did decide to compete (and very few of them did) they were unable to produce designs of true value because they felt too inhibited by the one assessor's known views on architecture. In all fairness, and in order that the competition system shall be allowed to produce significant results, it would appear essential that henceforth no competition should be held without a proper jury being appointed—

that is to say not less than three assessors. Comment must be made on one aspect of the winning design and on a paragraph of the assessor's report affecting it. It is evident that Sir Giles has a bias against the retention of the existing tower. As such is the case, surely the pros and cons should have been thrashed out in committee before the competition was held. As things stand it would appear that because of the assessor's unknown bias in this respect many architects wasted their time in producing solutions the raisons d'etre of which are dependent on the retention of the tower.

The Press in Liverpool at the moment is full of this very point. There is strong opposition to the destruction of the tower. No city, least of all Liverpool, can afford to destroy wantenly a point of punctuation in its profile. There is a fine contrast between the bold mass of this tower and the lower buildings around. The time when we could afford to build such towers has passed and is unlikely to recur; they are invaluable. Yet the incredible decision has been made, in the winner's design, to destroy this tower at great expense and build in its place another one only about half its height and quite suburban in scale and detail. Whatever Sir Giles may think of the existing tower's architectural merit it is at least a city tower which forms a fitting termination to Bold Street. Can he, with equanimity, picture the little box which is to replace it? Moreover (as may be seen in the drawings of the design placed third, where it is retained) it is strongly modelled and uniquely related to a splendid podium-like flight of steps second only in scale to the steps around the Cathedral and around St. George's Hall (this classical relationship of steps around the Cathedral and around St. George's Hall (this classical relationship of steps around the Cathedral and around St. George's preference for the winner's replacement is difficult to understand in view of his main criticism of the existing tower, i.e., that its silhouette has "straight vertical lines," a peculiarity also of the winner's. As for the great steps, they are to be swept away completely and replaced by two minute domestic flights which will complement, doubtless, the suburban scale of the Neo-Georgian Church House behind. Really, this is tragic.

BUILDINGS IN THE NEWS



London Airport

Above: foreground, Control Building; right, South-east Passenger Handling building, which will be in use by the public in mid-April. Right, vehicle tunnel which leads to the new buildings situated in the centre of the Airport. Bottom right is one of the passenger bridges and below is the Control Tower. The architect is Frederick Gibberd.







by lina-BSI

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BUILDINGS IN THE NEWS (continued)



Housing at Church Road, Pitstone, Bucks

The semi-detached houses (four bedrooms) shown above and the terrace of four houses (three bedrooms) shown opposite were designed by the Architects Co-Partnership for occupation by employees of the Tunnel Portland Cement Company Ltd. In each type of house the dining-room and living-room are separated by a sliding door. The terrace is linked with the semi-detached houses by six garages and a garden wall, as can be seen in the photograph below (from the south west). II-in. cavity external walls have an outer skin of Swindon wire-cut bricks and an inner skin of 4½-in. hollow clay blocks. Party walls are II-in. cavity brickwork. Ground floors are 4-in. concrete; first floors are 8-in. by 2-in. timber joists at 18-in. centres. Roofs are of trussed rafters at 6-ft. 6-in. centres with purlins and binders and rafters at 20-in. centres. The pitch of the slate roofs is 25 deg. Floor finishes



are quarry tiles in kitchens, halls and utility rooms, and timber boarding elsewhere—except in the terrace houses, which have wood block flooring in living—and dining-rooms. Bedroom floors are finished with linoleum. Fuel stores are faced externally with 5-in. by 1-in. vertical boarding. The general contractor was Charles R. Price. Sub-contractor are given on page 454.



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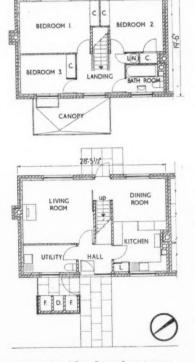
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Ground and first floor plans, semidetached house [Scale: 16" = 1'0"]



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

(Continued from page 43))

modular working, we anticipated a period of testing to see whether it stood up to the various kinds of demand which architects and industry might make upon it, or in what ways it could be modified to improve it. This is the counterpart of that aspect of scientific working which is devoted to proving the principle. the principle.

the principle.
In purely scientific work, the principle, once proved, stands as established knowledge which may have theoretical interest only, or perhaps will be found to have direct practical value. It depends on the nature of the work; in applied science it is assumed that practical application through development work and various other techniques will follow more or less automatically, and we anticipate this for the modular work.

THE MAIN OBJECT

Perhaps all this seems too deliberate, or too "scientific" for the nature of the problem. I am sure some people feel so, and would prefer us to go more directly to our goal. Let me then tell you frankly our feeling about the matter. We are trying to reach what we believe to be the main objective of medules expedite to the problem. modular co-ordination, which is to have a simplified pattern of dimensions around which the whole of the industry, wet and dry, architectural and constructional, can organize itself.

organize itself.

I think most people share this view, for any objective which aims at part of the industry only is, as we see it today, risking the raising of barriers in the future to the natural development of building practice and its simplification and economy. Similarly any unsound foundation for modules chosen today will risk the soundness of the super-

structure ultimately erected upon it.

That is why we feel that this is a time to work scientifically, for it is the only way known to man for learning with reasonable certainty. If it takes two or three years, that not long in relation to the history of building.

It was agreed, as Martin said in his paper, It was agreed, as Martin said in his paper, that initially his group at BSI would concentrate on the dimensions of building products, while we at the Station would give our attention to a review of experience in the field. This, of course, was all part of the work which is done in preparation for the "hypothesis" in a research, but the study of experience had another precise had a protect for the study of experience had a protect for the study of experience had a protect for the study of the st thesis "in a research, but the study of experi-ence had another special purpose, for we wanted to discover as far as we could what exact kinds of advantages, and for whom, were provided by modular co-ordination. The point is that it must benefit the archiect, the builder, and the manufacturer, and must not only do so, but do it in an obvious way and to an appreciable extent, or any one of these three could hold up application by failing to have any interest in it. To some extent this applies to the client also. Therefore it is important to know exactly what kinds of benefits each had found already, so that later one could see how to improve upon these in application and development.

ROUGH CO-ORDINATION

British experience of modular working lies almost entirely in prefabrication, mostly for schools but partly for housing, to the extent of some £30-£40 m. annually in completed buildings. Outside this there are various supbuildings. Outside this there are various sup-plementary kinds of dry construction, mostly curtain walls, partitions and suspended ceil-ings, which struggle to find a dimensional "niche" that is co-ordinated to something or other, but nobody is quite sure what it should be. A certain number of products for con-ventional building are related to the brick and might be said to be co-ordinated roughly but not formally. We concentrated first on the prefabrication systems which really were intended to be

systems which really were intended to be modular, and tried to appraise the experi-ence which designers, builders, and makers had of them, in terms of time, cost, and quality. On this aspect we made a fairly detailed examination of the experience of the architect's department of the Herts County Council, and careful studies of two firms which make parts for prefabricated buildings, as well as undertaking site assembly. We have recently added reviews of three timber systems, and some others, but for the sake of brevity I will not include details. The others are sufficient to illustrate this phase of the research.

Studies of prefabrication alone obviously could give us only limited help in applying modular ideas to conventional building, for they omit the brick and block construction which is and will remain for some time the main substance of the industry. We had therefore to consider how we could make good this deficiency. Fortunately it came to our notice through the meetings of the European Productivity Agency, when the whole project was being discussed, that in Germany modular ideas had been extensively applied to conventional building. We therefore arranged a fairly detailed study of this during the early studies.

We also put in hand at an early stage some studies relating to costs, and to various matters which bear very intimately upon the actual choice of modules, but I will come

Before I go any further, I must say something about terminology. We all know that "traditional" building has been changing a lot due to mechanization, partial-prefabrication and so on, and is no longer traditional. We also know that "prefabrication" can be interpreted to mean all kinds of factory and site manufacture, both wet and dry, as well as whole "systems" of prefabrication. We need some clarification, and for my own purposes now I am going to use the term "conventional" to represent the buildings which in British construction are based on relatively heavy combinations of masonry, steel, and concrete, using a fair amount of water and in situ construction. Then I will use "prefabrication" to mean systems of construction using rather large factory-made components, mainly put together by dry methods; and things like curtain walls, ceiling systems and prefabricated partitions will be generally called "dry assemblies."

Architects' experience of modular work is more varied and extensive in Britain than might be thought at first glance. Many offices have used planning grids, and quite a number of offices have done modular development work of various kinds, sometimes on parts of buildings such as partition or ceiling assemblies, and sometimes on whole building systems. All of these play a part in the general concept of modular design, the plan grids because they will normally be spaced on a modular basis, and the dry assemblies because interchangeability of parts is entirely dependent on some kind of dimensional co-ordination.

It is not possible to review this experience completely. We have made one attempt to completely. We have made one attempt to get views about plan grids by advertising in the RIBA Journal that we want this information volunteered by architects, but it has not brought much response, and we will have to try some other method. Nor have we been able to cover all the architects' offices that we know are working on modular ideas for dry assemblies, but we hope eventually to visit most of those which are really active. As I said a moment ago, we concentrated initially on the Herts County Architect's office or because of its outstanding experience in using prefabricated school construction, and we received so much help from them that I must take this opportunity to say that we are very grateful to Mr. Aslin, Mr. Tatton-Brown and their colleagues. But in addition we have questioned a moderate number of other architects, both private and official, who are active in this general field, and all have been very helpful.

ECONOMY BY PRE-FABRICATION

The outstanding fact upon which all are agreed is now probably fairly well known. It

is that prefabrication on a modular basis can effect a major economy in architects' offices. In the Herts County office the time spent on working drawings for schools was cut by roughly one-half. Part of this gain has been absorbed sensibly by giving more time to design and study, and, of course, the finished schools show the benefit as they do in other counties working similarly. At the same time, in appraising the economies effected one must remember that the Herts office devotes considerable time to development on its own account.

FLEXIBILITY

Their practice is to hold a pool of standard details and one might think that the gains are due merely to this, and that they are possible therefore with any standardized system. This is part of the truth but not the whole story. The significant factor is flexibility. You can, if you want to, push drawing-office economy to extreme limits, simply by the kind of standardization that goes together only one way, as some of the "kits of parts" for post-war houses did, and then you do not need to do any drawing-office work at all before using the products. But this kind of approach is so inflexible and its use so limited that it has little to do with the main stream of modular co-ordination, a vital objective of which is to facilitate the assembly of building products in a variety of ways as great as practicable. Flexibility is one of the distinctive merits of the prefabrication systems for schools, and its significance in this argument is that flexibility depends largely on dimensional or modular co-ordination and the drawing office economy comes not merely from standardization that is based on modular working.

SMALL ARCHITECTS SHOULD BENEFIT

It seems reasonable then to infer that modular working applied to building generally can lead to the same kinds of economies, and in fact we see it as one aspect of work later on when we come to active application and development, to ensure that drawing office economy and flexibility is made a specific objective. Even the small architect's office ought to be able eventually to benefit from the standardized detailing possible with modular development.

I am sorry to have taken so long developing this point, but while some people accept it readily, others have wondered about its validity.

I have said that we cannot possibly review all the architectural experience of modular working, but this does not mean we do not want to know about it. We will very much appreciate receiving any information that can be sent to us, and we particularly need to know about different sizes of plan-grids architects have used and why they chose them. If an architect feels he has more to contribute than he can reasonably put in a letter, we will do our best to come and see him if he will let us know.

In 1954 we examined closely the work and results of two of the firms making parts for modular prefabricated schools, and we obtained most interesting information for which I must take this opportunity of thanking the directors and staffs concerned. They were uniformly helpful.

were uniformly helpful.

There are many details I cannot review here for I must keep to main points. Undoubtedly the outstanding one is the big increase of productivity and the simplification experienced. In one firm where steel framework is designed and fabricated both on a conventional and a modular basis side by side, it was found that each draughtsman on the modular side can see three times as much steel placed per annum as his opposite number in conventional work. In addition to this, advance ordering is simpler, and more accurate, less skilled work is needed, and the standards of skill needed in the office, in the

factory and on sites, can be reached more quickly. All of these gains were ascribed partly or wholly to the simplification of modular working and all that it implies.

In the other firm much the same sort of thing was found. Estimating was quickened and made more accurate, and productivity in the design and drawing offices and on site was about doubled. In addition modular working encouraged interchangeability while keeping down jig costs and smoothing out production.

All these are gains, but modular working probably does not lead that way in all respects. For instance, it may be generally the case that the standardized use of framing components would make them heavier or more complicated on average than when designed for one condition only, and whether this leads to greater overall costs when offset against other advantages of working on a modular basis will depend on circumstances. Overall costs are generally competitive at present, but no marked economy is evident. Possibly this is due to the working of market conditions rather than strict logic, but we must also remember that all this development is in its infancy still.

Many opportunities have been taken to talk to builders and their foremen about their feelings of doing prefabricated work. No clear-cut concensus of view is evident, but it is obvious that such work affects their organization a great deal because it makes a change in the balance of demand for one trade or against another, and in the ratio of total building force to supervisory staff. Some reactions against this were to be expected and were found; but opinions had not formed very fully.

not formed very fully.

The German experience was very interesting to review. So far as housing is concerned Germans turned their backs on alternative forms of construction after the war and devoted themselves to improving output of conventional work. As a basis for this they introduced a number pattern for dimensional co-ordination into the German Standards (Federal Standard DIN 4172) and required construction and planning to be based on it wherever a subsidy was sought. Although application varies from poor to very good, they claim with reasonable justice that \(\frac{1}{4}\) of their 400,000 houses in 1953 were modular, and last year they say that virtually the whole of their 520,000 houses were basically modular, which represents a value p.a. of completed buildings of the order of £600-£700 m. The system has been thought out with bricks and blocks as a background though it is probably flexible enough to carry a considerable variety of techniques.

GERMAN NUMBER PATTERN

The number pattern or table itself is quite interesting. It is called "Preferred Building Numbers" and has two sides, one generating from a 12.5 cm. unit and the other from 10 cm. Both sides develop in module inter-vals, with smaller sub-divisions for certain purposes, and emphasis on some larger intervals for other purposes. The 12.5 cm. side is used for bricks, blocks and all carcassing (i.e., construction dimensions) while the latter is used for planning, each cell of a plan generally having its own 10 cm. grid. Each side seems to have emerged from a school of thought that held its particular module to be suitable for both planning and structure, but in practice it is said that the combination has practical arguments in its favour. One is that if the inside dimensions of rooms are laid out on a 10 cm. grid, and the carcase is on a 12.5 cm. basis, plaster finishes, skirtings and so on fill in the discrepancies between the carcase module line and the plan module lines with less result-ing trouble than the conflicts which would occur if one attempted to relate basic structure, finishes and planning around one module, and had the thicknesses of plaster, skirting and other trim as an overlap from the carcassing on to the plan grid. The viewpoint must be examined in detail with respect

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for the experience it represents, though in certain ways it may not attract at first glance. It is, of course, one aspect of the "thickness" problem.

The German standard for dimensions is supported and extended by standards for various classes of products, and by Federal standards for storey heights and certain

other planning factors.

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other planning factors.
In operation, as I said, German practice is variable. The best practice, so it seemed to us, was to be found in Schleswig-Holstein where, in addition to the Government organization, there was formed a Society called "The Working Team for Up-to-Date Building," whose function was to encourage co-operation among the various people concerned with building. Briefly, it then proved possible to concentrate design practice and production around a limited number of the modular standards, chosen to function with modular standards, chosen to function with an agreed range of room sizes, house depths, roof pitches, stairways and so on. Thus house depths of 6.25, 7.5, 8.75 and 10.0 metres were used, based on a 5 module grid (62-5 cm.), and the floor beam spans are organized in similar increments. Certain conventional relations were fixed between the grid and the carcassing to smooth out assembly difficulties. Production of standard units and assemblies was then organized to units and assemblies was then organized to correspond to the agreed conventions. The result is a considerable flexibility in design, and an economy which the authorities say brings their houses some 15-20 per cent. below the cost of comparable houses in the remainder of the country. It was impossible to appraise the accuracy of this, but given honesty, good standardization, low production costs in factories, simplicity of design, the advantages of nacking for shipping and the advantages of packing for shipping, and familiarity on the site, perhaps the figures are not too surprising, and it may be significant that similar figures have been reported

ficant that similar figures have been reported for similar work elsewhere.

This is modular practice developed in what seems to quite a sensible manner for low-cost housing. A particular merit is that flexibility is greatest where it is most needed. For example, a very limited range of modular doors and windows is available, but they can go anywhere on plan and elevation within multiples of the base module.

In sum, both freedom of design and reduction of cost are shown to be possible by the

tion of cost are shown to be possible by the use of products whose dimensions are chosen from a series of related numbers. Modular co-ordination provides this relation and it is used in Schleswig-Holstein to co-ordinate a range of standards. One cannot escape seeing a marked similarity between this development and some of the proposals of the Bailey Committee, and their implementation may deserve more effort than they received.

It is known that both Poland and Russia are using modular co-ordination extensively based on a 10 cm. module and certain preferred dimensions, and there are references to the production of standardized parts which sound not unlike the Schleswig development in principle. But we have not vertable and the school of the standardized parts which sound not unlike the Schleswig development in principle. But we have not yet obtained more information.

yet obtained more information.

One effort was made during the year to establish a technique for separating out the economic advantages of modular co-ordination from these of prefabrication by analysis of costs of several schools, but present methods and information were not able to give us what we wanted. It is hoped to make further efforts to obtain such data in the later stages of the work.

THE STUDY OF PRODUCT SIZES

It will be necessary before very long for us to know what dimensions of important building products are fixed, either rigidly or fairly firmly, by function, manufacturing process, or some other cause, and what dimensions might be changed if there were good reason to do so to fit into an operating modular system. Product sizes which are immobile will naturally influence the

final selection of some of the modular dimensions in any framework finally de-

Although this work was not planned to form part of the general review of experience, the latter had gradually given rise to it, and it is now in full swing. The field has been divided between ourselves and the B.S.I. in a convenient manner to get through it as quickly as may be. I cannot summarize any findings at this stage but it is proceeding smoothly and once again we must express our thanks in public to the many firms we have visited, for they have

many firms we have visited, for they have all been helpful in every way.

All this early work had several purposes. Chiefly it was intended to give us familiarity with the existing experience, and to reveal as exactly as possib'e what kinds of advantage might be hoped for in various directions, what order of economy might be expected, and what difficulties might also accounts the second of the control of the

directions, what order of economy might be expected, and what difficulties might already have displayed themselves.

The main observations will, I think, be evident, but to them must be added Martin's studies at the BSI, showing the extent of the present spread, and the great lack of order. Some 15-20,000 items are covered by Standards at present, and only the vaguest pattern of dimensioning can be discerned.

INTERNATIONAL INTEREST

In looking back over the early work I think I must add yet one more factor, somewhat intangible but very important. Our what intangible but very important. Our E.P.A. Contract has brought us into touch with the modular authorities of all the principal countries of western Europe, and we have become increasingly aware of the solidity of the movement towards modular co-ordination which is taking place at the same time in so many p'aces, even though the different countries organize the work in different ways and have reached very different stages of advancement. The impression is inescapable that the case for modular co-ordination is widely accepted, if not entirely on proof or demonstration, then on the sheer weight of the "rationale," which emerges both from the negative feelings that something better than accidental co-ordination must be possible, and the accumulation of positive indications, some minor and some major, that more order is possible, is much to be desired and will become increasingly needed as time goes on. E.P.A. Contract has brought us into touch

come increasingly needed as time goes on.

This seems particularly so in Britain now.

Look for a moment at this range of reference dimensions, either proposed or already ence dimensions, either proposed or already in use for modular design; there are grids of 33 in., 36 in., 39 in., 40 in., 48 in., 50 in., 76 in. and 99 in., and quite likely I have missed out one or two. As a group they bear no kind of deliberate or systematic relation to one another nor to any base module, yet some are growing strongly already and threaten to present themselves before long as blocks of entrenched assets and practices which however good in them. and practices which, however good in them-selves—and some carry the brightest flower-ings of post-war British architecture—may nevertheless easily become an embarass-ment to a well-ordered whole.

DRY CEILINGS

One can look at it another way. Consider a particular item of construction such as dry ceilings. As I see it, we are likely to want to use the same types in association with many kinds of construction, but in order to do this they must not only be able to work in with load-bearing wall construction. tion, frame construction, curtain walls, and dry partition systems, and be able to accommodate standard light sources, and so on, but then the dry partitions in turn must re'ate to plan grids for various classes of buildings, and the curtain walls must relate to windows and panel infillings, and so the chain of repercussions extends. There seems little hope of order here unless we can find a dimensional framework which can meet the varying circumstances of building, yet makes evident at all times a firm pattern of relationships. There is no proof yet that one dimensional framework can do all this, but it seems clear that we must at least seek a solution along these

Initially this problem is best considered in abstract by discussing modules rather than dimensions. As soon as we start dealing with feet and inches it becomes more difficult to keep our minds on the matters of principle which are our first concern.

So far as I know there has been no

thorough study or publication of a side-by-side comparison of the operation of the various modular systems now in use. It seems to me such an obvious early step that seems to me such an obvious early step that it came as a surprise to me when I first realized it had never been done. Quite apart from the advantages of avoiding other people's difficulties, such studies help greatly to free one from prejudice and to keep a balanced view.

It is not an easy kind of study to make, of course. People who are operating modular systems do not yet seem to have provided critical reviews of the kind which science expects, and without them it is

provided critical reviews of the kind which science expects, and without them it is necessary to go and study their operation yourself—always a difficulty when it means another country, another language, a different set of building habits, and so on.

We have gone some way in this direction, and although I cannot take time for a detailed review of these studies, I would like to draw upon them for some general comments on the two or three min alternatives.

ments on the two or three main alternatives

advocated or already in use.

The simplest concept no doubt is the idea of a single module with all of its multiples accepted as part of a "system." In principle it is much the same as Bemis's concept of structure composed of imaginary modu-

I think there is probably general agreement now that to accept all multiples gives too much freedom and too little guidance to serve the major purposes of modular coordination, either for architects or manufacturers. The view has consequently grown up that a selection of preferred multiples should be established, but there is no definitive view yet of how this should be done.

NATURAL SELECTION

Natural selection has been considered, or sometimes accepted without question. Our building industry is extremely varied, and left to its own free-will it throws up dimensions in a virtual continuum over the whole range of product sizes—that is, up to about 10 ft. or so. Martin has made many reviews of existing dimensions in British Standards of existing dimensions in British Standards which show this, and even in single classes of products, such as doors, or blocks, dimensions occur at astonishingly small intervals over the whole range. To some useful extent, perhaps, there is a pattern running through them; foot intervals are emphasized, and 9-in. dimensions also to some extent. But there is not much hope here, so far as we can see, for the view that natural selection will exclude any useful number of multiples of any particular module. It would be possible, of course, simply to

It would be possible, of course, simply to say that some selection had to be made and to make it arbitrarily. This is not a very attractive line of approach, partly because it is so difficult to make a wise selection when there are so many conflicting claims as in our industry, and partly because if things are to fit together readily, their sizes and shapes clearly must have some rational,

lexible relationship.

Earlier I described the German system and, of course, it is basically of the type which has a full sequence of multiples, though in fact it comprises two sequences side by side generating from separate modules.

It has evidently worked for some purposes, but in taking it as evidence one must remem-

but in taking it as evidence one must remem-ber several qualifications. First, it is used

mainly for construction using bricks and blocks, for which the first few multiples are the ones chiefly needed; it has not been extensively used for combinations of larger units where the guidance of preferred dimensions is most likely to be wanted. Second: where it appears to have been most success fully used—in Schleswig-Holstein—they did in fact select preferred multiples, but for a strictly limited range of uses, mostly traditional domestic construction. And third, the usefulness of the double sequence has not been fully appraised; we do not know if it

was devised of necessity, or from logic, or for compromise, or as a convention.

M. le Corbusier's "Modulor" is quite a different kind of system, for there is no module in the ordinary sense of the word.

He has two sequences of dimensions, like the Germans, each arranged so that each dimension is larger than its preceder by a constant ratio rather than by a fixed dimension. In other words, they are geometric. Of his two sequences, one has each of its dimensions twice as large as a corresponding dimension in the other sequence.

In setting up his pattern he used a geo-metric series where it also happens that each term is the sum of its two preceders. Many people know this as a Fibonacci arrangement, and it makes a rather unusual and useful kind of addition possible within the system. His second scale gives added flexibility in this respect when used together with the first. The ratio corresponds to that of the so-called "golden" section, which is one of the historically important bases of good proportions and the whole system has a strong aesthetic character. One of his key dimensions is taken from the human body, and through this and several other anthropometic dimensions in the sequence he obtains an automatic relation to human scale.

Criticisms of the system that seem to exist are these. There are rather considerable restrictions on the simple addition of equal-sized units to mesh to a larger size in the sequence. This is important. It is also the sequence. This is important. It is also the fact that the range of proportions is rather limited, and this seems likely to lead towards narrower band of aesthetic possibilities than architects in general might be willing to accept. And the system as a whole seems to be less easy to comprehend and use than is necessary for a mechanism of this kind for our present purpose.

THINKING FOR OURSELVES

Although this review of systems is not comprehensive, I think it indicates the present position fairly well, and the feeling that it gives to us is that none of the approaches tried so far offers a ready-made answer to the problem of dimensional co-ordination for a building industry like ours. We accept it as the case therefore that we have to think

for ourselves in this country.

If one were approaching this de novo in the light of the experience which now exists, it seems to us that one can postulate at least four conditions that a system should satisfy. Perhaps there will prove to be others, but here are the four as we have set down for the moment.

First: A full sequence of multiples up to about the first half-dozen is needed to cover bricks, blocks and other smallish units. Second: Gaps in the sequence should enter

at about that point and increase in size as the multiples themselves increase. The intervals between 30 and 36 are clearly less necessary than those between 0 and 6, for example. Third: It must be possible to add and com-bine the smaller numbers in very simple ways to equate to larger ones in the series. This is important if variety of use is to be made possible for products. We speak of this as the property of meshing. (This principle can be stated in other ways. One could say, for instance, that the upper range of multiples should be numbers that factor readily; i.e., that divide readily into other whole-number dimensions. Yet another way is to say that the larger prime numbers, such as 7, 11,

13 and their multiples should be omitted because they cannot be made up from equalsized units.)

Fourth: It must be possible to associate numbers in the sequence to give a wide range of proportions. An analogue might be said to be the well-tempered scale in music, modular in character, capable of wide musical expression, but itself aesthetically almost neutral.

If we could meet these conditions, we might conceivably have the outlines of a system that would deserve closer consideration. have been examining the problem and while we cannot claim to have proposals that we have tested to our own satisfaction, one particular result holds our interest for the moment, at least. Perhaps it will survive. I will not take time now to go through all the arguments of its development, but in principle what we did was to work on combinations of number series to see if certain merits which they possessed individually could be worked in together to advantage. The objective, broadly, might be described simply as a search for a way of deciding which multiples of a full sequence one should omit in order to leave the remainder with a good rational relationships between them.

PROMISING SEQUENCE

The most promising looking sequence resulted from a combination of an ordinary doubling series (1, 2, 4, 8, etc.) which gives the halvings and quarterings so commonly used in design, and a tripling series (1, 3, 9, 27), which gives the important thirdings, and a Fibonacci arrangement (1, 2, 3, 5, 8) which gives the unusual additive property I described earlier. The whole background was of course more complex than this, but these are perhaps sufficient reasons for the

Perhaps this sounds less tidy than it works out to be, for in fact it resolved itself into the following simple table. The Fibonacci arrangement is a spine, as it were, with doublings to right and triplings to the left.

Triples	Fibonacci	Doubles		
9 3	1	2	4	8
27 9	3	6	12	24
15	5	10	20	
	8	16	32	

Terms beyond 32 are omitted as being needlessly large for the present. The series one gets from the table can also

be written down in sequence and emerges as follows . 1 2 3 4 5 6 . 8 9 10 . 12 . . 15 16 . 18 . 20

You will see readily that it meets my first two conditions—the presence of the first half dozen terms and the spreading of the larger terms. In fact it omits about half of the total. The third condition—the one about ease of adding and combining smaller terms to equate to larger terms is also met at frequent points on the ascending scale of numbers. You might make your own trials of this, but consider 12 as one example. is on the table and can be made up from the is on the table and can be made up from the following elementary combinations, also on the table: 10 + 2, 9 + 3, 8 + 4 and 6 + 6; or 4×3 , 3×4 , 6×2 , 2×6 ; or 3 + 4 + 5, 2 + 4 + 6, and so on.

The fourth condition referred to aesthetic neutrality. The sequence incorporates 33 forms of proportions, including all that are of any historical importance except 2, which seems to us perhaps less important than some of the others. Actually it is not in fact too difficult to do it by a roundabout method.

Now I must emphasise that this meeting of our conditions only merits our saying at this stage that it seems to be an arrangement that deserves further study. We might or might not be on a trail to our goal. Quite apart from the fact that we may not have postulated the right conditions to start with, the pattern has to be examined and tested in several important respects. need to try it with modules of various sizes and see how it provides, for example, for dimensions that industry would find it hard or impossible to change. Its relation to problems of structural design, where "sub-modular" dimensions are likely to be very Its relation to important, has not been looked at yet in any respect. The dualism of the doubling and trebling might prove to have difficulties we do not foresee at the moment. All these and other important questions must have satisfactory answers before the pattern could satisfactory answers before the pattern could be consolidated as a definite proposal, and the testing might easily lead to changes, developments, or even to a quite different solution. I would like that to be very clear. Our reason for offering it for discussion at this early stage in the work is that this is a moment when many people are thinking about this aspect, and we would like the benefit of their views. The idea is therefore merely put forward now for others to be able to study and discuss as a possibility, and we will welcome constructive comment.

There are one or two remarks I would like to make on points of detail. Anyone who examines it with dimensions in place of these numbers should try it with quite a wide range of module sizes, including some which are smaller than those most commonly considered. They are quite interesting. Also, since it is always possible that we might find it useful to consider two base modules rather than one, it is worth noting that the table seems to have possibilities of simplifying the merger. And finally, of course, let it be clearly understood that for any particular purpose one would expect to be selective in respect of the multiples chosen, and not expect all of them to relate to all kinds of construction.

seems to us inevitable that careful study of this kind must precede formal advocacy of a complete modular system, for if it is established, it will be a major event in the history of building. Such a thing cannot be established or developed hastily and there is no point in moving without the testing and study necessary to confirm its fitness for our purpose, because all the history of technical development teaches us that a system which fails to meet the de-

mands made upon it will not survive.

I said earlier that we had started our studies in industry to see to what extent certain important dimensions are fixed by the functions of the material, the nature of manufacture and so on, because whatever dimensional framework is eventually agreed for general use must be set out with respect for manufacturing dimensions which it is impossible or undesirable to alter. work is well advanced.

Eventually, of course, there comes to everyone in modular work the problems of tolerance and thickness. They are not problems of the pattern but of its use, tolerances being mainly a question of manufac-ture and thickness a question of conventions for design. Though I will no more than mention them, we know their study is very important.

Conventions deserve one additional re-There are many which we constantly use to carry out both conventional and un-conventional building. The introduction of a modular framework for building dimensions would have to be followed by a con-siderable review of conventions, and it should give firm ground for many new ones to be established which could be the key to much of the economy and simplicity we hope to get from modular co-ordination. Inherent in much of this work is the testing of developing ideas and in this connection we are preparing ourselves to carry out trial designs and construction work as part of the general programme.

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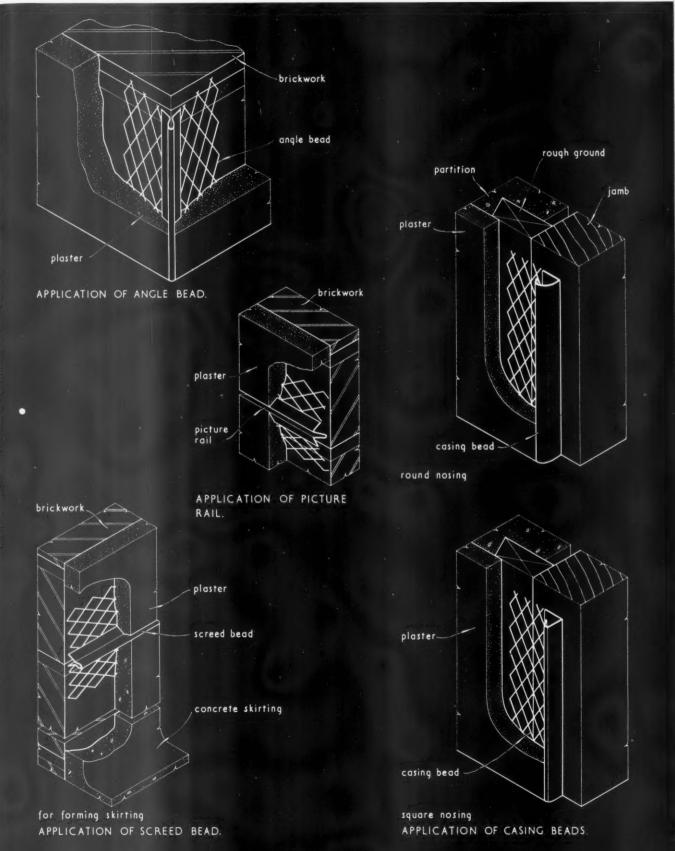
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PRODUCTS MISCELLANEOUS EXPANDED METAL

The Architects' Journal Library of Information Sheets 513. Editor: Cotterell Butler, A.R.I.B.A.



26.K1 · EXPAMET· EXPANDED METAL BEADS FOR PLASTERWORK

This Sheet describes Expamet expanded metal beads for forming arrises and trims for plasterwork. The drawings on the face show applications of each type of bead.

General

Beads are manufactured from steel sheet, the expanded metal flanges forming a key for the plaster.

Angle Bead

This provides a rapid and effective alternative to running-in the arris with a special plaster. The metal bead forms a straight, true nosing that will not chip or crack. The expanded metal flanges ensure that the bead is securely anchored in the full thickness of plaster on either side of the arris.

The standard lengths in which angle bead is available are 7 ft. 6 in., 8 ft., 8 ft., 6 in. and 9 ft. Special lengths can be supplied up to a maximum of 9 ft.

Picture Rail

This forms a neat, concealed fitting which can be fixed by the plasterer. It is embedded in the plaster leaving the slot open. The standard length is 10 ft. but special lengths up to this size can be supplied.

Screed Bead

This is used at the junction between two different types of plaster, as in bathrooms, kitchens, etc., where part of the wall has a cement finish, or to form a skirting where there is a concrete floor.

The standard length is 10 ft. but special lengths up to this size can be supplied.

Casing Beads

These are used for protecting the edges of the plaster round door and window openings, dispensing with the necessity for an architrave. There is a choice of two sections, round nosing and square nosing. The standard lengths in which casing beading is obtainable are 7 ft., 8 ft., 9 ft. and 10 ft. Special lengths can be supplied up to a maximum of 10 ft.

Fixing

Angle, picture-rail and screed beads should be initially held in position by being pressed into dabs of plaster placed at approximately 2-ft. intervals. In addition, the flanges may be nailed if desired by galvanised nails. Lengths of angle bead may be aligned by inserting a short length of wire into the hollow of the bead.

Casing beads should be fixed by nailing to the door or window frame.

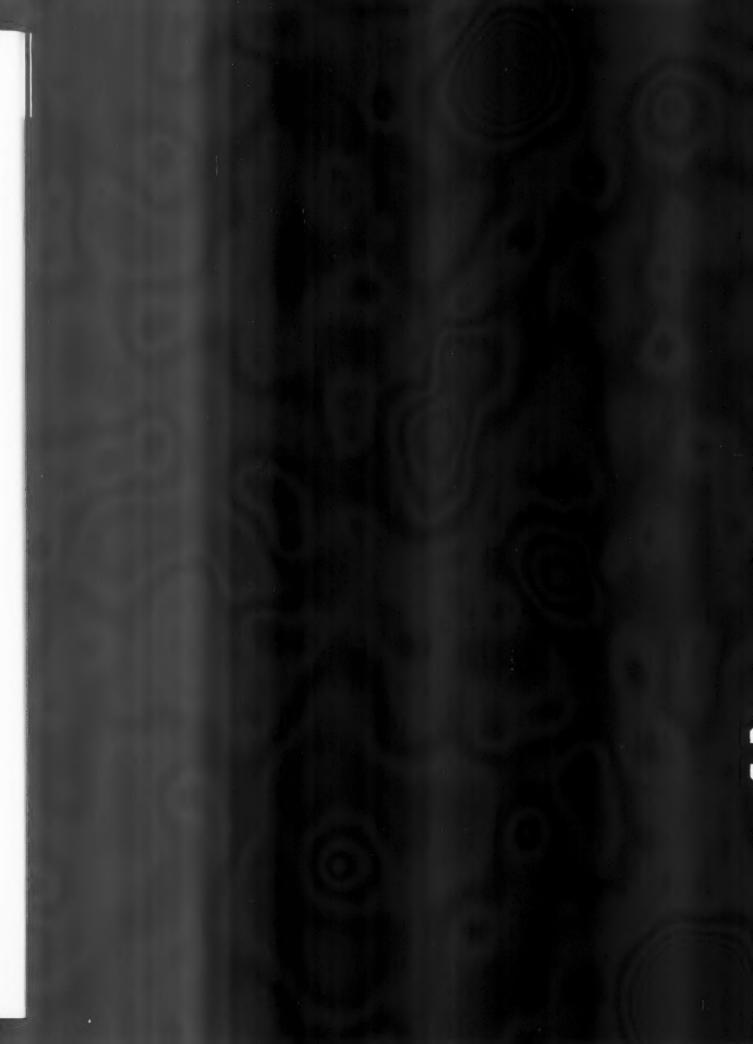
Finish

The expanded metal beads are "tight-coat" galvanised.

Compiled from information supplied by:

The Expanded Metal Company Limited.

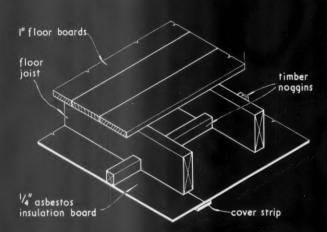
Address: Burwood House, Caxton Street, London, S.W.1, Telephone: Abbey 3933.



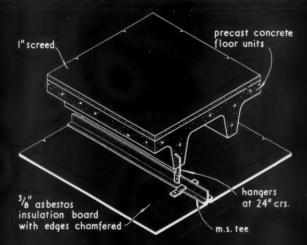


SHEET MATERIALS FIRE PROTECTING

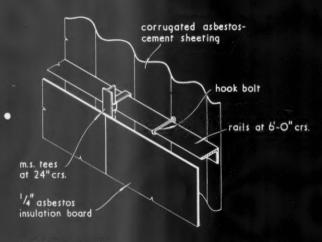
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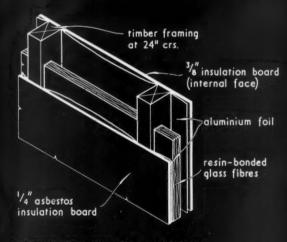
UNDER TIMBER FLOOR.
TYPICAL CEILING DETAILS.



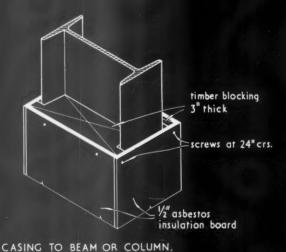
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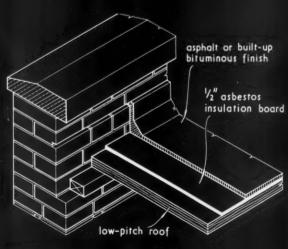
INTERNAL LINING



FACING TO INSULATED PARTITION.



NON-CONBUSTIBLE ROOF.



15.R2 'TURNALL' ASBESTOS INSULATION BOARD

This Sheet describes Turnall asbestos insulation board. The drawings on the face of the Sheet show typical applications of the board for fireproofing various types of structure and are based on the data obtained from official tests carried out at the Fire Research Station (J.F.R.O. test nos. 522 and 525).

Material

Turnall asbestos insulation board is made from asbestos fibres, of selected length and strength, bonded with a small quantity of Portland cement to form a low-density board with a low thermal conductivity value. The board is manufactured entirely in accordance with B.S. 1785: 1951, Thermal Insulating Materials for Buildings.

Properties

Fire resistance: The board is non-combustible and has been tested in accordance with BS. 476: 1953. Strength: The average modulus of rupture is 1,400 lb./

Moisture absorption: The board is unaffected structurally by moisture absorption. After 24 hours immersion in water the increase in weight is approximately 88%. The loss in tensile strength due to saturation is regained completely on drying out. Constant wetting and drying causes no structural deterioration in the material and it will withstand continual contact with steam.

Resistance to extremes of temperature: The board is not affected by extremes of temperature. Tests have shown that freezing causes no structural deterioration and that only direct and prolonged exposure to flames at high temperatures will cause a loss of tensile strength.

Resistance to chemicals: The board is highly resistant to most types of acid, alkali and gas.

Thermal insulation: The thermal conductivity of Turnall asbestos insulation board is 0.80 B.Th.U./ sq. ft./hr./° F./in. thickness.

The boards are 8 ft. 0 in. long by 2 ft. 0 in. or 4 ft. 0 in. wide and may be obtained in three thicknesses, 1 in., $\frac{3}{8}$ in. and $\frac{1}{2}$ in.

Fixing

The board is easy to cut with an ordinary saw, or it may be scribed deeply and broken over a straight edge. Nails may be driven through the board, but holes for screws and bolts should be drilled, not punched. Where the board is installed primarily as a fire protection or for exposure to high temperatures, the fixings to timber joists, rafters or fillets should be by screws with countersunk heads at least twice the diameter of the shank. When fixing to steel, allowance must be made for the expansion of the latter.

Applications

Turnall asbestos insulation board is very suitable for wall and ceiling linings where fire resistance is important or where steam or fumes are to be encountered. The drawings at the top of the face of the Sheet show two typical ceiling details; both these applications give 30 minutes fire protection; the application to the timber floor is also a suitable form of construction to serve as non-combustible insulation where metal flues are in close proximity to ceiling or wall panels. The internal lining illustrated also gives 30 minutes fire protection. The insulated partition and casing to beam or column both give 60 minutes protection. The non-combustible roof shown is laid on a combustible or short-lived substructure.

The board is greyish-blue in colour and has a slightly rippled surface texture.

Water-based, plastic emulsion and chlorinated rubber paints may be applied direct to the board without prior treatment. A suitable primer must be used before the application of oil gloss paint.

Further Information

The manufacturer maintains a technical advisory department and a research department which are available to answer questions and advise on this subject generally.

Compiled from information supplied by:

Turners Asbestos Cement Co. Ltd. (A member of the Turner and Newall Organisation)

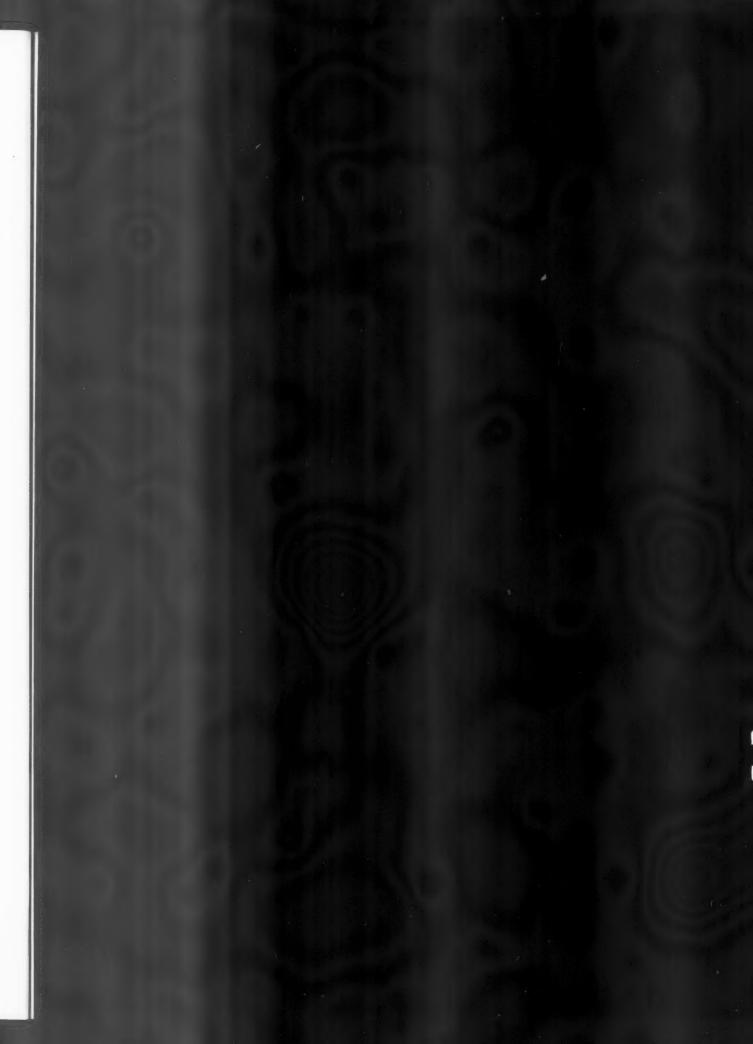
Head Office and Works: Telephone:

Trafford Park, Manchester, 17. Trafford Park 2181

Asbestos, Manchester Telegrams:

Telegrams: Aspestos, Manchester.
Branch Offices: Birmingham, Bristol, Cardiff, Glasgow,
London, Newcastle-upon-Tyne.
Works: Dalmuir, Erith, Rhoose, Tamworth,
Widnes.

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FACTORY AND OFFICES

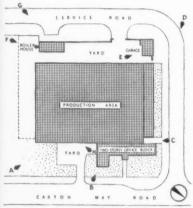
in the INDUSTRIAL AREA, STEVENAGE NEW TOWN for HILMOR LTD.

designed by D. P. REAY, former chief architect, and

L. VINCENT, chief architect, Stevenage Development Corporation

H.E.BUTEUX, group architect, A. FITCH, K. WOOD, A. MAKUCH, assistant architects

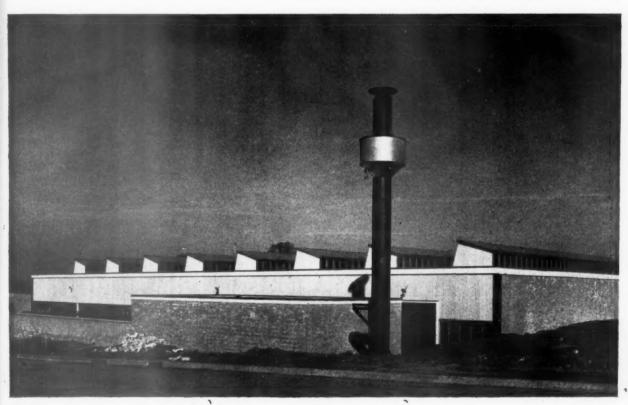
GARDINER and THEOBALD, quantity surveyors



Key plan showing photographic viewpoints

This is the first factory designed by the Development Corporation since the use of steel became derestricted, and was developed as a prototype for factories for light engineering work. The use of prefabricated components in the construction of the production area has met one of the main requirements of the industrialists—that factories should be erected with all possible speed. The production area was completed two months before the traditionally constructed office block, allowing the client to instal his machinery and services beforehand, and so to start production immediately on occupation of the offices. The factory produces tube-bending machinery.





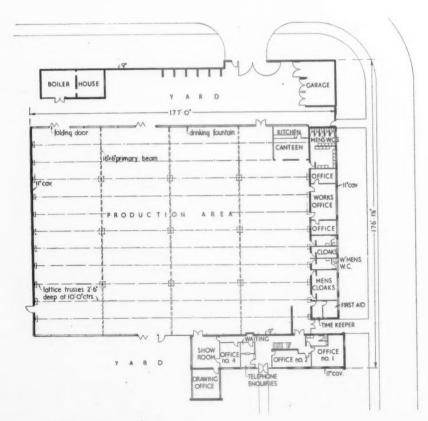




The two-storey office block is situated on the east side of the production area. The photograph above left, shows the two buildings (seen from point A) and the dispatch yard, which is sited in the corner formed by them. The production flow of the factory runs from west to east; the finished products leave by the sliding-folding doors in the centre of the illustration and are stored in the dispatch yard while awaiting delivery. Access to the yard and to the main entrance of the office block is from the estate development road. The works entrance and the access to the storage yard for incoming material are situated off the service road (see plan below), which runs round the north and west side of the factory. The office block, seen at closer quarters (from point B) in the photograph above right, is constructed of II-in. cavity brickwork (mild stock facings) with precast prestressed units forming the first floor and roof. The roof is insulated with ½-in. insulation board below the screed, and finished with white mineralized bituminous felt. The non-loadbearing panels below the windows of the projecting wing are of rendered clay pots.



Section through production area





First floor plan, office block

Ground floor plan [Scale: 4" = 1' 0"]





Left, the works entrance (seen from point C), approached through the narrow gap between the two-storey office block and the works offices, which run the length of the north side of the production area. The office window, in the top left-hand corner of the photograph, looks out over the roof of the works offices and from here a view of the clerestory light on the north wall of the production area can be seen, above. The clerestory consists of aluminium patent glazing with a mechanically-controlled opening system. The louvred ventilators in the monitor rooflights are adjustable and allow from one to five air changes per hour in the production area.

Below, the north side of the factory (seen from point D). In the distance is the two-storey office block, in the centre are the works offices, cloakrooms and lavatories, and in the foreground is the rear of the garages which face on to the receiving yard. The works offices are constructed in a similar way to the two-storey block, having II-in. and 9-in. loadbearing brickwork supporting a precast prestressed roof. The structure of the production area is separated from the walls of the offices by a $\frac{1}{3}$ -in. gap to take up thermal movement. The strip of site between the factory and the service road is to be sown with grass. No planting will be carried out on this particular site, although there is an overall planting scheme for the industrial area of which it is a part.

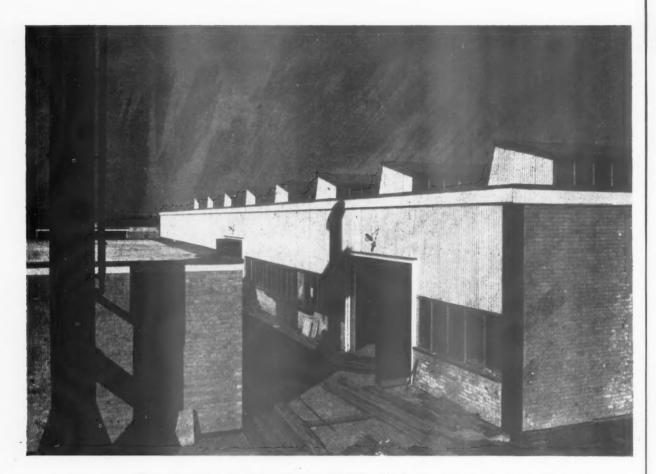




6 to 100

Left, the front of the three garages (seen from point E), which open on to the receiving yard. Incoming raw materials are stored either outside in the yard, which has access from the west service road, or inside in a storage bay running the length of the west side of the production area. The outside yards and the whole of the ground floor area of the factory were covered with a 4-in. blinding mat of concrete immediately the foundations had been completed, to provide a hard surface for the remainder of the building work.

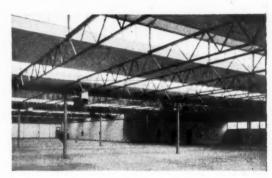
Abov The i 10-ft. lattic decki lights glazir moni sion i would carrie illust const syste ft., o to er finish



Above, the west side of the factory (seen from point F). In the foreground is the boiler house, with its steel chimney which supports an annular tank for cold water storage. Another photograph of this side of the factory (from point G) which shows the chimney and tank, can be seen on p. 437. The east and west walls of the production area are clad with corrugated asbestos sheeting and lined internally with insulation board; the part below the patent glazing is of 11-in. cavity brickwork. To the right in the photograph can be seen one of the box-type steel corner stanchions and part of the unfenestrated south wall, which is of 11-in. cavity brickwork. There are two sets of sliding-folding doors opening on to the receiving yard; a third set on the west side, open on to the dispatch yard. The doors are of timber, faced with galvanized steel sheet, painted black. A Working Detail of these doors will be published next week (April 7).



Above, the interior of the production area before the installation of machinery. The internal stanchion grid is 30 ft. by 40 ft., with perimeter stanchions at 10-ft. centres. The 16-in. by 6-in. R.S.J. primary beams span 20 ft. and the lattice secondary beams 30 ft., at 10-ft. centres. The roof is of asbestos cavitydecking, lined internally with insulation board fixed to battens. The monitor lights give even daylighting at working level over the whole area; side wall glazing has therefore been kept to a minimum. A Working Detail of the monitor lights will be published next week (April 7). The production area floor has a granolithic finish and is laid in sections of 300 sq. ft. with expansion joints. At a late stage it was decided that an overhead gantry system would be required over part of the area, and an independent installation was carried out by the client. Concurrently with the factory for Hilmor Ltd. illustrated here, a factory for Kodak Ltd. was erected nearby, using the same construction. A photograph of this is included, right, to show the structural system more clearly. The Kodak factory, which has a floor area of 67,000 sq. ft., offers more reliable information on the erection timing of the structure. It was completed and occupied in thirty weeks; the steelwork took four weeks to erect, and the roof was completed in fourteen weeks, allowing services and finishing trades to proceed early in the contract period.





The photograph, left, shows the entrance hall of the two-storey office block. The panel below the enquiry window is of glazed tiles in yellow, black, grey and white. The floor finish throughout the ground floor is thermoplastic tiling. The office block contains a showroom for finished products, a drawing office, general and managerial offices, cloakrooms and lavatories.

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Left, the staircase in the two-storey office block. The treads are finished with granolithic concrete. The walls to the offices and circulation areas are white, colour being used only in small areas, such as the doors, which are yellow-green. The landing at the top of the staircase is lit by clerestory windows looking out over the roof of the production area. An alternative means of escape in case of fire has been provided by a steel ladder from the first floor to the production area.

Below, two views of the general office on the first floor. The metal windows of the offices are taken from the Z range and are painted white. The ceilings are plastered direct to the prestressed roof units, and have a V joint at the junctions with the walls to minimize the effect of thermal movement. The floor finish is thermoplastic tiling; this is laid on a screed over 1-in. compressed glass fibre to give some degree of sound insulation between offices. Artificial lighting is provided by 5-ft. 80-w. fluorescent ceiling fittings. The client installed his own fittings and furniture. Contractors and sub-contractors, p. 454.





CLIENT'S BRIEF: his stated requirements

A factory of 20,000 sq. ft., with ancillary lavatory and cloakroom accommodation, and office space of 3,700 sq. ft. were required by the client, whose business is the manufacture of tube bending machinery. A timekeeper's office and three works offices were to be provided, with direct access to the production area, a yard for the storage of swarf, three small garages and a boiler house

accessible from a service road, and within the office block a showroom for the display of finished products.

It was the original intention that the structure of the production area should be designed to take a travelling gantry serving the whole area. On grounds of economy this requirement was dispensed with, but at a later date the client decided that a gantry serving part of the production area would be necessary, and an independent installation was carried out by the client.

Provision was to be made on the site for an extension to house the tube manipulation section of the firm.

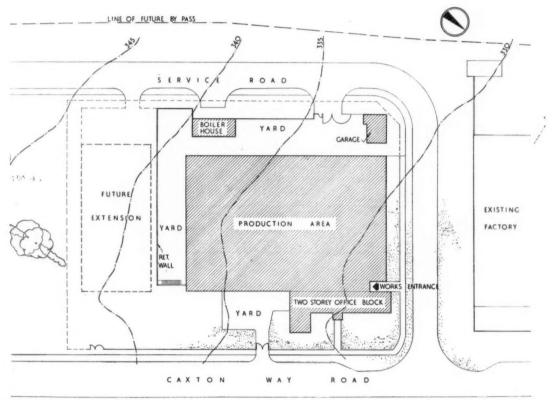
SITE: topography, surroundings, access and planting

The site, which is in the Industrial Area being developed by the Stevenage Corporation, is bounded on the east side by an estate development road, and on the north and west sides by a service road. Ultimately the Stevenage Bypass will be built alongside the service road on the west side: the land beyond the Bypass will

remain open agricultural land. On the remaining three sides other factories have been or will eventually be built. The site before development was agricultural land.

The ground in this part of the Industrial Area slopes steeply down from south to north and falls some 18 ft. diagonally across the site. No planting other than sown grass will be carried out on this particular site, but there is a planting plan for the whole of the Industrial Area of which it is a part.

AREA OF SITE: 1-99 acres.



Site plan

PLAN: general appreciation

The floor level of the main factory building is planned so as to allow for 2/3 cut and 1/3 fill. The extension to the south is proposed on an 8-ft. higher level in order to economize on site works and for ease of access to existing roads and drainage. The extension will be linked to the main factory by a covered way and a ramp. The

two-storey office block is approached from the estate development road, whilst the works entrance is sited off the northern leg of the service road. Access to the rear yard for incoming materials is from the west service road. Storage for raw materials is provided internally at the side of the production area and a production line

runs from west to east of the building with subsidiary production lines at right angles. The dispatch yard is situated next to the office block with access from the estate road. The works office, lavatories and timekeeper's office are planned along the north side adjacent to the works entrance.

MAIN CONSTRUCTION: general appreciation

An attempt has been made to design the factory production area along similar lines to that used in the construction of light steel framed single-storey schools. The primary objective was to develop a system of construction which could be speedily erected to meet the invariable requirement of the industrialists for factories to be com-

pleted in a minimum of time. To achieve this, dry processes were chosen wherever possible.

The 10-ft. grid was chosen as being a multiple of the 3-ft. 4-in. module. The 30-ft. × 40-ft. grid of the central stanchions was found to be the optimum economic grid in relation to steel frame costs (5s. per sq. ft.) and foundation

costs (the maximum load on central stanchions on this form of construction being 25 tons). All secondary purlins, etc., are eliminated. The decking units are based on an 8-in. module to each cavity and are manufactured in 1 ft. 4 in., 2 ft. and 2 ft. 8 in. widths, multiples of which can be suitably fixed into the 10-ft. grid.

MAIN CONSTRUCTION

LOADBEARING ELEMENT: a. R.S.J. or welded steel box stanchions carrying 16-in. × 6-in. R.S.I. primary beams: welded steel lattice secondary beams. b. 11-in. cavity brickwork supporting precast, prestressed concrete floor and roof. Location: a. Production area, b. Twostorey office block and works offices. Beam spans: a. Primary beams span 30 ft. Secondary lattice beams span 40 ft, at 10-ft, centres. b. Prestressed beam units span 18 ft. in twostorey office block, 15 ft. in works offices. Column grid: a. 40-ft. × 30-ft. Perimeter stanchions at 10-ft, centres. The structure is based on a planning grid of 10 ft. x 10 ft. Internal stanchions are 6-in. × 6-in. R.S.Js., perimeter stanchions 7-in. × 4-in. R.S.Js. except at corners, which are 10%-in. × 10%-in. welded box stanchions, and along the south wall, where brick piers are used. Reasons: a. Standard asbestos cavity decking used for roof spans to ft., giving spacing of secondary beams. The south wall is of unfenestrated brickwork, and therefore brick piers could be used, giving a slight saving in cost. b. Traditional load-bearing brick structure chosen for economy.

FOUNDATION TYPES: a. Mass concrete average depth 4 ft., or bored piles, average depth 30 ft., according to nature of subsoil. b. In-siru reinforced concrete ground beams, deepened where necessary to contain fill. c. Concrete strip foundations. Location: a. Under stanchions in production area. b. Around perimeter of production area. c. Office blocks. Subsoil: A marked variation in subsoil existed. Over part of the site there was good clay with a bearing capacity of 1—5 tons per sq. ft., but the remainder consisted of puddled clay and

chalk with the extremely low bearing capacity of 0.25 tons per sq. ft. Reasons and comments: Bored piles were an economical solution for foundations in the poor subsoil, going down to underlying chalk. The ground beams formed a plinth to the structure and were painted black.

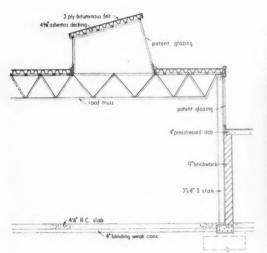
OUTER WALL TYPE: a. Non-loadbearing brickwork. b. Cladding. c. Loadbearing brickwork: d. Non-loadbearing panels. Location: a. Below sill level and to whole of south wall in production area. b. Above sill level in production area. c. d. Office blocks. Materials: a. Two skins 4½-in. brickwork with 2-in. cavity. b. Aluminium patent glazing, or 3-in. corrugated asbestos sheeting on timber studding, lined internally with ½-in. insulation board. c. Two skins 4½-in. brickwork with 2-in. cavity. d. 6-in. clay pots rendered. Finish: a. Mild stock facing bricks. b. None. c. Mild stock facing bricks, plastered internally. d. Light grey integral coloured rendering, rough texture.

ROOF TYPE: 4. Flat roof, b. 15-deg. pitch. c. Flat roof, Location: a. Production area, b. Monitor rooflights, c. Office blocks. Material: a, b. 43-in, ashestos cavity decking with 2-in, X I-in. battens glued at works to receive ceiling board. 2-in. × 2-in. battens glued at works to perimeter where required, to accommodate wind bracing within their depth. Unit span 10 ft. with 31-in. bearing on welded trusses or monitor frames, unit width 2 ft. 8 in. or 1 ft. 4 in. c. Precast prestressed hollow concrete beams. Finish: a, b. Joints taped, then three layers built-up felt with white mineralized finish. c. 1-in. insulation board sealed to concrete, 1-in. screed, and three layers built-up felt with white mineralized finish, Reasons: a, b. Wet trades eliminated, no shuttering required. Speed of erection; 20,000 sq. ft. of decking laid in ten days. The units provide a safety factor of 6. Experiments showed that the glueing of the battens added 50 per cent. to the strength of the units, c. Prestressed units proved to be cheaper than normal precast units.

FLOOR STRUCTURE TYPE: A 4-in. blinding mat of 1: 12, with 1-in. aggregate was laid over the whole area of the building and external yards immediately foundations were completed, as a substitute for hardcore. a. 5-in. reinforced site slab, b. Site slab, c. Precast prestressed concrete units. Location: a. Production area. b. Ground floor offices. c. First floor offices. Finish: a. 1-in. granolithic laid monolithically. b. Screed and thermoplastic tiles. c. 1-in. compressed glass fibre quilt, 2-in, screed, and thermoplastic tiles. Reasons: a. Heavy duty floor, economic. The floor slab was laid after the majority of trades had finished, in bays of 300 sq. ft. with expansion joints. c. Sound insulation to office block.

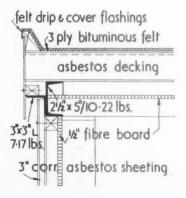
INTERNAL WALL TYPE: a. Loadbearing. b. Non-loadbearing partitions. Location: a, b. Offices. Material: a. Brickwork. b. 3-in. clinker blocks. Finish: a. Plastered in offices, fair faced on factory side of walls. b. Plastered. Reasons: Economy.

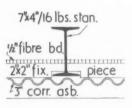
CEILING TYPE: a. Sheet. b. In-situ. Location: a. Production area. b. Offices. Material: a. 1-in. insulation board. b. Plaster, with V-joint at junction of ceilings and walls. Finish: a. Two sprayed coats fire check paint. b. Distemper.





Above left, section through the end bay of the production area adjoining the works offices. [Scale: $\mathbf{i}'' = \mathbf{i}' \mathbf{0}''$] Above right, view of the end bay, showing the secondary lattice beams. These are supported on 7-in. by 4-in. stanchions at the perimeter, and 16-in. by 6-in. primary beams internally.





Above left, section at junction of roof and side walls of production area. Above right, plan of side wall cladding and perimeter stanchion. [Scale: I'' = I' O']

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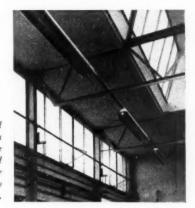
in.

source and fitting type: Mains A.C.

a. 5-ft. 80-watt fluorescent fittings with slotted reflectors for spread illumination. b. 5-ft. 80-watt fluorescent ceiling fittings. c. Tungsten with opalescent glass shades. Location: a. Production area. Fittings suspended from z-in. × 2-in. steel trunking which had the dual purpose of carrying lighting and power cables. b. Offices. c. Office circulation spaces. Illumination level: a. 13-5 foot candles at working level. Comments: Flexibility of layout for both power and lighting, and ease of access and rewiring achieved over production area.

POWER SUPPLY TYPE: V.I.R. cables in trunking. How distributed: Conduit drops to machines and switches; conduit extensions to outbuildings,

Right, detail of the artificial and natural lighting of the production area. The photograph shows the fluorescent fittings which are suspended from steel trunking, part of a monitor rooflight, and the north clerestory wall with mechanized opening gear.



NATURAL LIGHTING

WALL GLAZING: a. Continuous aluminium patent glazing. b. Z range steel coupled windows. Location: a. Production area. East and west sides, 4-ft. high glazing on 2-ft. module fixed clear of perimeter stanchions; 25 per cent. opening lights. North side, high level glazing on 2-ft. module with mechanized opening gear. b. Offices: Reasons and comments: The extent

of perimeter wall glazing has been restricted to a minimum except on north side, to cut down glare. Adequate natural lighting obtained from monitor rooflights.

ROOF GLAZING TYPE: Monitor lights clad with aluminium patent glazing and glazed with 3-in, rough cast glass. Louvre ventilators at 30-ft. centres. Location: Production area. Monitors spaced at 20-ft. centres and supported on the lattice beams at 10-ft. centres. Reasons and comments: This type of monitor gives an even daylight factor of 5·7 at working level. Glare is almost eliminated, erection is speedy and the flat roof allows glass to be easily cleaned.

THERMAL INSULATION

Type: a. Asbestos cavity decking with ½-in. insulation board. b. Asbestos sheeting, 2-in. cavity, ½-in. insulation board. c. Cavity brickwork. d. ½-in. insulation board. Location: a. Production area roof. b. Production area east and

west walls at high level. c. Production area south wall, and east and west walls below sill level, office walls. d. Office roofs. Value:
a. U = 0.23. b. U = 0.25. c. U = 0.25.
Comments: Insulation board on office roofs

minimizes expansion movement of prestressed concrete roof. White mineralized finish to roofs has light and heat reflection qualities.

HEATING AND VENTILATION

HEAT EXCHANGER TYPE: a. Low pressure accelerated hot water system with unit heaters having streamlined easy-clean casing with variable discharge louvres. b. Wall pattern radiators. c. Heating coils. Location: a. Production area, overhead. b. Production area and offices. c. Cloakrooms and lavatories. Criteria temperature: a. 60 deg. internally for 30 deg. externally, b. 60 deg, for production area, 65 deg. for offices, 70 deg. for first aid room; for 30 deg. externally. c. 65 deg. internally for 30 deg. externally. Air change rate': Production area, one to five natural air changes per hour, depending on control of natural air extract units fitted in monitors. Offices, two natural air changes per hour. Reasons and comments: Unit heaters at high level in production area allow for flexibility of heating when space reorganization is always likely to occur. Unit heaters are thermostatically controlled and equipped with a cut-out control so that fan may be run in the

summer to provide air movement.

BOILER TYPE AND CAPACITY: Cast-iron sectional boiler rated at 1,132,000 B.Th.U. per hour. Heat load: Margin of 25 per cent. over net requirements. Fuel type: Solid washed fuel. Stoking method: Automatic hopper with operating control, limit thermostats and time switch giving day/night/weekend control. Reason: Capital cost economy, ease of control and thermostatic control under varying conditions.

WATER HEATER TYPE: a. Insulated copper storage type calorifier. b. Unit heaters to isolated basins in office block. Fuel type: a. Operates off heating system in winter, and thermostatically-controlled electric immersion heater, insulated with prefabricated jacket, in summer. b. Electric.

PIPES AND JOINTING TYPES: a. Black mild steel class B tubing with compression joints

b. Copper with compression joints. Location:
a. Heating generally. b. Plumbing generally.
Comments: All pipework in boilerhouse insulated with I¼-in. plastic insulation, in external ducts with ¼-in. sectional lagging waterproofed with bitumen felt, protected with wire netting and painted two coats black bitumastic. Pipework in production area bracketed and run on surface.

COLD WATER STORAGE: Annular feed and expansion tank. Location: Fixed to steel chimney of boilerhouse. Materials: Steel, constructed in two halves. Insulated with 2-in. cork and encased in 16-gauge aluminium sheet. Reasons: The tank had to be fixed at a height where it could serve the proposed extension which will have a floor height 8 ft. higher than the present factory.

SPECIAL ACOUSTICAL TREATMENT

SOUND ABSORPTION MATERIAL: 1-in. insulation board. Location: Lining to upper walls and ceiling of production area. Comments: Factory operation involves use of noisy machinery, and

insulation board has the additional advantage of sound absorption properties.

SOUND INSULATION: a. I-in. glass fibre. b.

Cavity clinker blocks. Location: a. Below screed in first floor of office block. b. Partitions of office block. Comment: Medium standard of sound insulation required between offices.

SOIL WASTE

TYPE OF SYSTEM: Separate system to main sewer. *Materials*: Glazed stoneware, encased in concrete under buildings and paved areas.

RAINWATER DISPOSAL TYPE: Separate system to surface water sewer. Internal downpipes. Materiols: Vitreous enamelled iron. Comments: No gutters used, allowing outlets to be placed on opposite sides of building at ends of monitors, so as to give shortest possible runs to existing sewers.

FIRE

painted with fire check paint to bring it into Hose reels at 60-ft. radius centres combined Class I for fire spread. Office block of incom- with fire alarm system at these points. Planning bustible construction throughout. Grade of pro- precautions: Access for fire fighting provided by steel ladder into production area.

STRUCTURAL PRECAUTIONS: Production area tection: Half an hour for production area, two hard standing round three sides of building for and two-storey block separated by a 9-in. fire hours for office block. Apparatus: Hydrants to fire tenders. Means of escape: 40-in. doors fitted division wall. Ceiling board in production area comply with County Fire Recommendation. with panic bolts to County Fire Precautions standard, in production area. Alternative means of escape from first floor offices provided by

COLOUR

PAINT TYPES: a. Emulsion paint. b. Fire check paint. c. Oil paint. d. Distemper. e. Water paint. duction area. b. On insulation board in produc-

tion area. c. Wood and iron work. d. Plastered maximum reflectance factor and to take full ceilings. e. Plastered walls. f. Internal flush f. Wax polish. g. Oil with cellulose sealer. doors. g. Main entrance. Colour treatments: monitor lighting. Only small areas, e.g. doors, Where used: a. On fairfaced brickwork in pro- Generally the walls and ceiling of production coloured in bright tones to give relief. All colours area are either white or very light tints to give

advantage of high daylight factor given by selected from the Munsell range.

TIME SCHEDULE

Drawings: September, 1953. Contract signed: Work completed: December, 1954. Type of con-March, 1954. Work commenced: March, 1954. tract: RIBA lump sum with bill of quantities,

COST ANALYSIS

Tender cost of super	rstructure	Production area: 18,976 sq. ft.		Office blocks: 5,083 sq. ft.	
(including proportion of Pre-		ELEMENT	Cost per	ELEMENT	Cost per
liminaries and Insurance	es) £32,127		sq. ft. in		sq. ft. in
Tender cost of foundation	s (includ-		pence.		pence.
ing ditto)	£4,898	Preliminaries and insurances	34.20	Preliminaries and insurances	49.00
Tender cost of ancillary buildings and external works (including		Contingencies	5.50	Contingencies	8.00
		Work below ground floor level	38.00	Work below ground floor level	38.00
ditto)	£9,995	Abnormal foundations and piling	18.00	Abnormal foundations	18.00
		External walls and facings	10.00	External walls and facings	47.00
Gross total Cost	£47,020	Internal partitions	0.25	Internal loadbearing walls	2.50
		Structural frame	60.00	Internal partitions	17.50
Ground floor area (sq. ft.)	23,357	Roof decking, covering and lining	78.50	First floor construction and staircase	33.25
Total floor area (sq. ft.)	25,106	Rooflights	24.50	Roof construction and covering	59.50
		Floor finishes	10.25	Floor finishes	31.25
Cost per foot super of total floor		Vertical patent wall glazing	9.25	Doors (external) and windows	39.00
area	37s. 51d.	Sliding doors (external)	5.00	Doors (internal) and hatches	17.25
Cost per foot cube	Is. IId.	Doors (external)	1.00	Wall and ceiling finishes	22.75
		Ironmongery	0.50	Ironmongery	15.50
Tender date Fe	February 2, 1954	Plumbing (external)	1.00	Plumbing (external)	4.00
		Plumbing (internal)	1.25	Plumbing (internal)	9.25
		Sanitary fittings	0.25	Sanitary fittings	14.75
		Gas connection	1.00	Electrical installation	18.50
		Electrical installation	12.50	Heating installation	46.50
		Heating installation	26.75	Glazing	6.50
		Ventilation installation	4.50	Decorations	21.50
		Decorations	11.25	Special thermal insulation	5.75
		External work and paved areas	37.00	External works and paved areas	37.50
		Drainage	9.25	Drainage	9.25
		Proportionate cost of boilerhouse	26.00	Proportionate cost of boilerhouse	26.00
		Total	426.00	Total	598.00
			= 358. 6d.		498. Tod.
					4,000

COST COMMENTS

PRODUCTION AREA: Since this is the first factory for which the JOURNAL has published a cost (excluding preliminaries, insurances and continanalysis, we are not able to give readers the sort gencies). of comparative comments that are so valuable. But we suggest that readers keep this analysis by comments.

block per square foot floor area is the same as

that of the offices at Poole-some 45 shillings size-(Stevenage is about one-eighth the floor

Thus it will be interesting to see how distributions of cost in the two buildings vary. them until another factory is published, for we Grouping in each building the elements which cases, roofs and load-bearing element-we find difference occurs. Is it due to the difference in gation of the underlying causes.

area of Poole)-or in design or in functional requirements, or in materials' market differences? These are the questions which are raised by cost analysis. Answers to them must depend upon a study of the conditions and may then refer back to this one in making our comprise the shell—external walls, floors, stair-factors operating in the two cases. Analyses do make apparent both how little has been known that Stevenage is 113. 10d. and Poole is 23s. 6d. hitherto about the distribution of cost in building OFFICE BLOCK: We notice that the cost of this Obviously there is some good reason why this work, and how much there is a need for investiIn the past the emphasis on decentralization has been almost wholly on the removal of manufacturing industry from overcrowded areas. But at a recent meeting of the TCPA, Arthur Ling, the LCC's Chief Planning Officer, pointed out that according to surveys made by the LCC, office accommodation provides employment for about ten times as many people as manufacturing industry over the equivalent area. According to Mr. Ling, the reason why this fact has so far escaped the attention of planners is that the terms of the Barlow Report did not cover office employment.

Be that as it may, it is appalling to think that it has been calculated from the 1947 Planning Land User Survey that if all sites at that time cleared in central London had been redeveloped only for office space, the additional office accommodation thus produced could give increased employment to about 375,000 office workers. This is equivalent to 1 million people being additionally dependent on London. If this had happened, the whole of the present effort to decentralize manufacturing industry would have been completely ruined.

Mr. Ling's call for a new commission to consider the question of planning as it relates to the balance of employment seems timely.

22 SOUND INSULATION AND ACOUSTICS sound insulation of houses and flats

This week's special article

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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.

An important paper on "Recent Research on Sound Insulation in Houses and Flats," by P. H. Parkin and E. F. Stacey of BRS, was published in the RIBA Journal last July. The authors proposed the substitution of two standards for sound insulation—one for impact and one for airborne sound—in place of the accepted single standard. But they did not make it clear how this proposal might be put into practice. This week our Specialist Editor No. 14 (sound insulation and acoustics) discusses the proposal and puts forward suggestions for the types of floor construction which should be used to meet particular insulation requirements.

The recent revised proposals for the standards of sound insulation pose a number of questions which architects must either themselves answer, or be prepared to advise those who will. Decisions will have to be made in designing new housing as to whether any special precautions are to be taken to ensure good sound insulation, and if so, up to what standard, Grade II, Grade I, or higher.

It would seem extremely unwise to adopt methods of construction which are known to produce public protest from the occupants (the so-called "deputation level" of insulation). This rules out the use of plain joist floors without a floating floor surface or pugging for any party floor application. The next step up the insulation ladder is the joist floor with floating surface and no pugging.

This is so little above deputation level, however, that its use should be avoided except in cases of dire stringency. The last mentioned floor plus pugging appears still to fall short of Grade II insulation by a matter of 2 db. both in airborne and impact insulation when associated with normal presentday types of structure such as load bearing cavity external walls and thin internal walls. However, when this floor has been used in older buildings (usually as a modification of an existing floor) with very thick supporting walls the consequent reduction in "indirect" transmission may allow it to reach Grade I for both airborne and impact sounds (see Fig. 1, Example A). The separated joist type of construction illustrated in Fig. 1, Example B, is considered very unlikely to achieve Grade II insulation.

GRADING BY NOISE CLIMATE

Above this again are floors (mostly fireresisting) which fall in either the overall Grade II or Grade I category for insulation. It is suggested that the choice of a suitable grading for insulation might be related to the probable average noise "climate" of the environment. If dwellings are to be erected in very quiet rural or suburban districts it appears more important to ensure high values of insulation because any intruding noise will be noticed much more readily than in noisier surroundings. This fact may, in part, account for the regional differences in opinion of noise nuisance reported by Parkin and Stacey, where the occupants of flats who had probably been accustomed to living in noisy and overcrowded conditions for the whole of their lives were less concerned about the insulation of their dwellings than those who were accustomed to better standards. This is not to suggest that low insulation is advocated for town and city dwellers, but merely to imply that while a high background noise in towns remains unavoidable, the relative importance of well insulated dwellings is less. To extend this argument to an absurd conclusion, it might be said that if it is proposed to build a block of flats in close proximity to a helicopter landing station it would hardly be necessary to provide any sound insulation at all between dwellings!

RELATION OF STANDARDS TO ROOM USERS

Although no suggestion was made in the new BRS proposals for relating the new gradings to the old Post-War Building Study recommendations it is, perhaps, worth considering. For example, the old standards recommended that a higher value of airborne sound insulation should be provided between the living room of one dwelling and the living room or bedrooms of another than between the bedrooms of one and the bedrooms or other rooms (not living rooms) of another. In the case of impact insulation the requirements were for one standard only, applicable to all floors over living or bedrooms. If the old 55 db. standard is equated with the new Grade I and the old 45 db.

SUGGESTED DESIGN STANDARD FOR INSULATION OF FLOORS IN FLATS

		Airborne	Impact	Overall
Room Above	Room Below	Grade	Grade	Grade
Living room	Living room	I	I	1
iving room	Bedrooms	1	I	1
Bedrooms	Bedrooms or other than living rooms	II	I	H
Any room	Rooms other than living or bedrooms	11	II	H

Table showing suggested gradings for floors. Grade I represents 55 db. reduction, Grade II 45 db reduction.

standard to Grade II the design requirements would be as given in the Table above. Working on the lines suggested above, these requirements might be "adjusted" according to the environment, and in very quiet areas for example, all Grades II raised to

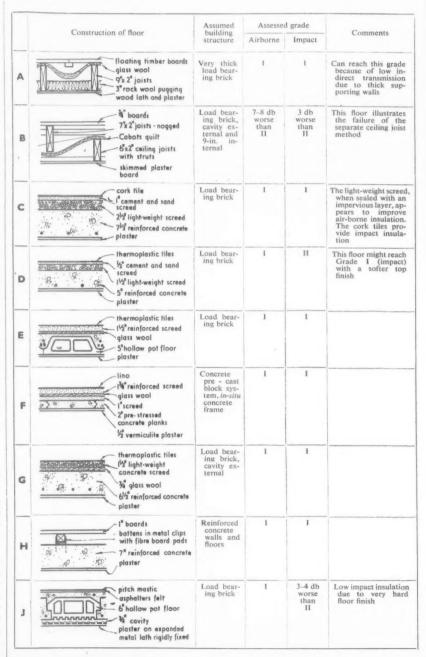


Fig. 1. Chart indicating the grades of insulation produced by nine typical floor constructions.



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Sydney Tatchell, Son & Partners, Fleet Street, E.C.4.

Contractors:

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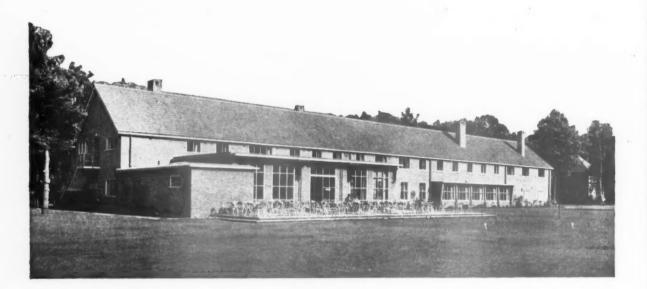
Assoc roofs

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Grade I, and conversely in very noisy areas or where extreme economy must be practised, all Grades I lowered to Grade II, but it is very doubtful if it is safe to use any construction for party floors which will not give Grade II insulation. Further, planners might very well consider the possibilities of reducing the number of higher grade insulation floors by methods which have been suggested for unorthodox maisonette blocks. One such type of building with the appropriate grades of floor insulation is shown opposite in Fig. 2.

Similarly, for walls, if a plan can be devised so that party walls occur only between bedrooms or other than living rooms, a Grade II insulation can be adopted. This can be realized with a construction somewhat lighter than 9 in. brickwork or 7 in. dense concrete.

STANDARDS FOR FLOORS

In deciding the standards for floor insulation, it is suggested that more weight should be given to the need for good impact insulation than for airborne insulation. This suggestion is based on the findings of the social survey, in which it is reported that the most prevalent cause of complaint was "banging and hammering." Although it is admitted that soft floor coverings will invariably raise the impact insulation quite considerably, the cost of such floor coverings is all too often prohibitive to tenants, especially in view of the fact that the buyer of the carpet does not benefit to the same extent, from an insulation point of view, as his downstairs neighbour. There also appears to be more benefit to be obtained by ensuring high airborne insulation in party floors than in party walls, since with floors and walls of approximately equal insulation, tenants found noise through the wall less disturbing than that through the

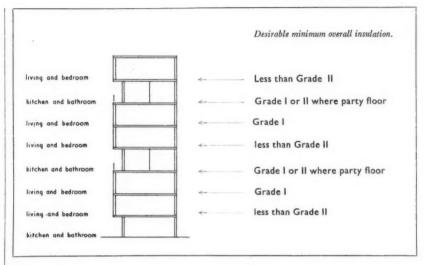


Fig. 2. Diagram showing desirable minimum overall insulation applied to the section of a typical block of maisonettes.

floor. This may influence the basic structure of buildings since it implies that the horizontal elements will need to be heavier than the vertical ones.

CHOICE OF CONSTRUCTION

The last question to be decided is, what form of construction will provide the grades of insulation chosen. A broad guide has already been given in the original BRS paper. The chart on page 448 which is intended to supplement this is based on the study of a number of actual measurements of insulation, and may be helpful to architects in deciding on an appropriate construction. A warning is given that the insulation obtained for a

certain element depends to some extent (and sometimes to a large extent) on the nature of the surrounding structure. A broad description of the associated structure is, therefore, given in the chart and it is reasonable to expect to obtain the quoted values of insulation only if the same supporting structure and method of bonding are used.

Finally, it must be remembered that variations in insulation do occur for sometimes quite inexplicable reasons, and the only way of being absolutely certain that a given floor will perform in the expected way in a given structure is to have measurements made, or to refer to the BRS for confirmation from their experience.

INFORMATION CENTRE

13.123 materials: timber CEDAR SHINGLES

Western Red Cedar Shingle Roofs. Reprint from F.P.A. Journal No. 26 (Fire Protection Association, 1955).

Shingle roofs are very attractive but there has been some anxiety about the risk of fire and particularly the spread of fire if a number of such roofs are in close proximity. Post-war Building Studies Nos. 20 and 29 suggested fairly tight restrictions. The Department of Health for Scotland included similar requirements in their 1954 Byelaws.

Some authorities have contended that experience with such roofs in America is not a true guide to conditions over here. Tests have now been carried out by the Joint Fire Research Organisation and the publication under review describes these and gives the results. The results lead the Fire Protection Association to recommend that shingle roofs should only be used on isolated build-

ings as recommended by the Fire Grading of Buildings Committee.

14.75 materials: concrete

WELDED CONSTRUCTION

Proceedings of the Conference on Welded Structures. (HMSO. 1954. 40s.)

Complete record of the conference on welded structures held in London in November, 1953, of interest to both engineers and architects.

Twelve papers were presented, of which six were devoted to building or allied works and six to the heavier industries. These latter are of no interest to architects. Many examples were given in the papers of the savings of weight and cost which could be effected by the use of welding instead of riveting. W. A. Mitchell gave an example of a typical design of a city building in which he showed that it was possible to save 5-10 per cent. of weight and 2½-5 per cent. of cost. This optimism was not entirely shared by the members of the conference and the conference was brought solidly to earth by a remark from an architect that "after all the steel frame was only a means to an end and he only wanted the cheapest solution whether riveted or welded."

The savings claimed for welding would certainly not put any concrete cased structure into competition with reinforced concrete and it seems that for some years to come

the latter will provide the cheapest answer to most multi-storey buildings.

15.127 materials: applied finishes, treatments FACTORY FLOORS

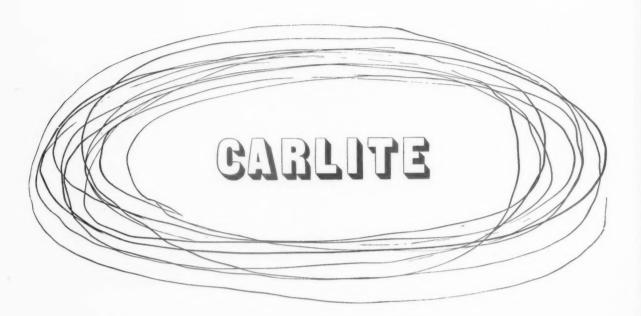
Corrosion Resistant Floors. Part I, Design Considerations. BRS Digest No. 73. (HMSO January, 1955. 3d.)

General discussion of conditions leading to corrosion either of floor finish or of buried reinforcement. Floor drainage and the use of protective layers beneath finishing material. Illustrations of details of construction such as curbs and underlays. Useful summary of commonsense material. The choice of finishing material to be dealt with in later Digest.

15.128 materials: applied finishes, treatments

Corrosion Resistant Floors. Part II, Materials for Finishes. BRS Digest No. 74. (HMSO, February, 1955. 3d.)

Previous Digest dealt with general design considerations. This note describes various finishes including ordinary concrete, high alumina cement mixes, asphalt, rubber latex, resin emulsion and clay tiles and bricks together with a variety of jointing materials for the tile and brick floors.



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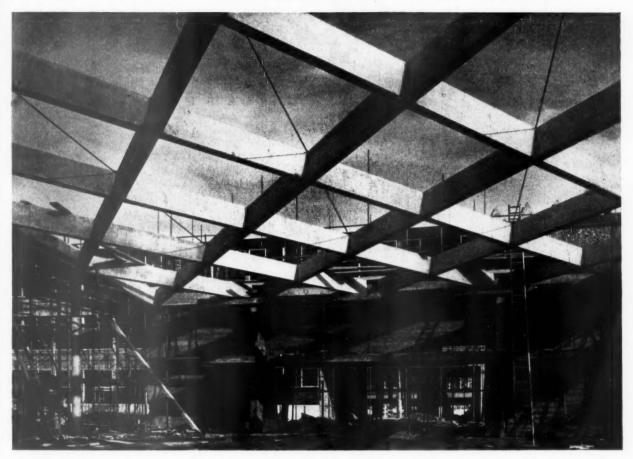
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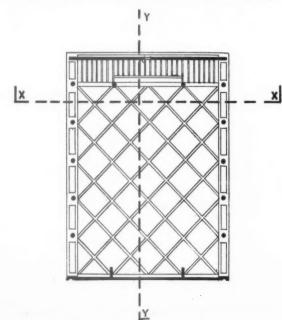
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DIAGRID ROOF AT HILLDROP ROAD SCHOOL, HOLLOWAY, N.1

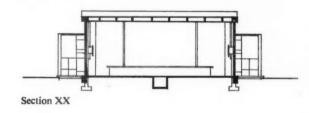


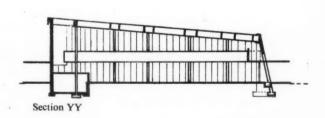
Spanning an area 56 ft. 7 in. by 70 ft. 0 in., the diagrid roof recently built over the assembly hall at the County High School, N.I., for the LCC, (Architect to the Council, Dr. J. L.

Martin: Structural Engineers, Ove Arup and Partners) has the widest spans used for this type of construction in this country (including the Regatta Restaurant at the South Bank Exhibition).



Plan of roof structure

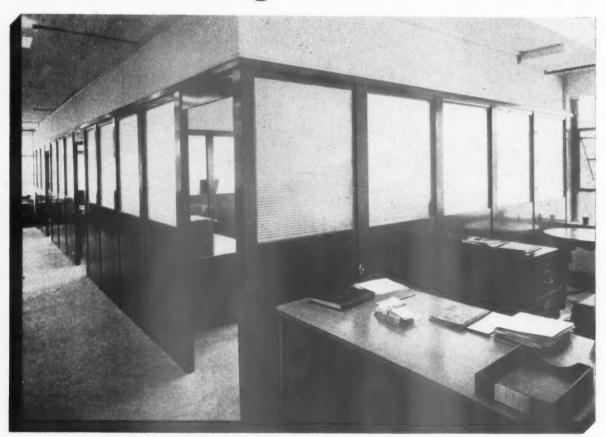




The separate units of the diagrid are 1 ft. 9 in. by 7 in. by 9 ft. $2\frac{1}{2}$ in. and weigh 1,400 lb. apiece. The roof is supported on three sides by 10-in. dia. r.c. columns and on the fourth side by



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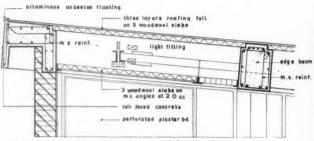
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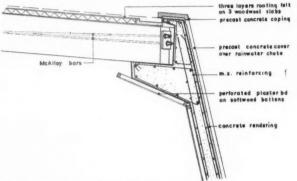
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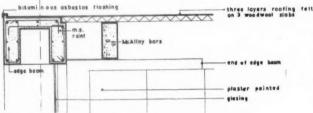
DIAGRID ROOF AT HILLDROP ROAD SCHOOL (continued)



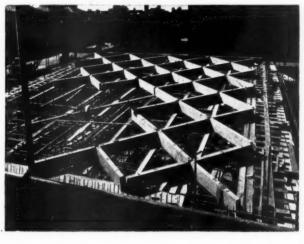
Section through head of west wall



General section through head of east wall



Section through head of north wall



a shelf which is integral with the sloping r.c. end wall. Beams are stressed to 2,000 p.s.i., with two Lee-McCall bars in each. The prestress was induced in four operations by means of two jacks, one at either end. The edge beams, which were cast in situ, provide the eaves to the roof and are hollow in section to save weight. The intersections of the diagrid were formed of rapid hardening cement in place of the more usual ciment fondu since the diagrid is to be visible from below and the dark colour of the latter is hard to conceal. The contractors for the roof were Stent Precast Concrete Ltd.

THE INDUSTRY

From the Industry this week Brian Grant reports on the Electrical Engineers' Exhibition at Earls Court. Among other things, he describes a new interchangeable switch, grid suspension wiring and a storage heating unit.

Although this is only the fourth Electrical Engineers' Exhibition, the show now takes up the whole of the ground floor of Earls Court. It is, of course, intended for the engineer rather than for the architect, but nonetheless it is possible to see a very large selection of switchgear and lighting fittings, as quite a large proportion of the established manufacturers are showing.

In light switches, several manufacturers have introduced during the last year a

range of switches which can be mounted in plastic depth boxes and still have a comparatively small projection from the wall. Switch units themselves have also become smaller, and in many instances are sealed at the factory, so that any unit becoming defective is replaced and not repaired. One of the more interesting developments is the MK Gridswitch (M.K. Electric

One of the more interesting developments is the MK Gridswitch (M.K. Electric Ltd., Wakefield Street, Edmonton, London, N.18). The range consists of interchangeable components, the switches being sup-



8-gang grid switch.

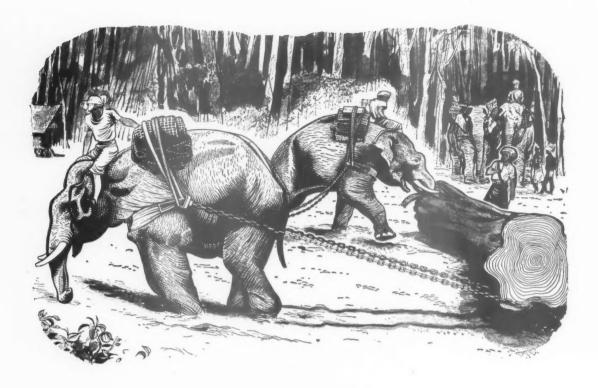
plied ready assembled on grids of one, two, three or four switches. The one- and two-gang grid assemblies fit into the same box, and the same applies to the three- and four-gang units. Six- and eight-gang units are made up of two threes or two fours, and these, too, use a single size of box, so that only three box sizes are needed to cover the range from one to eight switches. All the switches can be one- or two-way as required and an intermediate switch, interchangeable with the others, is also being developed. Switch plates in brass with BMA or matt chrome finish are made either flush or "protected" with a raised rib round the switch dolly. Insulated plastic switch plates are also made up to four way.

MK also show a fused switchplug for use when kettles, irons and such things as washing machines are used with unswitched sockets: the switch is very compact and is suitable for loads up to 3 kilowatts.

EQUIPMENT FOR RING MAINS

Many firms are now producing fused and switched spur boxes for use on ring main circuits. The diagram overleaf shows how they are to be used with fixed appliances such as inset fires. Incidentally, the diagram does not show the socket wiring accurately, as the live lead should go to the right-hand socket.

In general, considerable emphasis is now



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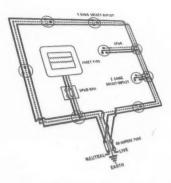
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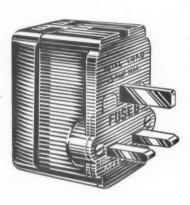
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Above, diagram of a ring main circuit incorporating a spur box for an electric fire. Below, Ashley 13-amp. socket adaptor.



being placed by most manufacturers on the BS.1363 13-amp. socket which, it may be hoped, will in time become universal. Britmac Electrical Co. Ltd., for instance (Britannia Works, Wharfdale Road, Tyseley, Birmingham 11), have a very full range with single units containing up to six switched sockets, and a multiway outlet (see illustration) in which the sockets are mounted at an angle so that there need be no interference between the cables from the plugs.

The same firm also showed a range of sockets and switches with plastic covers in a pleasant pale grey colour, and a hinged flap socket which can be mounted in the floor and fitted with rubber gaskets and a flap retaining screw so that the whole assembly can be made waterproof when the floor is being washed. Also shown were

various types of cylinder lock switch units, suitable for schools or public buildings where interference with corridor or other lighting must be prevented.

The Westair dehumidifying unit was shown by Westool Ltd. (St. Helens, Auckland, Co. Durham). This has a moisture extraction rate up to a maximum of ½ pint per hour, and the current consumption is up to 250 watts according to operating conditions.

GRID SUSPENSION WIRING

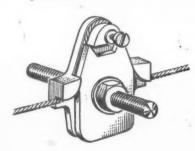
Not new, but perhaps not very well known to architects, is the grid suspension wiring system patented by Enfield Cables Ltd. (Brimsdown, Middlesex). This is a simple method of supplying current by means of self-supporting steel-cored cables which can be fastened to existing steelwork or walls, spanning long distances between supports. The catenary wire, which is tensioned at each end of its run, is made of high tensile steel, and the system can equally well be used for open-air work in goods yards and sports arenas where normal conduit runs would often be unsuitable. To transfer the load from the catenary strand to a wall bracket, hook or other support, each connecting box can be supplied with a mild steel bridle which takes all the load and at the same time an internal anchoring device provides the necessary slack in the insulated conductors to allow connections to be easily made.

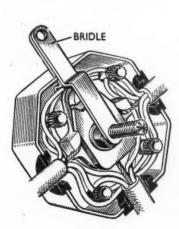
The system can be used for power supply in light machine shops as well as for lighting.

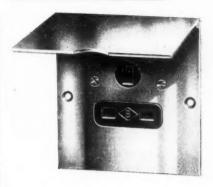
STORAGE HEATING

Storage heating units with ratings of 1, 1½ and 2 kilowatts were shown by Thermodare (Great Britain) (79/80, Petty France, London, S.W.1). The basic component of these units is a refractory heat storage material through which the heating elements are threaded. The heaters are connected to the mains supply through a time switch and take current for 8 or 9 hours at night, when supply companies generally charge lower rates. During this heating period about one third of the heat put into the storage blocks is radiated, the rest being stored and given out at a more or less constant rate during the remaining 16 hours of the day. For a system of this kind to work satisfactorily it is essential for the building's heat losses to be calculated with some accuracy, but if this is done a system can be planned which will show only small temperature changes in the building over the 24 hours.

Details of the grid suspension wiring system. Below, anchor block. Right, anchor block incorporated in a ceiling junction box.







Above, hinged flap socket to give protection against splashing. Below, multi-way socket unit.





12.N1. REFERENCE BACK

Readers are asked to note that Information Sheet 12.N1, published on August 7, 1952, has been cancelled from the Library and should be withdrawn from collections. It has been replaced by Sheet 12.N1, published March 17, 1955.

13.C10, 13.C11, 13.C12, 14.B1, 14.B2 and 14.B3 REFERENCE BACK

Readers are asked to note the following revision and to amend their copies of the Information Sheets in question. The address of the Northern District Office of the London Brick Company is now St. Paul's House, 20-22, St. Paul's Street, Leeds; the telephone number is unchanged.

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Buildings Illustrated

Factory and offices for Hilmor Ltd. at Stevenage New Town, Hertfordshire. (Pages 369-378). Architects: Stevenage Development Corporation, D. P. Reay, B.ARCH., A.R.I.B.A., A.M.T.P.I., formerly Chief Architect; L. Vincent, A.R.I.B.A., A.M.T.P.I., Chief Architect; H. E. Buteux, A.R.I.B.A., A.M.T.P.I., Group Architect; A. Fitch, A.R.I.B.A., M. DIP.ARCH., DIP.MECH.ENG., Assistants; Consultants: foundations, Pre-Piling Surveys Ltd., Quantity Surveyors: Gardiner & Theobald; General contractors: John Laing & Son Ltd.; Sub-contractors: foundations, The Franki Compressed Pile Co. Ltd.; reinforced concrete, Shockcrete Products Ltd.; bricks, Cement Marketing Co. Ltd., The London Brick Co. Ltd. (suppliers); structural steel, fencing and gates, Boulton & Paul Ltd.; special roofings, Brock Roofing Ltd., Universal Asbestos Co. (suppliers); roofing felt, Brock Roofing Ltd., and Macartney Ltd. (for felt roofing); patent glazing and glass, Faulkner Green Ltd.; patent flooring, Semtex (Semtex Tile) Co. Ltd.; plastering, Pollock Bros. (London) Ltd.; central heating boilers, ventilation, James Combe Ltd.; delectric wiring, Holliday Hall & Stinson Ltd.; door furniture, Alfred G. Roberts Ltd.; folding doors, Educational Supply Association Ltd.; plumbing, Mathew Hall & Co. Ltd.; sanitary fittings, Ashley Brandon (Kensington) Ltd.; doors, Hills & Son Ltd.; metal staircases, metal work, Clark Hunt Ltd.; tilling, Carter & Co. Ltd.; signs, The Lettering Centre; paint, Leyland Paint & Varnish Ltd.

Houses for the Tunnel Portland Cement Co. Ltd. in Church Road, Pitstone, Buckinghamshire, (Pages 432-433.) Architects: Architects' Co-Partnership. General Contractor: Charles R. Price. Sub-contractors: dampcourses, The Ruberoid Co. Ltd.; bricks, Erith & Co. Ltd.; slates, Roberts Adlard & Co. Ltd.; roofing felt, The Ruberoid Co. Ltd.; wood block flooring, Hollis Brothers; stoves and boilers, Allied Ironfounders Ltd.; door furniture, J. Parkes & Sons; window furniture, Dryad Metal Works Ltd.; flush doors, Jayanbee Joinery Ltd.; sanitary fittings, Adamsez Ltd.; sliding doors, E. Hill Aldam & Co. Ltd.

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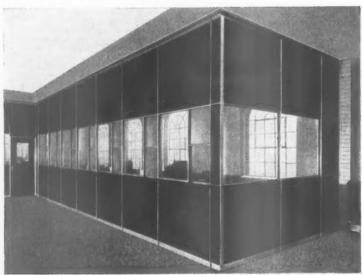
In the Teddington Group of companies Mr. V. C. Miles is returning to the Sunbury Works as Assistant Sales Manager for The British Thermostat Co. Ltd. Mr. Miles's former position of Midlands Area Manager is now being filled by Mr. L. E. Nicholls.

In the Thermovent Heating Division of Messrs. E. K. Cole Ltd. Mr. R. E. G. Durham has been appointed Technical Sales Representative for the Midlands Area; Mr. Durham is operating from 11, Brook Street (telephone Central 2505).

Messrs. F. Hills & Sons Ltd., of Stocktonon-Tees, have opened a London branch office at 28, Victoria Street, Westminster, S.W.1 (telephone ABBey 6542), and also a door depot at Livingstone Wharf, 50, Ferry Street, Millwall, E.14. In the same company Mr. T. H. Homer has been appointed London Branch Manager.

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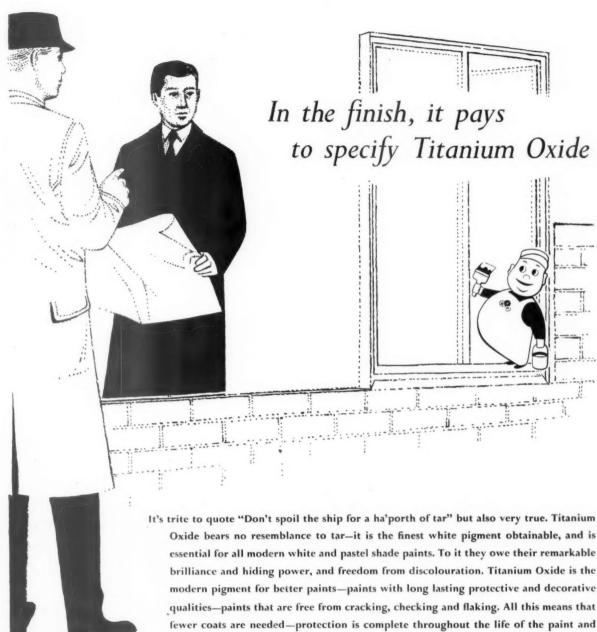
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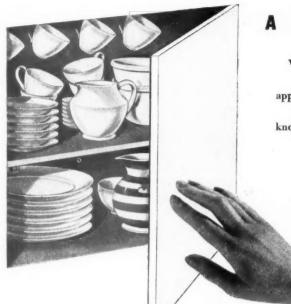
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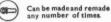


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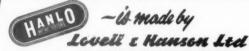
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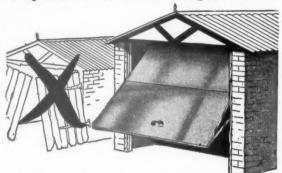
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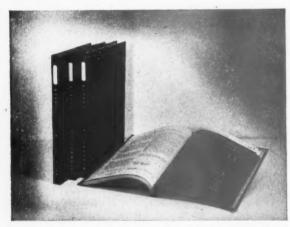
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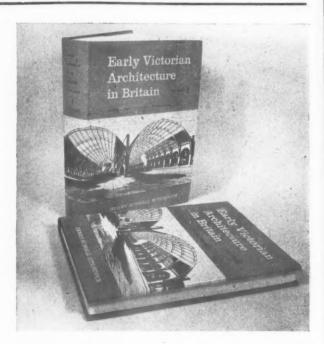
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CITY OF PLYMOUTH.

CITY ARCHITECT'S DEPARTMENT.
Applications are invited for the following appointments, which are subject to the Conditions of Service of the National Joint Council for Local Authorities. Administrative. Professional, Technical and Clerical Services: the Local Government Superannuation Acts 1957 to 1953; a satisfactory medical examination and one month's notice on either side for termination.

(a) 8 ASSISTANT ARCHITECTS—Grade A.P.T.

(b) 1 ASSISTANT ARCHITECTS—Grade A.P.T.

(c) 3 ASSISTANT ARCHITECTS—Grade A.P.T.

11 (2560 to 2660).

(c) 3 ASSISTANT ARCHITECTS—Grade A.P.T. II (£550 to £640).
(d) 7 ASSISTANT ARCHITECTS—Grade A.P.T. I (£500 to £580).

The Department is normally responsible for the whole of the Corporation's Architectural work, including Housing, Education and General Municipal Buildings and offers considerable scope to candidates with initiative and energy.

Applicants for (a) and (b) must be Registered Architects and preference will be given to members of the R.I.B.A. For (c) and (d) preference will be given to passed the Intermediate Examination of the R.I.B.A.

irly

R.I.B.A.

Applicants must not be over 40 years of age, but this condition may be relaxed in the case of a person up to 45 years of age employed by another Local Authority.

Applications on forms obtainable from the undersigned, accompanied by copies of not more than three recent testimonials and/or names of persons to whom reference may be made, should be received at my office not later than the 9th April, 1955.

The Corporation may make housing accommodation available to the successful married candidates.

H. J. W. STIRLING. A.R.I.B.A., City Architect.

Seymour Road, Plymouth.

COUNTY BOROUGH OF GREAT YARMOUTH.
SCHOOLS ARCHITEUT'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-£825).
Candidates should have a knowledge of modern
school design and construction.
Housing accommodation will be made available
if required.

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 9th April, 1955.

D. G. FARROW, Chief Education Officer

22, Euston Road, Great Yarmouth.

BOROUGH OF SOLIHULL.

(a) ASSISTANT ARCHITECT (A.P.T. Grade IV commencing at £735 × £30 - £825).

(b) ARCHITECTURAL ASSISTANTS (A.P.T. Grade III £600 × £25 - £725).

(c) ARCHITECTURAL ASSISTANT (A.P.T. Grade II £560 × £20 - £640).

Applications are invited for the above appointments in the Borough Engineer & Surveyor's Department, where additional staff is needed for an expanding programme of work on housing, schools and public buildings amounting to some 42,900,000 in the next few years.

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

of Service and to one month's notice on side.

Housing accommodation may be made available to the successful applicants if married.

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 & Surveyor, 90, Station Road, Solihull, not later than Tuesday, April 5th, 1985.

W. MAURICE MELL.

Town Clerk.

9177

THE UNIVERSITY OF LIVERPOOL.

Applications are invited for the post of LECTURER and STUDIO INSTRUCTOR in the School of Architecture. The initial salary will be within the range £650—£1,000 per annum, according to qualifications and experience.

Candidates will be expected to have had several years of experience in practice, and preference will be given to those with special knowledge of construction and building science, or with interest in pursuing architectural research in these fields. Applications, stating age, qualifications and experience, together with the names of three referees, should be received not later than 19th April, 1955, by the undersigned, from whom further particulars of the conditions of appointment may be obtained.

STANLEY DUMBELL,

STANLEY DUMBELL,

March, 1955.

BOROUGH OF SOLIHULL.

CLERK OF WORKS

(A.P.T. Grade II £560 × £20 — £640).

Applications are invited for the above appointment in the Architectural Section of the Borough Engineer & Surveyor's Department, where additional staff is needed for an expanding programme of work on housing and public buildings.

Applicants should have been apprenticed in the building trade and have had considerable experience as craftsmen and general foremen.

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

side. Housing accommodation may be made available to the successful applicant if married. 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 & Surveyor, 90, Station Road, Solihull, not later than Tuesday, April 5th, 1955.

W. MAURICE MELL.

Town Clerk.

9176

COUNTY COUNCIL OF THE COUNTY OF LANARK.

PROPERTY DEPARTMENT.

Applications are invited for ARCHITECTURAL ASSISTANTS on A.P.T. Grade VII (£790/£865) and A.P.T. Grade VII (£790/£865) and A.P.T. Grade VII (£790/£865) and preparation of working drawings for erection of schools, public buildings and police houses, etc. Placing according to qualifications and experience. Salary scales are as at May 1955.

Posts superannuable, Medical examination. No canvassing.

Canvassing stating age, qualifications and experience together with the names and addresses of three referees to be sent to W. R. Watt, County Architect, 34, Albert Street, Motherwell, not later than 9th April, 1955.

WM. C. BROWNLIE,

WM. C. BROWNLIE, County Clerk

LONDON COUNTY COUNCIL.

Grade III ENGINEERS (salary up to £392 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.I. (1025).

County Hall, S.E.I. (1925).

Architects and surveyors required for safety regulations of theatres and special buildings, and for general building regulation work. Salaries up to £892 19s., 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.I. (648)

County Hall, S.E.I. (848) 3487
ST. THOMAS' HOSPITAL, LONDON, S.E.I.
Applications are invited for the following posts
in the Hospital Architect's office for work on
design and working drawings of an extensive
reconstruction scheme:—
(a) SENIOR ASSISTANT.—R.I.B.A. Final
standard, preferably experienced in Hospital work.
This appointment will be one of growing responsibility as the office expands.
(b) JUNIOR ASSISTANT.—Near R.I.B.A.
Intermediate standard with a minimum of 2 years'
office experience.

Office experience.

Applications stating age, experience, present salary and the names of two referees to the Personnel Officer.

Personnel Officer.

COUNTY BOROUGH OF ST. HELENS.
Applications are invited for the appointment of TWO SENIOR ARCHITECTURAL ASSISTANTS in the Borough Engineer's Department within the new A.P.T. Grade IV (£675-£825), commencing salary according to qualifications and experience.
Applicants should be Registered Architects. preferably holding a recognised architectural qualification.
Housing accommodation will be made available if required by the successful candidates.
The appointment will be terminable by one month's notice and will be subject to the Local Government Superannuation Acts and medical examination and N.J.C. service conditions.
Candidates must, when making application, disclose in writing whether to their knowledge they are related to any member of the Council or to a holder of any senior office under the Council.
Applications stating age, qualifications, present

Council.

Applications stating age, qualifications, present and past appointments and details of experience accompanied by copies of three recent testimonials must be forwarded to M. Ward, M.I.Mun.B., A.M.T.P.I., Borough Engineer, not later than Monday, 25th April, 1955.

Canvassing in any form will be deemed a disqualification.

Town Hall,
St. Helens.

9291

St. Helens. 9291

BOROUGH OF LUTON.

Applications invited for:—

(A) SENIOR ARCHITECTURAL ASSISTANTS.
Salary Grade A.P.T. V (4750—4900). Fully qualified, with experience of housing, schools and public buildings.

(B) ARCHITECTURAL ASSISTANTS. Salary Grade A.P.T. 1—IV (4500—4825), according to qualifications and experience.

(C) SENIOR QUANTITY SURVEYING ASSISTANTS. Salary Grade A.P.T. V (4750—4900). Fully qualified with experience of taking-off, abstracting and billing for large contracts, including schools, and in settlement of final accounts.

including schools, and in settlement of the accounts.

(D) JUNIOR QUANTITY SURVEYING ASSISTANTS. Salary Grade A.P.T. I—IV (£500—£825), according to qualifications and experience.

(E) MECHANICAL ENGINEERING ASSISTANT. Salary Grade A.P.T. III (£500—£725) with experience in design of heating, gas, water and electrical installations.

N.J.C. service conditions. Application forms from Borough Engineer, Town Hall, Luton, returnable by 18th April, 1955.

A. D. HARVEY, Town Clerk. 9285

Applications are invited for the established post of ARCHITECT—A.P.T. IV £675 to £625 p.a., plus London Weighting). Candidates must possess final professional qualification. Application form and Conditions of Appointment from Borough Engineer (AJ), Town Hall, N.15 to whom applications must be delivered not later than 11th April, 1955.

than 11th April, 1955. 9292

WAR DEPARTMENT.
C.R.E. SHOEBURYNESS.
ARCHITECTURAL ASSISTANTS.
1. Vacancies exist on the establishment of the Commander. Royal Engineers, for ARCHITECTURAL ASSISTANTS—Males.
2. In addition to the usual draughtsman's qualifications, applicants should be capable of preparing detailed working drawings and be able to survey and level.
3. Applications are invited from persons between the ages of 21 and 50 vears.
4. Salaries payable will be from £420 p.a. at age 21 to £580 per annum at age of 28 or over, subject to deductions for provincial service ranging from £20 per annum to £30 a year at the maximum.
5. Letters of application giving details of age, experience and qualifications should be addressed to: The C.R. E. Shoundwards.

The C.R.E. Shoeburyness, Old Ranges, Shoeburyness, Essex.

HERTFORDSHIRE COUNTY PLANNING

Vacancy for PLANNING ASSISTANT in the
East Herts Divisional Planning Office, Bayley
Hall, Hertford, Salary £550—£640 (A.2.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.,
IMun.B., R.I.B.A., or R.I.C.S.
Forms of application from the County Planning
Officer, County Hall, Hertford. Closing date 7th
April, 1955.

CITY OF PETERBOROUGH.
QUANTITY SURVEYOR'S ASSISTANT.
Applications are invited for the above appointment in the Department of the City Engineer and Surveyor on Grade I, A.P. & T., £500-£580 per

Surveyor on Grade I, A.P. & T., 2000—2580 per annum. Forms of application may be obtained from the City Engineer, Town Hall, Peterborough, to whom they must be returned not later than 15th April, 1955.

C. PETER CLARKE, Town Clerk.

Town Hall, Peterborough 22nd March, 1955.

22nd March, 1965.

AYCLIFFE DEVELOPMENT CORPORATION.
ARCHITECTURAL ASSISTANT.
Applications are invited for this appointment at a salary in accordance with Grade A.P.T. III (2500 × 225-2725 p.a.).
Appointment subject to N.J.C. Conditions, Superannuation and medical examination.
Housing accommodation if required.
Preference given to applicants who have passed the R.I.B.A. Intermediate Examination.
Applications stating age, qualifications and experience, together with names of two referees to arrive not later than Saturday, 16th April, 1955.

(Sgd) A. V. WILLIAMS,
General Manager.

Newton Aycliffe, Co. Durham.

GOVERNMENT OF THE UNION OF SOUTH 'AFRICA.

DEPARTMENT OF PUBLIC WORKS.

1. Applications are invited from suitably qualified persons, on Contract for a period of three years, renewable for a further period, to the Public Service of the Union of South Africa for the following posts:—

2. Designation:—ARCHITECT Grade IV: Salary scale £540 × £48-£1,020 per annum. Previous experience will be considered in fixing the commencing salary.

ARCHITECT, Grade III: Salary scale £1,020 × £60-£1,200 per annum. In addition to the above, a Cost of Living Allowance of £234 per annum is payable to married persons.

3. Mrimmum qualifications:—Applicants must be qualified in their profession and be Members of the Royal Institute of British Architects. Applicants for the posts of Architect Grade III must have had at least five years' appropriate experience.

4. Conditions of employment will, in the first

cants for the posts of Architect Grade III must have had at least five years' appropriate experience.

4. Conditions of employment will, in the first place, be governed by the terms of the Contract and the Public Service Regulations. Successful applicants will be required to acquire within a reasonable time a knowledge of the Afrikaans language.

5. Duties of successful applicants will be in the field normally associated with the profession.

6. Transport expenses from place of residence to place of employment (3rd class rail in United Kingdom. Iourist, cabin or cheapest first class boat to South Africa, whichever is available, and 1st class rail in South Africa, including excess baggage to a maximum of 150 lbs. per adult and 75 lbs. per child, and similar return passage on satisfactory completion of Contract, will be paid by the Union Government.

7. Applications in writing giving full details of qualifications and previous experience should be addressed to Room 102, South Africa House.

Trafalgar Square, London, W.C.2, not later than 21st April, 1955.

2026

COUNTY BOROUGH OF BOURNEMOUTH.
BOROUGH ARCHITECT'S DEPARTMENT.
Applications are invited for the following
Appointments:—
(A) SENIOR ASSISTANT ARCHITECTS
(TWO POSTS)—Salary Grade A.P.T. VI (£825—
£1,000 p.a.).

(TWO POSTS)—Salary Grade A.P.T. VI (£825—£1,000 p.a.).

(B) SENIOR ASSISTANT ARCHITECT—Salary Grade A.P.T. IV (£675—£825 p.a.).

(C) ASSISTANT ARCHITECT—Salary Grade A.P.T. III (£600—£725 p.a.).

The above positions are Established Posts and applicants must be registered architects, members of the R.I.B.A. and have a comprehensive knowledge of architectural works required by Local Authorities. Experience and knowledge of the Education Building 1944 Act being essential for one of the nosts (A) and post (C).

(D) ARCHITECTURAL ASSISTANTS (TWO POSTS)—Unestablished—Salary Grade A.P.T. II (£500—£640 p.a.). Applicants must have had one/two years' experience, preferably on education buildings after passing the Inter. R.I.B.A. Exam. Successful candidates will be appointed at present salary if within the incremental scale. Application Forms and further particulars from Borough Architect, Town Hall. Bournemouth. Completed applications. with copies of three recent testimonials, must reach me by 10 a.m., 16th April. 1955.

A. LINDSAY CLEGG.

A. LINDSAY CLEGG, Town Clerk.

PORTHCAWL URBAN DISTRICT COUNCIL.
APPOINTMENT OF PERMANENT ARCHITECTURAL ASSISTANT.
Applications are invited for the appointment of a permanent ARCHITECTURAL ASSISTANT in the Department of the Engineer and Surveyor of the Council at a salary in accordance with the Special Grade for Architectural Assistants under the National Scheme of Conditions of Service and Salaries, namely, 4650 per annum rising to a maximum of £775 per annum.

Applicants must have had extensive experience in Municipal Architectural Housing work.
The Appointment will be subject to the National Conditions of Service, the Provisions of the Local Government Superannuation Acts, the passing of a Medical Examination and to one month's notice on either side.

Forms of application, which must be used, can be obtained from the Engineer and Surveyor, Council Offices, Porthcawl, and applications endorsed "Architectural Assistant," together with copies of two recent testimonials must be received by me not later than Monday 18th April, 1965.
Canvassing will be deemed a disqualification and applicants must disclose whether they are related to any Member or Senior Officer of the Council.

D. E. SMITH, Clerk of the Council.

D. E. SMITH, Clerk of the Council.

Council Offices South Road, Porthcawl. 24th March, Portheawl.

24th March, 1955.

9249

NORTH RIDING EDUCATION COMMITTEE, vacancy for ASSISTANT ARCHITECT in the Education Architect's Department, Grade A.?A.T. II, salary £560 × £20—£640. Candidates must have passed the R.I.B.A. Intermediate. Previous experience may be taken into account in fixing commencing salary. Local Government Superannuation Act. Form and further particulars from the undersigned. Canvassing disqualifies. F. BARRACLOUGH, County Hall, Northallerton.

9251

ESHER URBAN DISTRICT COUNCIL.

BNGINEER AND SURVEYOR'S

DEPARTMENT.

APPOINTMENT OF ARCHITECTURAL

ASSISTANT, GRADE A.P.T. II.

Applications are invited for the above-mentioned appointment. Salary £560-£640 per annum, plus
London Weighting.

The Council is prepared to assist with the provision of housing accommodation if required.

Send addressed foolscap envelope for form of application and further particulars to the Engineer & Surveyor, Council Offices, Esher, to whom applications must be returned by 12th April, 1955.

FREDERICK EDWARDS.

FREDERICK EDWARDS, Clerk of the Council.

Esher, Surrey. 21st March, 1955.

WARWICKSHIRE COUNTY COUNCIL.

Applications are invited for the following appointments:—

(a) SENIOR ASSISTANT ARCHITECT A.P.T.

IV, commencing salary £675, rising to £825 per annum. Applicants should be members of the Royal Institute of British Architects.

(b) CLERK OF WORKS (resident) to supervise the erection of new schools at Hartshill, near Nuneaton, and Leamington Spa. Salary £12 12s. per week.

The appointments are subject to the provisions.

per week.

The appointments are subject to the provisions of the Local Government Superannuation Acts,

1937-53.

Applications to be made on a form which can be obtained from:

G. R. Barnsley, F.R.I.B.A., County Architect, Shire Hall, Warwick.

L. EDGAR STEPHENS, Clerk of the Council.

Shire Hall, Warwick.

Warwick.

9253
THE NUFFIELD FOUNDATION.
Applications are invited for the post of ARCHITECTURAL ASSISTANT on the staff of the
Foundation's Division for Architectural Studies.
Candidates should be of Intermediate standard
and have had some experience of work on contemporary buildings. The selected candidate will
be appointed at a commencing salary within the
scale 2550—2550, increasing yearly increments of
225 according to age and qualifications. He will
be particularly concerned with working drawings
for a number of experimental buildings, including
hospitals, research laboratories and farm buildings.

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Applications giving age, qualifications, experience and the names of two referees should be sent to the Director of the Division for Architectural Studies, The Nuffield Foundation, Nuffield Lodge, Regent's Park, London, N.W.1, not later than the 8th April, 1955.

PORTIGH OF WATFORD.

BOROUGH OF WATFORD.

ASSISTANT ARCHITECT.

Applications are invited for the appointment of an ASSISTANT ARCHITECT on Grade II A.P.T.

(2560—1640 p.a.). Commencing salary will be fixed according to experience.

HOUSING ACCOMMODATION will be provided if required by the successful applicant.

Application forms obtainable from the undersigned are to be returned by April 7th.

Borough Engineer, Surveyor & Architect.

Town Hall,

Watford.

HEMEL HEMPSTEAD DEVELOPMENT
CORPORATION.
APPOINTMENT OF SENIOR ARCHITECT
Applications are invited from Associates of the
R.I.B.A. for an appointment in the department
of the Chief Architect (H. Kellett Ablett,
F.R.I.B.A., M.T.P.I.). Applicants should have
experience in commercial and domestic architecture.

experience in commercial and domestic architecture.

Salary scale £715—£975 p.a. Conditions of service broadly similar to those in Local Government.

Contributory superannuation, with opportunity of entering or continuing in Local Government Superannuation Fund.

It may be possible to provide housing.

Application forms from this office (please quote Vacancy No. 176a) to be completed and returned to undersigned by 14th April.

W. O. HART,

COR Appli persons office o (a) A

£720 × (b) A scale £ Work

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Hemel Hempstead,
MANCHESTER MUNICIPAL COLLEGE OF
TECHNOLOGY.
(Faculty of Technology in the University of Manchester.)

APPOINTMENT OF LECTURER IN STRUCTURAL ENGINEERING.
The Governing Body invites applications for a LECTURESHIP in Structural Engineering in the College with the title and status of Lecturer in the University of Manchester.
Candidates should be graduates in Science or Technology and should possess a good knowledge of Theory of Structures. The person appointed will be required to undertake research work on Structures and to assist in lecturing and laboratory work in Structural Engineering.
Salary: £650 per annum, rising by annual increments of £50 to £1,350 per annum. Commencing salary according to qualifications. Superannuation under F.S. U. and family allowances.
Conditions of appointment and form of application may be obtained from The Registrar, College of Technology, Manchester, 1. The last day for the receipt of application is Monday, 18th April, 1955.

B. V. BOWDEN.

B. V. BOWDEN, Principal of the College

The METROPOLITAN BOROUGH OF HAMPS758

The METROPOLITAN BOROUGH OF HAMPSTEAD require a JUNIOR ARCHITECTURAL
ASSISTANT. Salary Higher General Division (at
age 18 years, £230, rising to maximum of £475,
plus London weighting).

Medical examination; no housing provided.
Applications, giving three referees, to the Town
Clerk, Town Hall, Haverstock Hill, N.W.3, Closing date, 15th April, 1955.

BEDFORDSHIRE.
COUNTY ARCHITECT'S DEPARTMENT.
ADDICATION.
APT. Grade IV (salary £675 to £225). Forms
obtainable from the County Architect, Shire Hall,
Bedford, to be completed and returned on or
before 25th April, 1955.

CORBY DEVELOPMENT CORPORATION, Applications are invited for the following prointments in the office of the Chief Architect and under the direction of the Principal Quantity

appointments in the bund of the Principal Quantity Surveyor.

(a) SENIOR QUANTITY SURVEYOR (salary scale £900 × £50-£1.100.

(b) JUNNIOR QUANTITY SURVEYOR (salary scale £600 × £30-£690).

Candidates for the senior appointment should be professionally qualified and possess a wide experience of quantities and contractors' accounts of every kind.

Candidates for the junior appointment should have reached at least intermediate standard and have some experience in a first class office for at least two years.

Appointments are subject to one month's notice on either side, to the provisions of the Local Government Superannuation Act, and to a medical examination. Housing is available.

Applications, stating age, education, training, qualifications, past and present appointments and salaries, together with the names of two referees must be received by the undersigned not later than 10th April, 1955.

R. F. BROOKS GRUNDY.

Spencer House,

Control Montants.

Spencer House, Corby, Northants.

Corby, Northanis.

CUTY OF LIVERPOOL.

ARCHITECTURAL AND HOUSING
DEPARTMENT
Applications are invited for the appointment of
TECHNICAL ASSISTANT (PERSPECTIVES).
Salary, £506—£640 per annum (A.P.T. II). Applicants should have had experience in preparing
perspective drawings, illustrating (preferably
architectural subjects) in line and colour and the
preparation of drawings for publicity purposes.
Experience in lettering, setting out, etc., is also
desirable. Applications will be considered from
commercial artists, or persons with architectural
training. Application forms obtainable from
the City Architect & Director of Housing, Blackburn Chambers, Dale Street, Livernool, 2, must be
refurned to him not later than 28th May, 1955.
The appointment is superannuable and subject
to the Standing Orders of the City Council. Canvassing disqualifies.

THOMAS ALKER,

THOMAS ALKER, Town Clerk.

Municipal Buildings. Liverpool, 2. (JA. 3854)

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ER, Clerk.

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CORBY DEVELOPMENT CORPORATION. Applications are invited from suitably qualified persons for the following appointments, in the office of the Chief Architect.

(a) ASSISTANT ARCHITECTS (Salary scale £720 × £40—£940).

(b) ARCHITECTURAL ASSISTANTS (Salary scale £600 × £30—£690).

Work is now proceeding on the design of a new neighbourhood unit, some Town Centre buildings, and factories, and it would be useful if applicants had design, construction, and supervision experience in at least one of these fields.

Applicants for post (a) should be qualified and commencing salaries in both posts will be dependent on qualifications and experience. Appointments are subject to one month's notice on either side, to the provisions of the Local Government Superanmation Act, and to a medical examination. Housing is available.

Applications stating age, education, training, qualifications, experience past and appointments, and salaries, together with the names of two referees, must be received by the undersigned not later than 10th April, 1995. Envelopes should be endorsed "Architect."

R. F. BROOKS GRUNDY, General Manager.

Copporation Street,

Spencer House, Corporation Street, Corby, Northants.

BOROUGH OF EDMONTON.
JUNIOR ARCHITECTURAL ASSISTANT required for Borough Architect's Department, A.P.T. I. 4500 × 420—4580 plus London weighting. Candidates should be studying for professional qualification.
Applications on forms from Town Clerk, Town Hall, Edmonton, must be delivered by 7th April.

COUNTY BOROUGH OF SMETHWICK.
BOROUGH ENGINEER & SURVEYOR'S
DEPARTMENT.
Applications from Candidates, appropriately
qualified, are invited for the following appoint-

Applications from Candidates, appropriaces qualified, are invited for the following appointments:—

(a) PRINCIPAL ARCHITECTURAL ASSISTANTS (2)—Salary A.P.T. V (£750—6900 p.a.).
(b) ARCHITECTURAL ASSISTANT—Salary, Special Grade (£650—£775 p.a.).

The work of this section of the Department includes housing, housing development, new schools and general municipal buildings.
(c) QUANTITY SURVEYOR'S ASSISTANTS (2)—Salary A.P.T. IV (£675—£255 p.a.).

The work to be undertaken comprises Building and Civil Engineering quantities and preparation of estimates.

The posts are subject to the provisions of the National Scheme of Conditions of Service, the Local Government Superannuation Acts 1937—53, to the passing of a medical examination and the Erorms of application may be obtained from the Borough Engineer & Surveyor, Council House, Smethwick, and should be returned, in envelope suitably endorsed, together with copies of two recent testimonials, not later than 15th April.

CITY OF OXFORD.
CITY ARCHITECT AND PLANNING
OFFICER'S DEPARTMENT.
Applications are invited for the undermentioned

OFFICER'S DEPARTMENT.

Applications are invited for the undermentioned vacancies:—

(A) PLANNING ASSISTANT, within the salary range £650—£775 per annum.

Candidates should preferably have passed the final Examination of the Town Planning Institute, and additional qualifications would be an advantage, although consideration would be given to persons not yet fully qualified (i.e., who have passed the Intermediate stage or obtained exemption) in which case the salary would be in accordance with present qualifications.

The successful applicant will be required to undertake varied duties in the Planning Section of the Department and should have had experience in the planning work of a Local Authority.

(B) ARCHITECTURAL ASSISTANT within the salary range £650—£775 per annum.

Candidates must have passed the Final Examination of the Royal Institute of British Architects, and capable of preparing sketch designs, full working drawings, specifications, etc., and competent to undertake housing, educational and general architectural work.

HOUSING ACCOMMODATION, if required, will be provided by the Council.

Permanent, pensionable post; medical examination.

Forms of application and conditions of appoint-

Permanent, pensionable post: medical examina-tion.

Forms of application and conditions of appoint-ment may be obtained from the City Architect and Planning Officer, Town Hall, Oxford, to whom completed forms must be returned by the 12th April, 1956. Please indicate for which post application is made.

HARRY PLOWMAN, Town Clerk, 9244

THE DEPARTMENT OF HEALTH FOR SCOTLAND: Chief Architect's Office: Applications are invited from ARCHITECTURAL DRAUGHTSMEN with considerable office experience for a non-pensionable post. Duties include assisting architects on Housing projects. Health buildings and schools.

Salary range 4323—6880 (Women £600) with placing according to age and experience. Form of application, obtainable from Establishment Officer. Department of Health for Scotland. (Room 30). St. Andrew's House. Edinburgh. 1. must be returned by 21st April. 1965.

MIDDLESEX COUNTY COUNCIL—COUNTY PLANNING DEPARTMENT.

PLANNING ASSISTANT, Grade IV (£705 to £855 p.a. it 26 years or over). Should have architectural qualifications and be capable of controlling staff engaged on town planning work. Subject to confirmation, appointment at appropriate point on grade, according to qualifications and experience. Established pensionable subject to medical assessment and prescribed conditions. Application forms from County Planning Officer, 10, GL George Street, S.W.I. returnable by 22nd April (quote Q.154 AJ). Canvassing disqualifies.

THE DEPARTMENT OF HEALTH FOR SCOTLAND. Chief Architect's Office: Applications are invited for non-pensionable posts of ASSISTANT ARCHITECT: Headquarters, Edinburgh. Age 25-34. Salary range £660—£1,015 (Women e905). Duties include housing, school building (including research and development), health buildings, etc.

Further particulars and application form from Establishment Officer. Department of Health for Scotland (Room 30), St. Andrew's House, Edinburgh, 1. Closing date for applications, 21st April, 1955.

April, 1955.

COUNTY BOROUGH OF SOUTH/2ORT.
Applications are invited for the following appointments in the Borough Architect and Town Planning Officer's Department:—
(a) ASSISTANT ARCHITECT—Special Scale (£550—£75) per annum).
(b) ARCHITECTURAL ASSISTANT—A.P.T. Division Grade II (£560—£640 per annum).
Candidates must have passed the Final Examination of the R.I.B.A., for Post (a) and the Intermediate Examination for Post (b).
Application Forms obtainable from the Borough Architect and Town Planning Officer, 99/105, Lord Street.

R. EDGAR PERRINS,

R. EDGAR PERRINS, Town Clerk. 9217

CITY OF BIRMINGHAM.

CITY ARCHITECT'S DEPARTMENT.

Annlications are invited for the appointment of a SENIOR ASSISTANT ARCHITECT as Group Leader in the General Architectural Section, which is responsible for a large and varied programme, including the design and erection of large public buildings, such as police and fire stations, office blocks, baths and other civic buildings. The appointment will be within Grade A.P.T. VI (6285/E),000 per annum) at a commencing salary according to experience.

Applicants must be Associate Members of the R.I.B.A., or hold an equivalent qualification, and must have a contemporary outlook in Architectural Design.

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

Applications, stating age, present position and salary, qualifications and experience, together with the names of two persons to whom reference can be made, should reach the undersigned not later than 13th April, 1955.

Canvassing disqualifies.

Canvassing disqualifies.

Civic Centre,
Birmingham, 1.

CITY OF LEICESTER.
EDUCATION COMMITTEE.
APPOINTMENT OF SURVEYOR.
Applications are invited from qualified and/or registered Architects for appointment as Surveyor to the Education Committee. Salary in accordance with the J.N.C. recommendations, Grade C-present scale £1.202 10s. rising by annual increments of £52 10s. to a maximum of £1,412 10s. per annum.

ments of £52 los. to a maximum of £1,412 los. per annum.

The appointment will be subject to the provisions of the Local Government Superannuation Act. Duties will include responsibility for minor building works, the maintenance of all educational buildings and playing fields (and control of staff therefor) and the provision of all school furniture. Comparable local education authority experience in a responsible capacity essential.

Further particulars and form of application (which should be completed and returned not later than 14th April) may be obtained from the undersigned on receipt of a stamped addressed envelope.

ELFED THOMAS.

Director of Education.

Education Department, Newarke Street, Leicester.

Newarke Street,
Leicester.

COUNTY OF LINCOLN-PARTS OF LINDSEY.
Vacancy for Two ASSISTANT ARCHITECTS,
qualified A.R.I.B.A. Salary Special Grade £650
rising to £775, or APT. Grade IV, £675 rising to
£825, according to experience. N.J.C. Conditions
of Service, Canvassing will disoualify. Candidates must disclose in writing whether to their
knowledge they are related to any Member or
Senior Officer of the Council.
Allowance of 25/- per week and return fare home
bi-monthly may be paid up to six months to
married men unable to find housing accommodation.

Applications giving age, qualifications, experience and names of two persons to whom reference
can be made to be sent to the undersigned not
later than 6th April. 1955.

A. RONALD CLARK, A.R.I.B.A. A.M.T.P.I.,
County Offices,

County Offices, Lincoln.

SURREY COUNTY COUNCIL.

DEPUTY COUNTY PLANNING OFFICER.

Applications invited for this post on scale £1,517.10s.0d. & £52.10s.0d. & £1,780 per annum from persons with wide experience in Town and Country Planning.

persons with wide experience in Town and Country Planning.

Applicants must be corporate members of the Town Planning Institute and of one or more of the following:

Royal Institute of British Architects.
Institution of Civil Engineers.
Institution of Municipal Engineers.
Royal Institution of Municipal Engineers.
Application of Chartered Surveyors.
Appointment subject to medical examination and to Local Government Superannuation Acts.
Applications, stating age, qualifications and experience with names and addresses of three referees, to undersigned by 25th April.

W. W. RUFF,
Clerk of the Council.
County Hall,

County Hall, Kingston-upon-Thames.

STAFFORDSHIRE COUNTY COUNCIL.

STAFFORDSHIRE COUNTY COUNCIL.
EDUCATION ARCHITECT'S DEPARTMENT.
ASSISTANT INSPECTOR OF BUILDINGS.
Applications for the post of ASSISTANT INSPECTOR OF BUILDINGS in the South East Staffs. Divisional Area, are invited from persons having practical experience in the building trade, the preparation of specifications and estimates, and who are car owners. Salary will be in accordance with New Grade A.P.T.I. (£500×£20—£50 per annum).

Forms of application, which must be returned not later than the 14th April, 1955, may be obtained from:—
A. C. H. Stillman, F.R.I.B.A., County Education Architect, Green Hall.
Lichfield Road,
Stafford.

T. H. EVANS.

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

COUNTY BOROUGH OF GLOUCESTER.

CITY ARCHITECT'S DEPARTMENT.

Applications are invited from persons with suitable qualifications and experience for the following permanent appointments:

(a) ASSISTANT ARCHITECT—550 × 25—2775.

Parts I, and II, R.I.B.A. Final or Special Final.

(b) ARCHITECTURAL ASSISTANT, A.P.T. II £560 × 220—26640. R. I.B.A. Intermediate.

Superannuable posts, Medical examination. Municipal experience not essential. Male or female.

Programme includes schools, multi-storey flat re-development, shell concrete public buildings, etc. Applications stating age, married or single training, qualifications, experience, previous and present appointments, with copies of testimonials or names of referees, to City Architect, Suffolk House, Greyfriars, Gloucester, not later than Friday, the 15th April, 1955.

NEW SOUTH WALES, AUSTRALIA.

Permanent appointments in the New South Wales Government Service are available to:—

ARCHITECTUS;
ARCHITECTURAL DRAFTSMEN.

Salary: Commencing salary according to qualifications and experience between 2935 (Australian currency) per annum and £1,224, with promotion to considerably higher salaries. Superannuation.

Qualifications: University Degree. Technical College Diploma, or equivalent.

Location: Sydney, or country district offices in New South Wales.

Fares to Sydney: Appointee's contribution to fare is £10 sterling per adult.

Application form and further information may be obtained from the New South Wales Government Office, 56/57, Strand, London, W.C. 2.

2210

ARCHITECTURAL ASSISTANT required by Hayes & Harlington U.D.C. Salary A.P.T. II, i.e., £560 × £20—£640 per annum. plus London "Weighting" (up to 20 years £10, 21—25 years £20, 25 years and over £50 per annum. Candidates must have passed the R.I.B.A. Inter. Exam. Good knowledge of construction and ability to prepare drawings from preliminary sketches essential. Particulars of appointment and application forms available from the undersigned which when completed must be returned by 11th April, 1955.

GEORGE HOOPER, Clerk and Solicitor.

Town Hall,

Town Hall, Hayes, Middlesex.

Middlesex.

9211

LONDON COUNTY COUNCIL.

SENIOR PLANNING OFFICER required.
Salary £2.050—£100—£2.250. This officer is responsible, under the direction of the Architect to the Council, for advising on all town planning matters. These include the periodical review of the Development Plan, the civic design problems of Reconstruction aregs and the examination of the Council's own development proposals and these submitted by private applicants and other public authorities. He is assisted by a professional and technical staff of over 200 and by an administrative staff under the direction of a principal clerk. The position requires leadership and organising ability of a high order with proved ability as a planner. The position is permanent and pensionable. Applications must be submitted by 18th April. 1955, on the prescribed form obtainable together with full particulars from Clerk of the Council (CL/G), County Hall, S.E.1. (310). 9214

SOMERSET COUNTY COUNCIL.

APPOINTMENT OF DEPUTY ARCHITECT.
Applications are invited for the appointment of Deputy County Architect at a salary in accordance with Scale Go the Joint Negotiating Committee for Chief Officers of Local Authorities, viz., £1.675 per annum, rising by annual increments of £52 los. to £1.937 los. per annum.
Candidates must be Associate Members of the Royal Institute of British Architects, conversant with local authority building policy and associated financial control, also Committee procedure and be able to organise the resources of the department effectively to implement the Council's annual building programmes. The duties will include deputising for the County Architect at meetings, conferences, etc., as occasion demands.
The appointment will be subject to the conditions of the Joint Negotiating Committee for Chief Officers of Local Authorities, the rules and regulations of the County Council from time to time in force, the provisions of the Local Government Superannuation Acts 1937 to 1955, and to the passing satisfactorily of a medical examination by the Council's Medical Officer of Health.

Applications stating age, training, experience and qualifications, together with a copy of a recent testimonial and the names and addresses of two technical referees, should be sent to the undersigned not later than Tuesday, 12th April, 1955.

Canvassing of any form will disqualify and candidates must disclose any relationship to any Member or Senior Official of the Council.

R. O. HARRIS, F. R. I.B.A.,

County Architect,

Park Street, Taunton.

Taunton.

CITY OF LEICESTER.

EDUCATION COMMITTEE.

Applications are invited from men who have completed their National Service for the post of TECHNICAL, ASSISTANT in the Committee's Surveyor's Department. Salary in accordance with A.P.T. Grade I (£500/£580).

Candidates should have passed the R.I.B.A. Intermediate examination and have bad several years' experience in an Architect's Office. The duties will include preparation of drawings, preliminary estimates for scheme of minor works, drafting of specifications sufficient for inviting tenders. The appointment will be subject to the provisions of the Local Government Superannuation.

Applications in writing, containing for the committee of the containing of the containing for the containing for the committee of the containing for the containing for

Applications in writing, containing full par-ticulars, together with the names of two referees, should reach the undersigned not later than 12th

ELFED THOMAS.
Director of Education.

Education Department, Newarke Street, Leicester.

Leicester.

LANCASHIRE COUNTY COUNCIL.

PRINCIPAL ASSISTANT ARCHITECT,
21 S07 10s. v 529 10s—11.517 10s.

Duties: Helping Assistant County Architect
with the administration of the General Branch
which has a staff of 25 architects and deals with
all work except Education: occasional attendance
at Committee meetings and supervision of design
in the drawing office. The latter is a most
important duty and requires a flair for design
much above the average. There is a large and
interesting programme of work including Police
Stations and Courts. Fire Stations, Hostels for
the Azed, Clinics, etc. Application forms, from
the County Architect, P.O. Box No. 26 Preston,
to be returned by Monday, 18th April, 1955, quoting Ref. A/AJ.

COUNTY OF LEICESTER.

COUNTY OF LEICESTER.
RESIDENT CLERKS OF WORKS (12 guineas per week) for various contracts in the County. Applicants must be caoable of dealing with contracts £100.000 to £200.000. Apply by 19th April on forms obtainable from County Architect, (d), 123, London Road, Leicester.

Architectural Appointments Vacant

Architectural Appointments Vacant
lines or under, 7s. 6d.: each additional line, 2s.
The engagement of persons answering these
advertisements must be made through a Local
Office of the Ministry of Labour or a Scheduled
Employment Agency if the applicant is a man
aged 18-64 inclusive or a woman aged 18-59
inclusive unless he or she or the employment is
excepted from the provisions of the Notification
of Vacancies Order, 1952.

BUILDING SURVEYING ASSISTANT (about
R.I.C.8. Final Standard) with at least two
years' practical experience required by City firm
of Chartered Surveyors & Architects.

ARCHITECTURAL ASSISTANT: Intermediate
work: large-scale contracts. Watson, Johnson,
Stokes. Victoria Square. Birmingham.

ARCHITECTURAL ASSISTANT required for
busy practice covering North West England.
NORMAN AND DAWBARN require ARCHI-

BOX 9136.

NORMAN AND DAWBARN require ARCHITECTURAL ASSISTANTS at R.I.B.A. Final
standard or qualified with not less than 5 years'
continuous office experience. Salaries in the range
£700—£850, according to age, also length and
type of experience. Applications stating age and
details of career should be made in writing to 5,
Gower Street, London, W.C.I.
9168

SALARY up to £793, according to experience for ASSISTANT in first class City Office. Box 9169.

A RCHITECT'S ASSISTANT of Inter. Standard was to neat and accurate draughtsman with office experience. Varied and interesting work, mainly agricultural and housing. 5-day week. Apply, giving full particulars of age, experience, and salary required, to Box 9172.

REGENTLY required. ASSISTANT for responsible position in general practice with interesting work in hand over a large area. Salary directly related to ability. Accommodation available if required. Martindale and Jackson, F./A.R.I.B.A., Cathedral Chambers, Castle Street, Carlisle.

A RCHITECTURAL ASSISTANT required for Private Practice in Worcester, capable of carrying out work from sketch drawing to final account. 5-day week. Full particulars, including salary required, to Box 9158.

INTERMEDIATE Standard ASSISTANT required for general practice, Central London Arquired for general practice, Central London Acquired for general practice, Central London Acquired for general procession of the Company of the Company

A RCHITECTURAL ASSISTANT required, intermediate stage or above, some office experience. Write for interview. Box 8770.

A RCHITECTURAL ASSISTANT, Inter of Final standard, required for interesting contemporary work. Gerald Lacoste, M.B.E. F.R.I.B.A., 39, Gordon Square, London, W.C.1 Telephone EUSton 8175.

A RCHITECTURAL DRAUGHTSMEN required for industrial work, capable of producing drawings from sketch plans and instructions of architect.

Senior men with experience of this type of work preferred, but juniors would be considered. Apply stating age, training and experience, and salary required, to Box 1502, T. & G., 167, High Holborn, London, W.C.1.

A RCHITECTURAL DRAUGHTSMAN required in Estate Developer's office for the design and detail of industrial buildings. Good salary for applicant with ability and experience. Write stating age and experience to Box 9089.

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

ARCHITECTURAL ASSISTANT required, experience up to final or intermediate standard in preparation of working drawings, details, specifications, for South West London office. Apply in writing, giving full particulars of experience, age and salary required to Box 9098.

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

JUNIOR and intermediate ARCHITECTURAL ASSISTANTS required. Applicants with knowledge of commercial work, including offices and stores, etc. London experience an advantage. Box 5481.

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

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.

MESSRS. NORTH & PARTNERS are seeking an ASSISTANT with general experience in surveys of existing properties and building sites. As the practice extends throughout the whole of Gt. Britain the successful applicant must be prepared to travel. Ability to assist generally in the drawing office would be an added advantage. Salary according to experience. Reply to North & Partners, Maidenhead.

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

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

R ONALD WARD & PARTNERS require several ARCHITECTURAL ASSISTANTS. Apply 29, Chesham Place, Belgrave Square, S.W.l. or belephone Belgravia 3361.

A SSISTANT 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.

A RCHITECTURAL ASSISTANT required, experienced in industrial building design, in Wembley, Write, giving age, experience and salary required, Box 9097.

A RCHITECT'S ASSISTANTS required Senior and 2 Juniors) for West End Offic Write, stating full particulars and salary r quired, to Box 8725.

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

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

A RCHITECTURAL DRAUGHTSMAN required by multiple shop Co., interesting and varied work, involves a certain amount of travelling, 5-day week, staff canteen, pension scheme. Write, stating age, qualifications, salary required, to Box 9005.

ENSINGTON. ASSISTANT wanted, Inter. Standard, small busy office, interesting work, 5-day week. Salary according to capabili-ties. Phone WEStern 4841.

A RCHITECTURAL ASSISTANTS, Senior and Junior required in busy provincial office for varied and interesting work. Flat accommodation offered with senior post, help given if accommodation required for junior post. Write, stating experience and salary required, to:—Ruddle & Wilkinson, F/L/A.R.I.B.A., Long. Causeway Chambers, Peterborough. Tel.: Peterborough 5248/9.

EXPERIENCED ARCHITECTURAL ASSIS-London firm of architects. Apply, stating experi-ence and salary required, to Box 9145.

A RCHITECTURAL ASSISTANTS with censiderable experience required for general practice, good salary paid to suitable applicants. Reply, stating age and experience, to Thomas Worthington & Sons, 178, Oxford Road, Manchester 13. 13.

JUNIOR ASSISTANT required for Architect & Surveyor's Office, South London. Write, giving full details of age, experience and salary required to H. Wakeford & Sons, 184, Clapham Road, S.W.9.

A RCHITECTURAL ASSISTANTS required for Bristol Office. Applicants should be qualified or of Intermediate standard studying for Final. Varied and interesting work Contributory pension scheme. Write, giving age, experience and salary required, to W. H. Watkir s, Gray, FF.R.I.B.A., & Partners, I. Clare Street, Bristol. I. 2185

A SSISTS.—Inter. and Final standard. Salary according to ability. Office experience essential. Ring AMB 7271. Box 9191.

A RCHITECTURAL ASSISTANTS required for large industrial and commercial development programmes. Good salaries for suitable men, preferably Intermediate to Final R.I.B.A. standard. Write, giving details of experience and salary required: Howard, Souster & Fairbairn, 81. Piccadilly.

A RCHITECTURAL ASSISTANT required by Maidstone Brewery Co. The post is super-annuated. Reply stating age, experience and present salary to Box 9014.

PENING for QUALIFIED ARCHITECTS as Assistant Designers with an expanding firm of new traditional builders. Must have good general practical knowledge and a keen interest in new building methods. A prospect exists for working overseas. Starting salaries range between 2550 and 2750 according to experience, with an increase after six months' satisfactory service. Messrs. Reema Construction Ltd., Milford Manor, Salisbury, Willshire.

A RCHITECTURAL ASSISTANTS required for West End office. Salary £350—£600 p.a. according to experience and ability. Box 9025.

A SSISTANT ARCHITECT required for school work in North London Office. Practical experience and good draughtsmanship essential. Please write with details of age, experience and salary required to Box 9080.

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

A RCE temporar J. Seyn Crescent

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A RC Sussex. and all and co giving Box 90

A RC L and va and co qualific £500— Newton Row, I A RCHITECTURAL STAFF, all grades, wanted, interesting and varied work of contemporary character; light and airy offices. Apply J. Seymour Harris & Partners, 4, Greenfield Crescent, Edgbaston, Birmingham, 15.

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CHARTERED Architects and Surveyors, W.1.

area, require ASSISTANTS with long term view. Inter. to Final standard R.I.B.A. or R.I.O.S., preferably with experience of Commercial and Industrial work, and General Practice. Five-day week. Particulars and when available to Box 9051.

CENERAL ASSISTANT required by busy and expanding London office for work on half-inch details, full-sizes, surveys, etc. Variety of interesting work. Previous office experience desirable but not absolutely essential. Falary £400—2450 per annum or by arrangement. Also ASSISTANT of Intermediate standard or higher for more responsible post; salary from £600 according to experience. Box 9027.

A RCHITECTURAL ASSISTANTS (Two) of Intermediate standard, with office experience, required in Midlands office for interesting works programme. Write, stating full particulars and salary required, to Box 8985.

A RCHITECTURAL ASSISTANT required in small private practice. Should be quick, neat draughtsman of Intermediate standard, preferably with office experience. Apply in writing Deacon & Laing, F/A.R.I.B.A., 9, 8t. Paul's Supres, Bestord Deacon & Laing Square, Bedford.

A RCHITECTURAL ASSISTANT (male or female) required in private practice in Cotswold rural area, exceptionally varied work. Must be excellent draughtsman, able to detail and carry out surveys, car driver. Please give very full particulars of experience, salary required, married or single. Box 9011.

TWO ARCHITECTURAL ASSISTANTS required for busy practice engaged upon a large programme for schools, industrial buildings, offices, etc. Salaries up to £750 and £520 respectively according to qualifications and experience. Five-day week. Write, giving full particulars, to Johns, Slater & Haward, F/A.R.I.B.A., 32, Foundation Street, Ipswich.

Johns, Stater & Hawasu, 1995.

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

A PPLICATIONS are invited for the following: A Company of the Company

FARMER & DARK urgently require ASSIS-TANTS of all grades to work on a wide variety of new large scale industrial schemes. 5-day week; Non-contributory pension scheme. In applying please state experience fully and salary required. Farmer & Dark, Romney House, Tufton Street, Westminster, S.W.1.

CLIVER LAW & PARTNERS (Chartered Architects), 36, Ebury Street, Westminster, require two or three ASSISTANTS (Draughtsmen), some office experience essential. Salaries £600 to £800 per annum, according to experience.

A RCHITECTURAL ASSISTANTS required by B.B.C. in London for work on design of studios, transmitter and office premises. Candidates should be up to intermediate or final R.I.B.A. standard and have had some design office experience. Salary in scales £545 to £785 or £645 to £880, according to qualifications and experience. Requests for application forms to Engineering Establishment Officer, Broadcasting House, London, W.1, within 7 days, quoting ref. EX.27 A.J.

JUNIOR and SENIOR ARCHITECTURAL ASSISTANTS (male) required for London office of private Architect. Applicants should have had some office experience and be conversant with contemporary design. Write, stating salary required and giving full details of experience and qualifications, if any, to Box 9115.

A RCHITECTURAL ASSISTANTS required with office experience, preferably industrial or schools. Salary by arrangement. Liewellyn Smith & Waters, 103, Old Brompton Road, S.W.7.

A RCHITECTURAL ASSISTANT required by large company owning property in Kent and Sussex. Interesting expanding programme of new and alteration work. Pensionable post. A secure and congenial post for the right man. Reply giving age, experience and present salary, to Box 9015.

A RCHITECTURAL ASSISTANTS required at London and Southend-on-Sea in interesting and varied practice for work on schools, churches and commercial buildings. Salary according to qualifications and experience within the range £500-£600. Apply giving details to: Burles & Newton. AA.R.I.B.A., A.M.T.P.I., 25, Bedford Row, London, W.C.I.

A SSISTANT ARCHITECTS 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 R. C. Steel, A.R.I.B.A., Chief Architect, C.W.S. Limited, 90, Westmorland Road, Newcastle-upon-Tyne. 9269

A RCHITECTURAL ASSISTANTS urgently reproduced by the formal properties. State salary required. Fowler, Grove & Haggar, 140, Lodge Road, Southampton. 9283

A RCHITECT'S ASSISTANT required in Mid-lands. Not necessarily fully qualified. Experience in surveying, leveling, estate layout as well as architecture an advantage. Salary range £550—£700. Reply giving full particulars to Box 9281.

ENIOR ARCHITECTURAL ASSISTANT, A.R.I.B.A., required by professional firm in Westminster. Experience in industrial type buildings advantageous. Salary not now quoted as it will be considered on basis of qualifications and experience. Position permanency including staff pensions. Box 9280.

A RCHITECTURAL DRAUGHTSMAN if possible experienced or interested in Exhibition Design, wanted by Exhibition Design Studio.

A RCHITECTURAL ASSISTANT, up to Final standard, required for design work on large power station and industrial buildings, Salary according to experience. Apply Sir William Halcrow & Partners, MM.I.C.E. (Architectural Department), Stanhope House, 47, Park Lane, London, W.1.

JUNIOR ASSISTANT required to Staff Architect in small Drawing Office of Multiple Combine. Able to work with the minimum of supervision. Occasional travelling may be involved. Apply Box 9278.

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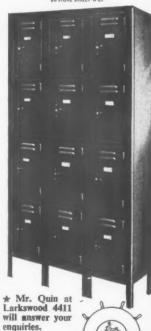
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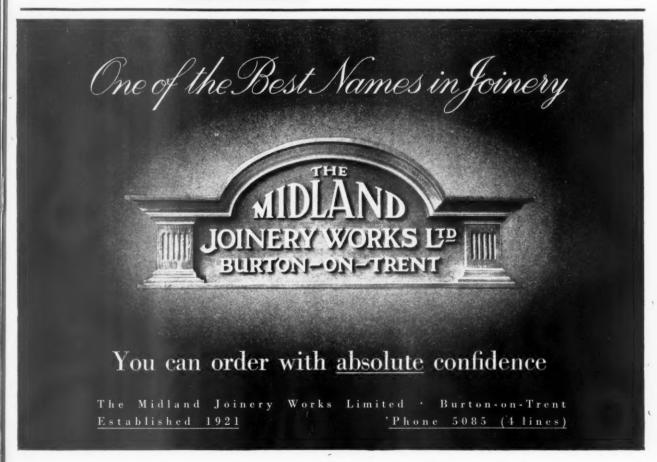
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