THE ARCHITECTS' JOURNAL

standard contents

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

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THE ARCHITECTURAL PRESS
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Registered as a Newspaper.

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

IGE	Institution of Gas Engineers. 17, Grosvenor Crescent, S.W.1.	Sloane 8266
IHVE	Institution of Heating and Ventilating Engineers. 75, Eaton Place, S.W.1.	Sloane 3158/1601
IIBD	Incorporated Institute of British Decorators. Drayton House, Gordon Street, W.C.1.	Euston 2450
ILA	Institute of Landscape Architects. 12, Gower Street, W.C.1.	Museum 1783
I of Arb.	Institute of Arbitrators. 35/37, Hastings House, 10, Norfolk Street, Strand, W.C.2.	Temple Bar 4071
IOB	Institute of Builders. 48, Bedford Square, W.C.1.	Museum 7197/5176
IR	Institute of Refrigeration. Dalmeny House, Monument Street, E.C.3.	Avenue 6851
IRA	Institute of Registered Architects. 47, Victoria Street, S.W.1.	Abbey 6172
ISE	Institution of Structural Engineers. 11, Upper Belgrave Street, S.W.1.	Sloane 7128
IWA	Inland Waterways Association. 11, Gower Street, W.C.1.	Museum 9200
LIDC	Lead Industries Development Council. Eagle House, Jermyn Street, S.W.1.	Whitehall 7264/4175
LMBA	London Master Builders' Association. 47, Bedford Square, W.C.1.	Museum 3891
MARS	Modern Architectural Research Group (English Branch of CIAM). Secretary : Gontran Goulden, Building Centre, 26, Store Street, W.C.1.	Museum 5400
MOA	Ministry of Agriculture and Fisheries. 55, Whitehall, S.W.1.	Whitehall 3400
MOE	Ministry of Education Curzon Street House, Curzon Street, W.1.	Mayfair 9400
MOH	Ministry of Health. 23. Saville Row, W.1.	Regent 8411
MOHLG	Ministry of Housing and Local Government. Whitehall, S.W.1.	Whitehall 4300
MOLNS	Ministry of Labour and National Service, 8, St. James' Square, S.W.1.	Whitehall 6200
MOS	Ministry of Supply. Shell Mex House, Victoria Embankment, W.C.	Gerrard 6933
MOT	Ministry of Transport. Berkeley Square House, Berkeley Square, W.1.	Mayfair 9494
MOW	Ministry of Works. Lambeth Bridge House, S.E.1.	Reliance 7611
NAMMC	Natural Asphalte Mine-Owners and Manufacturers Council. 94-98, Petty France, S.W.1.	Abbey 1010
NAS	National Association of Shopfitters. 9, Victoria Street, S.W.1.	Abbey 4813
NBR	National Buildings Record. 37, Onslow Gardens, S.W.7.	Kensington 8161
NCBMP	National Council of Building Material Producers, 10, Princes Street, S.W.1.	Abbey5111
NFBTE	National Federation of Building Trades Employers. 82, New Cavendish Street, W.1.	Langham 4041/4054
NFBTO	National Federation of Building Trades Operatives, Federal House, Cedars Road, Clapham, S.W.4.	Macaulay 4451
NFHS	National Federation of Housing Societies. 13, Suffolk St., S.W.1.	Whitehall 1693
NHBRC	National House Builders Registration Council. 82, New Cavendish Street, W.1.	Langham 4341
NPL	National Physical Laboratory. Head Office, Teddington.	Molesey 1380
NSA	National Sawmilling Association. 14, New Bridge Street, E.C.4.	City 1476
NSAS	National Smoke Abatement Society. Chandos House, Buckingham Gate, S.W.1.	Abbey 1359
NT	National Trust for Places of Historic Interest or Natural Beauty. 42, Queen Anne's Gate, S.W.1.	Whitehall 0211
PEP	Political and Economic Planning. 16, Queen Anne's Gate, S.W.1.	Whitehall 7245
RCA	Reinforced Concrete Association. 94, Petty France, S.W.1.	Whitehall 9936
RIAS	Royal Incorporation of Architects in Scotland. 15, Rutland Square, Edinburgh.	Edinburgh 20396
RIBA	Royal Institute of British Architects. 66, Portland Place, W.1.	Langham 5721
RICS	Royal Institution of Chartered Surveyors. 12, Great George St., S.W.1.	Whitehall 5322/9242
RFAC	Royal Fine Art Commission. 22A, Queen Anne's Gate, S.W.1.	Whitehall 3935
RS	Royal Society. Burlington House, Piccadilly, W.1.	Regent 3335
RSA	Royal Society of Arts. 6, John Adam Street, W.C.2.	Trafalgar 2366
RSI	Royal Sanitary Institute. 90, Buckingham Palace Road, S.W.1.	Sloane 5134
RIB	Rural Industries Bureau. 35, Camp Road, Wimbledon, S.W.19.	Wimbledon 5101
SBPM	Society of British Paint Manufacturers. Grosvenor Gardens House, Grosvenor Gardens, S.W.1.	Victoria 2186
SCR	Society for Cultural Relations with the USSR. 14, Kensington Square, London, W.8.	Western 1571
SE	Society of Engineers. 17, Victoria Street, Westminster, S.W.1.	Abbey 7244
SFMA	School Furniture Manufacturers' Association. 30, Cornhill, London, E.C.3.	Mansion House, 3921
SIA	Structural Insulation Association. 14, Moorgate, London, E.C.2.	Central 4444
SIA	Society of Industrial Artists. 7, Woburn Square, W.C.1.	Langham 1984
SNHTPC	Scottish National Housing. Town Planning Council. Hon. Sec., Robert Pollock, Town Clerk, Rutherglen.	
SPAB	Society for the Protection of Ancient Buildings. 55, Great Ormond Street, W.C.1.	Holborn 2646
TCPA	Town and Country Planning Association. 28, King Street, Covent Garden, W.C.2.	Temple Bar 5006
TDA	Timber Development Association. 21, College Hill, E.C.4.	City 4771
TPI	Town Planning Institute. 18, Ashley Place, S.W.1.	Victoria 8815
TTF	Timber Trades Federation. 69, Cannon Street, E.C.4.	City 4444
WDC	War Damage Commission. Devonshire House, Mayfair Place, Piccadilly, W.1.	Mayfair 8866
WEDA	Welfare Equipment Development Association. 74, Victoria St., S.W.1.	Victoria 5783
ZDA	Zinc Development Association. Lincoln House, Turl Street, Oxford.	Oxford 47988

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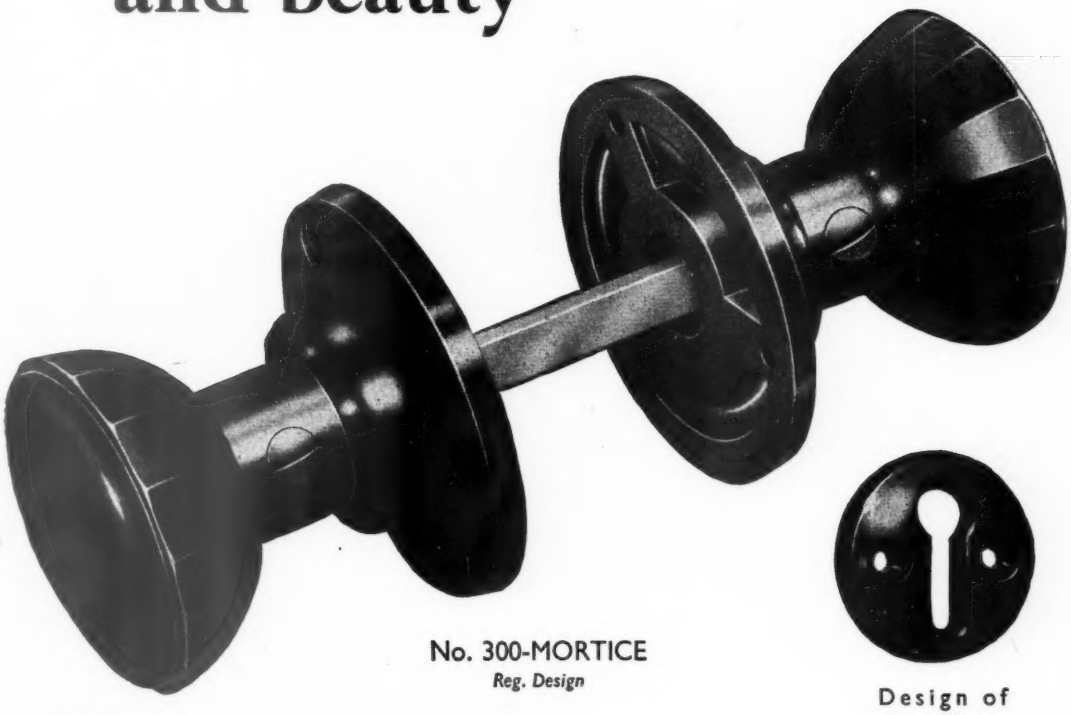
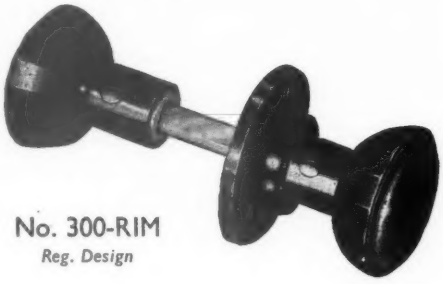


No. 300-MORTICE
Reg. Design

Design of escutcheon



No. 300-RIM
Reg. Design

No. 305 (mortice only), in the same general design as shown, is supplied with the patented "floating" spindle, which dispenses with grub screws yet allows perfect adjustment for any normal door thickness.

In this series, the knob is elegantly shaped, the front being slightly domed and the reverse having a number of flat surfaces which merge into the shank. This combination of plane and curved surfaces produces interesting light reflections, adding greatly to the beauty of the design.

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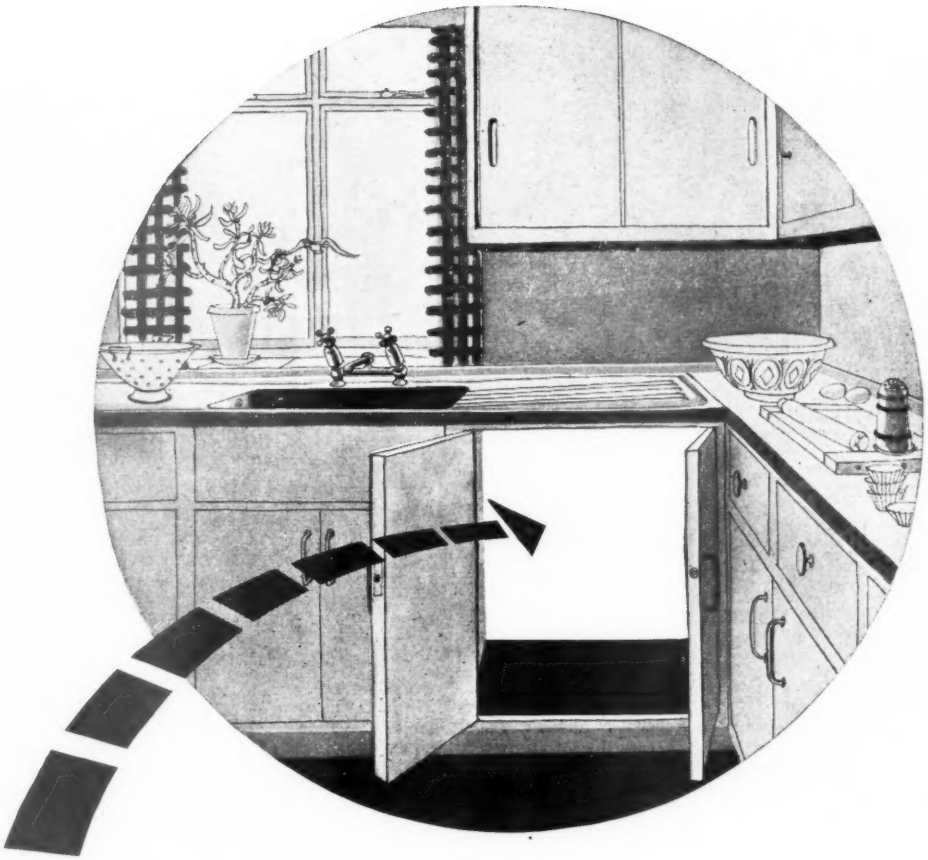

The water heater designed to go under the draining board

for kitchens where every foot of space must serve a purpose

THIRTEEN YEARS AGO, Sadia made a great contribution to the planning of small kitchens. They designed a compact electric water heater 33″ high x 20″ diameter to fit *under the draining board*. This position, because it is low and inconvenient for storing, had hitherto been wasted in most kitchens. With a Sadia type UDB electric water heater tucked away in the space, all kitchen walls are left free for cupboards and shelves.

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★ Two thermostatically-controlled heating elements. ★ A copper tank, twice tested to a pressure of 100 lbs. per sq. inch.
★ Cork insulation—all heat remains in the water. ★ Thermostatic control at 175°.

Sadia Works, Rowdell Road, Northolt, Middlesex. Scottish Agents : W. Brown & Co. (Engineers) Ltd., 89, Douglas St., Glasgow, C.2. Manufactured in South Africa by Sadia Water Heaters (Pty.) Ltd., 3-5 Newton St., Village Main, Johannesburg

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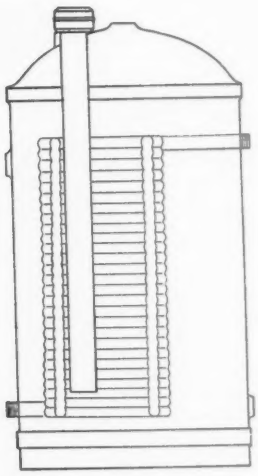
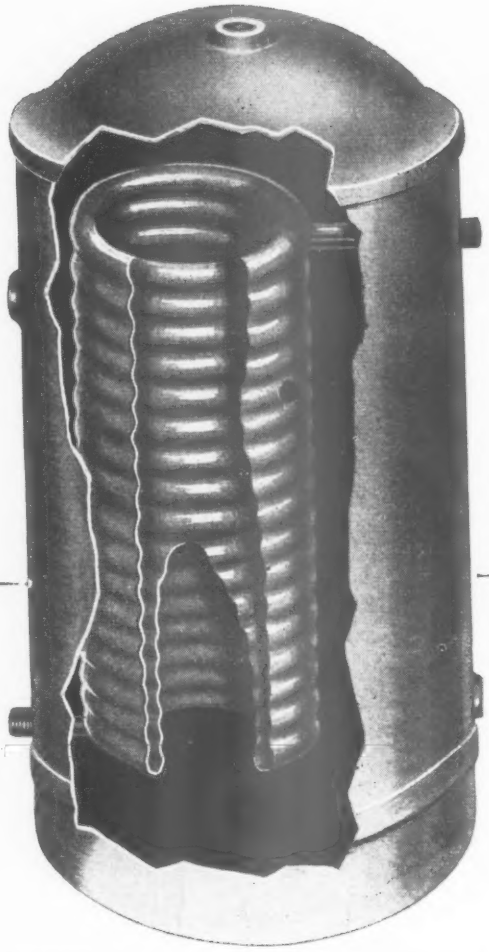
MUS MINUTUS. Because of his light weight, this smallest of British mammals is able to build where few of his enemies could find lodgement and constructs his nest of grass as high as the tallest growing corn will allow.





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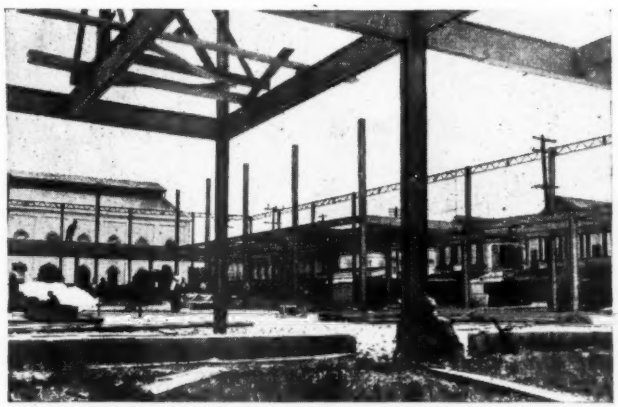
The entire framing of this large building at Georgetown, British Guiana, designed to be heavily loaded on its upper floors, is carried out in 'Duralumin' aluminium alloy. The building is over a volcanic pit, and the cost of piling to take a steel frame would have been prohibitive. The saving in weight by using 'Duralumin' enabled the whole building to be carried on timber piling.

Duralumin 'H' was used for the stanchions: the beams, which are hollow, have top-hat sections of the same alloy, and web-plates in Duralumin 'S'. In the roof structure, advantage was taken of the ease of extrusion of light alloy by using bulb angles, the increased section modulus so obtained permitting considerable extra saving in weight.

'Duralumin' is one of a range of aluminium alloys manufactured and marketed in this country solely by James Booth & Co. Ltd. Our Development Department will gladly give advice, without obligation, on the use of aluminium alloys for structural work.



Top: a general view of the building—for Messrs. Booker Bros., McConnell & Co. Ltd.

Above: the main building under construction, showing 'Duralumin' hollow beams.

The structure was designed by J. E. Temple, Whit. Sch., D.I.C., Consulting Engineer, 9a, Seymour Walk, South Kensington, London, S.W.10, in conjunction with the architects, Messrs. Watkins, Gray & Partners, FF.R.I.B.A., and the sections were fabricated by E. C. Payter & Co. Ltd., Limerick Works, Meeting Street, Great Bridge, Tipton, Staffs. Messrs. John Mowlem & Co. Ltd. were the contractors.

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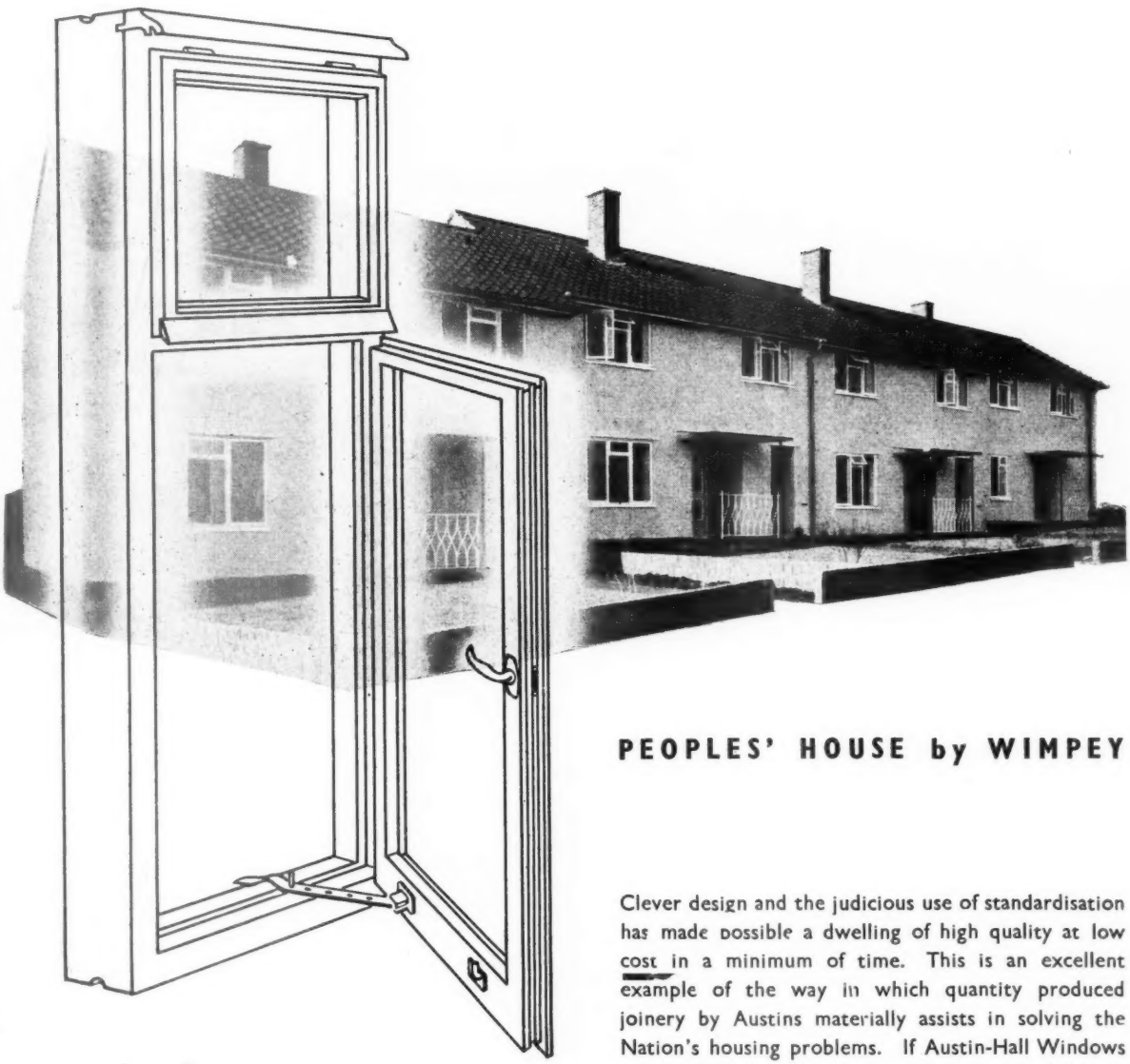
WATERLOO MANSIONS, DOVER
(By courtesy of Dover Harbour Board)



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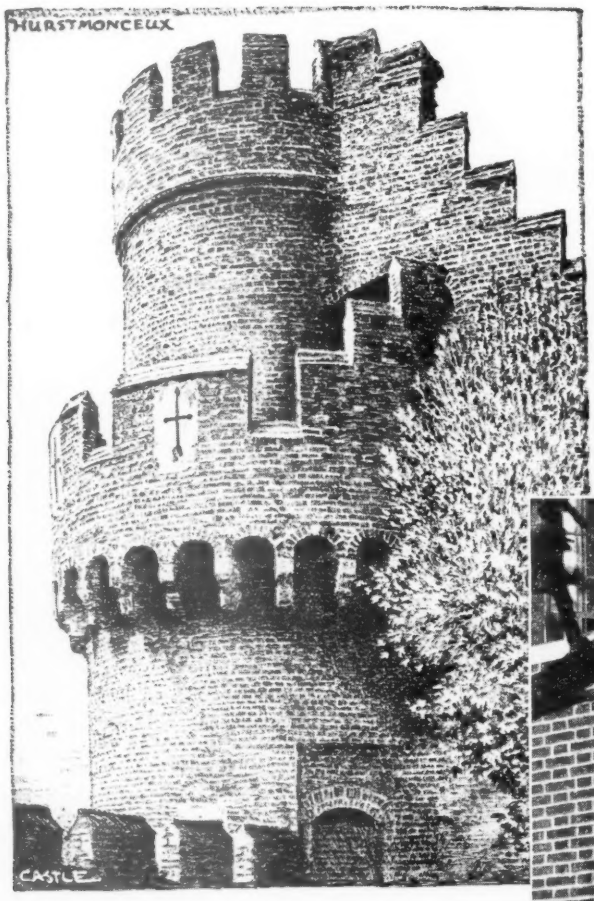
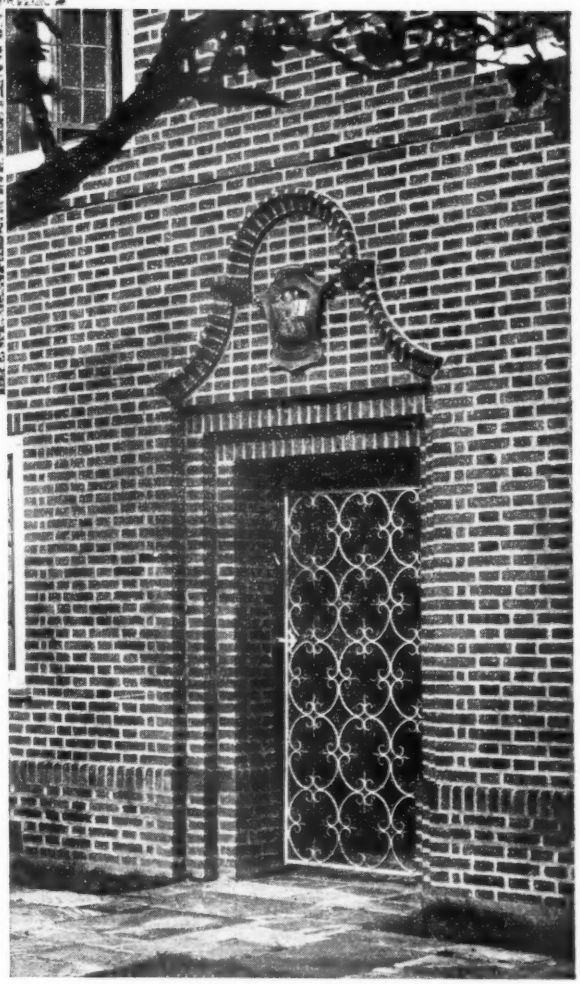


RESISTANCE

to Time

and Weather



A doorway. Fairholme Estate, Bedfont, Middlesex.
Architect : T. Cecil Howitt, F.R.I.B.A.

The passage of years, with its procession of summers and winters, may mellow the tone of brickwork, but a colourful texture remains with it always.

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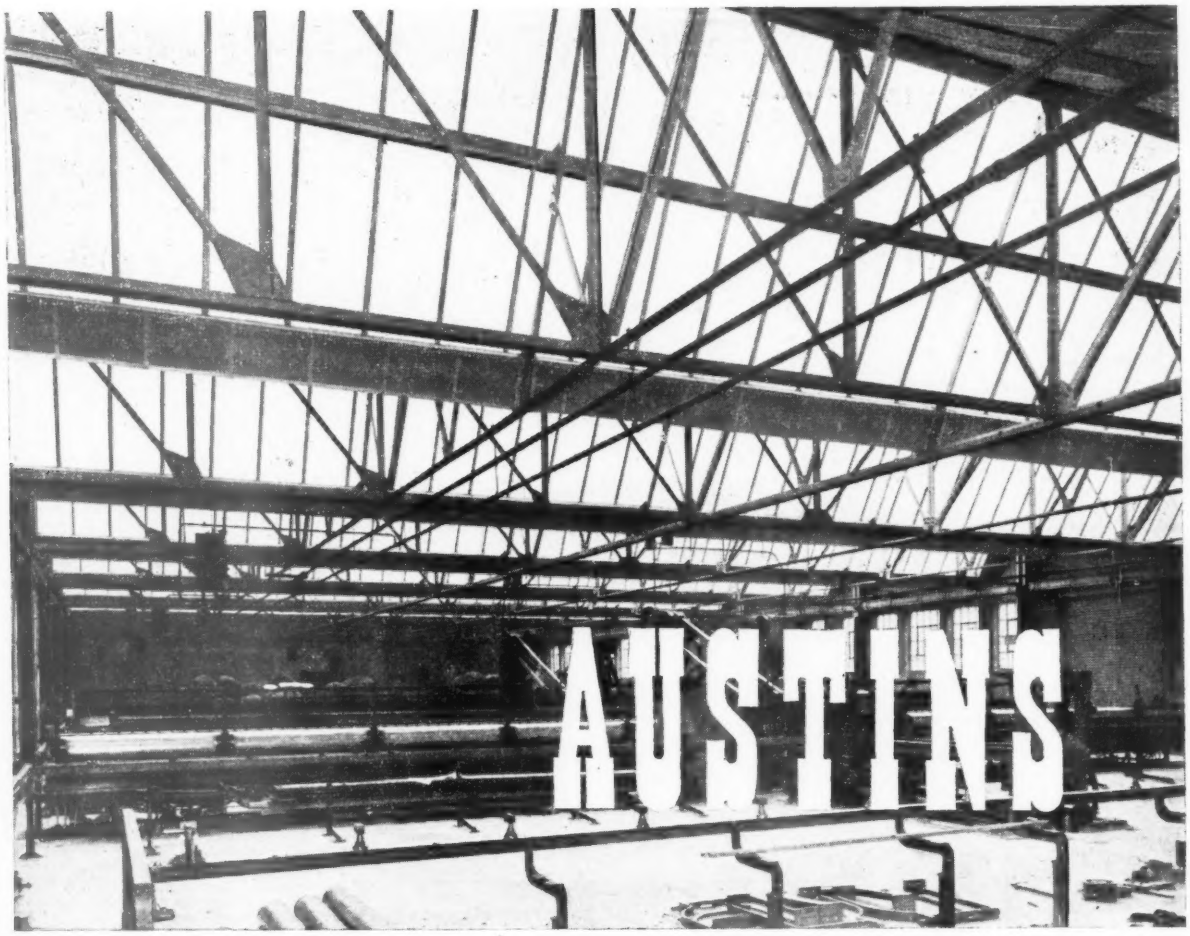

Architects: Messrs. Smith & Currey,
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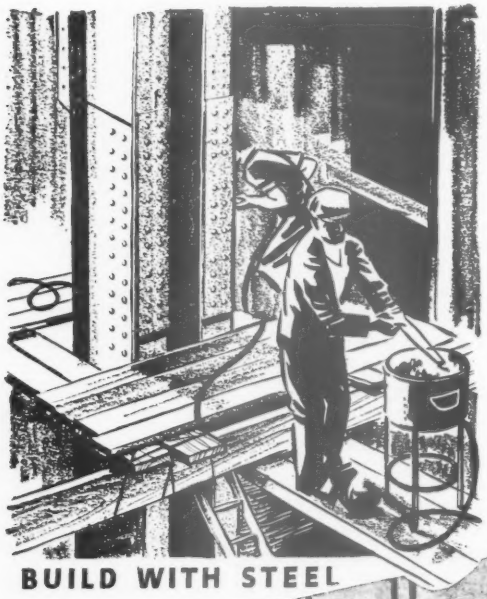

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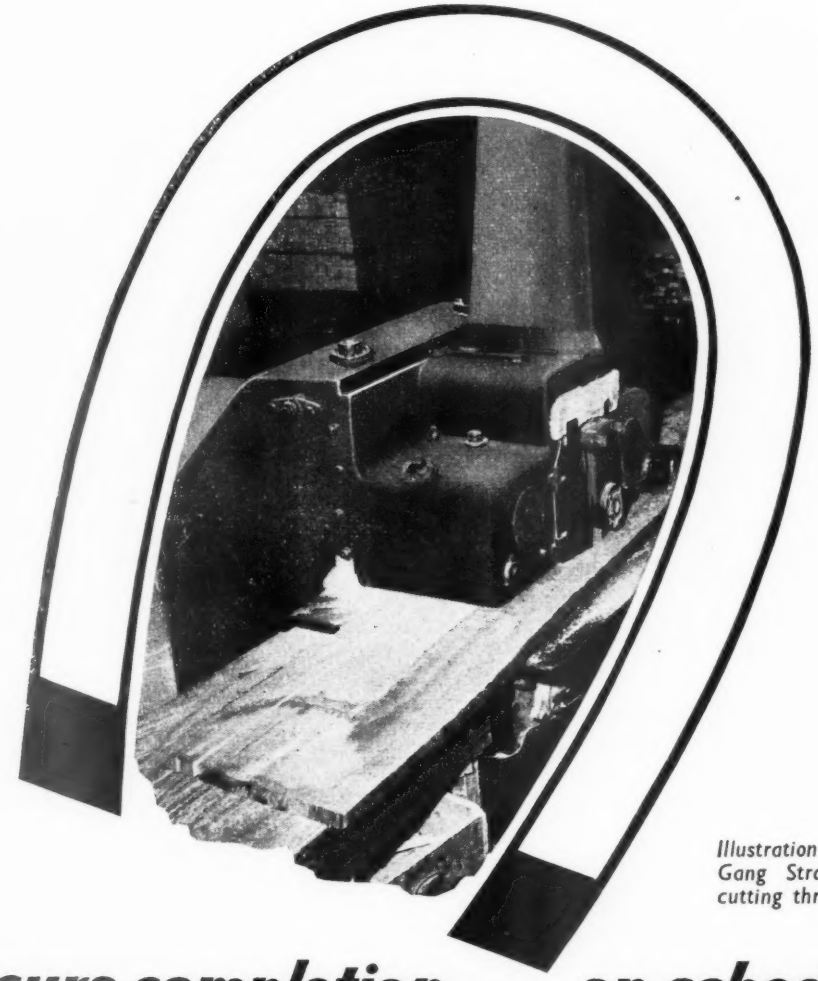

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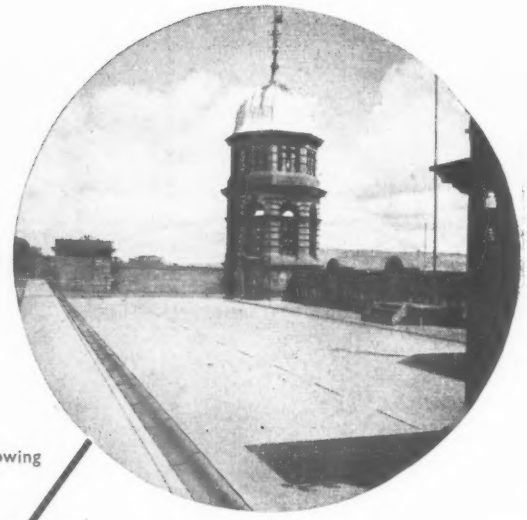
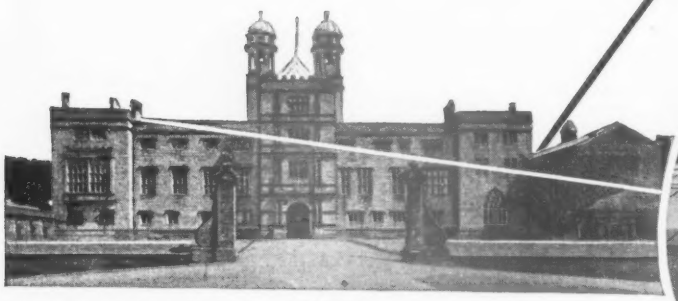
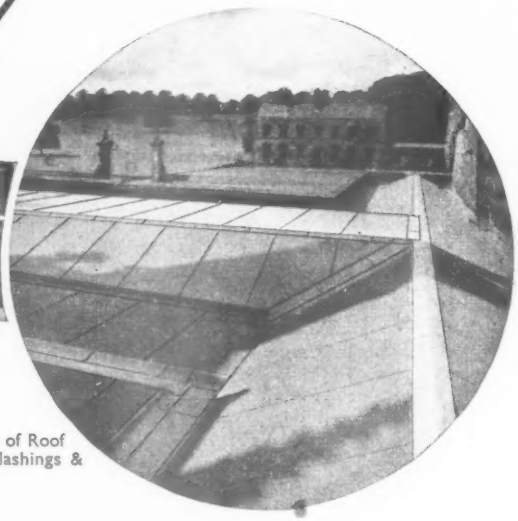


Section of Roof showing Gutters and Outlets.



Stonyhurst College, Hurst Green, Whalley.



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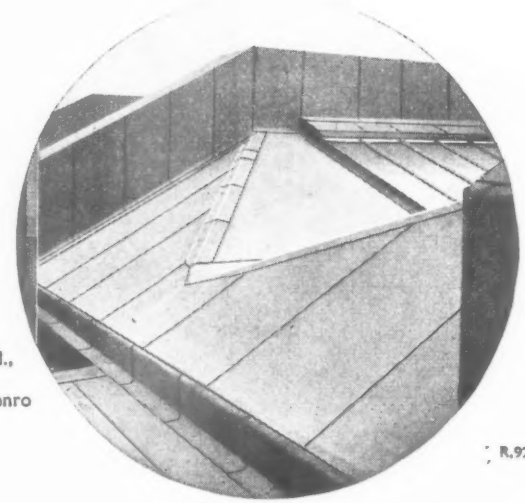

Section of Roof of Macfarlane Lang & Co. Ltd., Osterley.
Architects: James M. Monro & Son.

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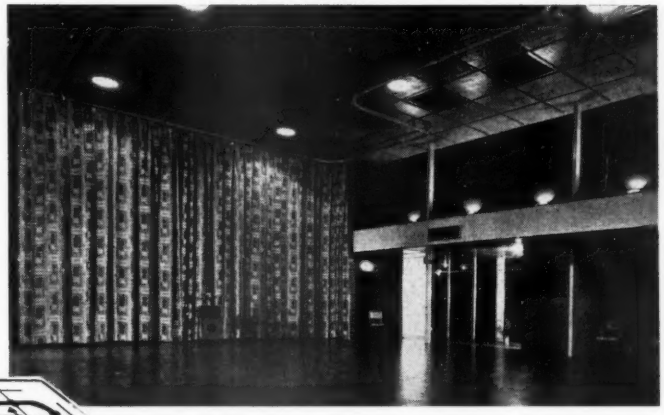
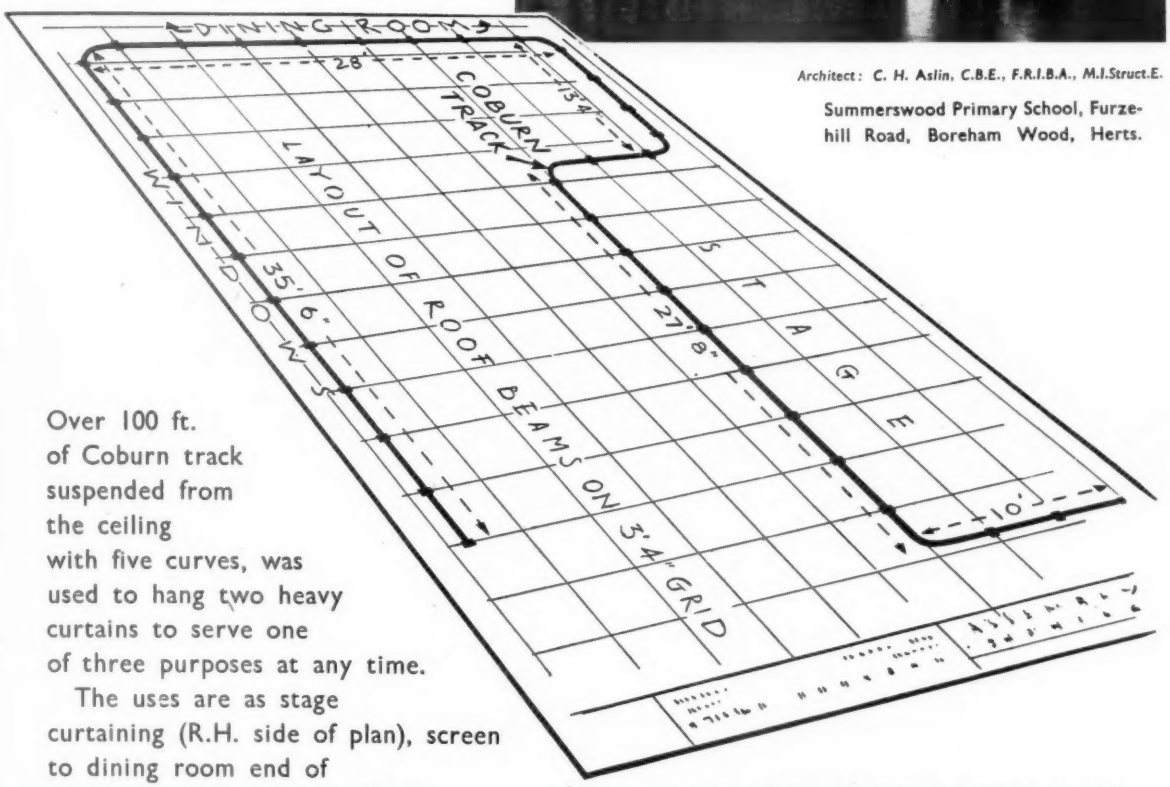


Architect: C. H. Aslin, C.B.E., F.R.I.B.A., M.I.Struct.E.

Summerswood Primary School, Furzehill Road, Boreham Wood, Herts.



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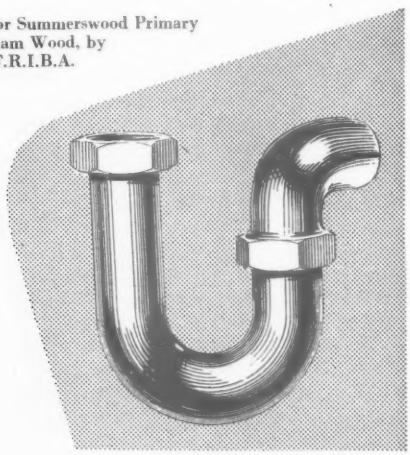

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AJ

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SAVING MATERIALS

Sir Charles Mole at MOW and the heads of the three service constructional departments have prepared a report* recommending a series of constructional standards to which future government and service buildings will conform. (It is also hoped that other authorities and private builders will conform to these standards.)

*

It seems to me that from the architect's point of view the main snag is that while government departments can do whatever they like, the rest of us have to conform to local bye-laws. What do we do, for instance, when asked to increase steel stresses from 10 to 20,000 lbs. for reinforcement? Let us hope that the new model bye-laws will do something to clear up all inconsistencies. We can all help to cut costs if it becomes legal to do so.

*

One way of cutting costs is, of course, to cut down material waste on sites. But that is more the contractor's business than ours.

A NEW NOISE

As ASTRAGAL, like Sir Alan Herbert, is allergic to the noise of low-flying aircraft, he doesn't much like the idea of helicopters running a shuttle service from the South Bank to our suburban airports. But now that aircraft speeds are getting steadily faster, it's obvious that something of the sort must be done. It is ridiculous to spend less time in the air (on the Paris-London run, for example) than you do in the motor coach.

*

Incidentally, one wonders whether the Festival Hall designers had helicopters in mind when planning to keep noises out of the building. The sound of trains—both above and beneath the ground—have been kept out, and maybe helicopters are no more difficult to deal with, though with a south-westerly wind they will presumably come in over the roof.

A SOUND BOOK

Fortunately, ASTRAGAL has never been faced with any major acoustical problem, but he always likes to be prepared for the unexpected, so he recently read Fritz Ingerslev's book, *Acoustics in Modern Building Practice*.* This was originally published in Danish, but has now been translated and revised.

It is a relief to find a book of this kind written by a scientist who understands the architect's point of view. This does not mean that the mathematical side of acoustics theory has been ignored. Far from it; the book has to be read very slowly by ASTRAGAL, whose mathematics are not what they were—not that they ever were, for that matter.

*

The formulæ, though complicated to those of us who normally go no further than looking up answers in the steelwork tables, *can* be followed with a little diligence. For the benefit of the timid, let me add that there doesn't seem to be any calculus.

THE UNESCO BUILDING

The sad story of the UNESCO building in Paris (see my note, March 27) has moved into what one hopes will be its penultimate chapter—to be followed by a happy ending. Whatever the international jury—Gropius, Le Corbusier, Rogers, etc.—may have thought of Beaudouin's design (which, it will be remembered, he produced with the help of Howard Robertson and Saarinen as consultants) they must have been unanimous—as we all were—about the impossibility of that "Beaux Arts" segmental site at the end of the Champs de Mars. They decided to reject the site as well as the design, and there is now a new dawn—*i.e.*, new architects and a new site, given once more by the French Government.

*

There seems to have been a chance—as there was during the earlier negotiations—of Le Corbusier being given the job, which would have aroused a great deal of interest, but, perhaps rightly, it

* *Economy of Building Materials*; HMSO; 2s.

* Architectural Press; 35s.

was not thought proper that it should go to a member of the jury, and the President of UNESCO was told so by one of the consultants. Le Corbusier, nevertheless, has one's sympathy; so, of course, has Beaudouin. The new architects are to be Marcel Breuer and Bernard Zehrfuss, with Luigi Nervi as engineer. The new site is between the Porte Dauphin and the Porte Maillot, adjoining the Bois de Boulogne. All fascinating enough and—if all goes well—something to look forward to. But it does seem as if there is many a slip between the UNESCO cup and the architectural lip.

BLANCHLANDSCAPE

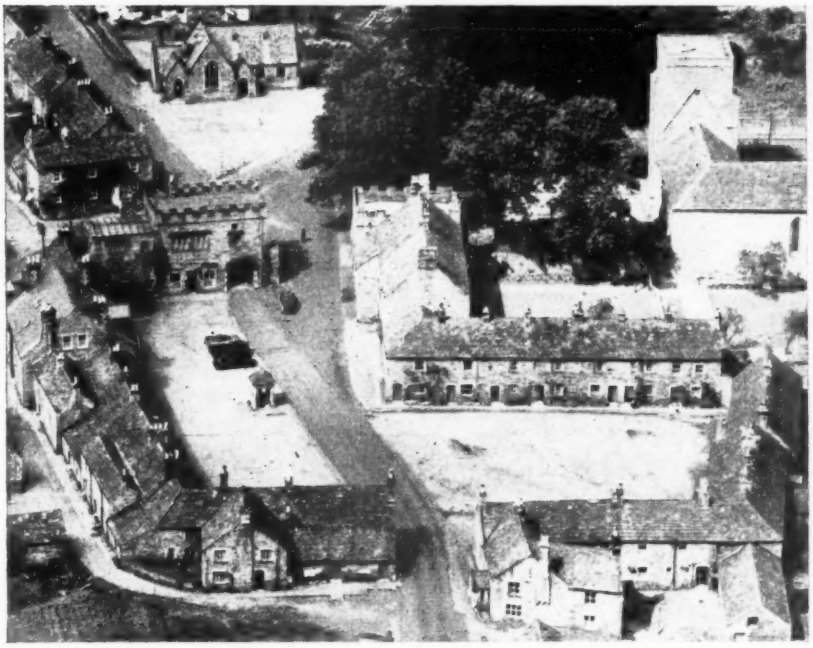
Did you notice last week's AJ frontispiece? It was an aerial view of the village of Blanchland, Co. Durham, and showed the L-shaped village centre—a paved area, surrounded by terraced housing on the six sides with the main street curving through the middle and distinguishable only by the different surface required for vehicular traffic from the remainder of the place. (This area is shown above, right.) There are no narrow, hard-to-mow grass verges, no high curbs, no railings, and no lamp-standards or telephone poles. The houses have no front gardens, no flower beds, and no fences or front gates. What a relief it is. As a result these forty-odd houses achieve a greater sense of urbanity than four hundred houses as commonly laid out today in housing estates or even in our favourite New Towns, currently being extolled in the JOURNAL pages.

*

Of course, the village is sub-standard. No one today can have a house, my town planning colleague tells me, facing directly on to a public way—and it would be a death trap for children who could be massacred by the passing motorist. But what a haven it would be for that neglected individual who hates suburbia and garden cities—who likes to see town life going on outside his window without a screen of shaggy hedges and flowers between (there is plenty of room for the garden at the back of the house) and who thinks the cure for traffic accidents lies more in basic training rather than in half-erected cages in which the respective road users can run berserk.

*

There are two other planning points in the same picture—amongst many—



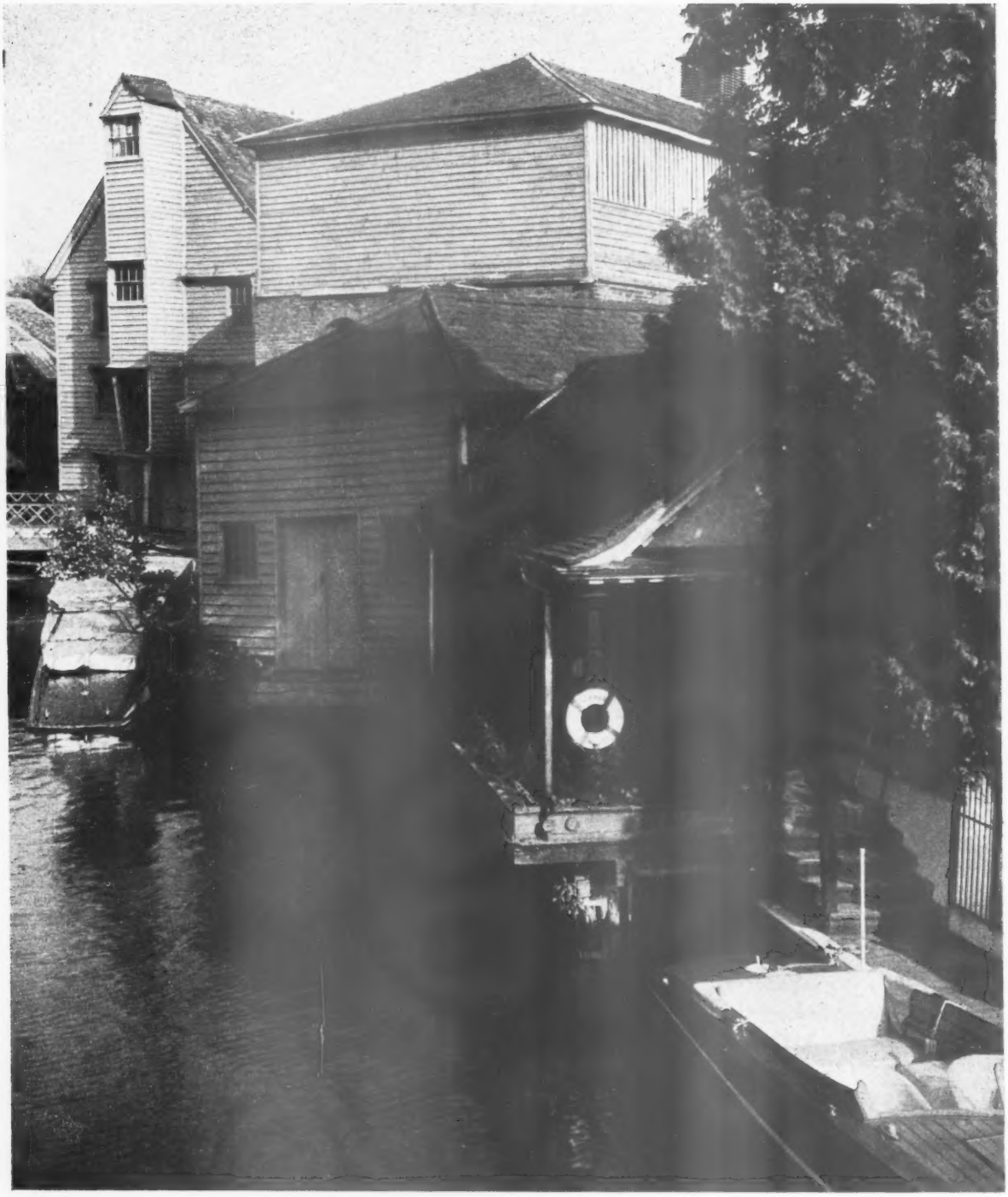
The village of Blanchland. (*Photo: Aerofilms.*) *See* ASTRAGAL'S *note on this page.*

which merit attention. Do you notice the small building—probably the village pump—which gave scale and interest to the centre of the open *place*? What is the 20th century equivalent? Not the drinking fountain or public convenience—that is 19th century. Today, surely, it is the bus stop and the public telephone kiosk. But has anyone given as much sophisticated care to either of these structures in a modern townscape as some unknown gave to this insignificant little building in Blanchland? (If so—examples, please, to the Editors.)

*

The other planning point (have patience—I've nearly finished) concerns the school—a dull bit of 19th century

Right: the Model Room (1719) by Sir John Vanbrugh, Royal Arsenal, Woolwich. *See note on page 155.*



Holiday Architecture

It has been said of Eric de Maré, the author of *Time on the Thames*—shortly to be published by "The Architectural Press"—that his objective is "to create a new civilization based on full unemployment." At this holiday season most of us must feel that this objective—one that Dr. Johnson would have applauded at any time—is laudable. But if our lives are ever to be one round of leisure someone will have to work very hard in the meantime to make our leisure worth having. Mr. de Maré has ideas about that, as readers of his books will know. His new book contains a chapter (once a special issue of *The Architectural Review*) pleading that the Thames should be made a National Park. All conflicts between millers, bolters, fishermen and others who once sought their livelihoods on the river banks are now ended, he says—so why not make the Thames a linear pleasure ground? And why not let a continuous towpath take the happily unemployed through buildings such as the one above—a mill which has been domesticated and enters cheerfully into the category of "holiday architecture"?

Gothic which, nevertheless, forms part of the village scene at the junction of two roads (more massacre of the innocents, I suppose). Now this school helps to create visually—as do so many schools of this and earlier periods—together with church, and pub, and shops—the village centre. There's only about one modern school which achieves this—the Yorke, Rosenberg and Mardall School at Lansbury—where the administration block and the assembly and entrance halls form two sides of what is to be a town square. Usually today the school is a brick henhouse to be seen over the back garden fences of the housing estate. Ringed round by houses it is approached by a long drive and commands a splendid view of backyard clutter. Sans church, sans pub (no licences), sans shops (Nissen-type only) and with the school in Farmer Giles's five-acre, in the average modern neighbourhood centre, there is such a small sense of urban enclosure that you could see to Hackney Marshes . . . if it were not for the houses.

PEVSNER ON LONDON

ASTRAGAL regrets that he has only just got around to reading Nikolaus Pevsner's *London** in the "Buildings of England" series, and to testing some of its "perambulations." It is a truism now to praise Dr. Pevsner's erudition and industrious cataloguing, both of which are miraculous. The real point about this guide is that it sets a precedent by making its closing date 1952 and dealing with the Festival Hall, Rosebery Avenue, etc., as informatively and (almost) as objectively as if they were, say, seventeenth century tombs. This book certainly creates a new class for guides. It is wonderful both in detail and in judgment. The illustrations are excellent. Some of us might like more pictures of the unfamiliar, but the guide is, after all, for the general reader.* For ASTRAGAL this book was worth while since it discovered for him the façade of Sir John Vanbrugh's Model Room at Woolwich Arsenal—a real chunk of dramatic, impressive Vanbrugh baroque in unadorned brickwork. (See page 153.) Some of the other illustrations, too, show the familiar, but in some entirely new and worthwhile aspect.

ASTRAGAL

* Penguin Books Ltd. 6s.

POINTS FROM THIS ISSUE

The Editors

EXPECTATIONS NOT FULFILLED

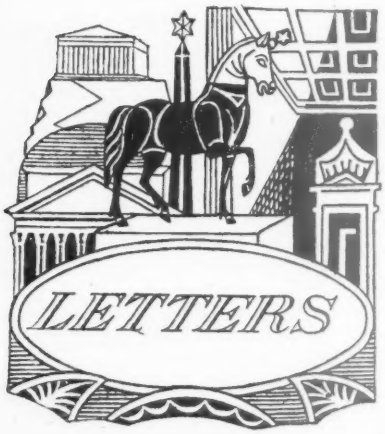
A REPORT* by a committee consisting of the DGW and the heads of the works departments of the three Services arouses great expectations. Unfortunately, these expectations have no been fulfilled. There are few recommendations in this report which architects had not already considered. Some of them are so obvious as to appear ludicrous in print ("Large areas of window . . . should be avoided"); others, so retrogressive that we must ask: "Is the situation really so serious that we should be recommended, for example, to omit plaster finishes and use fairface brickwork instead, or use felt for closing cavities at jambs?" The value of the report lies principally in that it gives official sanction to a number of economies long advocated but frequently frowned upon in official circles: the use of clinker blocks for the inner skin of cavity walling; prestressed concrete for floors and roofs; one-pipe plumbing; 7 ft. 6 in. ceiling heights, and short-bored pile foundations.

An important point is made in the section on maintenance which is equally applicable to building work generally: "It is possible to secure some economy in the use of materials . . . by improving the standard of technical control and supervision." The employment of more highly-trained men for site supervision has long been advocated—the Working Party noted the difference between British and American practice in this respect—but, unfortunately, the report does not say how site supervision might be improved.

One of the most serious defects of the report is the conflict between the section on building (concentrating as it does on short-term economies) and the section on maintenance. Many of these short-term economies, such as the substitution of gloss paint for terrazzo and tiles, not only reduce standards of aesthetics and hygiene, but also increase maintenance requirements. Another defect is one inherent in the problem of saving materials; the saving of one material, e.g., brickwork for parapet walls, often necessitates the use of another material (in this case, metal for a protective railing). Although the report lists four scarce materials in order of priority—steel, cement, bricks, softwood—it suggests as substitutes other materials that are by no means plentiful, or are expensive.

It is impossible to satisfy the conflicting requirements of materials' economy, cost economy *and* maintenance economy. This report represents another stage in the battle of Economy *versus* Standards. Regular readers of the JOURNAL will know on which side the editors stand.

* *Economy of Building Materials.* (HMSO, 1952. 2s.)



P. G. Beresford, A.R.I.B.A.

The Linear House: "Preservation of the Vista"

SIR,—I cannot refrain from adding my own to the other excited cries of joy which have greeted the linear house (AJ: July 3). Here is an example of the way in which discerning study of the past may be employed to further the growth of contemporary design. The vista, a device so well used by great architects of the past, is happily adapted for the use of architects whose work, though no less great, is of necessity on a smaller scale.

It occurs to me that it is the smallness of the twentieth century house which has been robbing our architecture of the grandeur of the past. Economic factors prevent us from building large palaces, in their full scale, and force us to erect those "scaled-down" versions which fill our housing estates. If only the people could be "scaled down" too! However, your suggestion has shown us an alternative to this wilderness of big people in little palaces. Instead of proportionately reducing the whole palace, we may now keep one bit of it at its proper scale and size and simply remove the remainder altogether. This gives us palace scale with council house size. And what a happy thought is this, in the linear house, to select for preservation the vista, the prettiest part of all ancient architecture. Away with the outmoded servants' quarters, the halls, the salons; away with them all! Let us keep only that gem of purest architecture, the vista.

With a little ingenuity we can as you have shown, replace the out-of-date ornaments of the past with the as-yet-fashionable ornaments of today, and embellish our vista with the open stair, the open screen, and the ever open kitchen cabinet.

I am impressed also by the way in which the linear house demonstrates the prodigality of this machine age. In the Dark Days it might have been as much as a day's journey between one pleasant vista and the next. But now, by exploiting the resources of science, we can have a vista every ten feet, down both sides of the street, and every one as magnificent as the last.

This is the first time I have seen a modern house deliberately designed to produce Pure Architecture in this way, but you may be interested to hear of one or two accidental cases of Vistascape which have come to my notice. The house in which I used to live was, by some accident in its planning (it was only a cheap house), so contrived that by opening a couple of doors, one could stand in the kitchen and look diagonally through the house and right across the road outside, a distance of some hundred and fifty feet. Then again, many new houses have a living room stretching from front to back, with large windows in both ends. Here I find that by standing in the back garden and looking through the house, and through the house opposite, one may enjoy a vista of the best part of a mile and a half.

Such cases as these are, of course, unplanned, and are liable to confuse the æsthetic sense if allowed to go unchecked. For this reason I was glad to see that the french windows at the rear of the linear house have obscured glass to prevent the vista from spreading into the open air. It seems questionable whether the advantage of extending the vista a distance of some eight feet by opening these windows is an adequate compensation for the danger that once unbuttoned the vista may extend itself considerably further. Vistas have been known, under such circumstances, to reach the sky, and it would be hard to justify such a length in the case of houses with subsidised rents.

Apart from this note of warning I have, as I say, nothing but praise for the linear house. Architects have spent too long in vain attempts to produce new architectural solutions out of the new problems of today. Your linear house shows a refreshing and welcome return to the principle of preconceived ideas fearlessly imposed.

P. G. BERESFORD

London.

[After taking careful note of all Mr. Beresford has to say we are still interested in serious comments from readers on the principles of the Linear House.—ED.]

Coronation Plans

E. Bedford, Chief Architect of MOW, will be responsible for the design of all the structures to be erected in connection with the Coronation in and around Westminster Abbey and on the procession route. Sir Giles Gilbert Scott has been appointed to advise the City of London on its scheme of decoration. He will work in collaboration with Sir Hugh Casson—who is advising the City of Westminster—and the MOW architects.

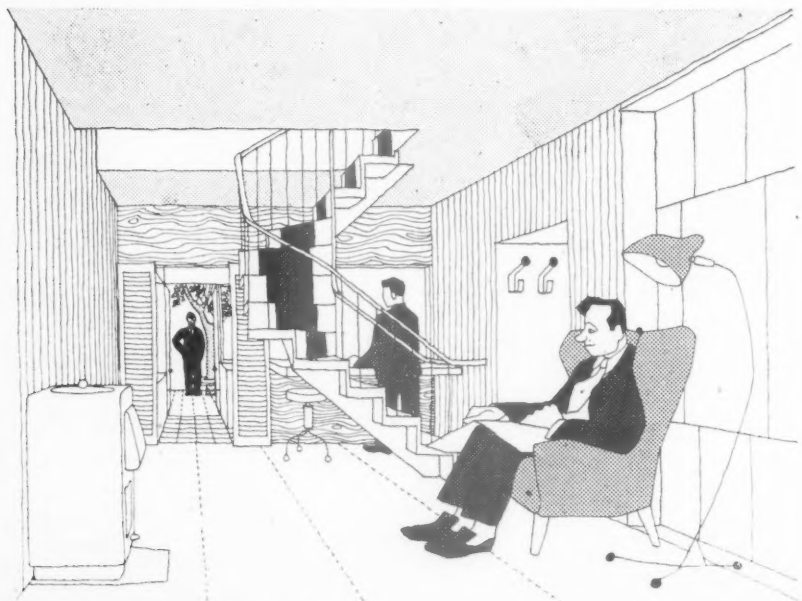
An annexe is to be built at the west end of Westminster Abbey. It will be used to assemble the Coronation procession. "Its design," said Mr. Eccles, "will give an opportunity to harmonize a modern structure with the ancient grandeur of the Abbey." Parliament Square and Broad Sanctuary are to have special stands (not the tubular-scaffolding type to be used elsewhere); government buildings along the route are to be floodlit and, in general, brighter colours are to be used.

When the designs are ready (probably this autumn) Mr. Eccles is to make them available to the Press.

Materials' Economy Report

The greater use of prestressed concrete (for floor and roof spans between 15 and 35 ft.), short bored piles (for foundations deeper than 2 ft.), clinker blocks (for the inner skin of cavity walls and for partitions), hardwood window frames (in *lieu* of purpose-made steel casements), and thermoplastic tiles (in *lieu* of more expensive floor coverings) is recommended in a report on economy in the use of building materials published last week.*

* *Economy of Building Materials.* (HMSO, 1952, 2s.)

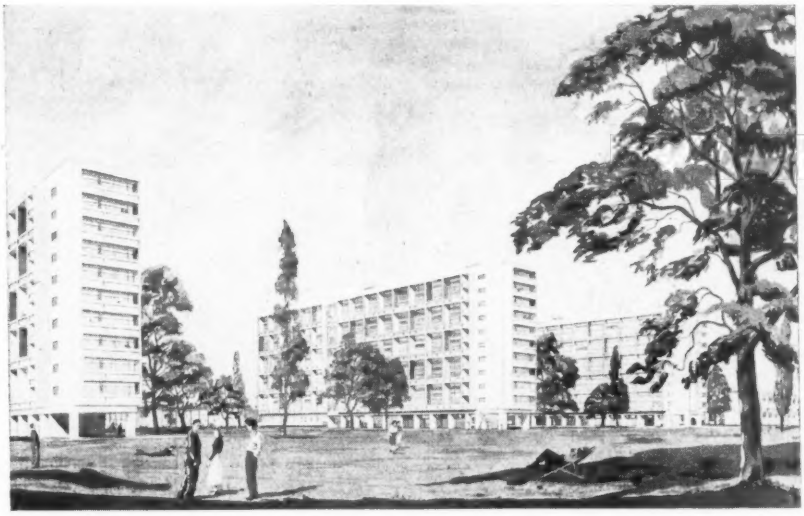


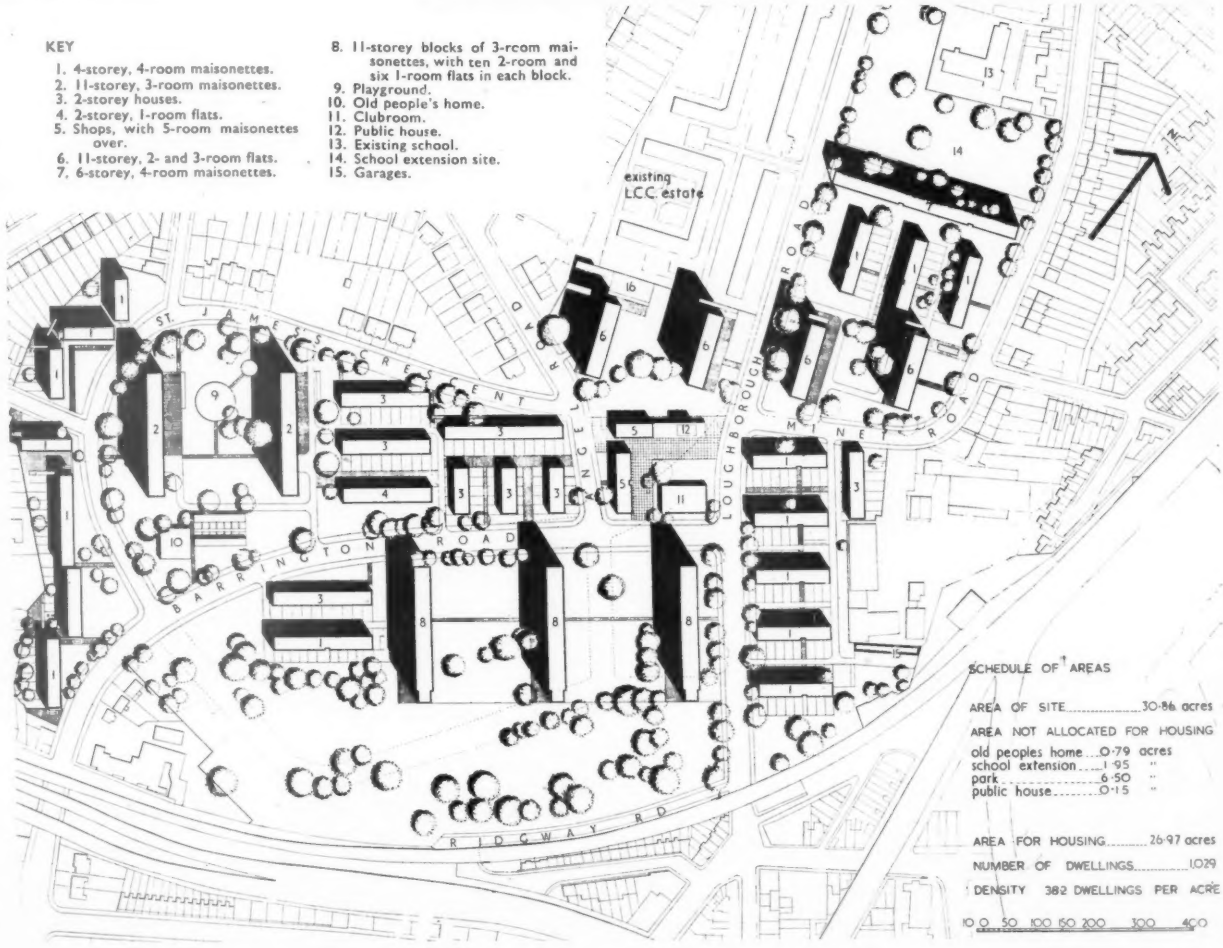
A sketch by Gordon Cullen illustrating the principles of the Linear House which was described and illustrated in the JOURNAL *for July 3.*

PROPOSED LCC ESTATE AT LOUGHBOROUGH ROAD, LAMBETH

(Photograph above by courtesy of Municipal Journal)

Below is a detailed site plan of the proposed LCC housing estate at Loughborough Road, Lambeth, which was described briefly in last week's JOURNAL. *Of particular interest are the eleven-storey blocks of three-room maisonettes, seen in the cross section of the site above and the perspective drawing on the right.* (*Plans on page* 158.) *The Housing Division of the LCC Architect's Department has developed these blocks as a means of providing an adequate number of three-room dwellings; grouping them in tall blocks makes it possible to provide larger families with maisonettes or houses with gardens.*

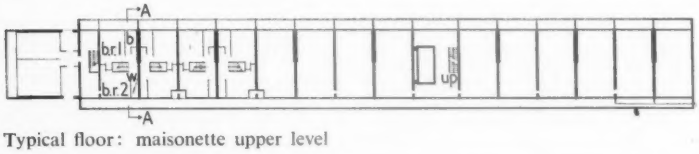




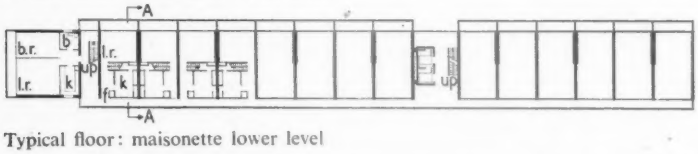
NEW LCC DESIGN FOR 3-ROOM MAISONETTES

It is proposed to erect on the LCC Loughborough Road estate five eleven-storey blocks of unusual design. The ground floor of each block comprises six one-room flats, laundry, tenants' stores, etc. Above are 70 three-room, 697 sq. ft. maisonettes (see plans above; scale ⅛ in. = 1 ft. 0 in.). In addition, in three of the blocks, there is one two-room flat on each of the upper floors. (See plans below.) Advantages claimed for this arrangement are: that tenants prefer maisonettes to flats; that they are more economical as intermediate floors can be timber; that, where central heating is not employed and solid fuel is used, the grouping of flues is simplified; that savings can be made on frontage, as the problem of avoiding bedrooms on the access balcony side does not arise.

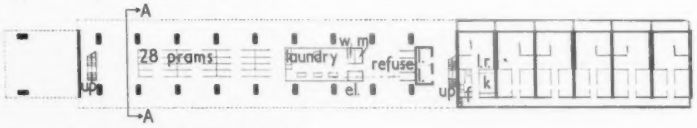
Section A-A



Typical floor: maisonette upper level



Typical floor: maisonette lower level



Ground floor plan [Scale: 3/64" = 1' 0"]

The report, which covers building, heavy civil engineering, maintenance, airfield construction, mechanical and electrical engineering and steel economy, has been prepared by Sir Charles J. Mole, Director-General of Works, MOW, Sir F. Arthur Whitaker, Civil Engineer in Chief, Admiralty, G. H. Fretwell, Director-General of Works, Air Ministry, and Major-General L. D. Grand, Director of Fortifications and Works, War Office. It has been framed to save scarce materials in the following order of urgency: steel, cement, bricks, softwood, and the authors ask members of the architectural and engineering institutions to give their findings the widest possible circulation.

"Within the government itself, steps should be taken," says the report, "to see that other departments (*i.e.* other than MOW and the three services) concerned with works and standards and with licensing are made aware of the principles and conclusions" set out in the report.

(See editorial comment on page 155.)

Export of Buildings

Within ten years, Britain may be exporting prefabricated buildings to the value of between £50 million and £100 million a year. Speaking at Leicester recently, David Eccles, Minister of Works, said that there was a wide market in the Commonwealth and in undeveloped territories for building materials and prefabricated houses. There was, he said, an unlimited demand for the type of building which could be broken down into pieces, packed in crates, sent abroad and re-erected on the site.

LAND BOARD

Annual Report

Many purchasers of land are disregarding the Central Land Board's advice not to pay building value for land if they will have to pay development charge in addition. Presumably they do so because they are willing to pay an excessive price for land they require urgently.

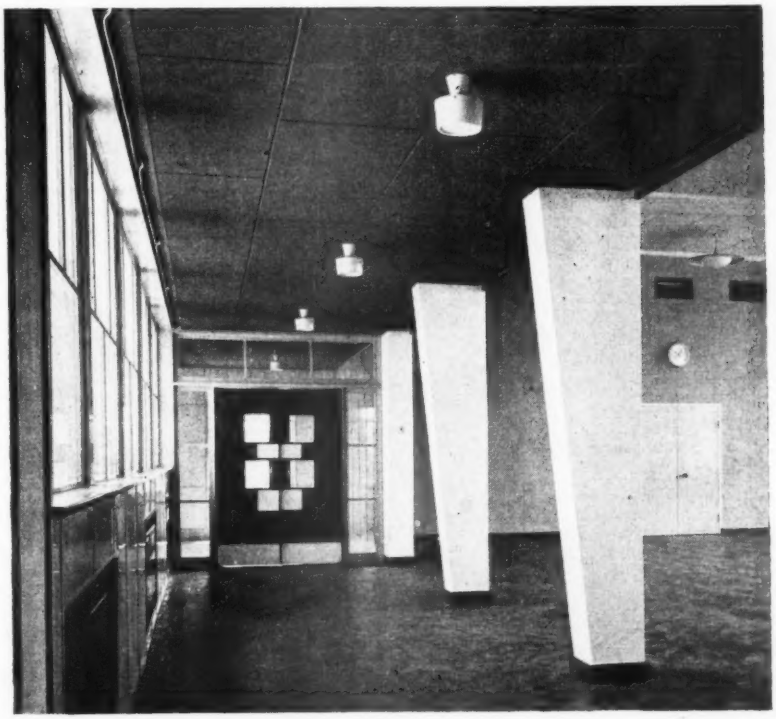
In its annual report for the year ending March 31, 1952 (HMSO, 6d.), the board states that most sales are taking place somewhere between existing use value and building value, or at building value. But when it is at building value, there is usually—though not always—an assignment to the purchaser of the seller's claim on the £300 million fund.

Ten Compulsory Purchase Orders were made during the year, including one in Wales and one in Scotland, bringing the total to 35. The board says the effect of its powers of compulsory purchase is apparent from the fact that some owners have agreed, as a result of the board's intervention, to sell their land direct to the board's applicants, either at existing use value or at a price inclusive of development charge for which the owner takes responsibility.

The board has now (March 31) issued over 750,000 statements of proposed development value in respect of claims on the £300 million fund—93 per cent. of the total; issued or prepared over 640,000 determinations of development value, of which nearly half were nil or *de minimis*; paid nearly £800,000 in respect of nearly 3,000 claims on properties the subject of value payments under the War Damage Act, 1943 and received development charges in cash amounting to nearly £4 million, of which nearly two-thirds was for housing development. A further £1¼ million was set off against claims by builders and owners of single house plots.

OLD PALACE PRIMARY SCHOOL, POPLAR, LONDON, E.3

The Old Palace School in St. Leonards Street, Poplar, was designed by Cecil C. Handisyde, in association with Hammett and Norton, for the London County Council. (Architect to the Council, Robert H. Matthew.) The consulting structural engineer is Felix J. Samuely. The photograph above shows the south facade of the classroom wing. The sculpture in the foreground is by E. Bainbridge Copnall. On the left is a view of the first floor assembly hall. This school for 240 juniors and 160 infants has been built on a restricted site of one acre, which previously contained a school destroyed by bombing. The area will be extended to provide additional "play-courts" and an entrance from a quiet road, instead of from a busy main road at a future date. The school will be illustrated fully in a later issue of the JOURNAL.



MOHLG

510 Objections to Kent Plan

The Minister of Housing and Local Government has received 510 objections to the Kent Development Plan (Part A), which deals with more than 900,000 acres of urban and rural land.

A statement from the County Council says: "It is understood that many of the objections relate to highway proposals. This is not unexpected because road projects have had to be shown in the plan diagrammatically, and thus the plan does not indicate precisely which properties may be affected by future road schemes."

The proposals now embodied in the plan were exhibited at eleven centres in Kent a year ago when they were in the drafting stage. Part A of the plan was submitted to the Minister on March 31 and has been on deposit for inspection by the public for the last three months.

The Minister is expected to hold a public inquiry into the proposals later this year. He had agreed, however, not to hold the inquiry before October 19, so that remaining differences of opinion may be discussed and perhaps settled. Many points of disagreement were resolved at talks held by the County Council with other bodies during the drafting stages of the plan.

Part A of the plan relates to the whole of the administrative county, except certain localities in north-west Kent, on or near the bank of the River Thames between Erith and Shorne. These localities will be subject of Part B of the plan. This will be drawn up by the County Council in consultation with other bodies when the Minister has made certain important decisions regarding the extensive cement workings in that part of Kent.

HOUSING

Release of Requisitioned Property

The National Requisitioned Property Owners' Association has submitted to the Government working party on requisitioned property a scheme for the progressive release of this property. There are 80,000 requisitioned houses in England and Scotland; of these, 16,000 belong to people seeking the release of their property on grounds of hardship. The association is, at present, concerned only with these 16,000 houses. It suggests that one out of every three publicly owned houses or flats erected in London, Greater London or Outer London, should be allocated to people living in requisitioned property, and that a special committee be set up to deal with the transfers of tenants.

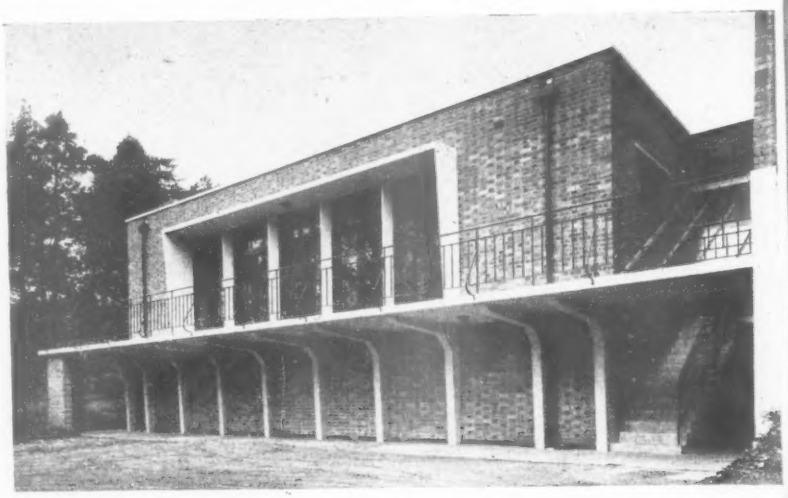
The association states that it believes this scheme would deal with all hardship cases within a year, with advantage to all parties concerned.

DIARY

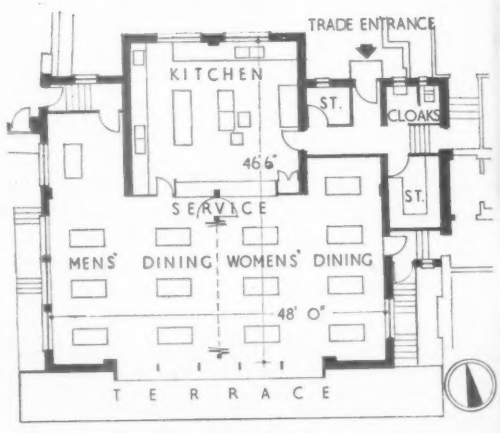
Architects of Tomorrow. Exhibition of work by students of Polish University School of Architecture; Department of Architecture of Kingston School of Art; Department of Architecture of City of Canterbury College of Art. At Building Centre, Store Street, Tottenham Court Road, W.C.1. 9.30 a.m. to 5 p.m. Saturdays: 9.30 a.m. to 1 p.m.
UNTIL AUGUST 16

Town and County Planning Summer School. At Bangor. (Sponsor: TPI.)
AUGUST 23-30

CONVALESCENT HOME AT BOURNEMOUTH



Two private houses in Branksome Wood Road, Bournemouth, have been converted into a Roman Catholic convalescent home on a site with a steep slope from north to south and a more gradual slope from east to west. A new dining hall and kitchen extension was required to serve both houses and has been designed by Archard, Worrow and Hardy. Access was required from each house internally and externally by covered ways. The dining hall is constantly used for social functions. The walls are of load-bearing brickwork and the roof is concrete. Floors are wood block and joinery is in oak. The kitchen installations are designed to meet all general forms of meal preparation. Above is the south facade of the extension and below is a view looking north-east. The contract price was £10,650, about 4s. 10d. per cub. ft. General contractors, James Drewett & Sons, Ltd. Sub-contractors, page 180.



Plan of extension [Scale: 1/8" = 1' 0"]

PRIMARY SCHOOL

in FURZEHILL ROAD, BOREHAM WOOD, HERTS.

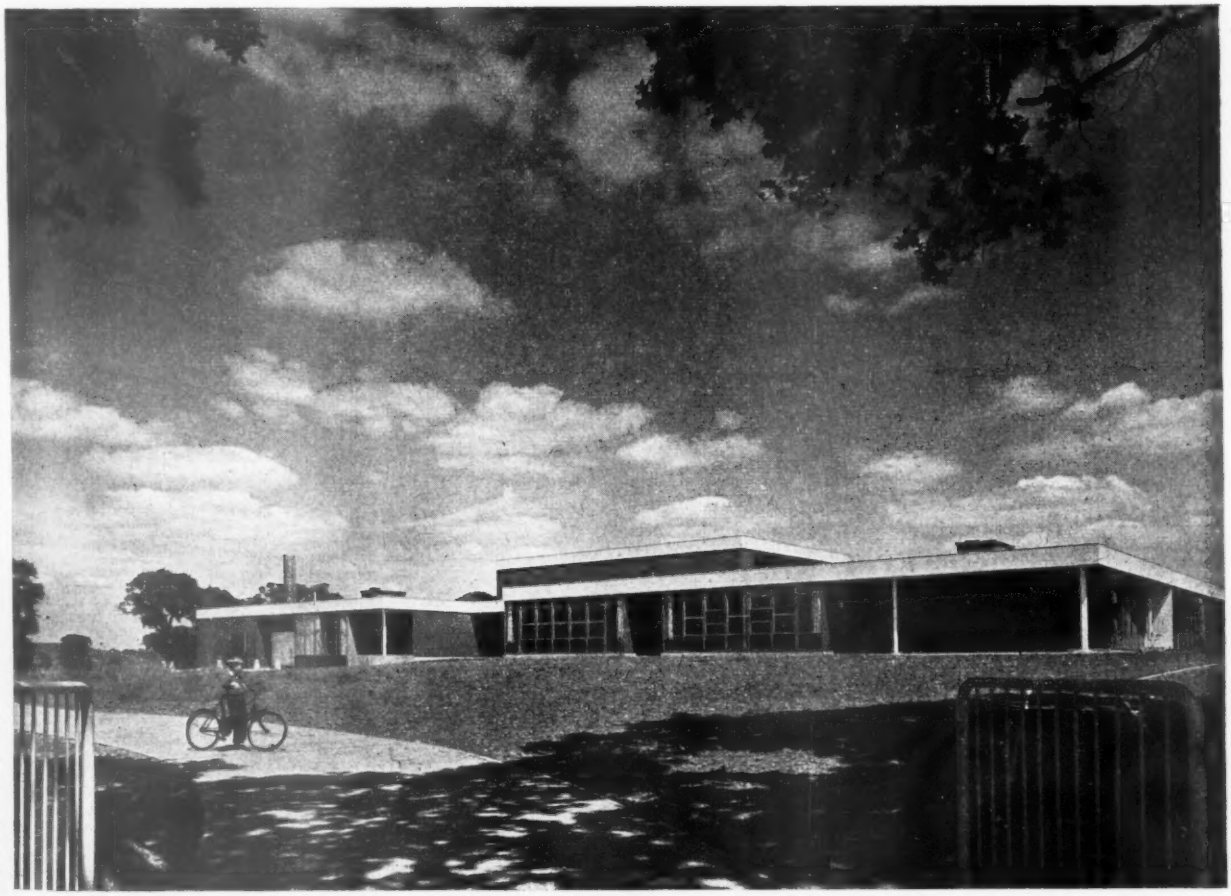
C. H. ASLIN, County Architect

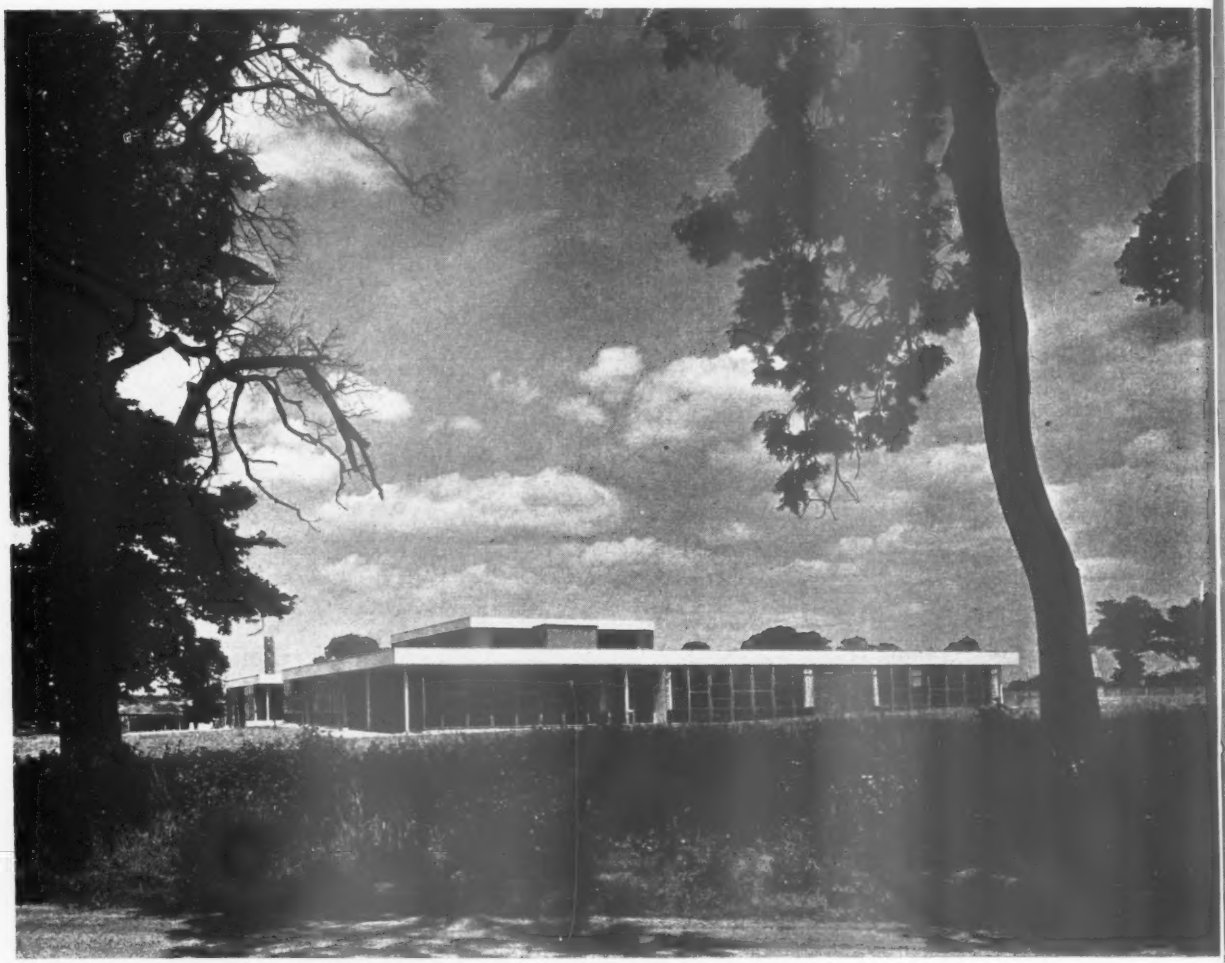
chief assistant, BRUCE MARTIN

The west facade: main entrance on the left.

The Summerswood Junior School for 320 pupils, which was opened on May 12, 1952, was designed in September, 1950 and included in the first part of the 1951 programme. The design, therefore, preceded the revised MOE regulations of 1951 and the new plan arrangements of the second part of that year.

View from the main entrance gates.





Above, the south and west facades seen from Furzehill Road.

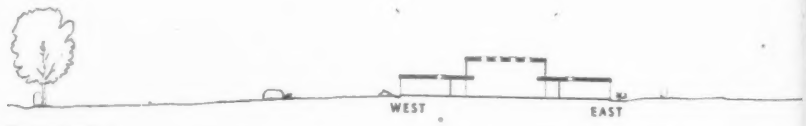
PRIMARY SCHOOL

at BOREHAM WOOD, HERTS.

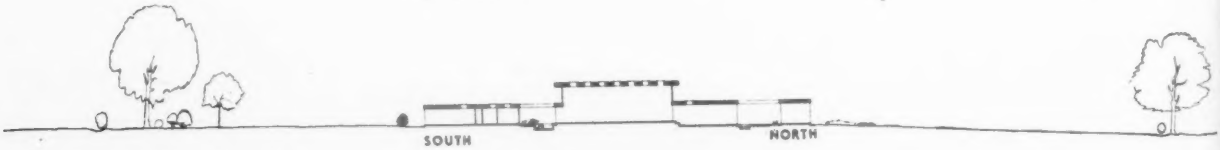
C. H. ASLIN, County Architect

SITE.—The site is hilly with sharp falls to the north, east and west, and with high trees on the north-west, south-west and east boundaries. The main approach is from Furzehill Road, but there is additional access to the site from adjoining housing areas to the north and south. The plan is on two levels to follow the fall of the ground and minimise excavation and alteration of the subsoil, which is London clay.

PLAN.—The total area of this two-form entry school is 14,000 sq. ft., a reduction from the usual 20,000 sq. ft. or more of previous primary schools, gained by the compact arrangement of the plan. The accommodation is the same as in previous primary schools of this type. The plan combines a regular structural layout with a free arrangement of wall panels. The structure gives wide spans with only 46 stanchions, in four lines placed along the brow of the hill, and the free arrangement of panels enclosing the spaces required and controls, lighting, colour and sound. To control sound transmission, all classrooms are separated from each other by stores, heating units and lavatories. To reduce



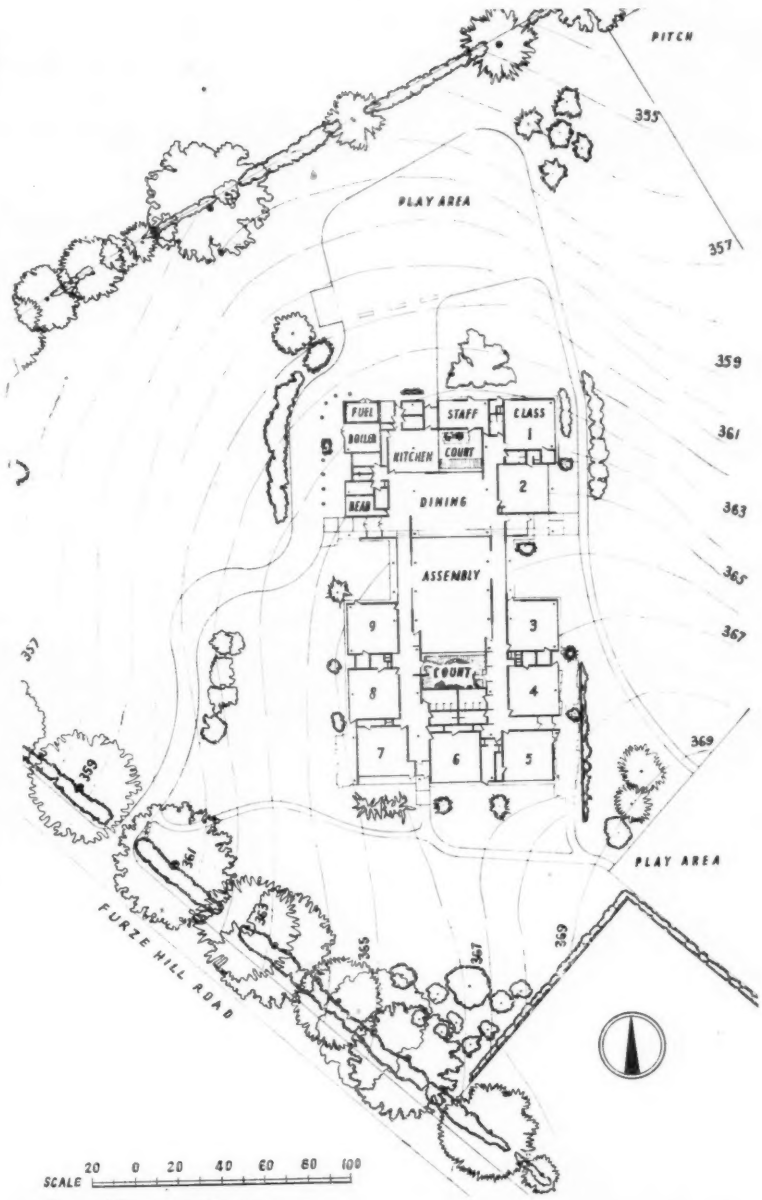
Cross-section



Longitudinal section through site

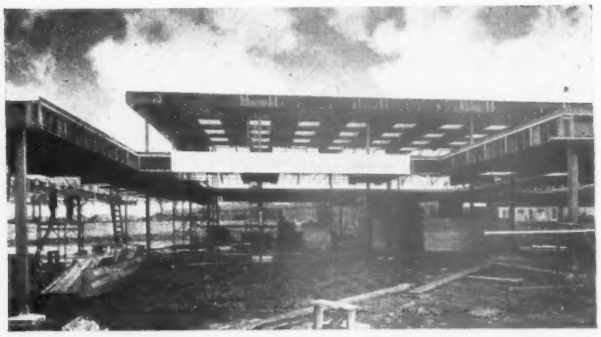
glare, large sky views are avoided by low ceilings, top lighting, projection of panels outside glass screens, curtains and the choice of colours. Open courts and top lighting are used to maintain a good level of illumination.

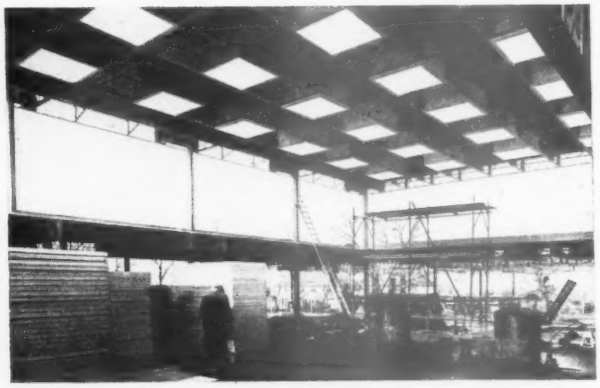
CONSTRUCTION and FINISHES.—The steel frame is carried on 46 stanchions supported on piles, used because of the low load-bearing capacity of the soil. The frame is on a 3-ft. 4-in. module and the stanchions, which are off-grid, carry a pair of main beams on the grid lines, which, in turn, carry secondary beams, also on the grid lines. The main beams span 30 ft. or 26 ft. 8 in. between capitals and the secondary beams usually span 16 ft. 8 in. between capitals. The conditions for the steel frame were (*a*) the frame should be composed of light components prefabricated in the factory; (*b*) the components should be such that they can be bolted or welded together on the site; (*c*) the components should be light enough to be lifted and manœuvred into position by not more than six men, using manually-operated tackle; (*d*) the components should be adaptable to forms of structure extendable in both directions; (*e*) the stanchion should be suitable for multi-storey construction; (*f*) a constant dimension between finished floor level and finished ceiling level was required, necessitating beams of constant depth, whatever the span and load. To achieve this it was inevitable that a little wastage of steel should occur on the shortest spans and that maximum spans should be limited; (*g*) the frame must comply with the 40-in. module; (*h*) it should be possible for service pipes to run in all directions within the depth of the beam framework. The walls, windows,



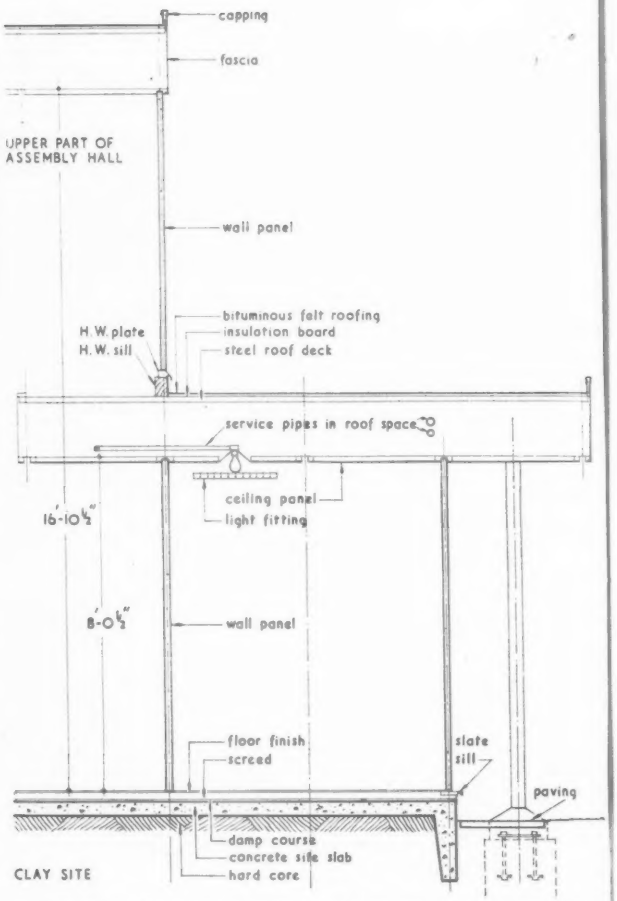
Ground floor and site plan

Below, the main entrance. Below right, outdoor teaching in progress.





Top, progress on January 21, 1952: the steel frame erected. Above, top lights to assembly hall and wall panels stacked on the site.



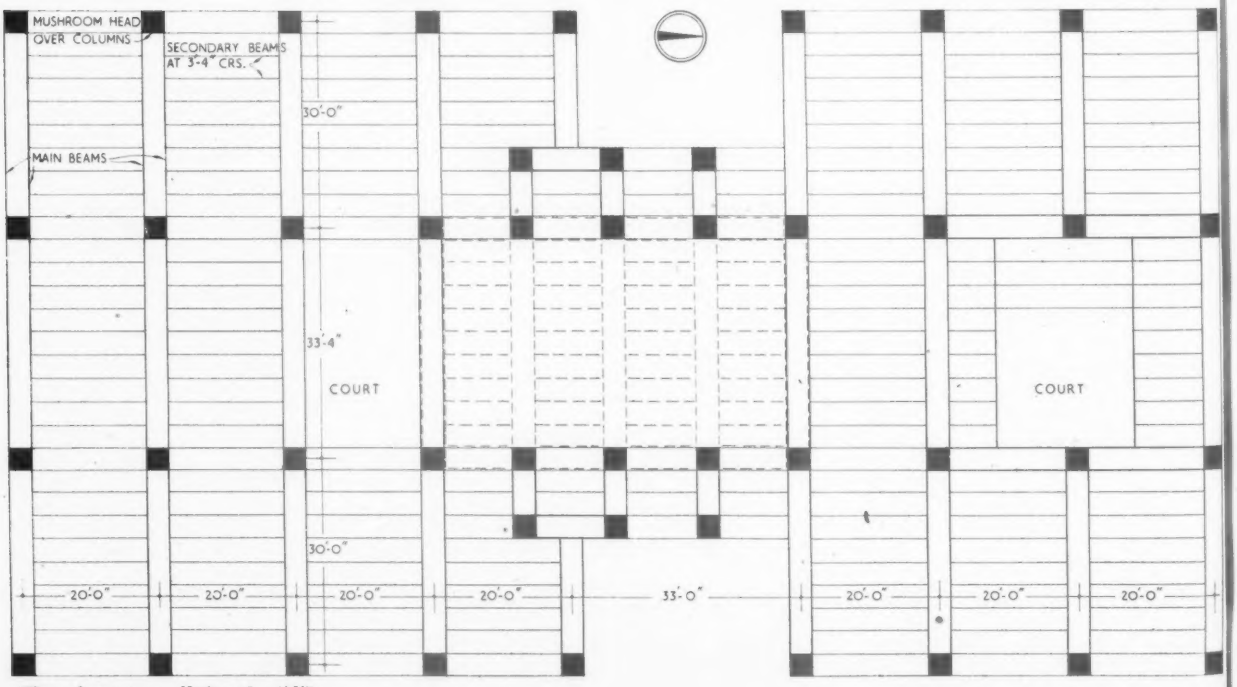
Typical section showing assembly of elements [Scale : ¾" = 1'0"]

PRIMARY SCHOOL

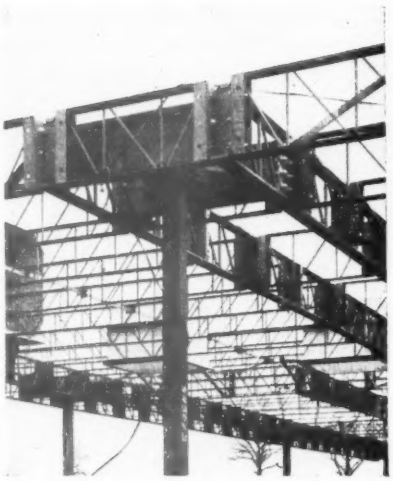
at BOREHAM WOOD, HERTS

C. H. ASLIN, County Architect

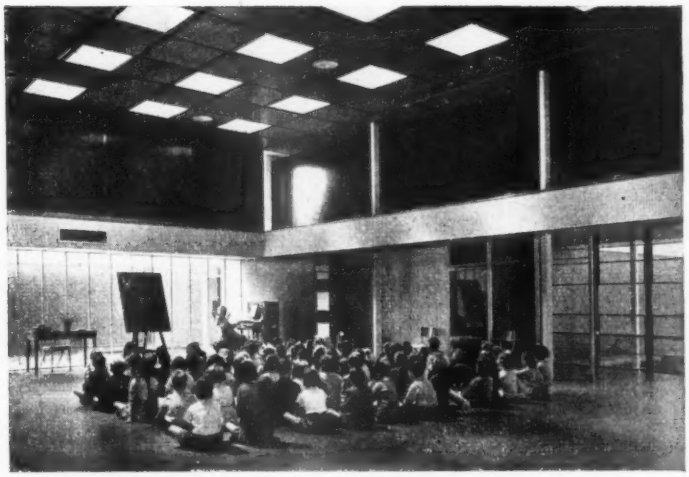
doors, partitions (both external and internal) are an interrelated system of panelling using aluminium extrusions as frames and plastic and glass as panel in fillings. The conditions for the wall panels were : (*a*) that panels could be erected in any order and later interchanged if required ; (*b*) that they should be fitted between the floor and the light steel frame ; (*c*) that under no circumstances would services



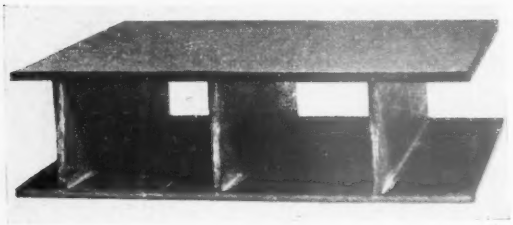
Plan of structure [Scale : 1/64" = 1'0"]



Above, mushroom cap over one of the steel stanchions.



The glazed south wall of the assembly hall, shown left in the photograph above and across the south open court, below.



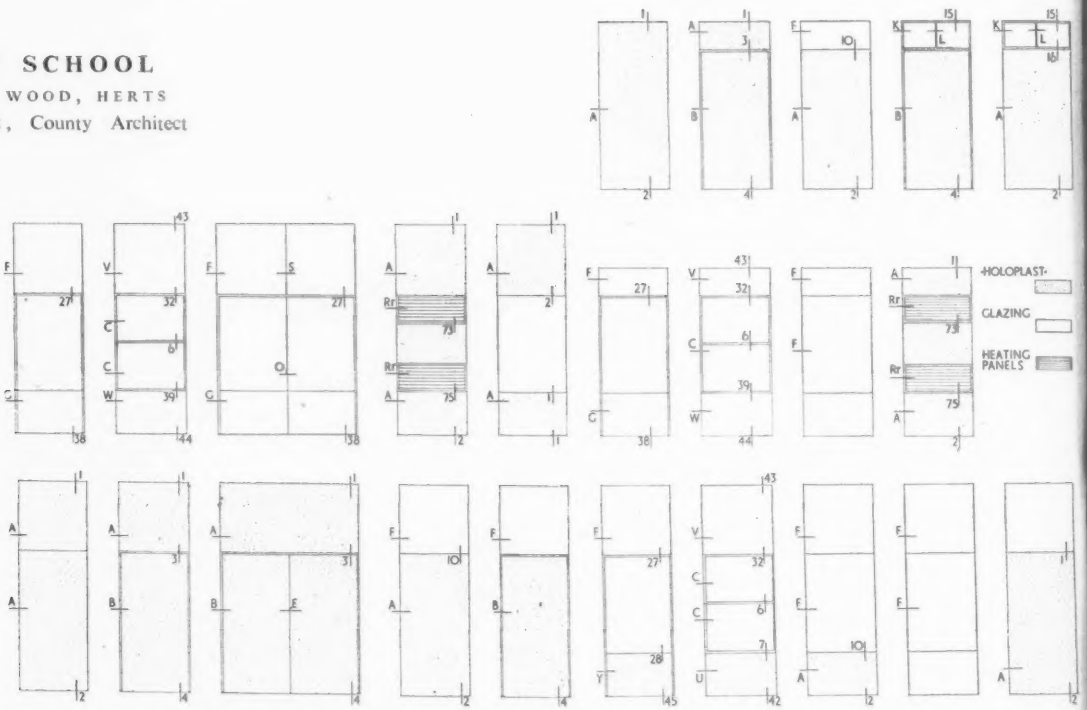
A cut-away section of 1⅝-in. thick laminated plastic wall panel.

pass through them. There are at Boreham Wood 29 types of wall panel consisting of arrangements of solid doors, glass doors, vertically sliding sash windows, horizontally sliding ventilators, heating grilles, fixed glass and laminated plastic panels, mostly 1⅝ in. thick. Wall panels have extruded aluminium edge members shaped to receive the various units, glazed or otherwise, and to enable the panels to be erected in 1, 2, 3 or 4-way and corner junctions. The units are assembled into panels in the factory

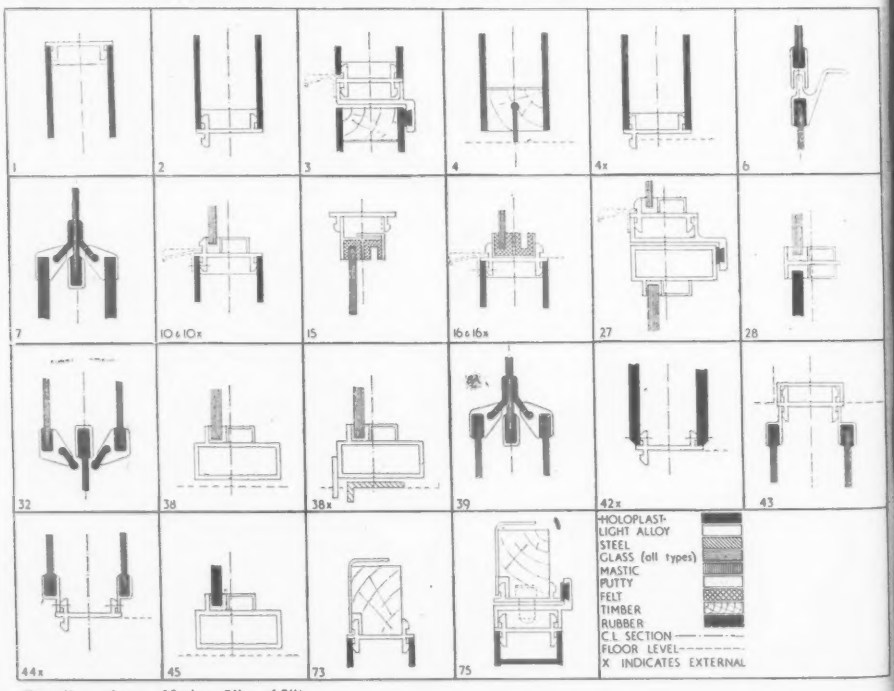
PRIMARY SCHOOL

at BOREHAM WOOD, HERTS

C. H. ASLIN, County Architect



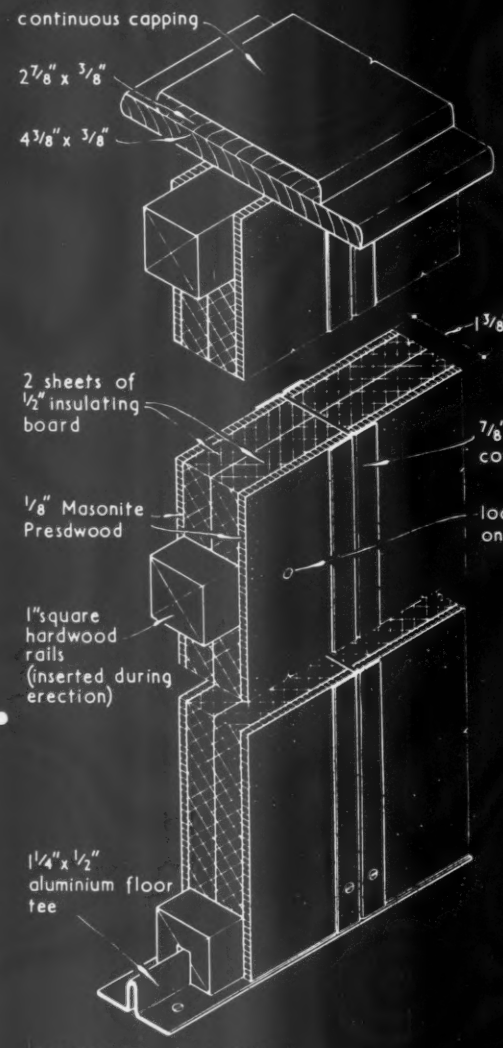
Elevations of most of the prefabricated wall panels. Numbers refer to sections below, letters to plans opposite [Scale : ⅛" = 1'0"]



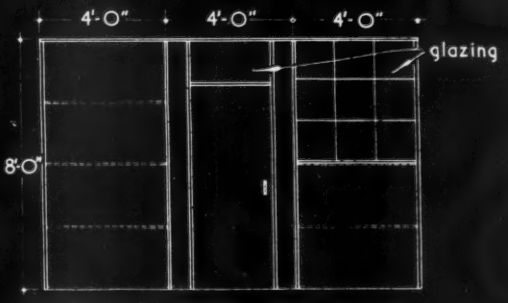
Detail sections [Scale : 3" = 1'0"]

PARTITIONS | BUILDING BOARD

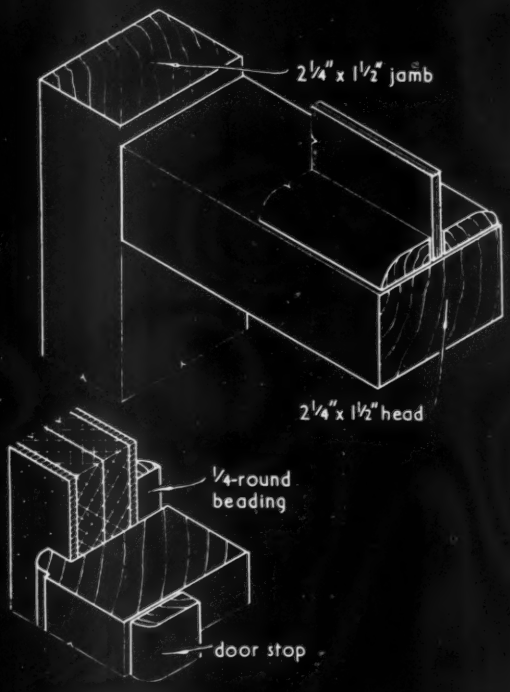
The Architects' Journal Library of Information Sheets 375. Editor: Cotterell Butler, A.R.I.B.A.



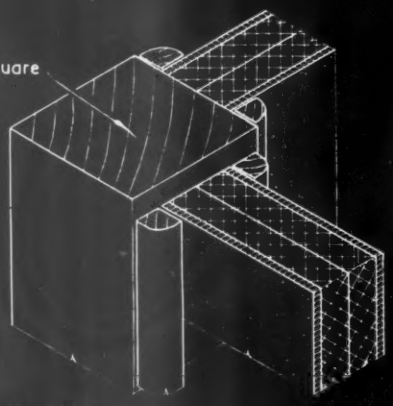
CONSTRUCTIONAL DETAIL.



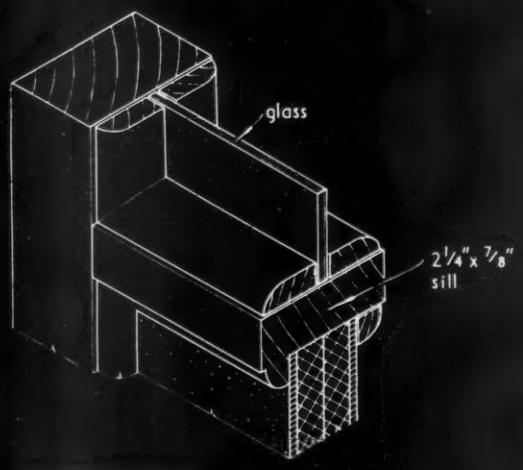
ELEVATION OF TYPICAL ARRANGEMENT.



DOOR OPENING.



CORNER POST.



WINDOW OPENING.

21.E1 COMPOSITE BUILDING BOARD PARTITIONS *(Provisional Patent No. 12117/52)*

This Sheet describes partitions built up from prefabricated composite building board panels with timber structural members. The system is based on panel units 4 ft. wide by 8 ft. high by approximately $1\frac{3}{8}$ in. thick, there being three types of unit available—door unit, window unit and wall unit. The partitions are readily demountable and units may be interchanged to suit requirements. Construction is dry throughout thereby minimising damage to existing floor and wall surfaces. The partitions may be obtained without a licence.

Construction

Wall unit : This consists of two layers of $\frac{1}{2}$ in. insulating board sandwiched between two sheets of $\frac{1}{8}$ in. Masonite Presdwood, all boards being glued together with waterproof synthetic resin adhesive. The insulating boards are stopped at intervals to allow horizontal hardwood stiffening rails to be inserted during erection. A hardwood rail at the bottom of the unit is recessed to take a continuous $1\frac{1}{4}$ in. by $\frac{1}{2}$ in. aluminium alloy tee screwed to the floor. A continuous timber capping is provided at the top to provide a finish and to assist rigidity of the whole partition.

Door unit : This consists of a 2 ft. 6 in. wide by 6 ft. 6 in. high flush door with a fixed or opening light at the head. The door is fitted with a 3 in. mortise lock, plastic furniture and pressed steel butt hinges.

Window unit : This consists of a 4 ft. square window frame above a 4 ft. square composite building board panel.

Joints : Joints between panels are effected by $\frac{7}{8}$ in. wide aluminium alloy cover strips screwed to the panels or rails.

NOTE.—The sizes of the timber structural members shown on the face of the Sheet are provisional only at this stage.

Spread of Flame (B.S. 476 : 1932)

Hardboard comes into Class 3 when untreated and Class 1 when painted with a suitable fire-resisting paint.

Thermal Conductivity

The thermal conductivity for the composite building board panel is 0·24 B.Th.U./sq. ft./hr./° F./in.

Finish

The metal cover strips are supplied untreated. The partitions may be left untreated or decorated in the normal manner.

Compiled from information supplied by :

Tentest Fibre Board Co. Ltd., Specialised Construction Dept.
Head Office : 75, Crescent West, Hadley Wood, Barnet, Herts.
Telephone : Barnet 5501 (5 lines).
London Office : 18, Pall Mall, S.W.1.
Telephone : Whitehall 9366.

RUBBER-BASED ADHESIVES

Many types of rubber-based adhesive possess the characteristic of being adhesive when dry so that treated surfaces, suitably prepared, can be simply pressed together and will instantly unite. Pressing with a hand roller or similar, is in most cases enough to complete the bond. With some other types of adhesive it is necessary for the surfaces to be brought together whilst still wet. In such cases, should the adhesive dry out on one or both surfaces before they can be assembled, the dry surface can normally be reactivated by wiping with a solvent. Whilst almost any substance or material can be bonded with the aid of a rubber-based adhesive *it is very important that the most suitable type be selected to meet particular requirements.* The table below gives a range of uses for rubber-based adhesives. A few examples only are given as each case presents its own problems.

Where special conditions are encountered The British Rubber Development Board should be consulted.

Materials to be bonded	Type of Adhesive	Characteristics	Method of Applying
Rubber underlays, rubber flooring or tiles, linoleum, cork or textile floor coverings *to* dry concrete, stone, clay tile, brick or wood	Floor laying rubber cement	Normally free-flowing and exceptionally sticky when dry, retaining this stickiness almost indefinitely. Also available in a viscous and quick-setting type	With brush or scraper to both floor surface and flooring material. Allow to become substantially dry and sticky before laying flooring material
Thermo-plastic tiles *to* dry concrete, stone, clay tile, brick or wood	Rubber cement (heavy duty)	Thick solution based on reclaimed rubber. Withstands temperatures up to 158 deg. F.	Preferably with a scraper. Allow to become dry and sticky before bonding
Leathercloth and upholstery textiles *to* themselves, or to wood or fibreboard	Rubber solution	Viscous, non-staining and quick-setting	With brush or scraper to both surfaces. Allow to become dry and sticky before bonding
Acoustic or insulation tiles and panels *to* wood, plaster or metal	Latex adhesive	Thick white cream. High rubber content. Quick-setting	With brush or scraper. The two surfaces can be simply pasted together (wet sticking) or allowed to dry and then pressed together (dry sticking)
Linoleum or felt underlay *to* wood	Latex adhesive	Thick white cream. High rubber content. Quick-setting	With brush or scraper. Paste down edges (wet sticking)
Leather, leathercloth and upholstery textiles *to* wood or metal	Latex adhesive	Thick white cream. High rubber content. Quick-setting	With brush or scraper. Paste both surfaces together (wet sticking)

12.N1 RUBBER-BASED ADHESIVES

This Sheet describes rubber-based adhesives and sets out in tabular form a selection of the types available, their characteristics and applications.

General

There are two main groups of rubber adhesive, i.e. rubber solutions or cements and latex adhesives. It is impossible within the compass of a single Sheet to deal with all the varying aspects of composition and application and consequently these are covered only in the broadest outline. It should be understood that rubber adhesives in one form or another can be prepared, in consultation with the British Rubber Development Board, for a wide variety of special requirements.

Rubber solutions or cements: The term "solution" is usually given to lightly compounded rubber adhesives. They are used as a general rule where light adhesion is adequate, as for example, in the bonding of textiles, paper, leather, or cellular rubber. Generally, the term "cement" is used to describe a more heavily-loaded rubber adhesive which will bond strongly to such materials as wood, metal, porcelain and concrete. This class of adhesive is normally used in laying rubber flooring and tiles. Although the adhesives may be of various colours it is important to bear in mind that colour is no guide to performance. The solvents employed may be of the petroleum group (inflammable) or of the chlorinated hydrocarbon group (non-inflammable).

Latex adhesives: Natural rubber latex consists essentially of minute particles of rubber suspended in water and is in itself an adhesive. It is used as the base of a range of adhesives in the form of dispersions in water which, in consistency, vary from a thin fluid, which may be sprayed, to a thick cream or paste.

Applications

Various applications and the appropriate types of adhesive are shown in the table on the face of this Sheet.

Durability

Rubber-based adhesives are particularly suitable for bonding materials with different coefficients of expansion. They are not appreciably affected by changes in humidity or atmospheric temperature nor are they subject to attack by dry-rot fungi or insects.

Strength

The tear-down strength obtained with the adhesives described on this Sheet is in the order of 3 to 30 lb. per inch width, dependent on the type of adhesive and the nature of the materials to be joined.

Precautions

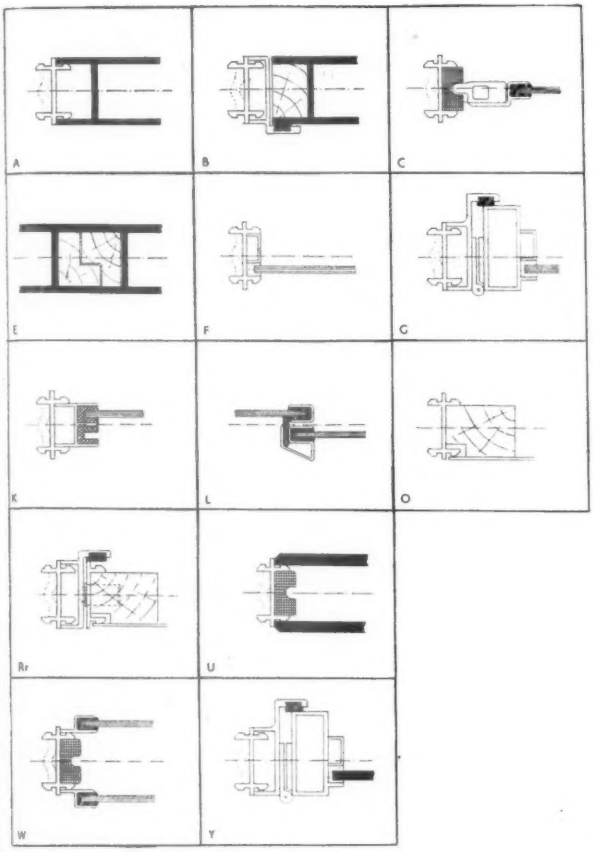
Adequate ventilation is essential where rubber solutions or cements are being used.

Inflammable solutions/cements: These are subject to the provisions of the Petroleum Acts but are not dangerous if proper precautions are observed during use. They must be kept away from electric fires, burning cigarettes or any naked flames. Even in adjoining rooms it is imperative that all flames be extinguished.

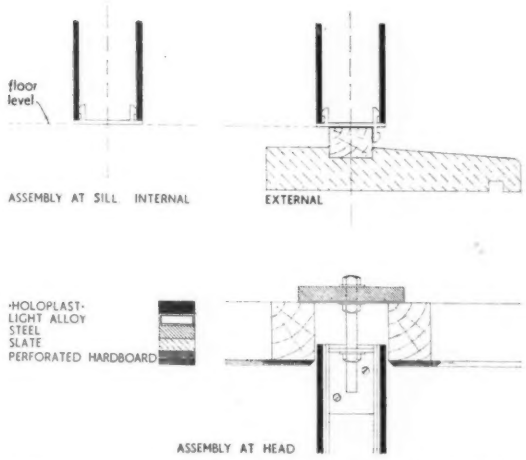
Non-inflammable solutions/cements: These are not subject to the provisions of the Petroleum Acts and there is no fire hazard. They must however be used with care as their vapours are toxic. They must not be used in badly ventilated places and must be kept away from naked flames, as the vapours thus produced may be injurious. For the same reason smoking in the vicinity should be forbidden. It is advisable, where possible, to use an electric fan to increase ventilation.

Latex adhesives: The above precautions do not apply to latex adhesives since the rubber film is formed simply by the evaporation of water. The liquid adhesive should not be allowed to come into contact with copper or brass as these metals affect the life of the adhesive.

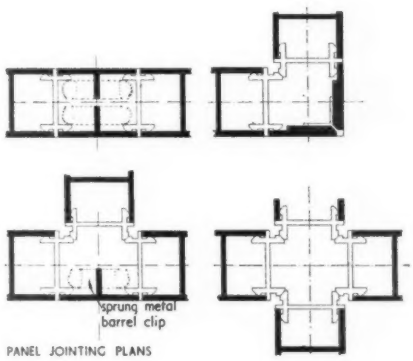
Compiled from information supplied by:
The British Rubber Development Board
Address: Market Buildings, Mark Lane, London, E.C.3.
Telephone: Mansion House 9383/4.



Detail plans [Scale : 3' = 1' 0"]



Panel connections at floor and ceiling [Scale : 3" = 1' 0"]



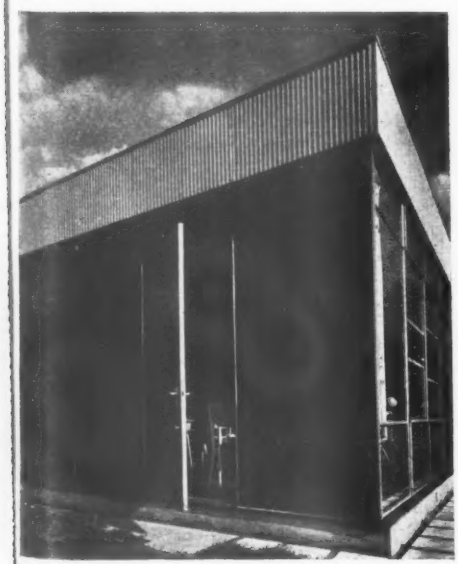
Plans of wall panel connections [Scale : 3" = 1' 0"]

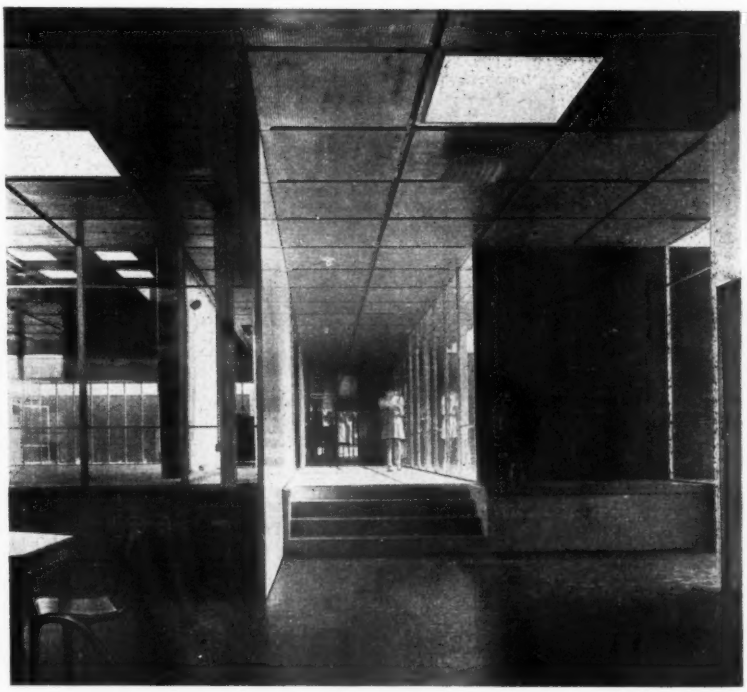
and delivered completely finished and glazed to the site. The external panels are erected after the slate sill has been laid. A solid, 8-ft. high panel weighs about 65-70 lb. It can be erected quickly and cheaply. The site fixing of the panels is simple, consisting of a ¾-in. bolt in the top corner between each panel, a screw in the bottom corner between each panel. Angle brackets are fixed on each side of the frame and after this the cover strips are clipped in place.

PRIMARY SCHOOL

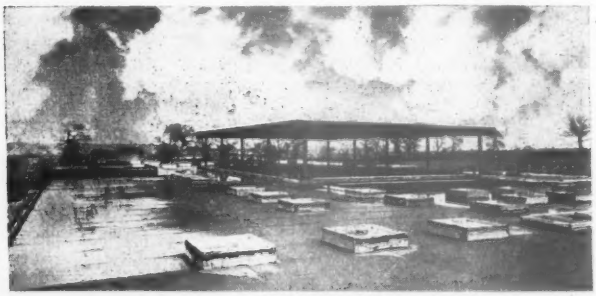
at BOREHAM WOOD, HERTS.
C. H. ASLIN, County Architect

Below left, view of typical external corner. Below, corridor, with assembly hall on left and main entrance on the right.

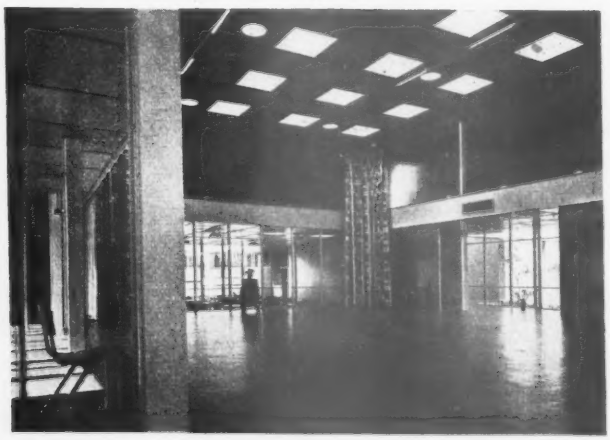




Above, the assembly hall seen from the south open court. Below, view during construction looking towards the high level roof.



Bottom left and right, two views of the assembly hall, looking towards the glazed north wall and dining area.



The panels are also easy to dismount. The horizontal sliding ventilators and the vertical sliding sash windows show the same finesse of detailing as the panels. The latter were designed in conjunction with the makers, 'bus window manufacturers. The solid units of the external panels are fitted with glass wool for thermal insulation. The beams carry a light gauge, steel, roof deck on the upper flanges; the service pipes through the web system and

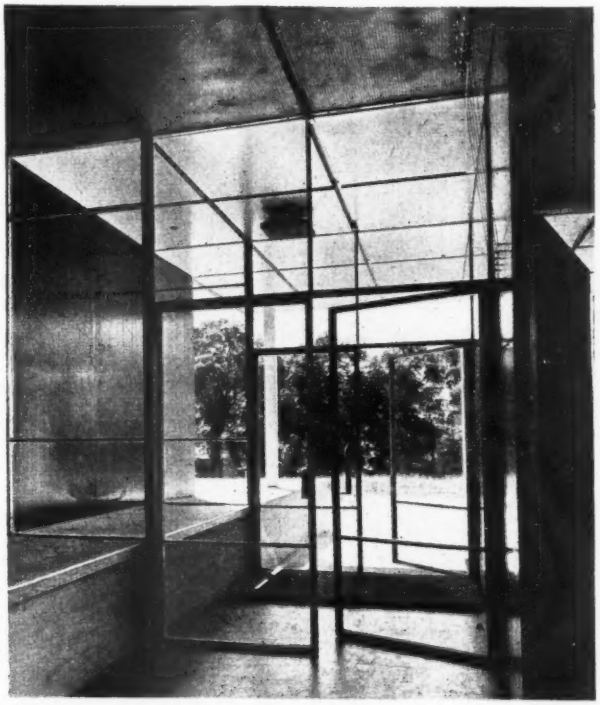
ceiling panels and wall panels on the lower flanges. The steel roof decking is 1⅛ in. deep, spanning across the secondary beams, covered with ½-in. insulating board and roofing felt with a mineral surface. Around the perimeter is an upstand, and the roof, which is quite flat, is drained by two 6-in. and two 4-in. cast-iron pipes. The fascia is of corrugated asbestos sheet, painted and fixed to a timber frame. The conditions for the ceiling panels were (*a*) that they should be demountable and interchangeable; (*b*) that they should be suspended between beams; (*c*) that they should be removable for access to services in the roof space. There are four types of panels, nominally 1 ft. 8 in. and 3 ft. 4 in. by 3 ft. 4 in. and these allow for the introduction of light fittings and trimmings to stanchions. The panels are made of a light timber framing with a perforated hardboard face filled with glass wool and with 2-in. strips of stiff paper across the back. The panels are held up by four aluminium U-brackets, which are fixed by bolts to the bottom flange of the beam. The floor is finished with cork or quarry tiles and is laid continuously throughout the building to form a level surface on which are erected the panels of all types. Most of the internal panels are stove-enamelled white in the factory, but those which are

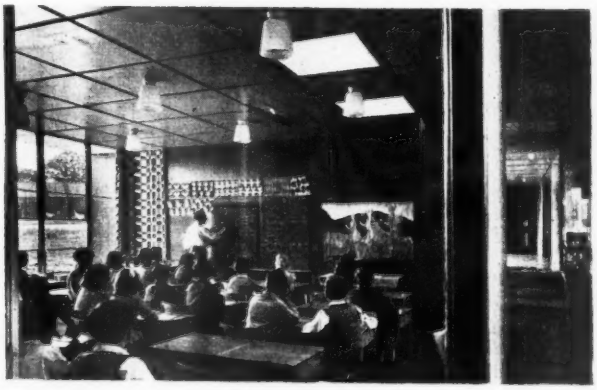
Below right, the main entrance doors. Centre left and right, two typical classroom interiors. Bottom left, kitchen looking towards the north open court. Bottom right, looking into the north court with the kitchen on the left.

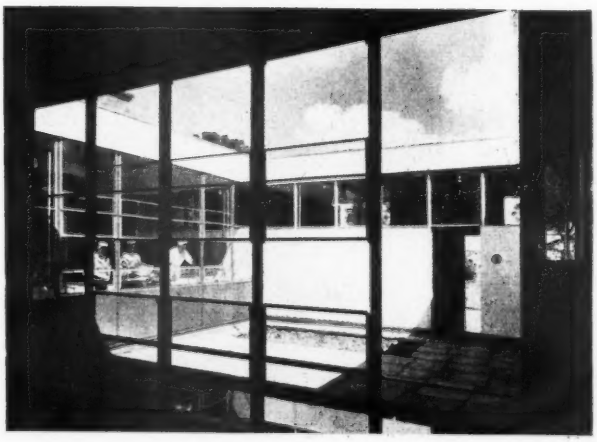
PRIMARY SCHOOL

at BOREHAM WOOD, HERTS.

C. H. ASLIN, County Architect







painted on the site have a special primer, one undercoat and one finishing coat. The colours used are specified by the Munsell code. The day lighting of the main rooms has been designed for a sky factor of 5 per cent. This has been achieved with an 8-ft. ceiling by having lighting from two sides or by using top lights.

SERVICES.—All services are concealed within the depth of the beam space and vertical drops are direct to individual pieces of equipment. The building is heated entirely by the warm air system used on previous Hertfordshire schools and hot water is from calorifiers heated by the same system. Ceiling switches for lights are used throughout.

The final cost of the Summerswood school is not yet settled, but details will be published in the JOURNAL as soon as figures are available.

The general contractors were the Hale Construction Co. Ltd. For sub-contractors see page 180.

Above, the headmaster operating a wireless receiving control set. In the background a 'bus type vertical sliding sash window. Below, wash basins in one of the lavatories.

PRIMARY SCHOOL

at BOREHAM WOOD, HERTS.

CC. H. ASLIN, County Architect

SUMMARY OF SITE MAN-HOURS

Foreman	2,200
External works, roads, paths, fencing, courts, pitches	5,764
Site clearance, and excavation for site slab	1,333
Excavation and pouring of foundations	44
Laying hardcore, pouring site slab, and holding down bolts	1,039
Drainage including excavation and back fill	1,410
Frame	1,392
Roof steel decking	497
Roof lights and glazing	238
External walls. "Holoplast"	1,126
Roof coverings, including fascias and gutters	2,001
Windows, external doors,and glazing	272
Brickwork, retaining walls, etc.	964
Heating	752
Electrics	1,816
Plumbing and sanitary fittings	1,037
Gas	112
Flooring, including screed	2,438
Partitions, internal doors and frames. "Holoplast"	1,256
Ceilings	3,504
Ironmongery, joinery and fittings	565
Painting and decoration	1,676
TOTAL	31,436

TECHNICAL SECTION

The terminology of reinforced concrete becomes more and more confusing. Architects who attended the recent CCA symposium on shell concrete will have learnt that a shell barrel vault is *not* a vault—it is simply a curved slab spanning from end to end. Similarly, shell domes, as used by the Architects' Co-operative Partnership at Brynmawr, are not domes, but slabs, spanning in two directions and curved in two directions.

All this does not mean that structural engineering, in so far as it affects the architect, is becoming a more difficult subject. On the contrary, as engineers master the science of the behaviour of structures, the basic concepts of engineering are more clearly revealed.

The Technical Section this week is devoted principally to an article by the JOURNAL's Specialist Editor No. 13 (Structural Engineering) explaining in simple terms the principles, economics and applications of shell concrete. The article refers to several of the papers presented by engineers at the CCA symposium, and is followed by an illustrated description of a particularly interesting shell roof completed recently at King's Lynn. Next week, summaries of two of the papers presented by architects will be published, together with extracts from the discussions which followed them. This will complete the JOURNAL's survey of this subject and should provide the architect with all the information he needs to know in order to design buildings which are to have shell concrete roofs.

This week's survey

18 CONSTRUCTION: THEORY
shell concrete

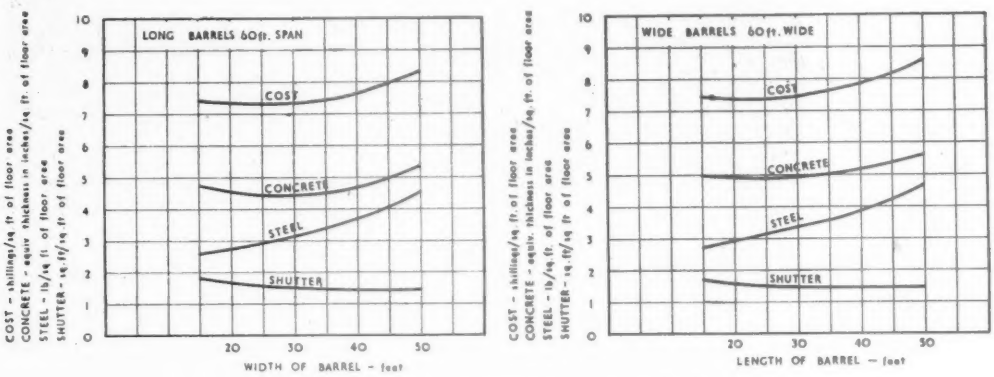
The number preceding the week's special article or survey indicates the appropriate subject heading of the Information Centre to which the article or survey belongs. The complete list of these headings is printed from time-to-time. To each survey is appended a list of recently-published and relevant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

Specialist Editor No. 13 (Structural Engineering) in writing this survey of shell concrete construction has concentrated on economic aspects of the subject. He also comments at length on the application of prestressing to shell roof construction. On page 173 is a table reproduced from H. G. Cousins's paper on "Design and Construction from the Economic Aspect," giving the approximate costs of various forms of insulation, roof lights and waterproofing.

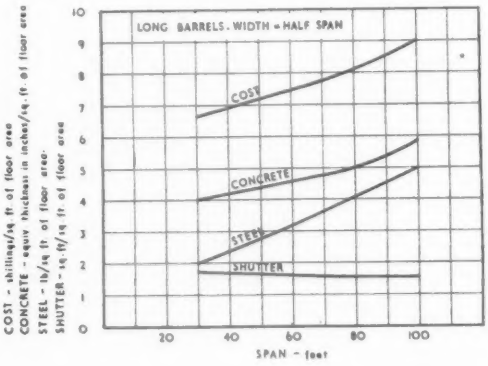
The roofing of a given area by a system of concrete shells can provide a structure of pleasing appearance, free from maintenance costs, with good lighting and insulation. The thin concrete skin is at the same time both structural member and cladding, cutting out much of the supporting framework inherent in other structural forms and often providing necessary headroom with a minimum overall height of building. Despite this the architect must consider the immediate cost of the project and H. G. Cousins's paper to the symposium set out to explain the influence of design factors and construction on the final cost of the structure. (References to costs below refer only to the cost of the reinforced concrete structure; other features, such as waterproofing, insulation, glazing, wall cladding and flooring must be considered separately.)

COSTS

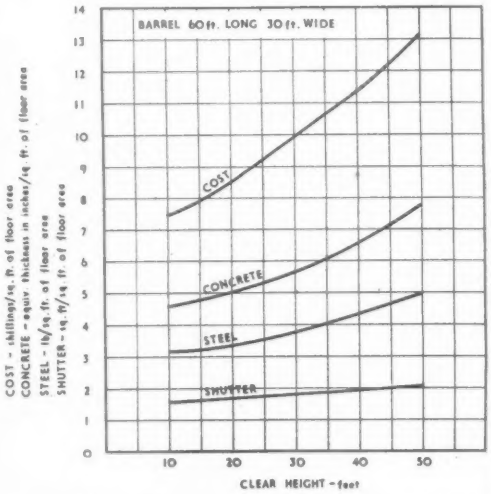
The cheapest forms of shell roofing, involving considerable repetition and



Left, Fig. 2. Graphs showing the effects on costs of varying the proportions of barrel vaults. Left, for long barrels; right, for short barrels. The two graphs may be compared; at the same position on each graph the areas of the two barrels are the same.



Right, Fig. 3. The effect on costs of increasing the span of barrel vaults. The shape being constant.



Right, Fig. 4. The effect on costs of increasing column heights.

using travelling scaffolding, cost about 4s. per sq. ft. of floor area covered. Normal structures of average span vary in cost from 8s. to 12s. per sq. ft. Buildings of great span and height or of particular complexity may cost as much as 20s. per sq. ft. These approximate figures were amplified in Mr. Cousins's paper by a series of graphs (see Figs. 2, 3 and 4) which show the influence of shape, span and clear height on the quantities of material used in normal barrel roof construction.

INFLUENCE OF PROPORTIONS OF BARREL

Assuming that the clear width required between two rows of columns is given it is possible to cover a given area between them either with a series of long barrels or a series of wide barrels.* For example, if the rows of columns are 60 ft. apart and we wish to cover an area between the columns 100 ft. long we can have either five long narrow barrels of 60 ft. span and 20 ft. width supported on twelve columns or four short wide barrels of 25 ft. span and 60 ft. width supported on ten columns. (See Fig. 1.) Fig. 2 shows the effects of varying the column spacings in this way. There is a marked similarity between the values for long barrels and those for short barrels. Total variations are small but it will be seen that the least material is used when the column spacing is small, increasing as the barrel approaches a square shape. The relative difference is probably greater than that shown in Fig. 2, because, if columns were close together and more vaults used, there would be greater repetition and lower shuttering costs.

INFLUENCE OF SPAN OF BARREL

Fig. 3 shows the increase in the amounts of materials required as the span increases from 30 ft. to 100 ft.; the proportions of the barrel being assumed constant for all spans. The difference in cost would be more pronounced if the effect of repetition on the smaller spans were taken into account.

INFLUENCE OF CLEAR HEIGHT

Fig. 4 shows the variations in cost for a barrel 60 ft. × 30 ft. with clear heights ranging from 10 ft. to 50 ft. It will be seen that the quantities of material in the columns become quite important as the height increases. Hence, the higher the building the wider should be the spacing of the columns.

Summarizing the conclusions deduced from these figures, it will be seen that if the problem is to cover a certain area in any one bay the most economical shape would be a square barrel, although this is the opposite conclusion

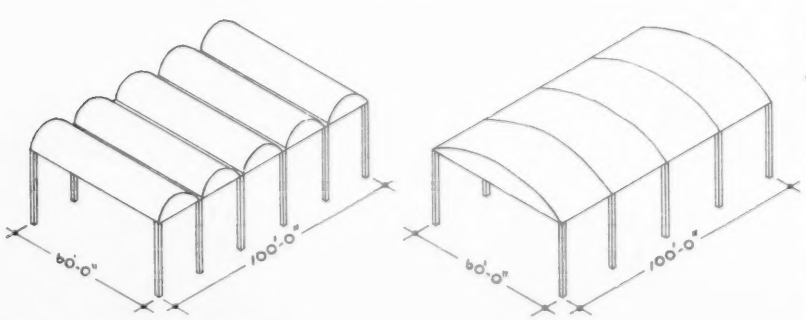


Fig. 1. Alternative methods of covering a given area with shell concrete barrel vaults; left, with long barrels; right, with short barrels

* Since a shell concrete barrel vault is, in effect, a curved beam or slab, the span (or length) is the distance between the end frames or diaphragms, not the distance in the direction of the arch—this, i.e., the distance between the edge beams or valleys is the width. Hence, a short (or wide) barrel is one with a large-diameter arc but a short span between diaphragms. A long (or narrow) barrel is one with a small-diameter arc, but a long span between diaphragms. (See Fig. 5.)

from that reached when the span alone is considered. These figures show the reason for the popularity of barrels in which one side is twice the other, for this represents a compromise between the various design considerations.

The reason for the high cost of the square barrel is the size of the end frame, *i.e.*, the stiffening beam, which encloses the arched shape of the shell. This is a rectangular beam with only the very thin " T " slab of the shell. An improvement over the square barrel is the square dome, which is, in effect, a barrel curved in each direction. This has end frames on each of its four sides, all of which have the structural advantage of the thickened edge of the shell slab. Relatively few square domes have been built, probably because the problem of providing an approximately square plan does not often arise. If the radius of curvature in each direction is constant at all sections, the difficulty and cost of shuttering is no greater than for a barrel curved in one direction only.

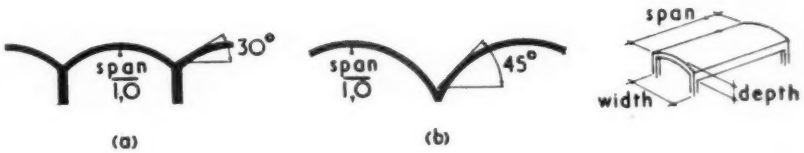
PRESTRESSING END FRAMES

Prestressing provides another means by which the end frame may be made more economical. Since it does not matter greatly if one or more barrels are carried on one end frame, if the span of the latter may not be varied, it may be better to use multiple barrels, supported on one prestressed end frame, than to use a square dome. However, if it is possible to have intermediate supporting columns under the end frames a single square barrel becomes economically feasible.

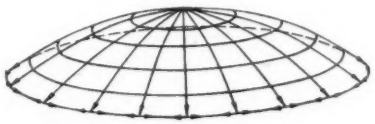
The total cost of concrete, steel and shuttering for end frames is similar whatever type of frame is used. Hence the architect may chose the type most suited to his design without unduly affecting the cost of the structure. End frames wholly below the shell slab may be of solid wall type, curved portal frames or open trussed girders. End frames can be placed above the shell itself but to do so requires more reinforcement and concrete in the beams, and the upstands tend to increase the cost of waterproofing. The only advantage of placing the beams above the shell is that it facilitates the use of travelling shuttering.

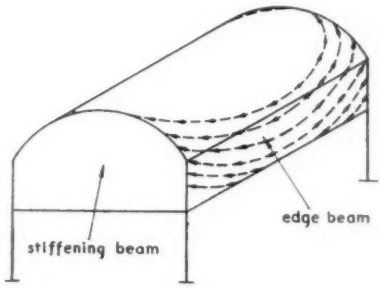
EDGE BEAMS

The use of edge beams at the intersections of the barrels is governed by a number of factors. From Fig. 5 it will be seen that the edge beam in (*a*) provides the correct rise to span ratio with an angle of 30° at the springing, while (*b*) requires an angle of, say, 45° to achieve this with the same width of barrel. Hence, for a narrow barrel the edge beam is essential, but as the width increases the structural depth may be obtained in the rise of the shell itself. The flatter the slope of the shell, the easier and cheaper the task of fixing



Above, Fig. 5, the effect of edge beams on the angle of springing. Below and right, Fig. 6, the major tensile forces in (below) a dome, (right) a shell barrel vault.





the steel and placing the concrete becomes. Shuttering for (*b*) is usually the easier to construct as there is no soffit to form for the edge beams, except at the outer edge of end barrels where stiffening beams are still required. If the headroom for (*b*) has been set at the intersection of the barrel soffits then this stiffening beam may have to be an upstand beam, which is rather uneconomical, unless, of course, the full clearance is not required at the outer edge. In case (*a*), while a number of edge beams have to be shuttered and poured they can serve to support the shells temporarily, so that the shell shuttering can be struck before the shell concrete is strong enough to carry its load in the direction of the span.

NORTH LIGHT SHELLS

Shell construction is readily applied to north-light roofs, but, as with steel roofs, the uniform lighting provided by north lights can only be obtained at increased cost. Not only are the quantities of materials needed for a north-light roof greater than those for a barrel of the same span, but the costs of construction are also greater. It is usually difficult to obtain as large an effective depth as with an ordinary barrel, and the beam below the glazing, which forms the gutter, tends to carry a large proportion of the load. But if the full floor height is to be retained at this point, a relative inefficient shallow beam must be used. In order to increase the structural depth of the shell without increasing the angle at the springing (already increased because the shell is tilted), the bays must be relatively wider than for barrels, so that the advantage of using narrow barrels does not apply to north lights, for which the width of the bay should be at least half the span.

The fact that the edge beam is above the gutter increases the costs of steel fixing and concreting, for the work must be sub-divided into sections, leading to delay.

FREELY SUPPORTED OR CONTINUOUS SHELLS?

Continuity in shell construction has some effect on its cost. As in other continuous structures, there is a redistribution of the bending moments and shear forces with little effect on the total quantities of materials involved. Since the total depth of a continuous barrel is often the same as would be used for a simply-supported span, some saving in steel is effected. Continuity is, however, especially valuable in north-light roofs, or other structures where a high span-depth ratio occurs.

Where two or more long barrels are used on end there is a considerable negative moment over the central support. This may be reduced by constructing one barrel first, removing the shuttering so that the barrel takes its dead load, and then constructing the second barrel monolithically with the first. The increase in the positive moment is small and some saving in steel can be effected. The amount of shuttering required is reduced also because the work is done in two stages.

PRESTRESSING SHELL STRUCTURES

Prestressing has added much to the scope of concrete shell construction and makes possible the use of concrete roofs over very large areas which would otherwise be uneconomical. C. V. Blumfield in his paper on " The Combination of Shells and Prestressing " referred both to pre-tensioning, and post-tensioning and their respective advantages. By pre-tensioning, we usually mean a system of construction in which the concrete is poured around tensioned wires which are released after the concrete has hardened, thereby imparting compression to the concrete. It is difficult to see how this could be applied to the large-span, thin-shell roof where anchor ends would be required at high levels but it is possible to use the technique in small shells pre-cast on the ground and transported to the position for erection; this system was actually used for small buildings in Germany during the war. Alternatively, edge

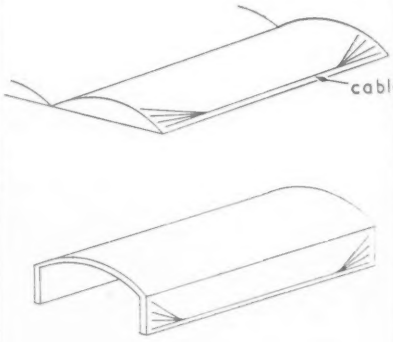
beams and end frames might be constructed by this method while the main shell is post-stressed.

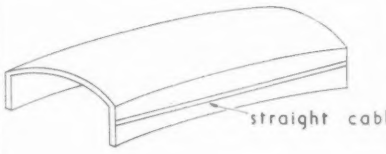
With post-tensioning the concrete is cast around unstressed cables or the cable is passed through holes formed in the hardened concrete. The cables are then tensioned by jacks and the compressive stress imparted to the concrete balances the tensile stress set up by the action of superimposed loads.

Fig. 6 illustrates the incidence of the major tension forces in domes and shells. The state of stress in a shell circular in plan is relatively simple and it is obvious that a compression stress in the circumference will cancel out the natural ring tension. In a barrel vault shell the major forces are in the edge beam and the lower parts of the shell, so the cables must be placed in these areas to provide a balancing compression. There are also tension forces in the end gables or stiffening beams. Where these beams are supported on closely spaced columns or are continuous over several spans it is doubtful whether any economy can be effected by post-tensioning. However, should the end beam carry several barrels, in order, for example, to provide wide access to a building, post-tensioning becomes of appreciable value. There seems little point in using cables along the arc of the shell as the forces along the curve are generally direct compression, with some secondary bending which is reduced by the post-tensioning of the valleys.

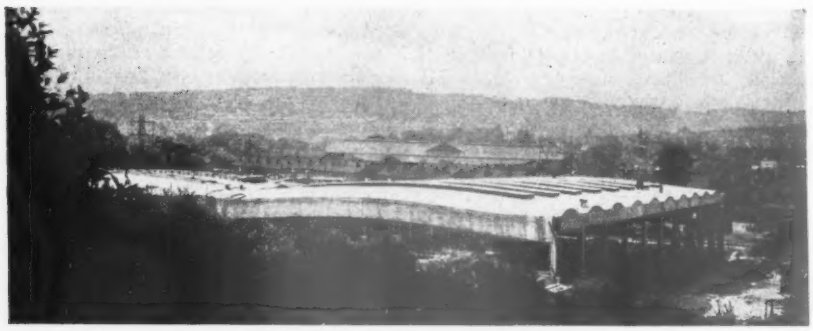
In a barrel vault roof the self weight of the structure provides the major portion of the stresses and there is, therefore, little variation in stress conditions. The vault acts as a beam and shear stresses occur at the ends, the diagonal tensions being indicated in Fig. 6. Where the cables are located wholly in the shell, when edge beams are not used or in north-light shells, a greater degree of curvature can be obtained, and, consequently, a larger proportion of the shear forces can be taken up by the cables, than where there are edge beams (see Figs. 7 and 8). An alternative method of design is to curve the shell and the edge beams and keep the cables straight (see Figs. 9 and 10).

Where the cables run through the shell it is necessary to increase the thickness of the shell from 2½ or 3 in. to at least 4 in., to compensate for the loss of area in the section and to give sufficient cover to the cable. The usual Magnel or Freyssinet technique is employed; cables can be sheathed and cast in the concrete or ducts can be used, the cable being fed in after the concrete has hardened. In the latter case one should not underestimate the difficulty of handling the cable (a special scaffold is probably required), freeing the duct tube and threading the cable—all of which may well cost more than the sheathing used in the former method.





Right, Fig. 7. The position of prestressing cables in a barrel vault without edge beams compared with one with edge beams. Left, Fig. 8. Photograph of prestressing cables in the valley between two shells without an edge beam. Note the high degree of curvature which is possible, as indicated in Fig. 7. Right, Fig. 9. Barrel vault, arched in direction of span, so that prestressing cables can be straight. Below, Fig. 10. Bus garage at Sheffield, covered by thirty 97-ft. 6-in. long prestressed concrete shells, in 3 rows, designed on the principle illustrated in Fig. 9. (Sheffield City Architect's Dept. Consulting engineer, H.G.Cousins.)



ADVANTAGES OF PRESTRESSING

The most important advantage of using post-tensioning appears to be that the length-depth ratio of the barrel vault can be increased. In ordinary shell construction it is desirable for large spans that the ratio between the length of the barrel vault and the depth, reckoned from the soffit of the edge beam or underside of the valley to the crown of the arch, should not exceed 10:1. If it is greater, for spans of 100 ft. or more, deflections will be considerable and serious cracks may

occur in the concrete which is in tension. By reducing the tensile stresses, and, thereby, preventing tension cracking, and by reducing vertical deflection, post-tensioning makes possible a much higher ratio—up to about 20:1. This is particularly important in north-light type barrel vaults, as their effective depth is much less than that of ordinary symmetrical barrels. The advantage of post-tensioning in this case is that the deep edge beams, which would otherwise have to be formed below the soffit at the lower edge of the vault, can be omitted. Morever, the higher length-width ratio permits flatter slopes in the shell, with usually a much improved appearance. A further advantage, particularly important at present, is the considerable saving in the weight of steel required. The prevention of cracks forming in the concrete is important not only to ensure the full protection of steel reinforcement against corrosion but also to ensure the watertightness of the roof, thereby enabling economies to be made in waterproofing.

DISADVANTAGES

These advantages must be weighed against the extra time and labour used by the contractor in placing cables and anchorages, tensioning them and grouting them in. It is apparent that the greater the length of the barrel, the less in proportion will these factors add to the cost; hence, post-tensioning becomes more economical as the length of the barrel increases. With ordinary symmetrical barrels, post-tensioning is probably hardly worth while for lengths of spans below 70 ft. From 70 ft. to 110 ft. there is not much difference in cost, but above a length of 110 ft. the advantage of post-tensioning rapidly increases. For north-light barrels the economical length would be less.

The use of post-tensioning with shell concrete construction will probably be used in future mainly in order to increase the length of span. Spans of 200 ft., 300 ft. or even more would be economically feasible. Post-tensioning can also be used to increase the distance which a cantilever may project. The spread of the tensioning cables through the shell allows a high degree of reverse bending moment, the tensile forces being in the shell, not simply in the edge beams.

An important development for the future will be the use of shells designed so that the tensioning cables can be as near as possible to straight lines. The principal difficulty in doing this is the provision of suitable shuttering but by the careful design of shuttering consisting of sheets of a flexible material this difficulty may be overcome.

CONSTRUCTION FACTORS

The amount of concrete in shell roofs is small and it is necessary, therefore, for jobs to proceed rapidly in order to keep the concrete gang fully employed and to reduce the time for which the shuttering is in use. The layout of the concreting plant must receive careful consideration. It is usual to have a concreting way along the crown of the barrel and to concrete the shell starting from the crown and working down to the springing so that the men are standing below the work when placing and screeding. H. G. Cousins, in his paper on economic aspects of the design and construction of shell roofs, mentioned methods of spraying concrete which have been tried out in many countries. It has often been found that this is an expensive procedure, but many domes and barrels in America have been sprayed successfully and cheaply and there seems to be no reason why large shells should not be concreted in this way.

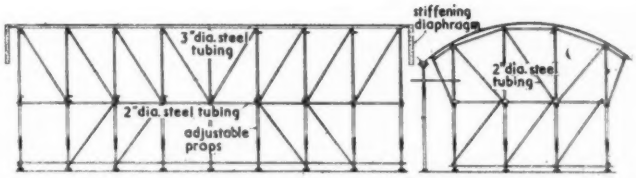


Fig. 11. Travelling shuttering for a factory at Greenford, in position for concreting.

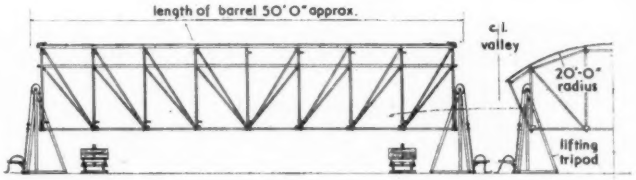


Fig. 12. The same shuttering mounted on bogies and ready to be moved.

REINFORCEMENT

The usual requirements for steel in reinforced concrete work apply to shells. The work is made simpler by keeping bars in straight lengths, except for those in beams and columns and the trajectory bars, *i.e.*, the bars which follow the lines of the tensile stresses. Long bars may be used to cut out laps, although the cost of laps in fabric reinforcement may be partially offset by the ease of fixing the sheets.

INSULATION

Various methods of insulating shells can be used. There was some disagreement between the authors of different papers as to the value of using building board as permanent shuttering. Good results can be achieved if sufficient supervision and care are exercised, but, unfortunately, building board seals off the underside of the concrete from inspection and there is no warning of honeycombing in the slab. Spraying or rendering the concrete soffit with asbestos fibre or vermiculite is one method of overcoming this disadvantage. Alternatively insulation can be applied to the *outside* of the slab, in the form of wood wool, cork or vermiculite screed. Some costs of finishes given by Mr. Cousins are shown in Table I.

FORMWORK

It will have been appreciated that there is little scope for a reduction in the quantitiy of materials used in reinforced concrete vaults, and if there is to be a reduction in costs this must come from the use of an alternative shuttering technique. Several of the large scaffolding firms hire out scaffolding and steel shuttering for barrel vaults but the initial cost is high and the hire rates do not usually make the use of this shuttering economical except on very small jobs. Consequently timber has been used for most of the important shells that have been constructed so far. However, should a contractor decide to specialize in shell work, as some do, in cooling towers, it would be economical for him to invest in steel shutters.

In general too much scaffolding is used, too much plant involved and too much labour expended in erecting and dismantling. The use of travelling shutters would be one solution to the problem, but if they are used the architect and the engineer must give much consideration to their use during the early planning of the work. To use travelling shutters most economically, the building should be designed with wide barrels of short spans, so that after a complete unit has been poured, the shutters can be struck quickly

TABLE I

Insulation	Per sq. yd.
½-in. building board	5s.
1-in. wood wool slabs	6s.
2-in. wood wool slabs	8s. 6d.
1-in. cork slabs	8s.
2-in. cork slabs	15s.
1-in. vermiculite screed	7s.
2-in. vermiculite spray	11s.
¾-in. vermiculite spray	7s. 6d.
½-in. asbestos spray	12s. 6d.
Roof lights	**Per sq. ft.**
Patent glazing	3s.–5s.
Deck lights	7s. 6d.–10s.
Clear glass in precast concrete units	7s. 6d.–10s.
Glass and concrete lights	13s. 6d.–17s. 6d.
Dome lights	15s.–30s.
Waterproofing	**Per sq. yd.**
Bitumastic pastes	3s.–5s.
Roofing felt	5s. 6d.–10s.
Built up bitumastic waterproofing	6s.–15s.
Asphalt	10s.–20s.

USING this system of Guttering shows a tremendous saving in cost, material and maintenance charges. Finlock Gutters are made with a fine waterproof concrete—simple in design, easy to use and *permanent*.

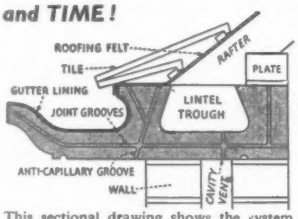
Finlock forms the eaves and gutters *(says Mr. Fin)*

. . . and saves £15 per house! (says Mr. Lock)

On the illustration below "a" shows the trough in which lintels can be cast *in situ* if required, "b" shows the large sectioned gutter channel which permits laying without fall. Strong enough to walk in and to withstand all building stresses. Completed by a bituminous lining after laying. "c" indicates the jointing grooves.

★ *A fully illustrated Technical Booklet is available on request, from our Head Office (A.J. Information Sheet No. 33010)*

HOW FINLOCK SAVES MONEY and TIME!



This sectional drawing shows the system in detail and illustrates the ways in which FINLOCK saves approximately 5 yards of brickwork, 80 ft. of rafter, 40 ft. of normal guttering, 40 ft. of fascia, 40 ft. of soffit and 80 ft. super of roof tiling per single house. Painting is eliminated and a reduction in down pipes and drainage is obtained. The complete eaves for a building, with all fittings, can be fixed in one day.

Some typical FINLOCK units are shown below:—

Regd. Pat

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Over 200 local authorities are now using Finlock.

The buildings shown are in accordance with the winning design in the £1,000 low cost housing competition organised by "THE BUILDER". By courtesy of J. L. Womersley, Esq., A.R.I.B.A., A.M.T.P.I., Borough Architect for Northampton.

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20 ST. JOHNS RD., TUNBRIDGE WELLS, KENT

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DHB

and moved on to the next unit. Some remarkable shuttering times have been recorded for a stadium roof in the USA spanning 240 ft. (see Information Centre item 20.208:6.12.51). Upstand ribs allowed a clear soffit and constant travel for the shutter, so that it was possible to strike and re-erect within three hours a section 60 ft. long with a span of 240 ft. An interesting example of travelling shutters was given in a paper on shuttering shells by H. F. Rosevear, of Sir Robert McAlpine and Sons Ltd. Mr. Rosevear described the shuttering for a factory at Greenford where an area of 151 ft. 6 in. by 400 ft. 6 in. was roofed by 15 barrels spanning the 151 ft. 6 in., each with two diaphragms in their length, so that 45 separate areas required shuttering. A travelling frame of scaffolding tube members was used, supporting a flexible shutter composed of 20-g. steel sheet stiffened by "V" ribs of 20-g. steel at about 8-in. centres on the underside. Fig. 10 shows the frame in position for concreting; Fig. 11, the frame being mounted on bogies prior to travelling.

INFORMATION CENTRE

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

4.73 planning: urban and rural

NEW TOWN IN S. AFRICA

Welkom—A Town Planned to Serve the new Gold Mines. W. O. Backhouse. (Optima, March, 1952, pp. 12-17. The Anglo-American Corporation of South Africa.)

Description by the Town and Regional Planning Consultant to the Anglo American Corporation of South Africa of one of four new towns which are to be developed in the Orange Free State. Illustrated.

In due course a large population is expected to migrate into the new mining area. The plan is to establish several average-sized towns, each separated from the next by rural areas and with a maximum European population of 50,000.

The town of Welkom will serve a compact block of six mines in the geographical centre of the mining area. The site of the new town consists, partly, of a vast expanse of open country with no physical obstacles to prevent the laying out of a town of any shape or design. However, the planner is faced with certain limitations. Apart from lack of ordinary building facilities, which are more of concern to the builder, account has had to be taken of the areas needed for shaft-sinking, for mine buildings and for the accommodation of slime dams. The need for separate areas for the accommodation of Europeans and non-Europeans, and the legal conditions relating to land tenure in South Africa had also to be considered.

The plan of Welkom is intended to be more than a mining township. It is to combine the qualities of a garden city with the utilitarian requirements of ordinary commerce and industry. In shape the town consists of a series of different size wedges, between which are the mines. On the face of it the general plan looks ugly because of the massing and monotony of the layout. The civic centre, planned around a park of 8½ acres is surprisingly large. Nevertheless, it is surprising that quadrangular courts for the public buildings should still be the dominant motif.

18.102 construction : theory

FIRE SHUTTERS

Fire Resistance of Shutters for Moving-stairway Openings. Building Materials and Structures Report 129. (US Dept. of Commerce. 1952. 10 cents.)

Importance of fire shutters to moving stairways in commercial buildings. Test results on flexible roller shutters. 9 pages and 11 figures.

20.212 construction : complete structures

REINFORCED CONCRETE

Slab Costs Cut with Paper-formed Hollows. (Engineering News Record [USA], May 29, 1952. pp. 46, 49.)

New method of forming voids in ribbed floor construction, interesting to architects, engineers and builders.

The American contractor spares no effort to produce light floors by casting concrete around any hollow object and previous examples have included the use of specially formed pans placed on the formwork or even ice-cream cannisters so used as to provide a waffle-type slab. Latest addition in this field is the use of paper tubes which are cast within the slab itself leaving a concrete soffite for plastering or acoustic tiles.

The tubes were used in concrete floors of a two-storey high school in Windsor, Conn. These floors have spans of between 24 ft. and 35 ft. Ribs run between the tubes and for the 24 ft. span, using a depth of 9½ in. for roof slabs and 10 in. for floor slabs, a steel weight of only 27 lb. per sq. yd. was required. As the slabs are supported on load bearing walls or spandrel beams of depth equal to that of the slab, there is no loss of headroom in the classrooms. The tubes in these cases were ¼ in. wall thickness, 6 in. dia., and placed at 8-in. centres. In other spans over 28 ft. the slabs are 12 in. thick, paper tubes 8-in. dia., $\frac{3}{16}$ in. thick, and placed at 10-in. centres. The tubes are wired to the reinforcing steel and at laps; joints are wrapped with bituminous building paper. Where a partition wall lies parallel to the ribs the tubes are omitted and a solid strip with extra reinforcement is obtained.

21.42 construction: miscellaneous

RESTORATION AND REPAIR

Structural Repair and Ancient Buildings. Report of paper by J. E. M. Macgregor and J. S. Wilson. (The Builder. June 13, 1952.)

Useful and interesting report. Causes of structural failure. Accurate methods for recording movements. Analysis of cracks in masonry. Some general remarks on repair methods.

This is a four page article containing much sound and original advice on the examination and repair of ancient buildings. There are general remarks on the main causes of structural failure, a useful page of sketches showing different types of cracks and why they occur and also some repair methods. Perhaps the most valuable contribution is a good description of accurate and practicable methods of measuring movement in cracks and the plumbing of walls to give accurate data over a period of observation.

22.55 sound insulation and acoustics

SOUND REINFORCEMENT

Sound Distribution Systems. BS C of P 327.300 (1952). (British Standards Institution. 6s. 1952.)

A useful reference for those designing buildings where sound reinforcement is required, although its detailed recommendations mainly concern the acoustic engineer or manufacturer. It is unfortunate that there is no mention of the recent German work on the use of time delays to improve intelligibility and naturalness in sound systems (the Haas effect) presumably due to the long time which elapses between writing and publication of such documents.

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

ENQUIRY FORM

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

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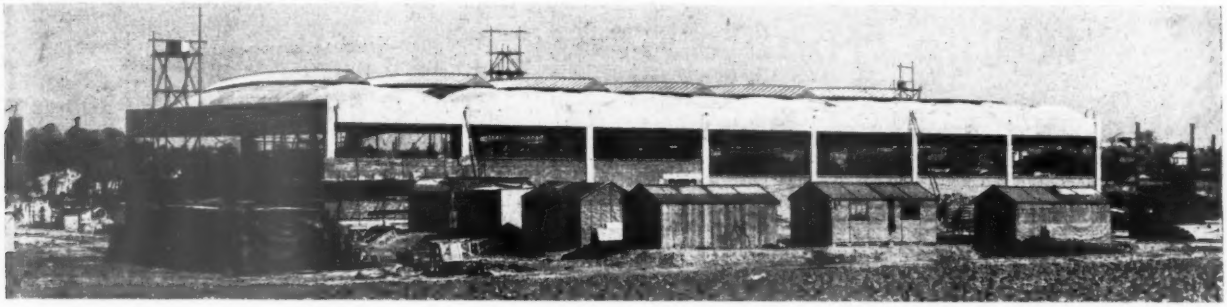
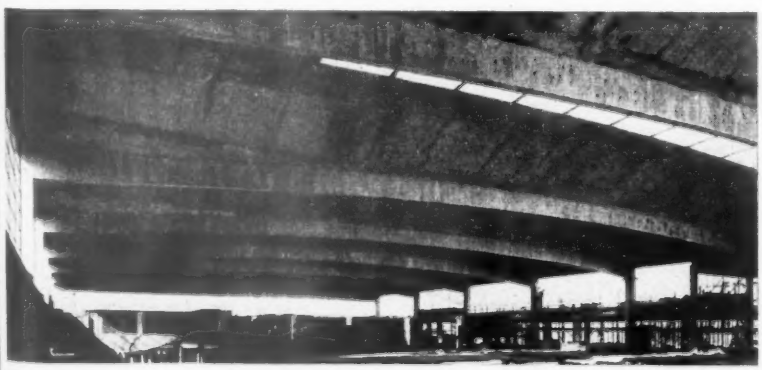
AJ 7.8.52

PRESTRESSED SHELL ROOF AT KING'S LYNN FACTORY



The roof of the main factory erected at King's Lynn in 1951 for Fropax (Ware) Ltd., was the first prestressed shell to be formed in England. A series of seven shells, each 28 ft. wide, was used to span 112 ft.; giving a clear floor area of 196 ft. by 112 ft. As the factory is close to the River Ouse, piling was necessary for the foundations; hence by reducing the number of columns required by using a shell roof a considerable saving was effected in the cost of the foundations. The shell slabs are 2½ in. thick; their radius is 20 ft. Edge beams and end frames are 8 in. thick; the concrete in them was vibrated. The edge beams were post-tensioned by the Magnel-Blaton system. This eliminated the need for normal tensile reinforcement in these beams, reduced the stresses in the shell itself, permitted a reduction in the constructional depth of the shell and eliminated bending moments in the columns. The whole roof was arched in the direction of the edge beams, so that the cables in them could be kept straight; the rise is 38 in. in the 112-ft. span. It was required that the external edge beams should have flat soffits, so in these the cables are curved. It is of interest that it was necessary to apply to them a force 2½ times as great as that applied to the straight cables in order to achieve the same tension—140,000 lb./sq. in. In spite of bad weather six of the roof bays were completed in eight weeks. In order to speed up the striking of shuttering, the shell was thickened up to form curved ribs at 28-ft. centres. These ribs, supported by tubular scaffolding, carried the weight of the roof temporarily so that the shuttering could be moved on to the next bay before the prestressing was carried out. The end frames were constructed in normal reinforced concrete and over part of their length formed one wall of the water storage tank. No expansion joints were used in the main roof, the columns of which were sufficiently flexible, but two joints were formed dividing the amenities building and water storage tank to prevent damage to the brickwork. All roof



construction was supported on tubular scaffolding and for the shuttering to the shells two methods were used. The first consisted of plywood sheets fixed to curved battons resting on longitudinal tubes. The second consisted of plywood sheets wired down direct to longitudinal tubes supported on curved cross tubes. Both methods proved satisfactory. The underside of the roof, seen unfinished in the photographs above and left, was finished with cement paint. Three-layer roofing felt was applied externally. The roof lights of patent glazing follow the curve of the roof. The building was designed by the architectural department of Fropax (Ware), Ltd.; the shell roof by Chisarc and Shell "D" Ltd. (consulting engineer, H. G. Cousins). General contractors were Holst & Co. Ltd. Prestressing equipment was supplied by Stressed Concrete Design Ltd.

THE INDUSTRY

From the Industry this week Brian Grant reports on the use of the recently developed curved corrugated "Perspex" for roof lights; the "Frenger" combined ceiling heating and sound absorbing system and Courtney Pope's new showroom for shopfitting and lighting fittings.

ROOF LIGHTS

Until recently the use of corrugated "Perspex" has been confined to flat surfaces and roofs sheeted with corrugated iron or asbestos cement, but, as the photograph, right, shows, this material is now being produced in curved sheets suitable for top lighting on flat roofs. These sheets, available for spans from 3 ft. to 8 ft., in 6-in. increments, were first produced for top lighting in a school for the Middlesex County Council. There are no glazing bars or framing, so that full daylighting is obtained through the whole area of the opening.

The length of these "lanterns" is unlimited and, since the sheets themselves have a weight of only one quarter that of ¼-in. wired glass, they can be supported by the normal roof structure without any extra reinforcement—a saving which is most important when metal-decked roofs or other types of lightweight construction are used. The sheets themselves can be fixed to the kerbs of the lanterns either by bolting them to an extruded light alloy member, the bolts having washers of "Welvic" (another plastic), or by fixing them direct with similar washers and "Rawlnuts" (see sketch top right). The "Welvic" washers make the fixing watertight and, at the same time, allow for thermal expansion.

Where the installation has to be dust-tight, or where the weather is liable to be severe, the gap at the eaves can be covered with a special moulding. (*I.C.I. Ltd., Imperial Chemical House, Millbank, London, S.W.*1.)

LIGHTING FITTINGS AND CEILINGS

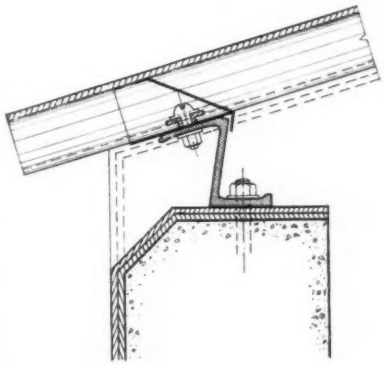
The section on the right shows the "Frenger" ceiling, in which is combined a radiant panel heating unit and an efficient sound absorbing surface.

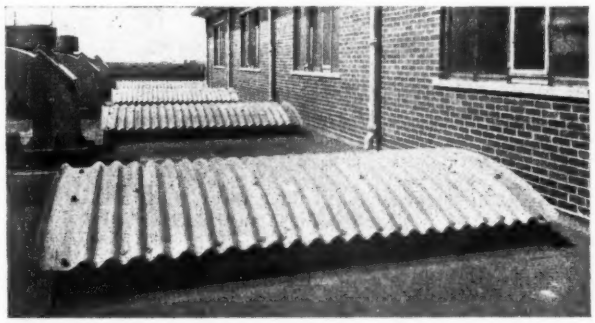
It is prefabricated, comparatively easy to erect and easy to adapt for different shapes of room and different lighting and ventilating systems. It is made up of a grid piping system supporting perforated square metal panels and blanketed by insulating material. Square pipes are used for the grid which is connected to a hot water system. The pipes are prefabricated to make installation quick, easy and accurate, and they are suspended from the main roof or ceiling of the room.

The insulating material is placed over the panels and the pipes. It prevents heat escaping upwards and absorbs sound waves most efficiently. The perforated metal panels, 24 in. square, pressed from aluminium, can be snapped easily into position and can be removed for inspection of the services concealed above them. The whole weight of the ceiling, including the water in the pipes, is only about 3·5 lb. per sq. ft.

The ceiling can be designed to fit any room as the panels are easily cut to fit round projections, such as piers and columns, or to suit a particular lighting system, and there are special lighting fittings designed for this ceiling to replace one or more of the standard panels.

Inspection is reasonably simple—merely a matter of removing a few panels to get at the part that needs attention. (*Frenger Ceilings, Ltd.*, 29, *Woburn Place, London, W.C.*1.)





Left, the application of curved corrugated "Perspex" for roof lights. Above, fixing detail for fixing the "Perspex" direct to a kerb.

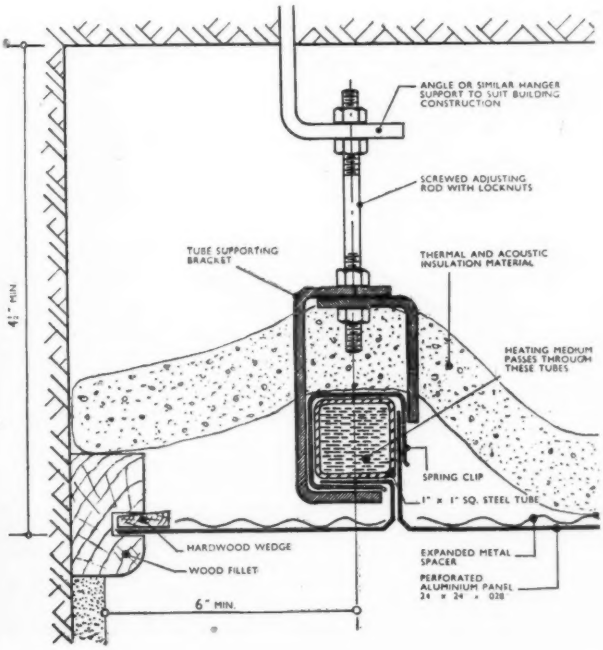
SHOPFITTING

Readers who would like to look at a ceiling of this kind will find it simplest to have a look at Courtney Pope's new showrooms, which are concerned with lighting fittings (installed in a "Frenger" ceiling) and a well thought out range of shopfittings produced under the trade name of "Visiflow." The basic idea is to provide fittings which permit rapid re-arrangement within the structural walls.

In designing the range an arbitrary counter length has been avoided and a series of standardised lengths has been evolved based

(continued overleaf)

Right, section through the "Frenger" combined ceiling heating and sound absorbing system, as used, below, at Courtney Pope's new showroom.



(continued from page 179)

mainly on the needs of the stock stored in the lower section of the counters. Corner units and splayed end counters are also produced.

The recommended external finish is grey oak, which offers maximum durability combined with lightness of colour. The durability of the equipment is further increased by a recessed rubber skirting and the introduction of an anodised aluminium trim to the vulnerable edges of the top sections of all fittings.

All fittings and counters can be provided with fluorescent lighting housed in suitable reflectors and wired complete to control gear, situated in a special trap in the base of the unit and terminated with a reverse socket and plug.

Three alternative sizes of moulded plastic tray are available, giving the necessary flexibility for different types of goods. In the top sections of all fittings the trays are supplied in cream; in the lower sections of fittings and counters they are brown. (*Courtney Pope, Ltd., and Courtney Pope (Electrical), Ltd., Amhurst Park Works, Tottenham, London, N.*15.)

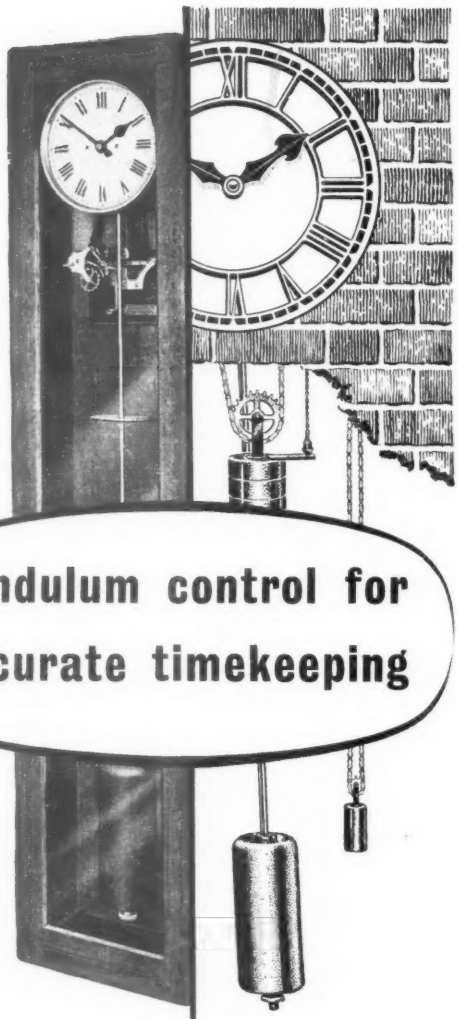
BRIAN GRANT

Buildings Illustrated

St. Joseph's Convalescent Home at Branksome Wood Road, Bournemouth, Hants. (Page 159.) Architects: Archard, Worrow & Hardy, F./A./A.R.I.B.A. Quantity surveyors: Davis, Belfield & Everest. General contractors: James Drewett & Sons Ltd. Sub-contractors: reinforced concrete, fireproof construction, Girlingstone; structural steel, James Bros. (Hamworthy) Ltd.; "built-up" type special roofings, Permanite Ltd.; patent glazing, casements, Wiggins-Sankey Ltd.; woodblock flooring, Horsley Smith & Co. (Hayes) Ltd.; asphalt and patent flooring, Permanite Ltd.; central heating, Barrett & Wright Ltd.; kitchen equipment, stoves, boilers and sanitary fittings, G. F. E. Bartlett & Son; electric wiring, Electrical Services (Shears) Ltd.; door and window furniture, Stedall & Co. Ltd.; metalwork, James Couper & Co. Ltd.

Summerswood Primary School, Furzehill Road, Boreham Wood, Herts. (Pages 161-170.) For the Hertfordshire County Council. Architect: C. H. Aslin, C.B.E., F.R.I.B.A., M.I.STRUCT.E., County Architect: Bruce Martin, A.R.I.B.A., Chief Assistant; Miss H. E. Hope, A.R.I.B.A., Senior Assistant Architect. General contractor: The Hale Construction Co. Ltd. Clerk of works: E. H. Abrams. General foreman: G. W. Douse. Sub-contractors: piles, Earth & General Contractors Ltd.; slate sills, Bow Slate & Enamel Co. Ltd.; Leicester red pressed paving brick, Uxbridge Flint Brick Co. Ltd.; stone, The Wimpenny's Stone Quarries Ltd.; structural steel and folding gates, Hills (West Bromwich) Ltd.; fascia, Turners Asbestos Cement Co. Ltd.; quarry floor tiles, Carter & Co. Ltd.; special roofings, and roofing felt, The Ruberoid Co. Ltd.; partitions, glass and cloakroom fittings, Holoplast Ltd.; patent glazing ("Aluminex"). Williams & Williams Ltd.; patent cork flooring, Jaskel Robertson & Co. Ltd.; central heating, Weatherfoil Heating Systems Ltd.; gas fixtures, Ministry of Works, gas fittings, Eastern Gas Board; electric wiring, E. Wight & Co. Ltd.; electric light fixtures, E. Wight & Co., Benjamin Electric Ltd.; ventilation, Greenwoods & Airvac Ventilating Co. Ltd.; waste pipes and traps to lavatory basins, Econa Modern Products Ltd.; tanks, F. Braby & Co. Ltd.; sanitary fittings, Adamsez Ltd.; stone stair-treads, The Wimpenny's Stone Quarries Ltd.; casements, Quicktho Ltd., for Holoplast Ltd.; telephones, G.P.O.; stage curtain track, The British Trolley Track Co. Ltd.; textiles, Gerald Holtom; furniture, Education Supply Association Ltd., Geo. M. Hammer & Co. Ltd., Norbury Joinery & Cabinet Works Ltd., Abbott Bros.; paint, R. Gay & Co., Vitretex Ltd.; ceiling board, The Cape Asbestos Co. Ltd.; shrubs and trees, H.C.C.; water supply, The Colne Valley Water Co.; mats, The United London Workshops for the Blind; electrical cables, British Insulated Callender's Cable Co. Ltd.

In addition to the usual products on view in the showrooms (at Aldwych House: photo above) of J. H. Sankey & Son, Ltd., the enlarged brick section now contains a comprehensive display of over 130 varieties of stocks, rustics, wire cut, facing and engineering bricks, and a certain number of sand limes, all of which are readily available from stock and are suitable for local conditions south of the Midlands. Visitors are welcomed and their enquiries will receive expert attention.



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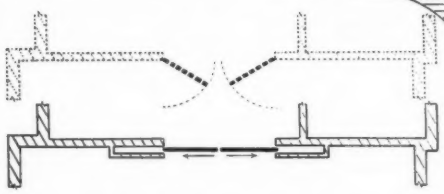

True Plans of a Conversion from two swing doors to a pair of bi-parting sliding doors gliding into cavity walls. Full constructional details will be found in "The Sliding Door" edition 25 Section 4 Pages 98/108.

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SLIDING DOOR GEAR

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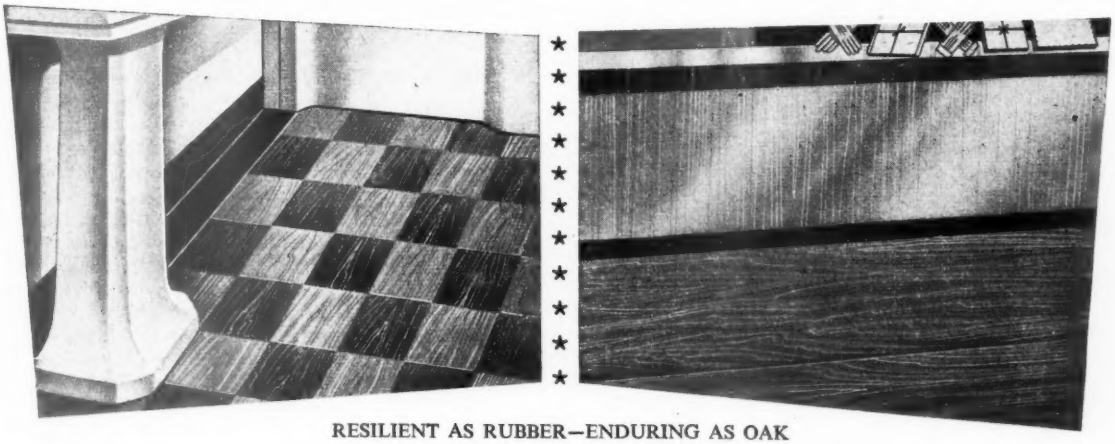

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CLASSIFIED ADVERTISEMENTS

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

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

Public and Official Announcements

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

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

AMENDED ADVERTISEMENT.
CRICKLADE AND WOOTTON BASSSETT RURAL DISTRICT COUNCIL.
APPOINTMENT OF ENGINEERING AND SURVEYING ASSISTANT.

Applications are invited for the appointment of Engineering and Surveying Assistant to the Engineer and Surveyor, Mr. J. C. Grindley, A.M.I.C.E., A.R.I.C.S., A.M.T.P.I., at a salary in accordance with Grade II of the A.P.T. Division of the National Conditions of Service (£495×£15—£540).

The appointment will be subject to the provisions of the Local Government Superannuation Act, 1937, and to the successful candidate passing a medical examination.

Experience in housing works will be considered an advantage.

Applications, endorsed "Engineering and Surveying Assistant," stating age, qualifications and experience, together with copies of not more than three recent testimonials, should reach the undersigned by Monday, 1st September, 1952.

Canvassing, directly or indirectly, will be a disqualification.

W. J. HOSIER,
Clerk of the Council.

Council Offices, Wootton Bassett. 7181

THURROCK URBAN DISTRICT COUNCIL.
ARCHITECTURAL ASSISTANTS, GRADES IV AND III.

Applications are invited for the appointment of Two Architectural Assistants on the terms mentioned below.

(1) An Architectural Assistant at a salary in accordance with Grade IV of the A.P.T. Division of the National Scale of Salaries, *i.e.*, £555, rising by three annual increments of £15 to £600 per annum.

General architectural experience is necessary, and applicants must be capable of preparing detailed plans and specifications and supervising housing schemes. Candidates should have passed the Intermediate Examination of the Royal Institute of British Architects.

(2) An Architectural Assistant at a salary in accordance with Grade III of the A.P.T. Division of the National Scale of Salaries, *i.e.*, £525, rising by three annual increments of £15 to £570 per annum.

General architectural experience is necessary, and previous success in some part, or parts, of the examination leading to the qualification A.R.I.B.A. will be an advantage.

Housing accommodation, if necessary, may be provided for the successful candidates if they live more than twenty miles from the Thurrock Urban district.

The appointments are subject to the provisions of the Local Government Superannuation Act, 1937, and the successful applicants will be required to pass a medical examination.

Applications, endorsed "Architectural Assistant, IV," or "Architectural Assistant, III," as the case may be, stating age, qualifications and experience, with copies of not more than three testimonials, should reach the undersigned not later than first post on Tuesday, 12th August, 1952.

Canvassing will disqualify, and applicants must disclose in writing any relationship to any member or senior officer of the Council.

A. E. POOLE,
Clerk of the Council.

Council Offices, Whitehall Lane,
Grays, Essex. 7178

WARE RURAL DISTRICT COUNCIL.
ARCHITECTURAL ASSISTANT.

Applications are invited for the appointment of Architectural Assistant in the Department of the Surveyor to the Council.

Experience in housing is essential, and candidates must be proficient in surveying, levelling and preparing detailed drawings and specifications.

Salary, Grades VI to VII, according to experience and qualifications. Car allowance.

The appointment will be subject to the Local Government Superannuation Act, a satisfactory medical examination, and one month's notice on either side.

Full particulars and forms of application may be obtained from the Surveyor, 97, New Road, Ware. Applications to be returned on official form to the undersigned by first post on 15th September, 1952.

E. J. HOWLETT,
Clerk of the Council.

Council Offices, 97, New Road, Ware, Herts.
29th July, 1952. 7196

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DOUGLAS, ISLE OF MAN
TO REGISTERED BUILDING CONTRACTORS

Registered Building Contractors are invited to submit their names for consideration in connection with the Proposed Erection of a New Children's Wing and Twin Operating Theatre Unit on the Hospital Site in Westmoreland Road, Douglas, Isle of Man in accordance with Plans and Specifications prepared by the Hospital's Architect, Mr. W. T. Quayle, F.R.I.C.S., F.I.A.A., of Douglas. Tenders will be based on Bills of Quantities.

Only Contractors of repute, who have sufficient labour and resources to undertake buildings of a complex nature need submit their names. Contractors should have experience in the construction of steel framed and reinforced concrete buildings. The names of Architects to whom reference can be made in respect of works carried out by Contractors, must be submitted with the application. The names of Contractors will be given full consideration and a selected list will then be asked to submit firm tenders.

Applications are to be submitted in the first instance to the Secretary, Noble's Isle of Man Hospital, within fourteen days after the appearance of this advertisement.

E. C. KNEALE,
Secretary.

Noble's (I.O.M.) Hospital,
Douglas, Isle of Man. 7171

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

Applications are invited for the following appointments in the Quantity Surveyor's Section :—

(*a*) ONE PRINCIPAL ASSISTANT QUANTITY SURVEYOR, A.P.T. Division, Grade VIII (£735—£810).

(*b*) TWO SENIOR ASSISTANT QUANTITY SURVEYORS, A.P.T. Division, Grade VI (£645—£710).

(*c*) ONE ASSISTANT QUANTITY SURVEYOR, A.P.T. Division, Grade V (£570—£620).

Candidates for appointment (*a*) must be thoroughly experienced in the preparation of Bills of Quantities for Housing, Flats and building work of a general character. In addition, the post requires a Surveyor capable of assisting in the supervision of the Quantity Surveyor's Section under the direction of the Contracts Officer and Chief Surveyor. Candidates for appointments (*b*) and (*c*) must have had experience in the preparation of Bills of Quantities, specifications, estimates, and the settlement of final accounts on all kinds of building contracts. Preference will be given to professional Associates of the Royal Institution of Chartered Surveyors.

The appointments will be subject to the National Conditions of Service as adopted by the City Council, to the provisions of the Local Government Superannuation Act, 1937, and to one month's notice on either side. The successful candidates will be required to pass a medical examination.

Applications, stating position applied for, age, particulars of training, qualifications, experience, present and past appointments, together with copies of two recent testimonials or the names and addresses of two persons to whom reference may be made, should be addressed to George Kenyon, A.R.I.B.A., A.M.T.P.I., City Architect, 18, Cloth Market, Newcastle-upon-Tyne, 1, not later than the 23rd August, 1952.

JOHN ATKINSON,
Town Clerk.

Town Hall,
Newcastle-upon-Tyne, 1.
29th July, 1952. 7203

CITY AND COUNTY OF BRISTOL
CITY ARCHITECT'S DEPARTMENT

Applications are invited for the following permanent staff appointments :—

(*a*) Grade VI (£670—£735) SENIOR ASSISTANT ARCHITECTS.

(*b*) Grade III (£525—£570) ASSISTANT ARCHITECTS.

(*c*) Grade II (£495—£540) ARCHITECTURAL ASSISTANTS.

(*d*) Grade I (£465—£510) ARCHITECTURAL ASSISTANT.

Applicants for (*a*) must be Associate Members of the R.I.B.A. or hold equivalent qualifications, and have had considerable experience in design, construction and contract administration, preferably with a large Local Authority.

Applicants for (*b*) and (*c*) must have passed the Intermediate Examination of the R.I.B.A., and have had experience in surveys, preparation of working drawings, details, etc.

Applicants for (*d*) must have had good experience on surveys, colouring, tracing and detailing.

Housing accommodation provided if necessary at an economic rent.

The appointments are superannuable, subject to satisfactory medical examination and one month's notice in writing on either side.

Applications indicating the specific appointment applied for, stating age, training, qualifications, experience, present appointment and salary, together with the names of two referees (including present employer) must be delivered to the undersigned by Wednesday, 13th August.

J. NELSON MEREDITH, F.R.I.B.A.,
City Architect.

Council House,
College Green, Bristol, 1.
25th July, 1952. 7186

BOROUGH OF WIDNES.
BOROUGH ARCHITECT'S DEPARTMENT.

Applications are invited for the appointment of an ARCHITECTURAL ASSISTANT, at a salary in accordance with A.P.T., Grade IV, of the National Scale of Salaries, commencing at the minimum of the grade.

Applicants must be student R.I.B.A. and have worked in an Architectural office for at least two years subsequent to having passed the Intermediate Examination.

The appointment will be subject to the National Scheme of Conditions of Service as adopted by the Council and to the Local Government Superannuation Act, October, 1937, and to one successful candidate passing a medical examination.

Applications, stating full particulars of age, experience and qualifications, etc., together with names and addresses of two referees, to be sent to the Borough Architect, Brendan House, Widnes Road, Widnes, not later than Friday, the 29th August, 1952.

Canvassing, directly or indirectly, will disqualify.

FRANK HOWARTH,
Town Clerk.

Town Hall, Widnes.
23rd July, 1952. 7196

STAFFORDSHIRE COUNTY COUNCIL.
COUNTY PLANNING DEPARTMENT.

Applications are invited for the appointment of a PLANNING ASSISTANT on the Headquarters Staff of the County Planning Department. The salary will be within grouped Grades IV-VI (£530-£710), commencing salary to be according to qualifications and experience.

The Department is concerned with the implementation of the County Development Plan. Candidates should preferably have experience in the preparation and carrying into effect of housing estate layouts, estate development work, and urban redevelopment schemes.

Candidates should be qualified Architects or Surveyors, and Corporate membership of the T.P.I. would be an advantage.

Applications should give details of age, education and training, qualifications, present and previous appointments and experience, and should include copies of two recent testimonials and the names of two other persons to whom reference can be made. Applications should be sent to D. W. Riley, County Planning Officer, 41a, Eastgate Street, Stafford, not later than 8th August, 1952.

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

7194

AYCLIFFE DEVELOPMENT CORPORATION
(NEW TOWN OF NEWTON AYCLIFFE)
APPOINTMENT OF CHIEF QUANTITY SURVEYOR

Applications are invited from fully qualified and experienced Chartered Surveyors for the appointment of Chief Quantity Surveyor in charge of a department which is shortly to be set up as a section of the Chief Architect's Department.

The salary for this post will be in accordance with Grade A.P.T. IX of the scale of salaries for local government staffs, namely, £815 per annum rising by annual increments of £40 to a maximum of £935 per annum.

The appointment will be subject to the National Scheme of Conditions of Service made by the National Joint Council for Local Authorities' Administrative, Professional, Technical and Clerical Services, to the provisions of the Local Government Superannuation Act, 1937, to a satisfactory medical examination and to one month's notice, in writing, on either side.

Housing accommodation will be available, if required.

Applications stating age, qualifications and experience, together with the names of two persons to whom reference can be made should be forwarded to the undersigned to arrive not later than Saturday the 6th September, 1952.

A. W. THOMAS,
General Manager.

Newton Aycliffe,
Co. Durham. 7193

SURREY COUNTY COUNCIL
COUNTY ARCHITECT'S DEPARTMENT

Applications are invited for the appointment of ASSISTANT QUANTITY SURVEYOR, GRADE VI, at a commencing salary of £645 per annum, rising by annual increments of £20/£25 to a maximum of £710 per annum, plus London Allowance of up to £30 per annum according to age.

Preference will be given to applicants who are Members of the Royal Institution of Chartered Surveyors (Quantities Sub-Division) and who have adequate experience in the preparation of Bills of Quantities, site measuring, and in settlement of final accounts.

The appointment will be subject to the provisions of the Local Government Act, 1937, and the successful applicant will be required to pass a medical examination.

Applications, stating age, qualifications and experience, and accompanied by copies of three recent testimonials, should be sent to The County Architect, Surrey County Council, County Hall, Kingston-upon-Thames, not later than the 16th August, 1952.

Canvassing, either directly or indirectly, will disqualify a candidate from consideration.

The Council will be unable to provide any housing accommodation and the successful applicant will be expected to make his own arrangements in this direction.

W. W. RUFF,
Clerk of the Council.

County Hall,
Kingston-upon-Thames. 7207

WORTLEY RURAL DISTRICT COUNCIL
(Population : 45,167. Rateable Value : £249,359)
APPOINTMENT OF CHIEF ARCHITECTURAL ASSISTANT AND ASSISTANT ARCHITECT

Applications are invited for these appointments as follows :—

I. CHIEF ARCHITECTURAL ASSISTANT—salary in accordance with A.P.T. VI of the National Scales (£570—£735).

II. ASSISTANT ARCHITECT — salary in accordance with A.P.T. V of the National Scales (£595—£545).

Applicants for post I should be Members by examination of the R.I.B.A. and preferably have had municipal experience. Applicants for post II should preferably have passed the final examination of the R.I.B.A., and should at least have passed the intermediate.

Housing accommodation available if required

Forms of application may be obtained from the undersigned, to whom applications must be delivered not later than 25th August, 1952.

ADRIAN M. KELLY.
Clerk.

Council Offices,
Grenoside, Sheffield. 7189

COUNTY COUNCIL OF DURHAM
COUNTY PLANNING DEPARTMENT

Applications are invited for the following permanent appointments in the County Planning Department :—

(*a*) ONE RESEARCH ASSISTANT, Grade IV A.P.T., at a commencing salary of £555 rising by annual increments of £15 to a maximum of £600 per annum.

(*b*) TWO DRAUGHTSMEN, Grade III, Miscellaneous, at a commencing salary of £355 rising by annual increments of £15 to a maximum of £415 per annum.

Applicants for :—

(*a*) Must hold a University Degree in Geography or kindred subject and be able to carry out general research work on such aspects as population, industrial development, minerals, etc., and prepare specialised surveys and reports. Previous experience in this field is desirable.

(*b*) Should have had experience in a town planning office, in ordnance map revision and be a competent draughtsman and colourist.

The appointments are subject to the National Scheme of Conditions of Service as adopted by the County Council; to the provisions of the Local Government Superannuation Act, 1937, and the successful candidates will be required to pass a medical examination by the Council's Medical Officer; and to termination by one calendar month's notice in writing on either side. Canvassing, either directly or indirectly, will disqualify, and applicants must disclose in writing whether to their knowledge they are related to any member or senior officer of the Council.

Applications, stating age, whether married or single, and giving full particulars of qualifications, experience, present appointment and salary, and the names of two persons to whom reference may be made must be delivered to the Employment Exchange, Saddler Street, Durham, by 20th August, 1952.

J. K. HOPE.
Clerk of the County Council.

Shire Hall, Durham.
29th July, 1952. 7208

Architectural Appointments Vacant

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

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

TWO JUNIOR ASSISTANTS required. Office experience essential. Salary £350-£400. Write G. H. N. Inman & H. A. J. Darlow, F./A.R.I.B.A., The Charterhouse, E.C.1. 7175

RESPONSIBLE experienced senior assistant required immediately for varied general practice. Kenchington & Farms, F/A.R.I.B.A., 130, Crawford Street, W.1. 7190

ARCHITECTS AND ARCHITECTURAL ASSISTANTS required. Salary Scale :

Architectural Assistants	£500 by £25—£750
Architects	£550 by £25—£800
Senior Architectural Assistants	£710 by £40—£950
Senior Architects	£760 by £40-£1,000

Superannuation and Bonus Schemes in operation. Applications should be made in writing giving age and details of experience to The Scottish Orlit Co., Ltd., Sighthill Industrial Estate, Edinburgh, 11. 7187

SIR JOHN BURNET, TAIT & PARTNERS, 10, Bedford Square, W.C.1, require thoroughly experienced Assistant about 40 years of age with ability for contemporary design. Salary by arrangement. 7201

ARCHITECTURAL ASSISTANTS with 3 to 5 years' experience required immediately. Good salary and prospects. Five day week. Write to Messrs. J. M. Sheppard & Partners, 38, Bedford Place, W.C.1, giving particulars of age, qualifications, experience and salary required. 7198

Architectural Appointments Wanted

ARCHITECTURAL ASSISTANT, A.R.I.B.A. (26), with little experience, seeks post with London office offering sound experience and prospects. (Ex. Capt. R.E.) Box 509.

TWO ARCHITECTURAL ASSISTANTS (German), employed British Authorities, Germany, require positions architectural office, any district. Housing and general experience. O. Wortmann, c/o Works and Buildings, H.Q., N.A.A.F.I., B.A.O.R. 15. 7192

ARCHITECTURAL ASSISTANT, inter R.I.B.A., requires immediate appointment. Box 514.

IF your office is in London or S.E. suburbs and you require a Student R.I.B.A., with 5 years' experience, please write to Box 513.

ARCHITECTURAL ASSISTANT, with varied experience, good draughtsman, seeks position in London. Box 515.

ARCHITECTURAL DRAUGHTSMAN seeks full- or part-time job, London area. Box 516.

Other Appointments Vacant

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

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

FIRST-CLASS DRAUGHTSMAN required. Capable of producing final ink drawings for "The Architects' Journal" Information Sheets and Working Details. Write, giving age and experience to The Information Sheet Editor, "The Architects' Journal," 9, Queen Anne's Gate, London, S.W.1. 7170

THE COUNCIL OF INDUSTRIAL DESIGN requires a young man over 20 as administrative assistant in the Exhibitions Section. Interest in contemporary design, ability to do a working drawing, and either a university degree, or school certificate with art school or architectural training. Business experience an advantage. Starting salary according to age and experience from £370-£430 rising by annual increments to £650. Write giving full particulars of age, education, qualifications and posts held to The Establishment Officer, The Council of Industrial Design, Tilbury House, Petty France, S.W.1. 7209

A VACANCY occurs on the technical staff of "The Architects' Journal" for someone with a keen interest in and a sound knowledge of building construction. Write, giving age and experience to the Technical Editor, "The Architects' Journal," 9, Queen Anne's Gate, London, S.W.1. 7169

RE-INFORCED CONCRETE DESIGNER DRAUGHTSMEN wanted. Previous experience of Pre-cast Concrete work desirable. Good salary and prospects offered to those possessing the requisite qualifications. Superannuation and Bonus Schemes in operation. Applications should be made in writing giving age and details of experience to the Scottish Orlit Co., Ltd., Sighthill Industrial Estate, Edinburgh, 11. 7188

Services Offered

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

DUPLICATING AND TYPEWRITING, Bills of Quantities, Specifications, etc.; all grades of Office Staff supplied.—Trinity Bureau, 50, Bedford Street, Strand, W.C.2. TEM. 3002. 6983

TYPEWRITING, DUPLICATING.—Bills of Quantity, Specifications, etc., expertly typed/duplicated. Express service. Work collected/delivered. JOSEPHINE HALL & PARTNERS, 501/2, GRAND BUILDINGS, TRAFALGAR SQUARE, W.C.2, WHI. 6411/2, and 87, High Street, Tunbridge Wells. Telephone: 1255. 7005

DUPLICATING.—Bills of Quantity, Reports, etc. Prompt service; accurate work. Send to Fisher's, Hythe Street, Dartford, Kent. 7160

ARTIST, prepared to quickly execute Perspective Drawings, in any medium, from Architect's own details, sketches or instructions. Box 6610.

CONVERSIONS, ALTERATIONS, EXTENSIONS, and all small Building Contracts efficiently carried out at keen prices by enthusiastic South London builder. Parsons, 18, Maplestead Road, S.W.2. TUL : 3052 for immediate attention. 7191

LONDON BISHOP'S STORTFORD, CAMBRIDGE AREAS. Surveys, drawings, details, specifications, typing, etc. Enquire for other services. Box 7200.

EXPERIENCED REPRESENTATIVE, keen and imaginative, with good connection among London Architects, seeks appointment with good prospects with firm of repute. Highest references. Box 7197.

A.R.I.B.A., with good all round experience, requires part time or free lance work to help his growing practice. MUSeum 9106. 7205

For Sale or Wanted

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

RECONDITIONED EX-ARMY HUTS, and manufactured buildings. Timber, Asbestos, Nissen type, Hall type, etc. All sizes and prices. Write, call, or telephone, Universal Supplies (Belvedere) Ltd., Dept. 25, Crabtree Manorway, Belvedere, Kent. Tel.: Erith 2948. 6803

PRIME BELGIAN BLOCKBOARDS; 18 mm. 4 ft. by 7 ft. Faceveneer : Poplar 195s. 6d. per 100 sq. ft.; Gaboon 205s. f.o.m. London. M/A. to approved Accounts. Sample crates containing 6 boards at your disposal. Please apply Box 7136.

STOCKS FOR SALE

DRY FRENCH OAK BOULES sawn ¾ in. Dry French Plane Boules sawn 1 in., 1¼ in. 1½ in. and 2 in. A limited quantity of Selected Butts. Oak, 24s.; Plane, 19s. 6d. per cub. ft. f.o.m. London Dock. Inspection invited. Baltic Plywood & Timber Ltd., 88, Fenchurch Street, E.C.3. ROY. 1374 and 2779. 7199

PLAN CABINET, light oak, double elephant size. Six drawers in two sections. In good condition, £18. Leslie J. Bailey, M. Inst. R.A., Amersham. Tel.: 672. 7204

PRACTICE in progressive West Cumberland industrial development area for sale, owing to death of Fellow. Varied and particularly interesting owing proximity English Lake District. Box 7202.

Miscellaneous

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

A. J. BINNS, LTD., Specialists in the supply and fixing of all types of Fencing, Gates and Cloakroom Equipment. Harvest Works, 96/107, St. Paul's Road, N.1. Canonbury 2061.

FENCING FOR ALL PURPOSES supplied and erected. Established over 100 years. Cloakroom equipment also a speciality. Write Parker, Winder & Achurch Ltd., 80, Broad Street, Birmingham, 1. (MIDland 5001.) 6526

AUTHORS invited to submit MSS. all types (including poems), for publication. Stockwell Ltd., Elms Court, Ilfracombe. (Estd. 1898.) 7206

FLATS TO LET

ST. JOHN'S WOOD (close to Lords). Self-contained flat with roof studio in newly built block with lift. Rent, £295 exclusive. Snell & Co., 47, Maida Vale. Cun. 6181. 7210

Educational Announcements

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

R.I.B.A. and T.P.I. EXAMS.—Stuart Stanley (Tutor Sch. of Arch., Lon. Univ.) and G. A. Crockett, M.A./B.A., F./A.R.I.B.A., M./A.M.T.P.I. (Prof. Sir Patrick Abercrombie in assn.) prepare Students by correspondence tuition. 10, Adelaide Street, Strand, W.C.2. TEM. 1603/4.

R.I.C.S., I.A.A.S., and I.Q.S. Exams.—Postal Courses conducted by the Ellis School (Principal: A. B. Waters, M.B.E., G.M., F.R.I.B.A.), 103B, Old Brompton Road, S.W.7. KEN. 4477/8/9. Descriptive booklet on request. 7020

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