THE ARCHITECTS' JOURNAL

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★ A glossary of abbreviations of Government Departments and Societies and Committees of all kinds, together with their full address and telephone numbers. The glossary is published in two parts—A to 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. 75, Cannon Street, E.C.4.	City 5040
WDC	War Damage Commission. Devonshire House, Mayfair Place, Piccadilly, W.1.	Mayfair 8866
ZDA	Zinc Development Association. Lincoln House, Turl Street, Oxford.	Oxford 47988

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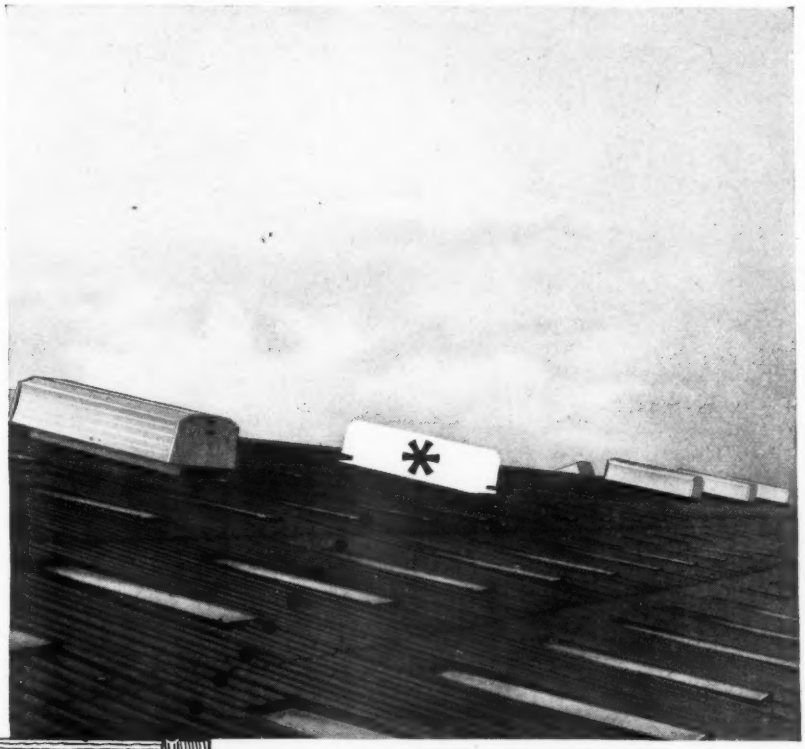

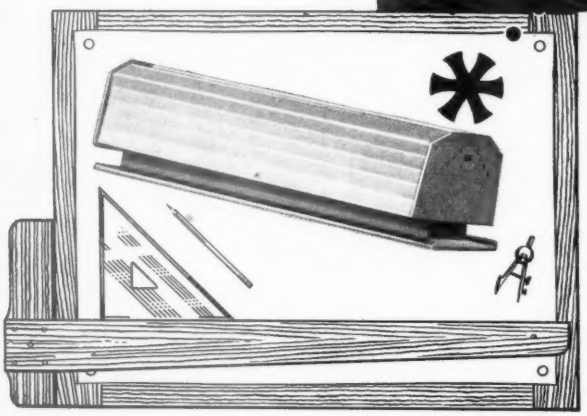

The Eagle Pottery of J. & G. Meakins Ltd., at Hanley, was being reorganised and Colt were called in to submit recommendations for its ventilation. On the first floor Potters' shop the problem was how to remove the heat from the stoves and ovens before it could affect the entire floor and make conditions hot and unpleasant for the operatives. Colt Industrial Type S.R. Heavy Duty Roof Extractors were installed and the problem was effectively solved. Many firms all over the country have cause to be grateful for the specialised knowledge of Colt—for as well as ensuring more efficient production, good ventilation means better working conditions and less staff problems.

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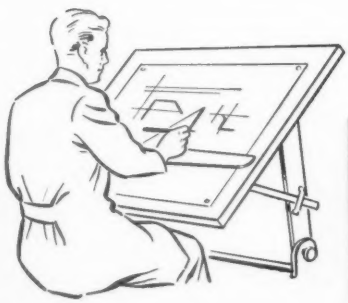

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A.16

Paton & Baldwin Ltd. Canteen—Darlington
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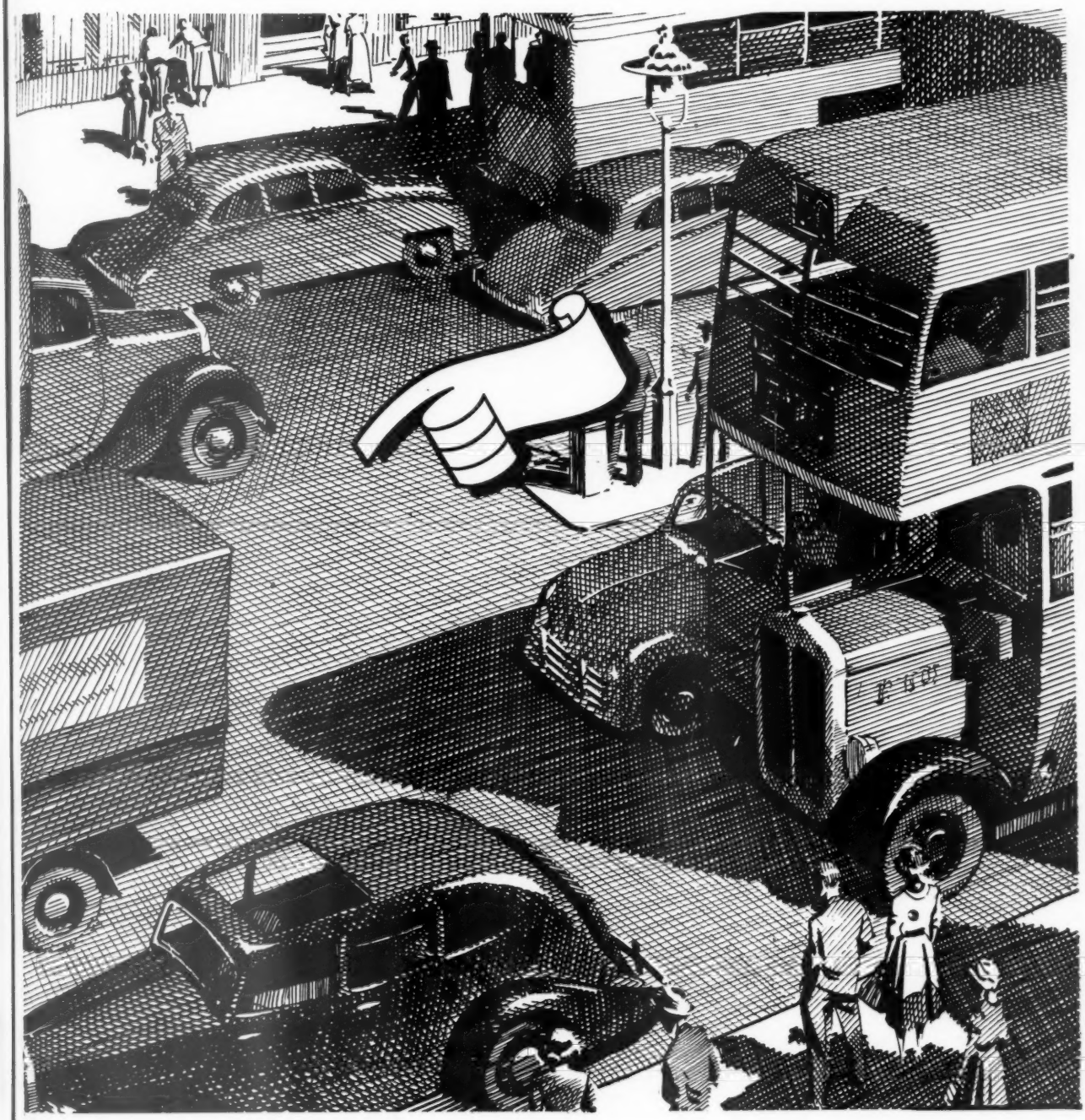

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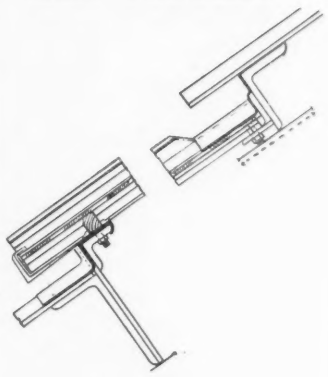

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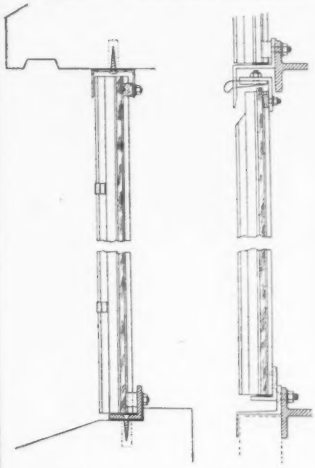
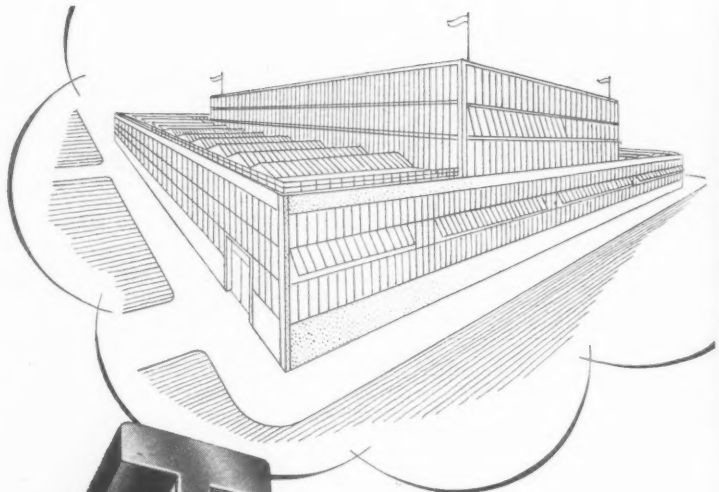
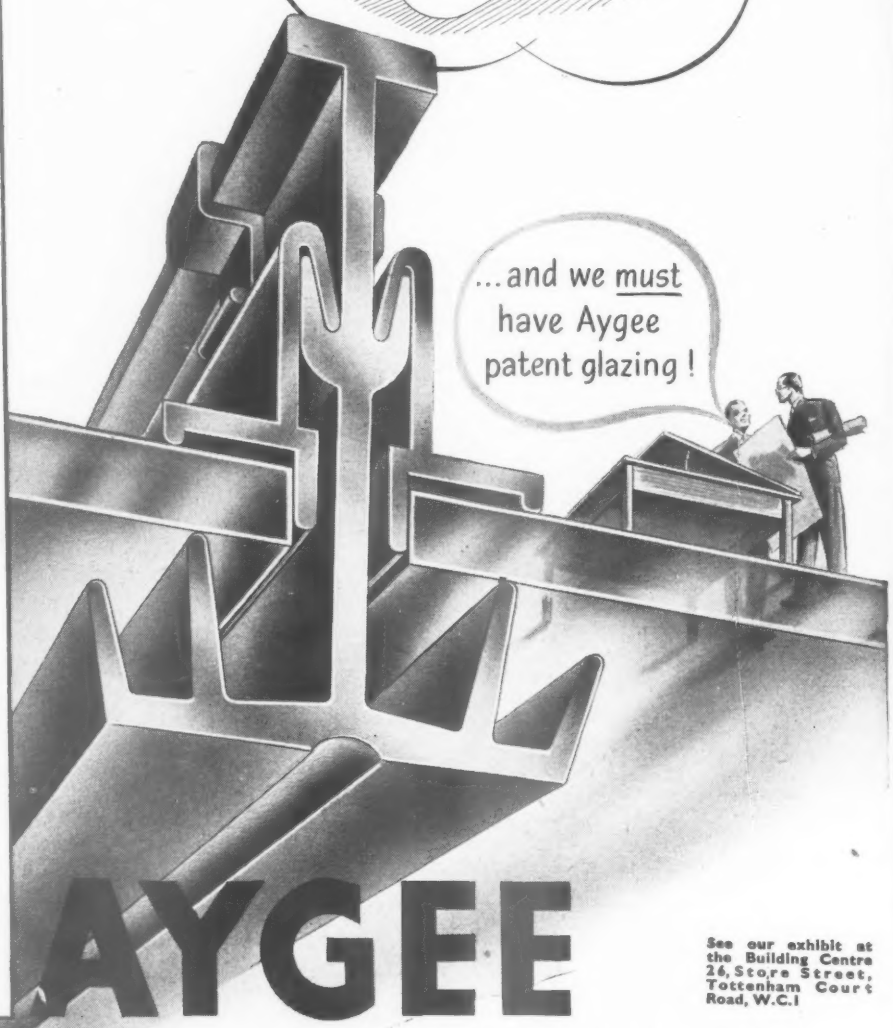


Section through fixed portion

Section through opening portion





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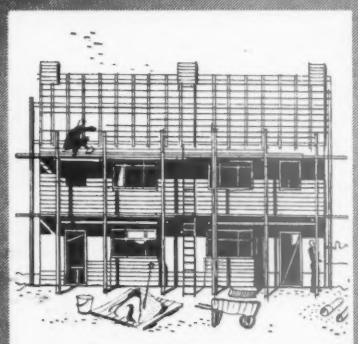

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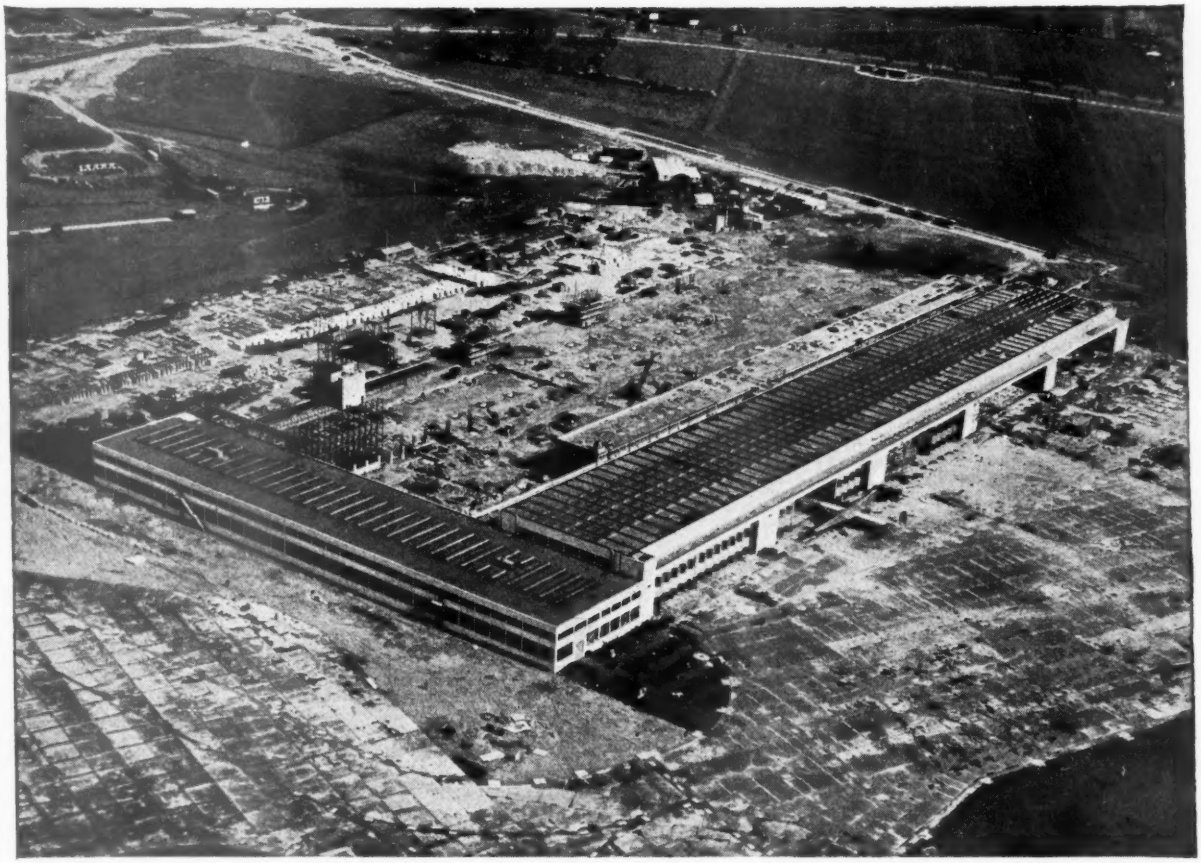

C61

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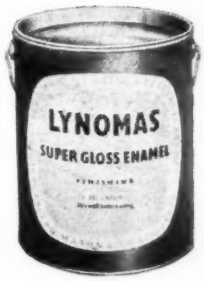

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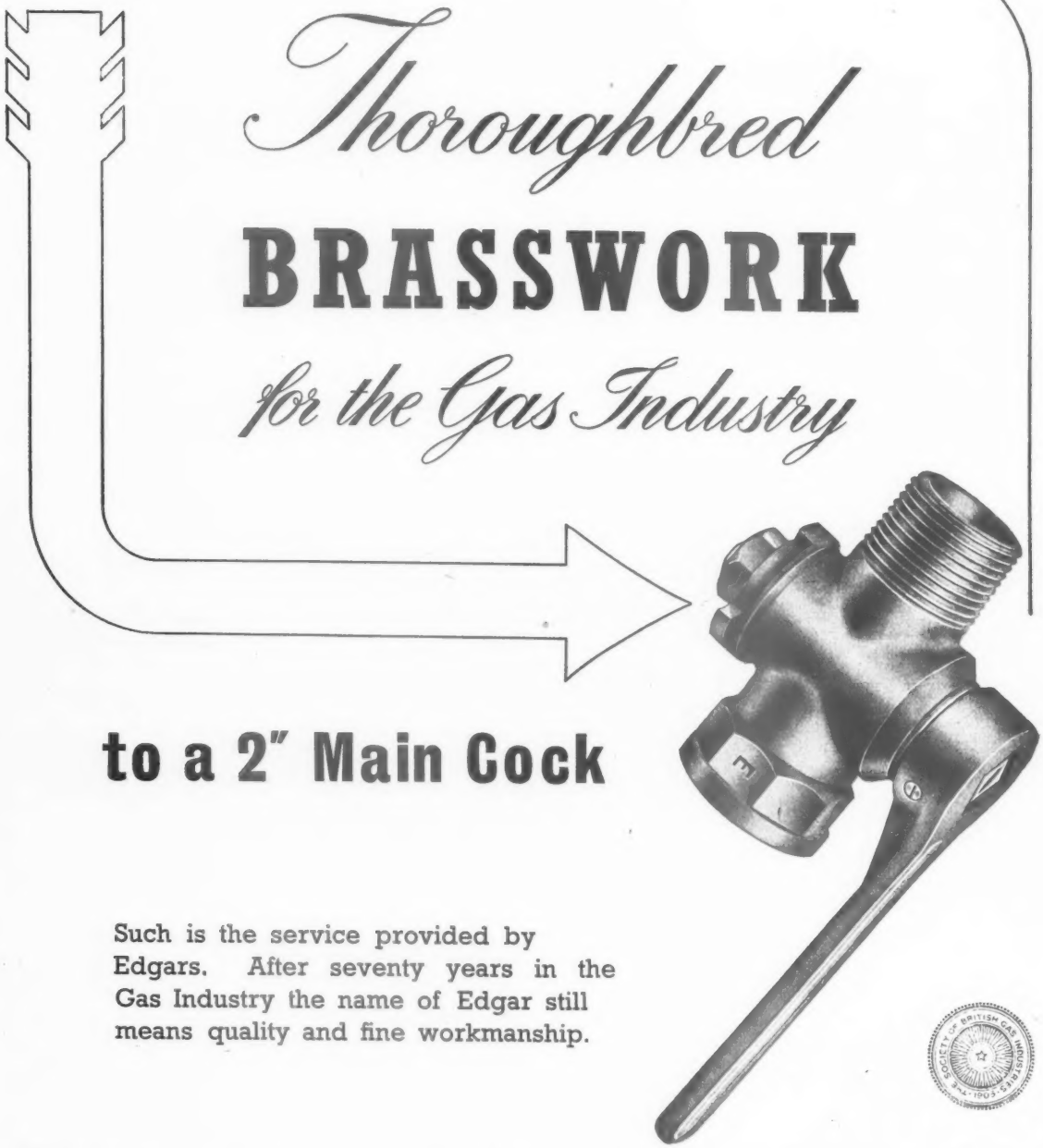

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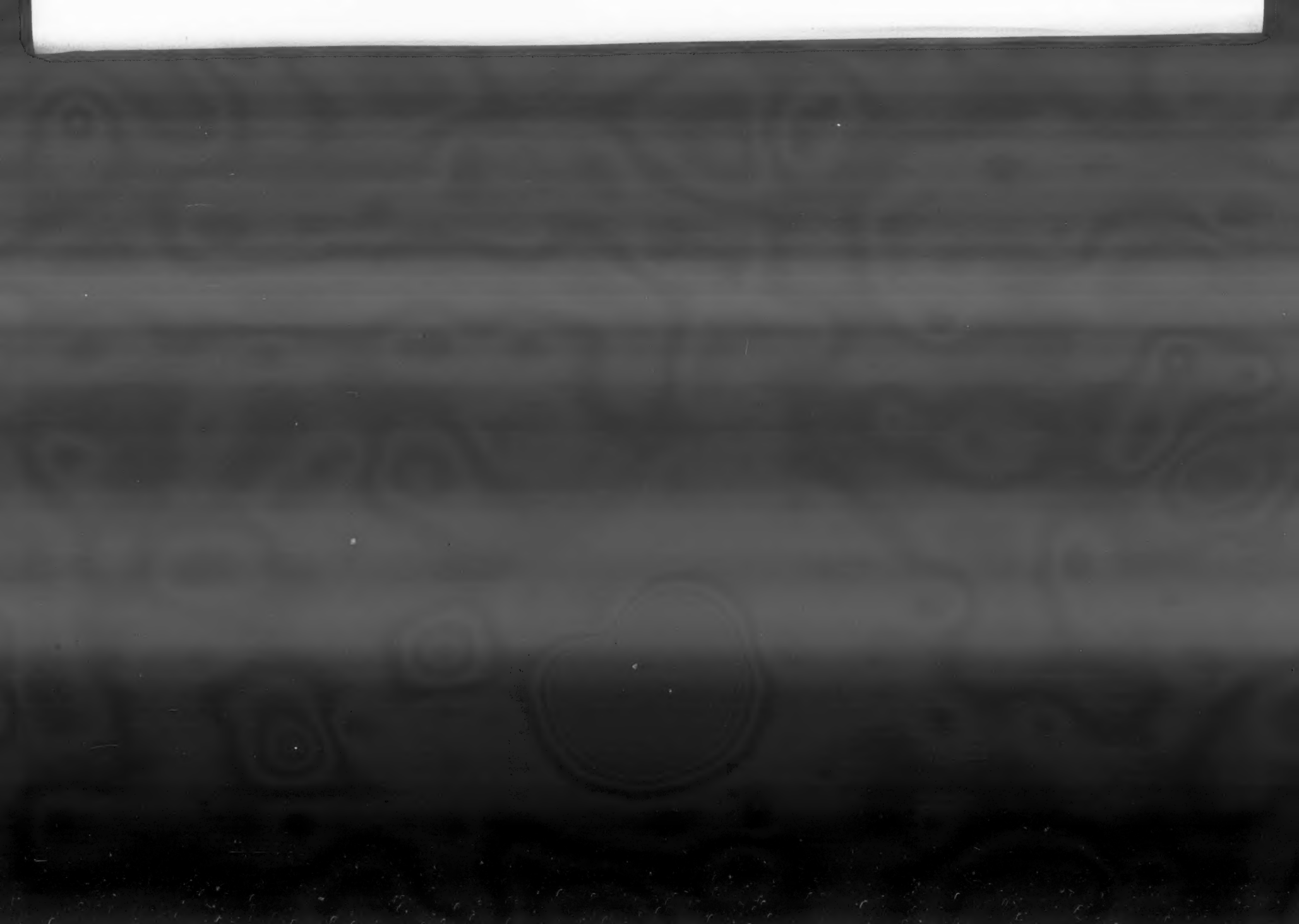
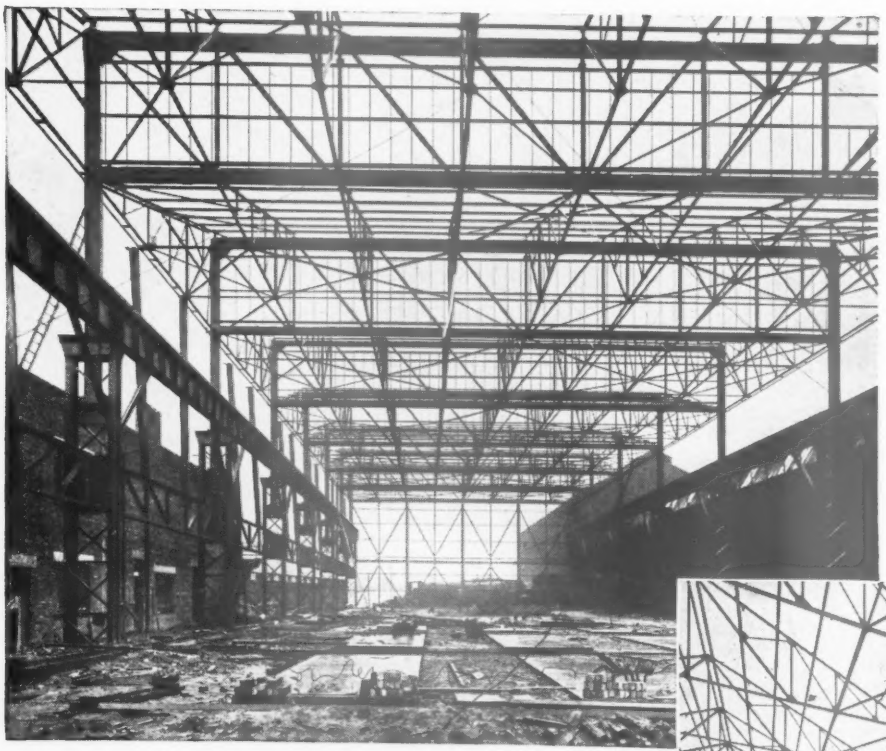
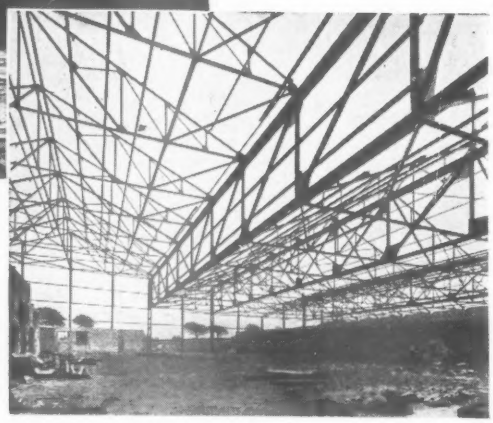


Structural Steelwork





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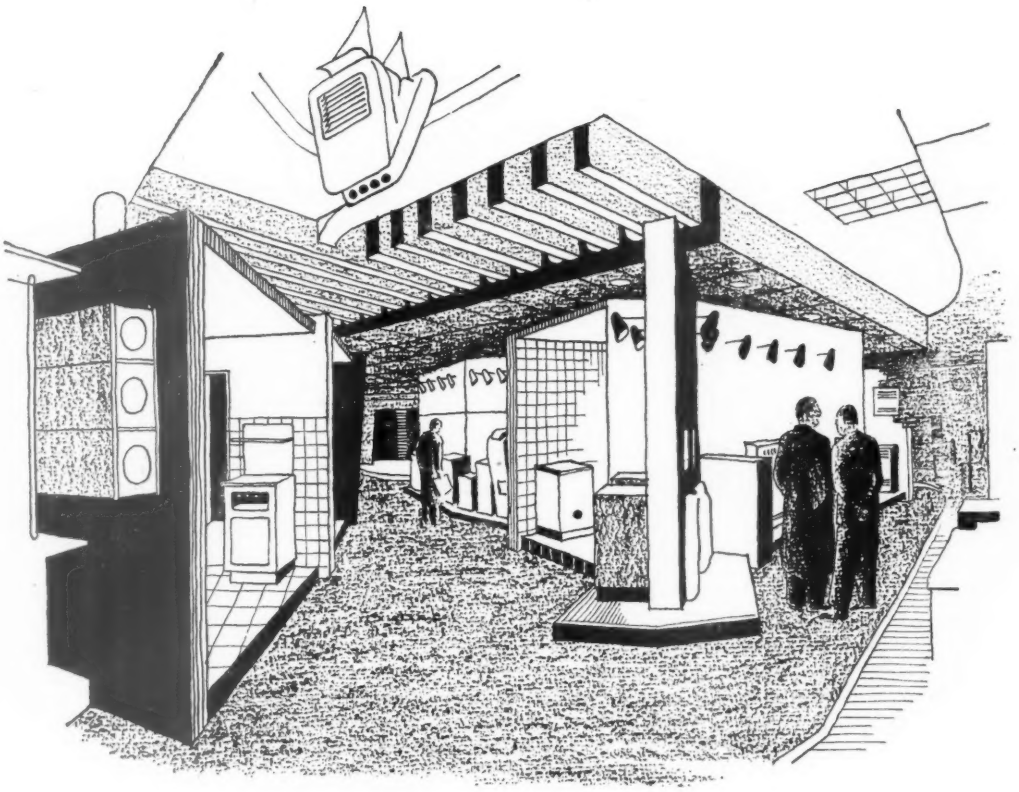
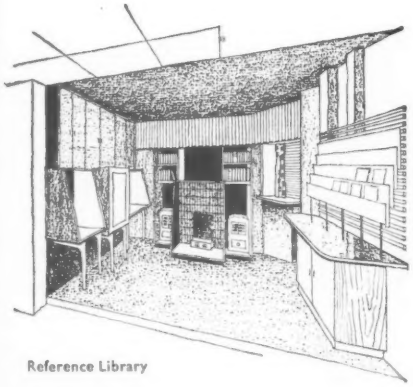
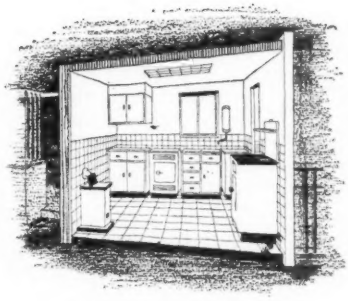


Gas in the design for living

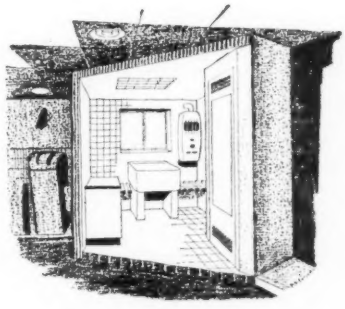
The new enlarged gas and coke exhibit at the London Building Centre is now open. In it visitors will find the latest information on the use of gas and coke, mainly for domestic, but also for commercial purposes. Also shown are approved methods of gas and coke installation in contemporary housing. There is a sectional display of the latest gas and coke equipment, together with examples of commercial appliances. A technical representative is available to answer queries and there is a comprehensive reference library. Visits from individuals or parties are welcomed, (prior notice of a visit from an organised party will be appreciated).



Reference Library



Gas & Coke kitchen



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GC17

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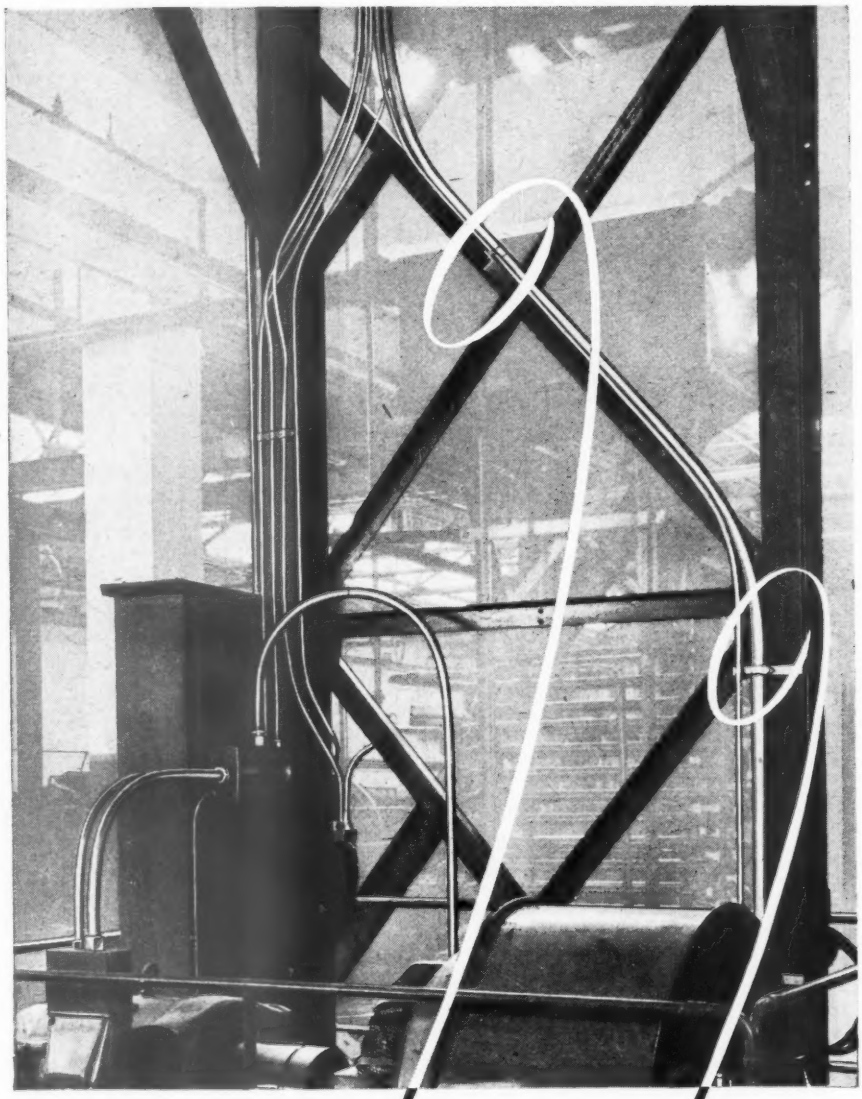

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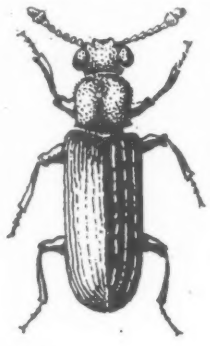

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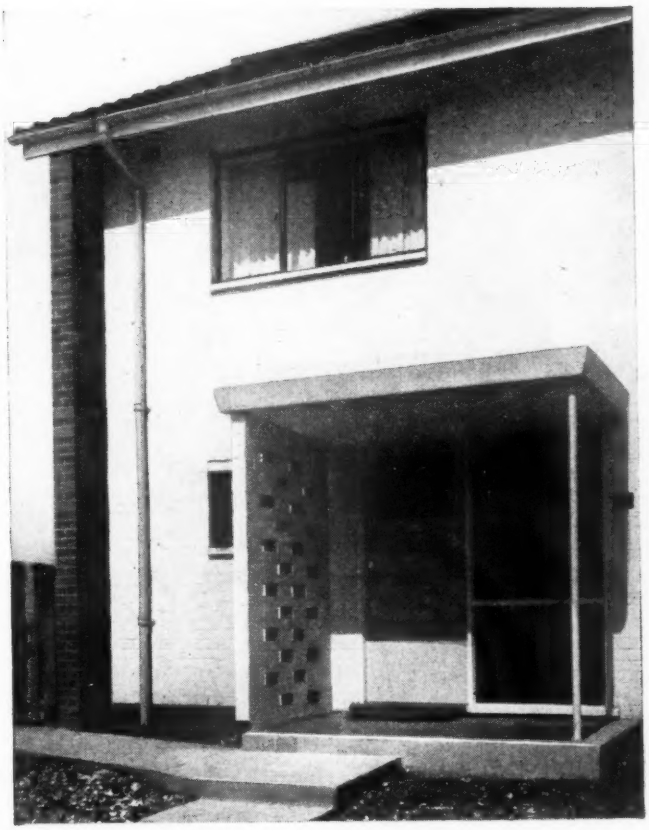
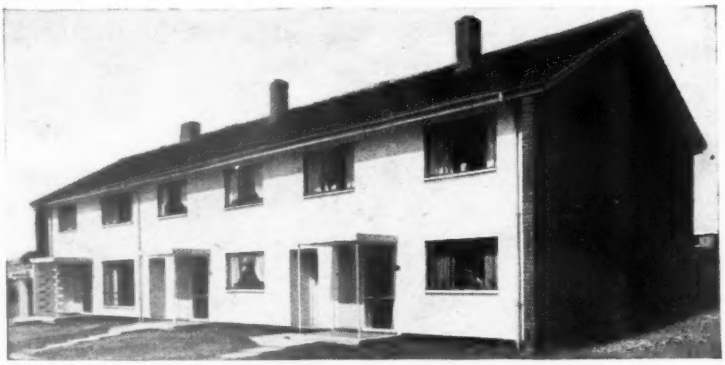


Stevenage Development Corporation (Stony Hall Housing). Former Chief Architect and Planner, Clifford Holliday, M.Arch., F.R.I.B.A., M.T.P.I. Contractors: William Sindall, Cambridge



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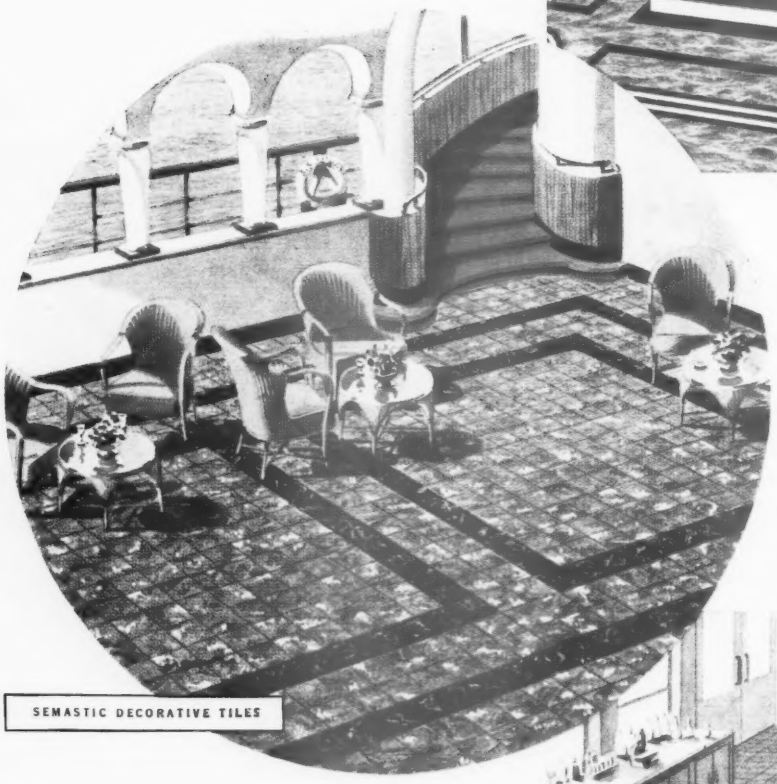

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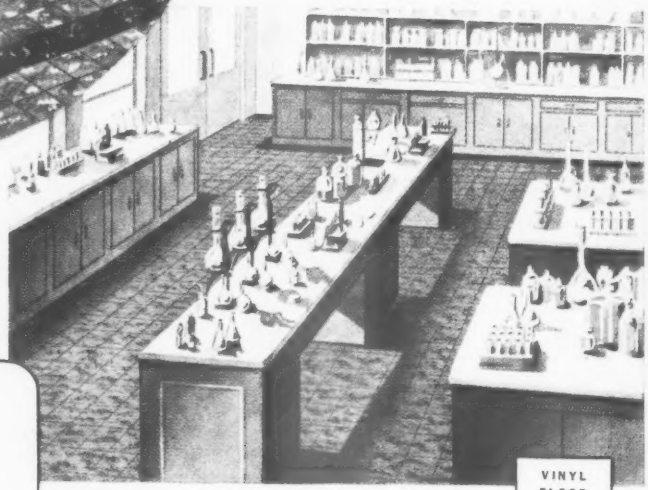

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THE ARCHITECTS' JOURNAL

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

No. 3014 December 4, 1952 VOL 116

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DON'T BLAME THE ARCHITECTS

When Mr. David Eccles said that it was "up to the architects" to evolve a more satisfactory system of tendering he was being even more unfair to the RIBA than I realized a fortnight ago. As we all knew, or should have known, the RIBA Council has published two condemnations of London Builders' Conference activities, but now, from a recent letter to *The Times* by Howard Robertson, the president of the RIBA, it appears that the RIBA arranged a joint meeting with the RICS and the NFBTE as long ago as January of this year. Comments from the NFBTE were invited, but as far as one can discover it took something like six months for the Federation to decide that it had no comment to make except expressing disapproval of the RIBA's declaration form. This seems a pity, for it is obvious that any revised form of tendering must be fair and acceptable to the contracting side of the industry as well as to architects and surveyors; if, on the other hand, the contractors can't make up their minds what they want, it is difficult to see what more the RIBA can do save discuss the whole problem with MOW. But at least the RIBA cannot be accused of inactivity.

NEW MODEL BYELAWS

The chief thing about the new model byelaws is that they seem to be based more on performance—heat transmission, strength, weather tightness, etc.—than on a rigid code of materials and dimensions. In so far as this encourages the use of non-traditional methods of construction, it is all to the good. There are also many references to the various BSS and Codes of Practice, which are fairly regularly revised. In some cases this will mean that the byelaws are automatically revised at the same time. What we must all hope for now is that we shall have a bit more uniformity between one borough and the next.

NORWAY AT THE AA

Most English architects talk about "Scandinavia" a good deal, and what they have in mind is Denmark and Sweden. What a very good thing, therefore, that the Norwegians should have an exhibition at the AA of their own arts and crafts; and on the whole a very good exhibition, too. [There was a bamboo chair that ASTRAGAL particularly coveted.] It is very Scandinavian but distinctly Norwegian, too—elegant and highly decorative and rather self-conscious. The metal work may be a little too thin and the pottery a little too crafty, but can we, with twelve times the population, do any better?

A BATTLE WON?

Not so elegant and far from self-conscious was Sir Owen Williams's explosive address to the AA last week on the subject of "Architecture, Trade, Profession or Vocation?" We expected a lot of fireworks and a general approach suggesting that architects were of no importance whatever compared with engineers. In fact we had the fireworks, but not very much discussion on the subject of the paper. Good engineers, it seems, often design in much the same way as good architects, and *vice versa*. Comparing this with the sort of remark one used to hear in the 1930's it seems that the battle is almost won. Twenty years ago engineers looked upon architects with fairly good natured amusement and thought of them mainly as suppliers of trimmings. Now they seem to feel that the architect may be quite useful—in fact almost an equal. What, I wonder, will be happening in 1972? Will architects then be whimsically tolerant of the foibles of engineers?

THE PUBLIC'S WATCHDOG

Architects would take more interest in the Royal Fine Art Commission's reports if they weren't so out of date. The report just published,* for example, deals with the years 1950 and 1951. The Stationery Office surely does not really need nine months to print a modest report of only twenty pages, without illustrations?

* Cmd. 8697. HMSO. Price 9d.

One of the drawings by Inigo Jones which will be on view at a tercentenary exhibition at the RIBA from Tuesday next. This is his design—which was, of course, never used—for the rebuilding of the West Front of St. Paul's. *See also page 664.*

As a consequence of its dilatory production, the report deals with controversies as old as Carlton House Terrace, the new Colonial Office, the St. Paul's Memorial Garden, and Mecklenburg Square. These are important, but by now almost forgotten, and comment is perhaps best confined to general issues. The big general issue is, of course, the role of the Commission itself. A little while ago there was a widespread feeling that on many occasions it was doing more harm than good by allowing itself to be used by government departments to gain official sanction for wrong actions, instead of being the public's watchdog that prevented them.

*

The Commission is now clearly aware of this danger, and is being much more careful about what building projects it allows to carry the seal of its approval. The report makes it clear that it does not regard it as its function to accept or reject a design outright so much as to give advice at every stage when advice can be useful to building owners, government departments and architects.

*

The report shows that the Commission is also doing useful work in the background persuading the gas and electricity authorities to follow the right principles of design and get the best advice on siting and building at an early enough stage. It has wisely handed over to the COID the task of approving designs for lamp-standards, but is still interesting itself actively in the way they are used, especially in the streets of beautiful old towns.

INQUISITION

Last week the ICA held the first of a series of critical discussions on current architecture. The buildings to be criticized were the familiar Pimlico flats, and the architects Powell and Moya, having first briefly described their scheme, handled the questions and criticisms shot at them by the audience with deftness and authority, and, at the same time, with a touch of that humility which marks them as men who are forever students of their subject. Or marks them perhaps, as engineers, in Owen Williams's definition of the title, as "one who begins at the beginning." It is this quality which has put them in front of all their contemporaries.

*

ASTRAGAL went to the discussion naively looking forward to hearing fresh comments on modern architecture from the artistic and poetic intellectuals who fill the membership of the ICA. But all the questions asked were so typically architectural in

Inigo Jones, by Inigo Jones

Next Tuesday the tercentenary of the death of Inigo Jones will be celebrated at the RIBA headquarters, Portland Place, by the opening of an exhibition of his work and a talk about him by Professor Rudolf Wittkower. Two of the sixty original drawings to be displayed are reproduced in this JOURNAL. The one above is a self-portrait; the one on page 663 shows Jones's proposals for alterations to St. Paul's west elevations. They both belong to the Burlington-Devonshire Collection which are on loan to the RIBA from the Duke of Devonshire and the Trustees of the Chatsworth Settlement. The exhibition will also include photographs of surviving buildings by Inigo Jones and some of his designs for the Court masques. (It will remain open until January 3.)

character that he could not but wonder, before long, how many of the distinctly bohemia-tainted audience either lived with, studied under, or were related to, architects. Indeed, a feverish search after the meeting amongst the jarred, bearded, chunky-jewelled Waugh-types revealed only one non-architect, and even she, alas, intended marrying one before long.

*

So this series of discussions, to date, is only fulfilling a want which could as well be met at the AA and the RIBA. It is to be hoped that before long other artists and laymen will join in these discussions. They will, however, be fortunate if they ever again have such self-critical and ingenuous architects on whom to test their critical ability.

CORRESPONDENCE CORNER

Last week's letters in the JOURNAL were particularly sharp-voiced about (*a*) Lloyd's proposed building, (*b*) High Paddington, (*c*) the V and A exhibition, and (*d*) " House and Garden " colours. ASTRAGAL had to stand well back to avoid being cut by flying adjectives. "Misplaced architecture. . . ." "cleverly faked nightmare. . . ." "warped decadence." Dodging the brickbats, ASTRAGAL only puts his head round the door to say (*a*) . For him Terence Heysham's project rang the Lutine Bell (only rung in times of disaster, if I may explain my joke in the manner of the *Punch* of the 20's) (*b*) Much as ASTRAGAL shrinks from the High Paddington solution, sociologically speaking, he foresees that, architecturally speaking, high building and its attendant risks of inhumanity is to some extent inevitable unless some other yet undreamed of alternative presents itself.

*

(*c*) It is impossible to say *exactly* what contemporary textile designers are influenced by; of course they love birdcages and crystals and feats of Klee, but they are probably also equally (if subconsciously) affected by Charles Macintosh, William Morris and his chirping colleagues. (*d*) Witty as Mr. Stockwell is, in defending the range of " House and Garden " colours, ASTRAGAL still prefers to take his colours neat and unlabelled—ungrateful possibly, irrational perhaps, obstinate certainly—like all the writers of our best letters.

ASTRAGAL

POINTS FROM THIS ISSUE

The Editors

REVISION OF BYELAWS

We have had to wait a long time for the first revision of the Model Byelaws. It was a requirement of the Public Health Act, 1936, that revisions should be made every 10 years; the intervention of the war has been responsible for the six years' delay. However, we have the revision at last and it is clear that a lot of hard work and thought have been put into its preparation.

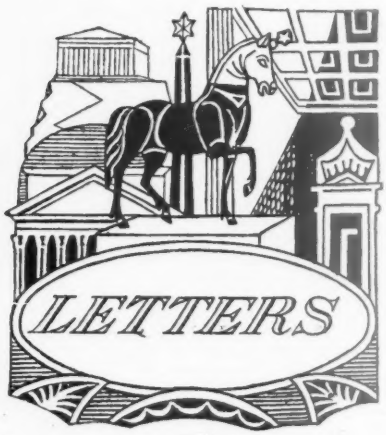
Some important changes have been made; the most important is that the new byelaws state, in many cases, the performance required, instead of the manner in which it is to be satisfied. This is a procedure which has been advocated in many quarters, but its adoption presents the industry with a challenge; to take advantage of the change we have to eliminate " rule of thumb " methods and work, to a far greater extent than hitherto, to codes of practice and design rules based on current technical developments.

How will the new byelaws affect the architect? Will they make his work easier or harder? Will they make building more or less expensive? In particular, will the change described above be as great a help to the profession as its advocates have claimed? We propose to examine these questions at some length in the near future, for they cannot be answered without making a detailed study of the new byelaws. But it is clear that the main advantage will be gained when it is proposed to introduce a new method of construction. There are now some positive rules.

There are drawbacks in the new byelaws, as well as advantages. For example, the requirements in respect of fire resistance have been made far more explicit, and, as a result, some methods of construction which were considered adequate under the old byelaws will not pass the new regulations. On the other hand, foundation design can now be more rational.

We note, also, that full advantage has been taken of British Standard Specifications and Codes of Practice; the large amount of work which has been put into their preparation now finds justification which it has, perhaps, lacked in the past. This means that architects who haven't already done so will now have to invest, at considerable expense, in the various Codes and Standards referred to.

We welcome the new byelaws and congratulate the team that prepared them. They have given a lead by making the new regulations more flexible; we hope that local authorities will follow their lead and apply them with equal flexibility.



58 Local Government Architects in London

H. Creighton

Peter Hampton, A.R.I.B.A.

Eric Bellingham
Director-General, Coal Utilisation Council.

Housing Standards : An Appeal to the Profession

SIR,—The new MOHLG house plans reviewed in your issue of November 13 raise questions that have been haunting architects concerned with housing for some time. One of these is clearly expressed in your editorial comment:—"Isn't it socially wrong of him (the Minister) to publish such plans as the large family house type NF/D1" (a 4-bedroom house with bath, basin and w.c. downstairs, no pram space, an extremely cramped dining-kitchen, winders at the top of the stairs, and no cupboard space upstairs).

If it is "socially wrong" for the Minister to publish such plans it is certainly also socially wrong for our profession to accept them. The official architect has a duty to the people who are to live in his houses as well as to the government or local authority employing him. We have reached a stage in the "economy" drive at which a contradiction has arisen between these two duties. In the interests of those who have to live in them, we have to draw the line at some point in the process of lowering standards to build more, smaller, cheaper, and inevitably worse, houses. When, as in these type plans, insufficient space begins to prejudice chances of a reasonable family life in a house, have we not reached that point?

The utmost care and real economy in planning is clearly vital, but we cannot just sit back without protest and congratulate ourselves on working out more and more clever solutions to problems which we should not allow ourselves to be set.

It is argued that these standards are necessary to reach the target of 300,000 houses a year. But if this target is to be achieved only by a drastic reduction in standards, and simultaneously reducing production of other buildings, then further questions arise. We have to ask ourselves not simply "What can we afford?" but a'so "What *should* we afford?" Are there not better ways of saving money and materials than by cutting down space standards; for example, the use of new techniques and the more efficient organization of the building industry? Are there not other sectors of the national economy in which reductions in capital expenditure could be made? Should we accept the annual expenditure of £1,500 million of public money on rearmament when only another £10 million in subsidies would be sufficient for virtually double the number of houses now built per year? If we are not prepared to design smaller, cheaper and nastier houses *ad infinitum*, we find that our answers to these questions are in flat contradiction to the answers of our present political leaders. Their decisions dominate our work, and if it is objected that it is their job, and not ours, to answer these questions, we must reply that our professional status and knowledge oblige us to criticize when we are asked to build houses to standards that are socially and architecturally below a reasonable minimum.

We feel that your criticisms of these plans are completely on the right lines, but we would go further and call for vigorous protest from the profession against any further reduction in housing standards.

58 LOCAL GOVERNMENT ARCHITECTS IN LONDON.

The UNO Building

SIR,—In your criticism of the Assembly Hall of the United Nations (November 27) you suggest that the requirements of acoustics may have influenced the shape of the auditorium and that the sloping walls may be "acoustically ingenious."

The reverse is true, for these features are acoustically most undesirable and the only ingenuity displayed in the matter is that of the acoustical consultants in mitigating their consequences. At the Building Research Congress in 1951 one of the consultants, Dr. Leo Beranek, described the acoustical design of the hall and he had the sympathy of his audience for being confronted with so intractable—and unnecessary—a problem. The solution he outlined was to destroy, as far as possible, the curvature and inclination of the walls by mounting on them very powerful diffusers and absorbents; the smooth surface had then to be restored, visually, by covering these acoustical materials with the facing of wood strips which is seen in your photograph.

So far, therefore, from being dictated by acoustics, the shape chosen for the hall creates very serious acoustical difficulties, and is open to severe criticism on these grounds alone. The design appears to exemplify in this respect an approach which there was reason to hope was a thing of the past.

H. CREIGHTON.

Bucks.

Let's Modernize Victoriana?

SIR,—It seems to have become the fashion nowadays for Victoriana to be condemned as being all that is worst in architecture, particularly the mass of small housing now broadly classified as slums.

It now behoves us to re-examine this in the light of the failure of the present-day planners to do anything better—anyone who has visited Crawley and Hemel Hempstead and has imagined these towns twenty years hence will agree on this—and to consider whether it would not be preferable to concentrate more on renovation of the old "slums" and less on covering acres of the best agricultural land in the world with new ones.

Some time ago I had occasion to inspect some property which had reached a new "low" in condition, and was passing by legacy to a new owner, and recently I again visited the neighbourhood, this time to admire the change which had been made. Bathrooms and kitchens had been added, the structure repaired, brickwork cleaned down, and bright new coats of paint had been applied. The removal of the old kitchen ranges, the insertion of some larger windows and coats of plaster on top of old match-boarding had resulted in the formation of dwelling units every bit as good as those now being built. Cost? £200 per house or one year's maintenance licence.

Two valuations had been made for investment purposes, before alterations £844, after alterations £1,850 per house freehold (excluding the effects of Rent Restriction Acts), thus additional value of £1,006 was obtained for the expenditure of £200. Original cost to build in 1880 was £99 18s. 6d.

The rooms were small, but adequate in view of the recently decreasing acceptable standards, and the gardens were several times as large as many I have seen in the new towns. This property before modernization was typical of most of the urban development in the nineteenth century, typical of East London, Birmingham, Doncaster, Leeds, Middlesbrough and a hundred other towns and cities.

Much of the criticism of these old properties is of the neglect brought about by a combination of ill usage and worse maintenance; and it would appear that many of the local authorities have avoided their responsibilities in the past in not bringing pressure on the landlords to keep their properties up to standard. Ill usage, of course, is the result of insufficient social education and general ignorance of hygienic living, a state of affairs which may well become non-existent in a generation or two when universal education is fact rather than fancy.

For any small-house estate to retain its planned amenities effective maintenance and enlightened tenancy must work together, and if either fails, so does the plan.

It would seem a golden opportunity for local authorities, instead of spending *all* their substance in producing the planned slums of 1970 to buy up as much of Victoriana as seems expedient so to do, to modernize to improved standards, and to keep in repair. As so many of these properties are able to be bought for £100 or less each; each unit with improvements would probably cost £300-£400—much less than the cost of demolition and building a new house elsewhere.

Now that landlords are unable to repair because of the Rent Restrictions, the local authorities, who are not bound by the Acts can do so, and it would seem to be their duty (and profit) to do so.

PETER HAMPTON.

Sussex.

Hot Water

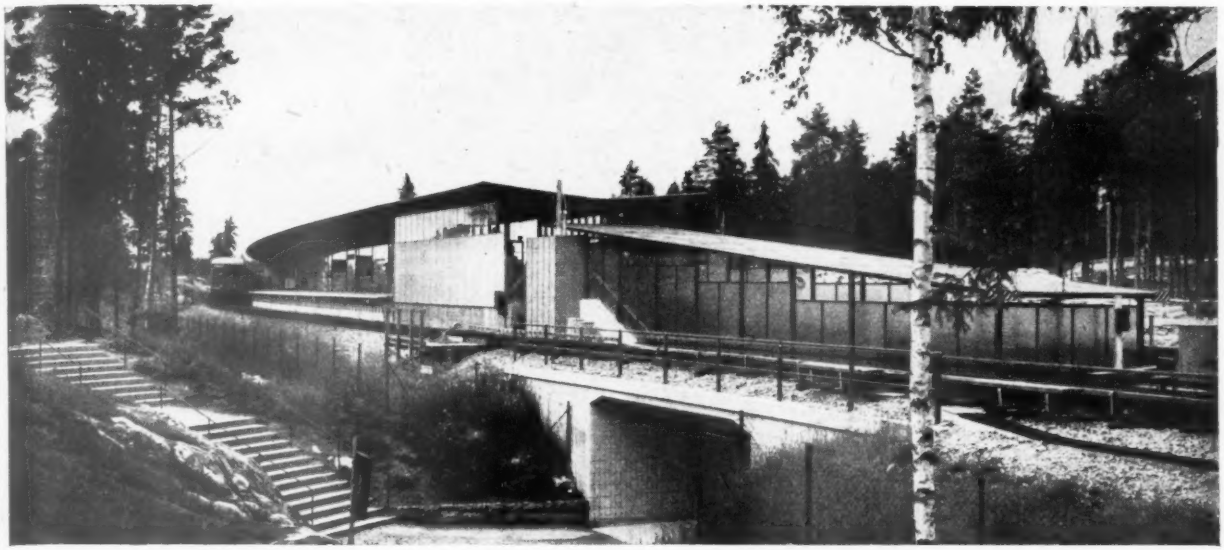
SIR,—From your notes in the current JOURNAL I see that ASTRAGAL does not find much of importance to architects in the new Report on Domestic Hot Water Supply.

I should like to draw his attention to the last sentence of the introduction (page 5). The average hot water requirement for a household of four persons is here assessed, on the results of the survey, as 300 gallons per week at 140° F. The Report continues:—"This provision at the moment seems unlikely of attainment at an acceptable weekly cost on current prices except where solid fuel appliances are used. It is, however, possible to obtain 150 gallons by gas or electric water heats at an acceptable cost, and this quantity should perhaps be regarded as a minimum provision for existing dwellings of all types."

I think this a matter which should be of interest to all architects who are providing for domestic water heating. Architects who want their clients to be able to obtain a desirable supply of hot water will presumably double this minimum, and provide for heating by solid fuel!

ERIC BELLINGHAM.

London.



BUILDINGS IN THE NEWS

Underground Station at Stockholm.
One of the stations designed by Peter Celsing for the new "underground" railway south of Stockholm. It has glass wind-breaks in metal frames, and is covered by a cantilevered canopy supported on iron columns. Each station has an identification colour.

Flats at Stevenage.

Right : a 7-storey block of flats, one of a group at Sish Lane, Stevenage New Town, which will soon be illustrated and described fully in the JOURNAL. *The architects are Yorke, Rosenberg and Mardall (associate architect, J. R. B. S. Penoyre; chief assistant, D. R. Hickman) in collaboration with C. Holliday, the former chief architect, Stevenage Development Corporation.*

Flats at Peckham.

Below : this block of 52 flats for Old People at Peckham Rye contains 24 flats of the one-person bed-sitting room type and 28 of the two-person living-room and bedroom type, as indicated in the plans. It was designed by Co-operative Planning Ltd.

EDINBURGH

Robert Matthew to Design Air Terminal

On the recommendation of the Scottish Aerodromes Board, the Minister of Civil Aviation has invited Robert H. Matthew (who is Scottish) to prepare designs for the proposed new civil terminal building for the Edinburgh Airport at Turnhouse. Mr. Matthew has accepted the invitation.

KENT

"Sign Declaration or Don't Tender" says Council

All builders on the Kent County Council's approved list have been asked to sign a declaration against restrictive practices. Two-thirds have done so; the others will be retained on the list but will not be invited to tender for work for the Council until they do sign.

AUSTRALIA

Competition for Olympic Swimming Pool

Olympic authorities in Melbourne have called for designs for the 1956 Olympic Games' swimming and diving pools in an Australia-wide contest. The pools, to be built in Fawkner Park, within five minutes' drive of the centre of the city, will seat 6,000 spectators and will cost a maximum of £A350,000, including £A60,000 for plant.

The competition is open to architects registered in Australia. Entries close on December 17. Particulars can be obtained from Australia House, Strand, W.C.2.

LYNMOUTH

Final Report on Plan

A final report on the Lynmouth floods by C. H. Dobbie, consulting engineer to Devon River Board, sets out proposals "to make the town safe, and safe for all to see" at roughly assessed costs of £400,000 for river works and £40,000 for sea defence works. It is proposed that:—

Adequate channels and bridges should be constructed. No buildings should be allowed on the area between the East and West Lyn rivers, and existing remains should be removed.

A relief channel should be constructed on the right bank across the recreation grounds in front of Manor House. [This proposal is being amended because of adverse criticism.]

Check dams to collect boulders should be constructed in both the East Lyn and West Lyn valleys.

Mr. Dobbie pointed out that the restoration of Lynmouth was a special case and that the design of works should provide for the passing of a similar flood in complete safety. If these principles and the financial implications proved acceptable to the authorities, the works to implement the policy recommended in the report could be undertaken. The importance of the appearance of the works in relation to visible safety and to the beauty of their setting was emphasized.

Mr. Dobbie suggested that the dams should not be provided with grills because they are unsightly. The check dams of concrete on solid rock faced with masonry, would be a novel feature for England, he said, and he saw no particular difficulty in fitting them to the scene.

UNESCO

New Site Offered for Headquarters

The French Government has decided to end the arguments about the design and the site of headquarters in Paris for UNESCO by offering free and immediate possession of ground known as the Fontenoy barracks, behind the Ecole Militaire. Because of its proximity to that splendid specimen of French eighteenth-century architecture, building on the proffered site is hedged with rigid restrictions of style.

This effectually precludes designs of the sort that had been proposed—somewhat similar to that of the United Nations building in New York—and will make it necessary to adopt a severely classical design in keeping not only with the Ecole Militaire but with most of the public buildings of Paris.

M. André Marie, French Minister of Education and head of the French delegation at the UNESCO conference, has issued a statement expressing the delegation's concern over erroneous reports that France had reconsidered her earlier decision to welcome UNESCO in Paris and to build a permanent headquarters for it there. The funds, he said, had been voted and set aside for this purpose. Controversy had arisen only about the site of the building.

The committee of five architects set up to plan the permanent building of the organization also issued a statement that it deplored the French Government's decision to abandon the site previously offered to the organization on the edge of the Bois de Boulogne, and insisted that the new structure must be the expression of the ideal of UNESCO and of the present trends in architecture.

SOUTH BANK

Interim Layout for Upstream Section

The MOW has told the LCC that it does not wish to proceed with the lease of the 11-acre upstream section of the South Bank exhibition site, and the council's general purposes and town planning committees are considering alternative proposals for its permanent development.

The general purposes committee considers that an interim layout comparable with the downstream section would be appropriate and that the site should be made accessible to the public. The layout and the necessary lighting are estimated to cost £20,000 and £12,500 respectively.

USA

3½ Miles of Prestressed Concrete

Details were released last week of the longest prestressed concrete structure in the world, now under construction in the USA. Nearly 3½ miles of a 15-mile link across the Tampa Bay, Florida, is to be prestressed by the Lee-McCall system; all the prestressing steel being exported to the USA from Great Britain. (The only plant at which the necessary processing can be carried out is at Sheffield.)

As a result of using prestressed, instead of ordinary, concrete the spacing of the piles was increased from 36 ft. to 48 ft., thereby reducing the number of piles by 25 per cent. Full details of this important dollar-earning project will appear shortly in the Technical Section.

LCC

To Consider "High Paddington"

At a recent meeting of the LCC, Norris Kenyon, Leader of the Opposition, asked the chairman of the Housing and Town Planning Committees whether their attention had been drawn to the proposed development scheme to house some 8,000 people, known as "High Paddington," and whether they would arrange for the scheme to receive careful consideration from the committees, particularly in its technical and financial aspects and to report thereon to the Council. Replying by arrangement with the Chairman of the Housing Committee, Mr. Fiske, Chairman of the Town Planning Committee, stated that the officers of the Council had been instructed to report on the scheme, but obviously it would take some time to consider a project of this complexity.

"High Paddington," as readers will remember, is the project designed by Sergei Kadleigh and published as a book by *The Architect and Building News*. The scheme is for a town for 8,000, rising to a height of 400 feet sited astride extensive goods yards of Paddington railway station where trains will run under the town unhindered. The town has two-storey dwellings with accepted standards of living space, and front and back gardens; its own shopping centre spaced around a central court; commercial properties, entertainments, sports, garages, and crowning the tops of its three tower-like blocks a hotel, two schools and a church.

DIARY

Inigo Jones: Architect and Man of Letters. Professor Rudolf Wittkower. At 66, Portland Place, W.1. 6 p.m. Exhibition of Inigo Jones's work will remain open (10 a.m. to 7 p.m.; Saturdays, 10 a.m. to 5 p.m.) until January 3. (Sponsor: RIBA.)
DECEMBER 9

ABS Annual Ball. At Dorchester Hotel. Tickets £2 2s. obtainable from C. J. Epril, 55, Pall Mall, S.W.1. 8.30 p.m.
DECEMBER 10

Cheaper Building: The Contribution of Modular Co-ordination. M. Hartland Thomas. At Royal Society of Arts, John Adam Street, W.C.2. Chairman: Howard Robertson. 2.30 p.m. DECEMBER 10

Fuel Policy for Housing. Chairman: Viscount Ridley. At the Housing Centre, 13, Suffolk Street, Haymarket, London, S.W.1. 2.30 p.m. DECEMBER 11

Mr. Watkins outlines here the problems encountered by the owner of rented property who wants to keep it in good repair, and shows how little incentive he has to prevent his property from deteriorating.

ERNEST WATKINS

The Future of House Property (3)

The original Rent Restriction Act of 1920, in part a consolidation of Acts passed earlier in the war that had just ended, had two ends in view, and both of them may still be thought of as admirable. In a time of acute housing shortage it is right to give the tenant already in possession of a house a much greater security of tenure than that allowed by the law governing the tenancies on which such houses are commonly let. And it is right that there should be a restriction on the amount by which his rent may be increased. This Act was a temporary measure, in its way comparable to the Army hut converted into a family dwelling. But what is one to say of a situation in which no Parliament over the succeeding thirty-two years has had the political courage to approach the whole problem afresh and which has, instead, dropped entirely the provision that rents may properly be increased as the cost of living, and of wages, rises? Nothing very complimentary.

It is not the purpose of this article to argue whether or not landlords should have any increase in their pre-war incomes from house property. That has become a matter of party difference. The condition of the houses themselves, whoever owns them, is another matter altogether. They are a capital asset, and the rate at which they waste is a matter of public concern.

It can be argued on party lines that all rents should be subsidized. It would seem harder to argue that only a minority of tenants should be given the benefit of a rent subsidy and that the fortunate minority should be selected because of their position on a housing list and not because of their financial circumstances. And on what grounds can one justify the fact that while the community pays some £60 million a year to assist local authorities to keep some 2,000,000 comparatively new houses in repair, it pays nothing towards the cost of repairing the remaining, and on the average older, houses?

SELF-SUBSIDY

It is possible for the owner of an occupied house himself to subsidize its maintenance, by recourse to what other capital he has or can raise. It is difficult to see why he should be expected to do so, but he *can* and some property owners do. But, disregarding this possible source of subsidy, what financial aid or inducement is offered to the owner of a property with a restricted rent towards the repair or improvement of the property?

For repair, there is none. The owner may be penalized by criminal process by the local authority if he fails to repair. He is offered no inducement to do so, nor aid in doing so. He even has difficulty in avoiding paying tax on a non-existent income. If the cost of repairs exceeds the statutory allowance made on his Schedule A income tax assessment, he may claim greater relief, but his claim must be based on the average cost of repairs over the previous five years and be supported by vouchers. Unless the owner is clerically minded, or able to pay for professional help, he may be defeated in his claim at the start.

INDUCEMENT TO IMPROVEMENT

There are two possible inducements for improvements. Under the Rent Acts themselves (Section 2 of the 1920 Act, as amended by Section 7 of the 1932 Act) a landlord may increase the standard rent by an amount equal to 8 per cent. of what he spends on improvements, structural alterations and additional fittings to the house (but not on decorations or repairs) provided that what he does is "necessary." The County Court has power to decide what is necessary, and the Courts have held that the installation of a modern sanitary system is an improvement and necessary, that the substitution of rough cast for weatherboarding on the exterior is an improvement, but unnecessary, and that the replacement of a thatched roof by a slate one is a repair.

The other inducement to improve property is to be found in the Housing Act of 1949. Under this Act a local authority may pay, by way of grant, half the cost of altering and improving property where the cost is not less than £100, or more than £600, but the grant is subject to conditions. If the property has been previously let, the former rent may be increased by no more than 6 per cent. of the cost *to the owner* of the work; otherwise, the rent to be charged for the reconstituted property must be fixed by the local authority. If the conditions under which the grant is made are broken, the grant or a proportion of it becomes repayable.

In short, an owner willing to improve an existing property may look forward to an 8 per cent. return on his money if he pays the whole cost himself and to one of 6 per cent. if he himself finds no more than a proportion and obtains the rest in the form of a grant. In the first case he may also have to face the chance of court proceedings on the question of whether or not the work is "necessary." In both cases he must increase his cash investment in the property (provided he can find the cash) with an expected return on it which is below what he could obtain by investing that money in many other more easily saleable investments.

There is no provision for assistance—and this is a pity—comparable to that available to the owner of agricultural property. Under the Improvement of Land Acts, 1864 to 1899, money spent on improving land, and houses and cottages used in connection with its cultivation, may be borrowed from public bodies on terms which allow the repayment of the *total* spent and interest over periods up to forty years. Further, the form of the charge securing the repayment gives it priority over an existing mortgage of the property. The result is that in the end an owner repays the whole cost of the work, but may be free from the need to provide any part of the cash in a lump sum before the work can begin. In addition, the terms of repayment make the annual burden comparatively small. There are many who would argue that this is a more sensible approach to the finance of property improvements and that the state of the bulk of property today would have been improved if these provisions had been extended to house property long ago.

A GLOOMY PROSPECT

The conclusions that can be drawn from these circumstances seem to be these:—(1) Unless it is accepted that all rents should be subsidized, it is reasonable to suggest that all rents should be sufficient to cover the cost of normal repairs and to provide interest on capital.

2. The level of controlled rents today discourages an owner from current repairs and provides nothing towards improvement. It was not the intention of the original restriction scheme that controlled rents should never be raised.

3. The existing inducements to improve house property are not well designed for that purpose. There is no provision to help the impecunious owner over the barrier of the initial payment to the builder.

And—if one wishes to be gloomy—there is no prospect that any of these conclusions will be faced by Parliament in the near future. Eight million votes in controlled houses can't be ignored.

This article, the second in the series describing the Wokingham School (the first appeared in the JOURNAL *for October 16, 1952), deals in detail with the prefabricated components which constitute the fabric of the building and which were described briefly in the first article. The authors also make some comments on prefabrication in general. They suggest that much factory production could be transferred to the site, that some processes in the factory should be more highly mechanized and that "production-line" methods may be needed to make factory production sufficiently economical for the building industry.*

John Stillman and John Eastwick-Field

MOE DEVELOPMENT WORK: WOKINGHAM: 2

FOR a purely technical description of the components and the method of their assembly see *Building Bulletin No.* 8,* where a complete and well-illustrated description is given. In the following article we shall describe and comment on the most significant features of the structure, and, by means of photographs, supplement the drawings in the Bulletin. In addition we shall describe how certain of the components are manufactured, since we feel that certain trends in the manufacture of materials and components for building may ultimately have a considerable influence on the industry as a whole.

FACTORY PRODUCTION

A growing proportion of the materials used both in so-called traditional and non-traditional methods of building are now made in a factory before being delivered to the site; for example, the extensive use of precast concrete floor and roof units to replace *in situ* reinforced concrete. As we mentioned in our first article, the difference between traditional building and most systems of prefabrication is, in this respect, less fundamental than might at first be supposed. There are, however, wide differences between the methods of production of various materials in factories, and systems of prefabricated construction vary correspondingly in the extent to which they take advantage of modern mass production methods. For instance, Le Corbusier, when talking of prefabrication, no doubt envisaged production-line methods such as are used to make aeroplanes and motorcars—methods which he considered would lead to savings in labour and cost.

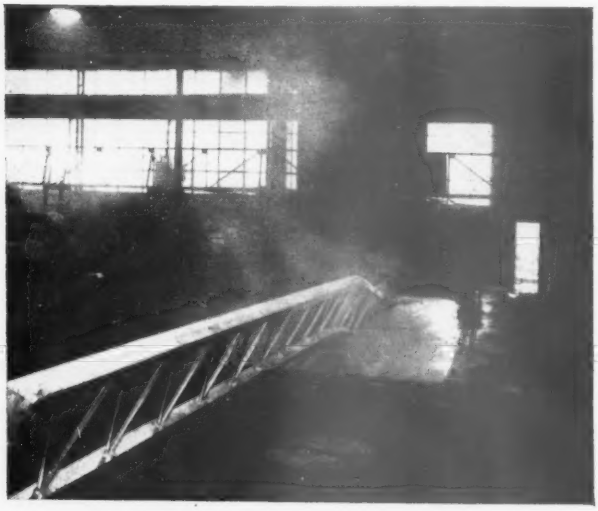
At its worst, factory production may now mean little more than the carrying out by hand, under the cover of a shed, the same operations that would otherwise have been carried out on the site. This applies particularly where heavy traditional building materials are used; it is mainly with the new and less orthodox building materials, such as sheet metals, plastics, and building boards, that improved production techniques are employed. It is argued that the setting up of a fully mechanized production line is inflexible, restricts development work, and prevents improvements being made to the design. Nevertheless, it is clear that, once the prototype of a component has been made and tested, a sufficient quantity should be manufactured to make factory production economical.

SITE PRODUCTION

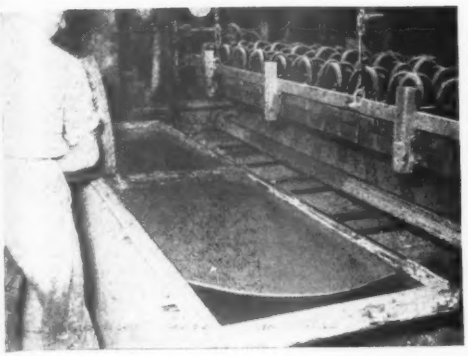
For economic reasons it looks as if the traditional heavy materials—clay, plaster and cement products, all of which are indigenous—will continue to be used for some time in prefabricated systems, even though they may at first appear unsuitable. Perhaps a new kind of factory production is needed to utilize these materials to their best advantage.

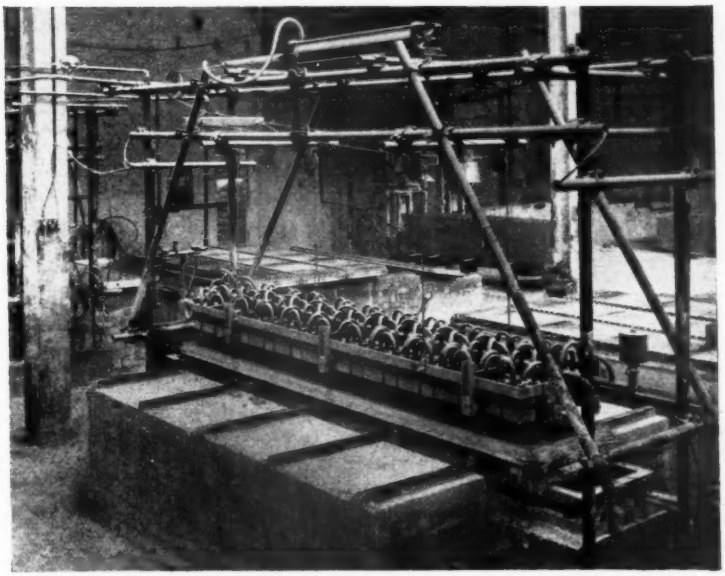
In their raw state these materials are already distributed throughout the country, whereas the transport of finished components from centralized plants is costly. The solution may, perhaps, be to bring such plant as is required—and this is often of a fairly simple kind—to the job, and to manufacture the components on the site. The originators of the plaster panels used for partitions at Wokingham have intelligently developed this technique: a number of important contractors have leased the necessary plant from them, and have mostly set it up in light

* HMSO, 1952. 3s. 6d.



Above, Fig. 1, a steel lattice beam being welded in the works. Left, Fig. 2, a cranked lattice beam (not used at Wokingham) being galvanized by dipping in molten zinc.





Right, Fig. 3, a general view of a typical plant used in the production of the honeycomb gypsum plaster panels which form the partitions. Above, Fig. 4, pouring the liquid plaster, after mixing, into the mould in which one face and the honeycomb web will be formed. The honeycomb is formed by inverted rubber cups which are withdrawn after the plaster has set.

demountable sheds on the sites on which they are working. The panels are then manufactured by these firms under licence from the originators. One local authority arranged, as part of a building contract, that a section of the actual building under construction should be set aside for the purpose of producing the panels. This type of prefabrication could well be more widely used for the manufacture of precast concrete products.

NEED FOR MORE MECHANIZATION

Many of the components used at Wokingham, including structural steelwork, pressed metal, metal windows and doors, and concrete products, are made in one factory in the Midlands, and, although the firm has shown great enterprise and flexibility and has been prepared to experiment, it would seem to an outside observer that there is scope in large factories of this kind for improvements in layout and increased mechanization. For instance, Fig. 1 shows each of the welds in a typical lattice beam being made by hand. One would have thought that it would be possible for a repetitive operation such as this to be done by machine, in order to increase output. After all, mechanization, even in the building industry, has been in people's minds for over a hundred years. Giedion, speaking of the American industry of 1850, says: "In America materials were plentiful and skilled labor scarce; in Europe skilled labor was plentiful and materials scarce. It is this difference which accounts for the difference in the structure of American and European industry from the 'fifties on. In America, just about that date, mechanization began to replace skilled labor in all the complicated crafts." Europe has now followed America in suffering from a shortage of skilled labour, and economic forces are bound to lead to much more mechanization.

STRUCTURAL STEEL FRAME

In the opinion of the manufacturer, the steel framework designed for an 8-ft. 3-in. grid for school construction and developed first in Hertfordshire has, after several years of manufacture, reached a stage at which production is unlikely to be interrupted by modifications.

In using at Wokingham a framework which, in many respects, is of a similar character to that which has already been fairly widely used elsewhere, the Ministry was able to benefit from the experience already gained. On the other hand, the adoption of a 3-ft. 4-in. instead of an 8-ft. 3-in. grid meant that a new system had to be designed, and that modifications may have to be made as a result of the experience which will be gained. As secondary schools were being considered, it was also necessary to make it possible to build multi-storey structures. At Wokingham, a four-storey block is being built, but it would be possible with the same structural components to erect a 10-storey building.

As with the 8-ft. 3-in. grid system, the essential characteristic is that the stanchions, where they occur, are placed on the intersection of the grid lines, and that, provided stanchions can be placed not further apart than the span of the longest beam, the planning is restricted only to the line of

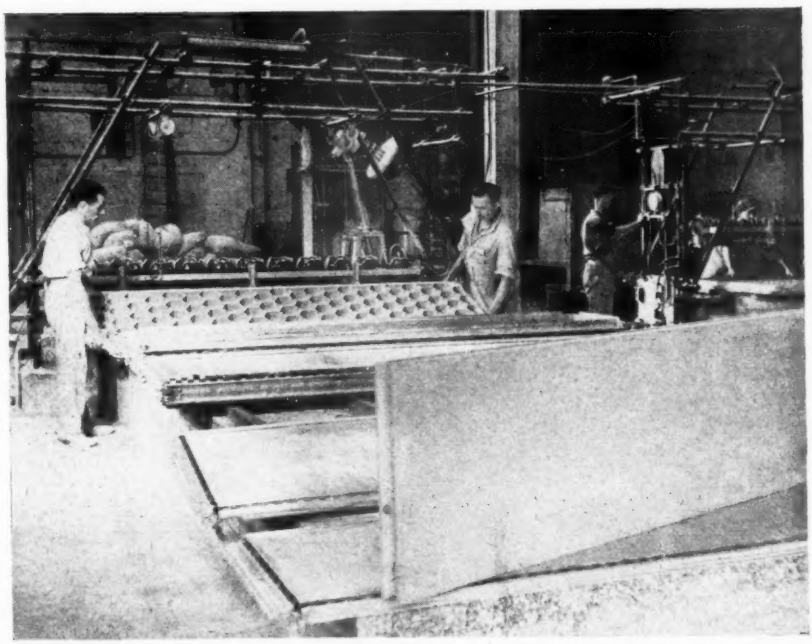
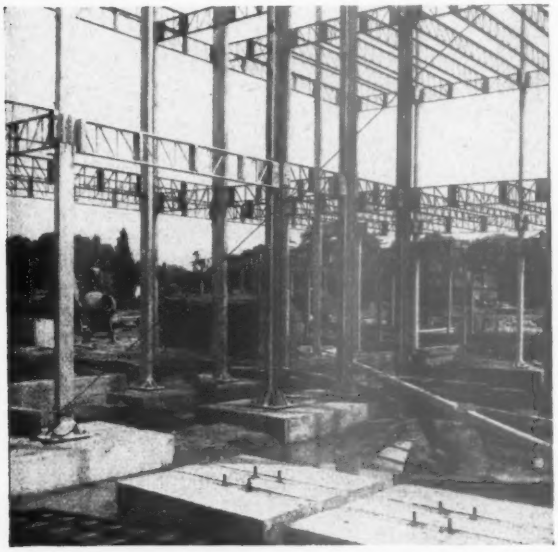
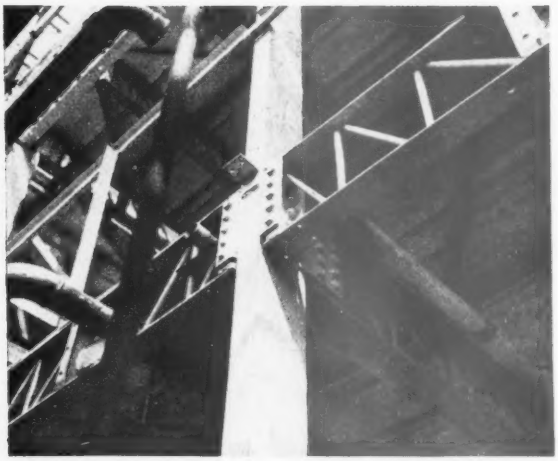


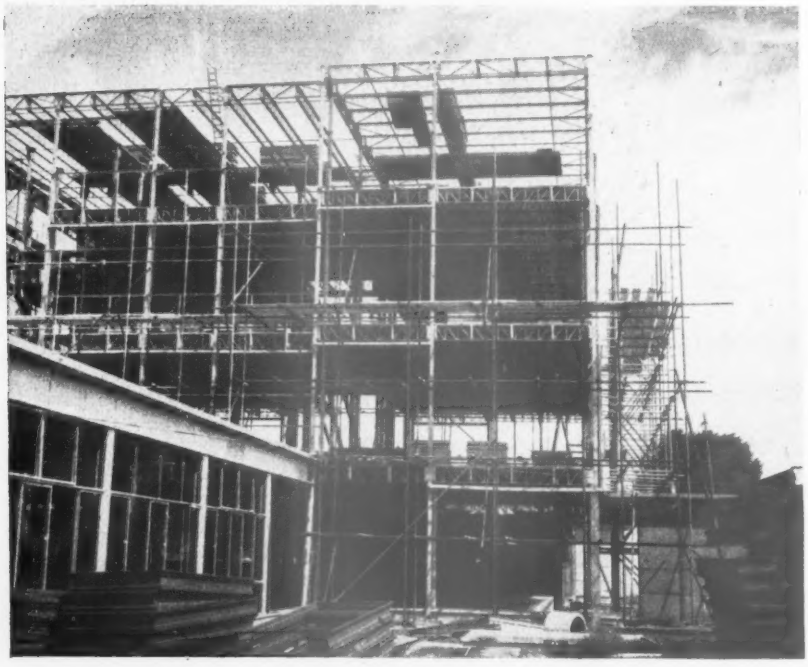
Fig. 5, manufacturing the gypsum plaster panels—transferring the first mould from the pans to the second mould, on to which it will be placed face down, thus forming the complete panel.

MOE DEVELOPMENT WORK: THE STEEL FRAME





Left, Fig. 6, steelwork in 4-storey block, showing the stanchion bases and foundations. Box and cruciform stanchions can be seen. Above, Fig. 7, 4-storey block under erection; note the cleats. The tackle is of an elementary type. Left centre, Fig. 8, detail of beam fixing cleats; note services within depth of beams, cladding tees, and undersides of R.C flooring units. Below, Fig. 9, 4-storey block under construction. On the left, a range of windows in the dining room, above which can be seen the shallow cladding slabs necessitated by the eaves beam. With the structural system as at present designed no window can be taken up to the underside of the eaves.

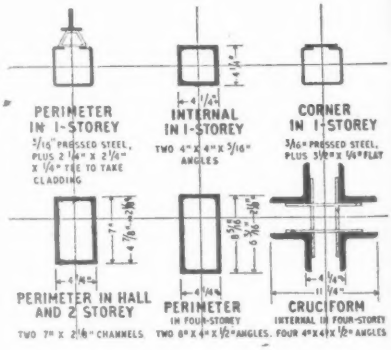


the grid. External cladding is in front of the columns, and the width of the panels can therefore conform to the grid, although special corner pieces are necessary to cover the exposed portion of the column wherever the wall returns. The partition panels, however, do occur on the grid lines, and narrower panels are required where the partitions abut against the stanchions.

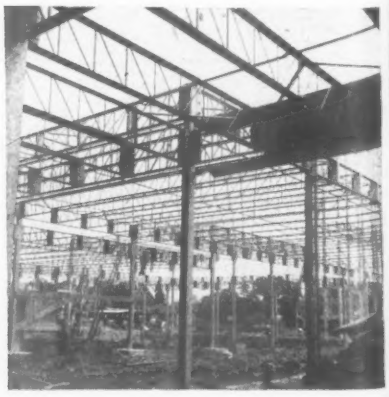
The framework is designed to conform to a vertical module of 2 ft. which controls the finished floor and ceiling levels, the top of eaves and fascia, and the lengths of the stanchions. This module is reduced where necessary to a smaller module of 8 in.

LIMITATIONS OF THE SYSTEM

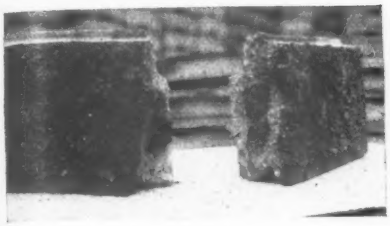
In considering the system, it must be appreciated that there are, as with all systems of construction, certain limitations, unless "specials" are introduced. Amongst these are: that all roofs must be flat, that beams must be of a constant depth of 16 in. and that, even when the heaviest sections are used, spans are limited. At Wokingham, the maximum span of a 16-in. beam is 30 ft. A hall 46 ft. 8 in. wide was required and, in order to achieve this span, main beams 2 ft. 8 in. deep, were used; this depth preserves the



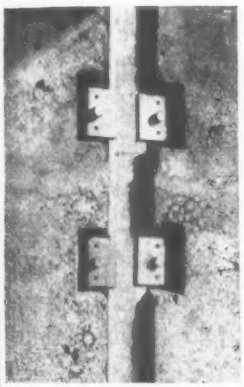
Above, Fig. 10, diagram of stanchion types. Below, Fig. 11, single-storey steelwork, showing roof beams at 3-ft. 4-in. centres. This necessitates an edge beam and more steel than is structurally necessary, but it enables the grid to be maintained for roof and ceiling units.



THE WALL SLABS



Above, Fig. 12, section through one of the precast vibrated 3-ft. 4-in. by 1-ft. 4-in. by 3¾-in. wall slabs, showing the wood-wool core and the granite chipping surface. The ⅝-in. sawdust-cement layer which forms the back of the slab cannot be distinguished in the photograph, but forms part of the composite slab and is used as a fixing for the plasterboard lining.



Above, Fig. 13, wall slabs stacked on site. Those in foreground have facings of granite chippings and those in background of Derbyshire spar. The slabs weigh 27 lb./sq. ft. and have a thermal transmittance of 0·21. Each of the larger slabs is considered a two man load. Left and extreme left, Figs. 14 and 14a, after being placed roughly in position the slabs are secured on the inside by bolts which go through clips holding the slabs to the cladding tees. The slabs are then tamped into their final position and the bolts tightened. The slabs rest on one another and have a mortar bed across the inside half of their thickness. Left, Fig. 15, wall slabs in position, showing the cladding tee and the 22-g. aluminium vertical weather strip (coated with zinc chromate paint and holding two oiled asbestos cords); also horizontal aluminium weather strip.

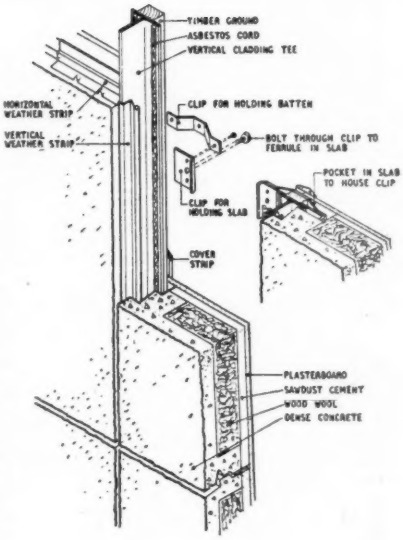
vertical module. The standard secondary beams were replaced with two sets of special small beams, 6 in. deep, to receive the roof and ceiling panels. This use of deeper beams for large spans is restricted to single-storey parts of the building which are mainly independent of the rest.

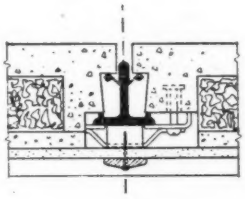
A more fundamental limitation of the system is that in multi-storey construction the floor-to-floor height includes 2 ft. for the depth of the floor construction, and this adds significantly to the cube of the building. (Incidentally, the suspended ceilings used are accepted as giving sufficient fire protection to the steelwork.)

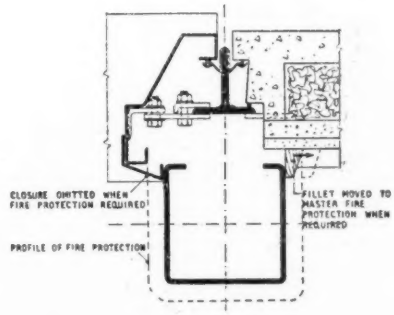
In single-storey work the extra cube and cost of the ceiling may be partially offset against the service ducts in the floor, which would otherwise be necessary.

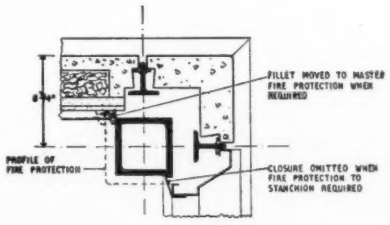
THE USE OF STEEL

Anyone visiting Wokingham during the course of erection would have been impressed by the seemingly copious use of steel, and on this point the Ministry comments: "Three main factors control its design: first, the components of the frame should be highly standardized; secondly, the frame should permit the simplification and standardization of all the other components of the building; thirdly, it

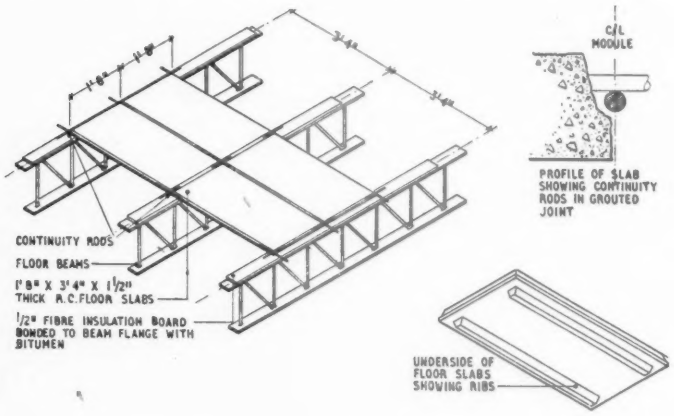








Above, Fig. 16, details of wall slab joints; plans at wall slab to wall slab and wall slab to window. Above these, Fig. 17, isometric of wall slab fixing, from outside. Left, Fig. 18, detail plan at external corner.



MOE DEVELOPMENT WORK: FLOOR SLABS

Left, Fig. 19, reinforced vibrated concrete floor slabs 3 ft. 4 in. by 1 ft. 8 in., stacked in the manufacturer's yard. They are 1½ in. thick excluding the ribs. To form a floor they are laid on the beams, bearing on strips of ½-in. fibreboard, the joints have continuity rods in them and are grouted. The top surface is roughened to receive the screed. Above, Fig. 20, floor slab details. Below, Fig. 21, floor slabs in position.

should meet all the conditions of planning within the limitations of the 3-ft. 4-in. horizontal and 2-ft. vertical modules, including any combination of storey heights without loss of standardization. A steel frame designed without consideration of these factors could *itself* have been more economical in steel and money, but these other requirements have been imposed on the steel frame in order to simplify the building as a whole and to save site labour."

The experience gained at Wokingham has suggested one or two modifications to the framework and these are being investigated in connection with the design by the Ministry of a further school at Coventry. It is hoped to reduce the number of bolts for site connections, and experiments have been made to eliminate some of the secondary beams by substituting precast reinforced concrete floor units spanning between the main beams.

WALL SLABS

Composite concrete wall slabs are used 3¾ in. thick, 3 ft. 4 in. wide and of three heights, 8 in., 16 in. and 2 ft. The slabs form a " one thickness " wall and when erected serve to prevent water penetration and to provide reasonable heat insulation. They are self-finished on the outside face with exposed aggregates (⅜-in. Derbyshire spar or ⅜-in. Penmaenmawr blue granite), but the inside face is subsequently lined with plaster board which is painted.

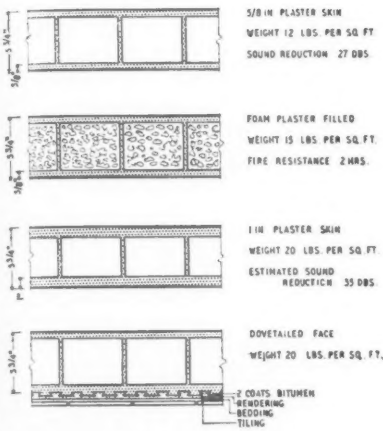
The slab is composed of a 2-in. wood wool core with 1⅛ in. of dense concrete lightly reinforced on the outside face and ⅝ in. of sawdust cement on the inside face. The thermal transmittance value is U = 0·21.

It is considered that it might be better to use light expanded clay aggregate as an alternative to the wood wool core, and experiments in the manufacture of such slabs are proceeding. The slabs are made with double rebates at the vertical edges and ferrules are cast into the backs. In fixing the slabs to the cladding rails they are drawn back against two oiled asbestos cords by bolts screwed into the ferrules.

The slabs weigh 27 lb./sq. ft. Sheet materials would appear to have many advantages over concrete slabs for cladding; they are easy to erect and to handle. It will be interesting, therefore, to compare the Wokingham School with others now under construction in which plastic or glass is used for the cladding panels.

PARTITION PANELS

The partition panels, which are 5¾ in. thick, are of full room height and 2 ft. standard width. They are made of neat hemi-hydrate gypsum plaster, and are reinforced with short lengths of viscous fibre. The mixing of the water with the plaster is automatically controlled. The panels consist of two plaster faces

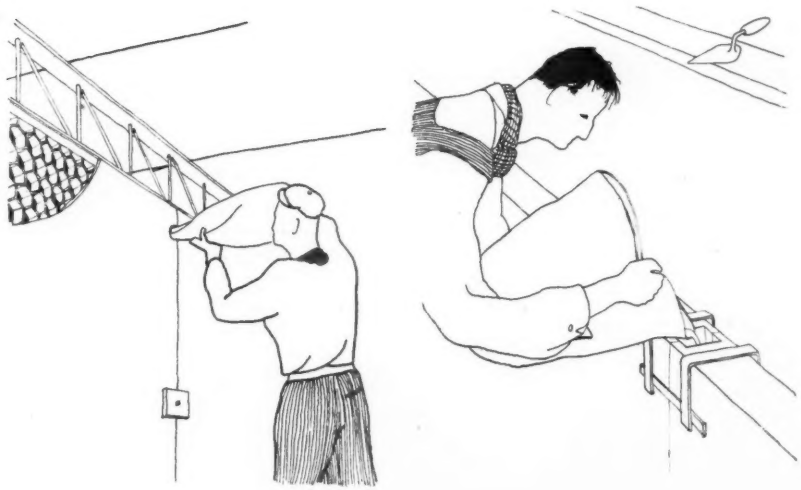


formed with a continuous reinforced plaster honeycomb core. The edges of the panels are solid and have grooves for pouring in liquid plaster for jointing.

The panels are produced from a plant which includes a semi-automatic press and the whole plant is relatively simple to operate. From it (with two presses) about 100 panels can be produced per day. Three men are required to operate the plant for each press employed.

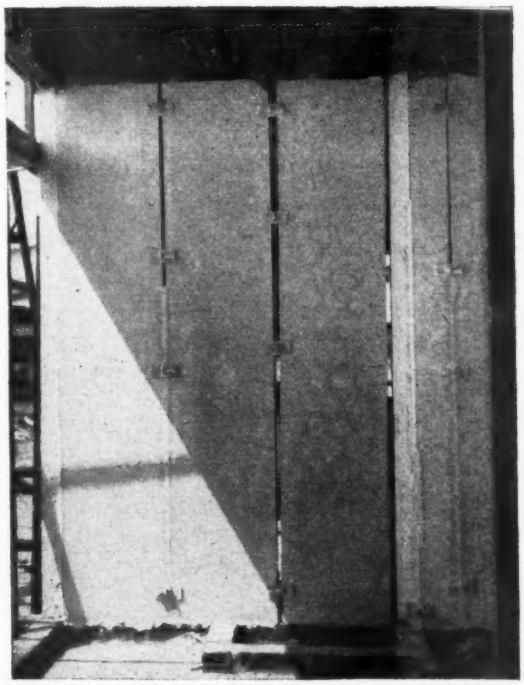
The cost is claimed to be comparable, thickness for thickness, with clinker blocks plastered both sides, but the panels can be erected more rapidly, and decoration can be applied to the very accurate surface of the panels without further preparation. Plasterers are required only to form the plaster seal between adjoining edges of panels, thereby forming channels into which liquid plaster is poured to make the joint solid (see Figs. 23 and 24). When properly formed, the joints cannot be detected after decoration. Fig. 25 shows panels manufactured by an obsolete method; with this method the pattern of the honeycomb core sometimes appeared on the surface of the panels; there were also wide gaps between the panels.

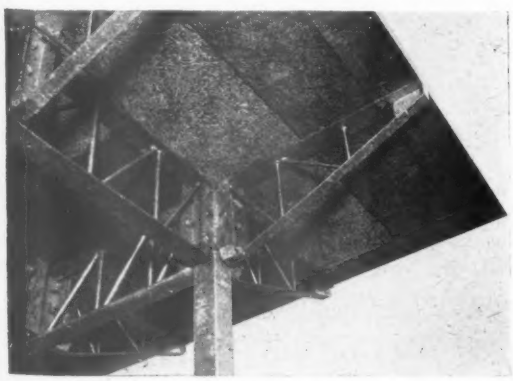
These panels can be made 3, 4 and 6 in. thick and 7 ft. 6 in., 8, 9 and 10 ft.



PARTITIONS

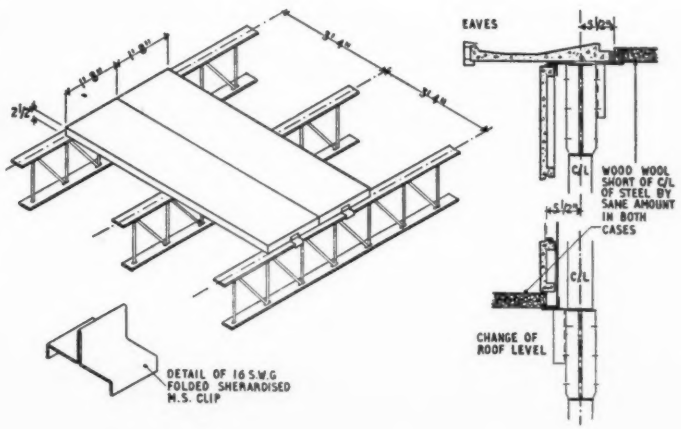
Above left, Fig. 22, four types of partition. Above centre, Fig. 23, pouring in liquid plaster to form a solid joint in the plaster partition panels, when there is no access to the top of the panel. Note the side clamp used for alignment. Part of the panel is cut away to show the honeycomb web. Above right, Fig. 24, making a joint in the plaster partition panels when it is possible to pour the liquid plaster from the top. Note clamp on top of panel. Right, Fig. 25, hollow gypsum plaster panels, with honeycomb plaster core, during course of erection. These panels are precast, temporarily wedged into position and joints are made with poured plaster after aligning with clamps. No further plastering is required and the panels can be decorated direct. The system of manufacture has been changed since the photograph was taken, and the honeycomb pattern is no longer liable to appear on the slabs which are now manufactured.





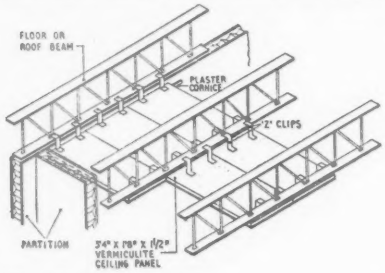
Above, Fig. 26, part of covered shelter, showing special cantilever eaves brackets, supporting wood-wool roofing slabs. All roof slabs are heavy duty wood-wool, 2½ in. thick, 6 ft. 8 in. long by 1 ft. 8 in. wide, spanning 3 ft. 4 in. between beams. The roof is finished with a screed laid to slight falls and two layers of built-up roofing felt. Right, Fig. 27, roof slab details.

ROOF SLABS



CEILINGS AND GUTTERS

high. The present standard widths are 1 ft. 6 in. and 2 ft., with filler pieces 3-6 in. wide. The panels can be sawn; holes can be made in them for cables; brackets can be embedded in them with plaster grout to support shelves, basins, etc.; they are capable of supporting a reasonable load (for instance, the upper floor of a house could satisfactorily bear on them when they are used as the inner skin of a cavity wall). The thermal transmittance of a standard panel, when foam filled, is 0·15 B.Th.U.; the weight is 9 to 10 lb./sq. ft. for the 3-in. panel.



The ceiling panels are of vermiculite concrete 3 ft. 4 in. by 1 ft. 8 in. by 1½ in. thick. Left, top, Fig. 28, a workman screwing hangers and reinforcing battens to pockets of screw-holding concrete in the slab. Above and right, Fig. 29, isometric and key section of ceiling panels. Below, Fig. 30, ceiling panels in position. Left centre, Fig. 31, fixing the precast reinforced concrete gutter slab which forms the eaves. There are no cantilever steel brackets, the slabs being bolted direct to the perimeter beam and eaves angle.

The Ministry states in its bulletin, "Precast gypsum plaster units are used throughout the whole school for internal partitions. This particular type of partition was chosen partly because of its reasonable cost, partly because the units can be erected by unskilled labour (as a plasterer is only required for final trimming and preparation for decoration), and partly because the material is sufficiently flexible in manufacture to be adapted to a number of special conditions (such as varying degrees of fire protection and sound insulation, tiled finishes, or fixing for equipment) without involving variations in overall dimensions." The varieties of panel used are shown in Fig. 22 (page 675).

CEILINGS

Ceiling panels are made of vermiculite and cement; they are suspended from the beam flanges by steel clips. Vermiculite is expanded mica, and, as an aggregate, makes a very light-weight concrete, with excellent fire-resisting properties. The panels have a textured surface, which is a good sound-absorbent, and their extensive use will, it is hoped, add to the general comfort of the school.

WORKING DETAIL **COVERED WAYS AND CANOPIES: 5**

CANOPY OVER ENTRANCE DOOR: FLATS AT STEVENAGE

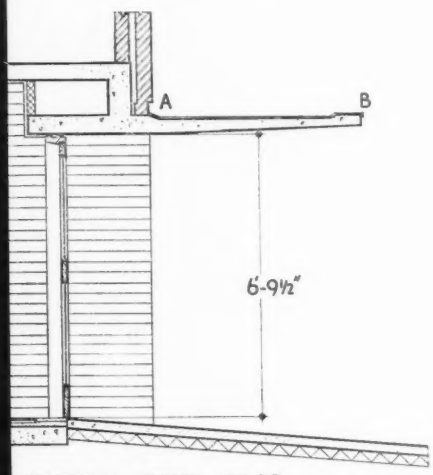
F. R. S. Yorke, E. Rosenberg and C. S. Mardall in collaboration with C. Holliday, architects

The shaping of the canopy around the stairway window allows for its opening and admits light to its lower part.

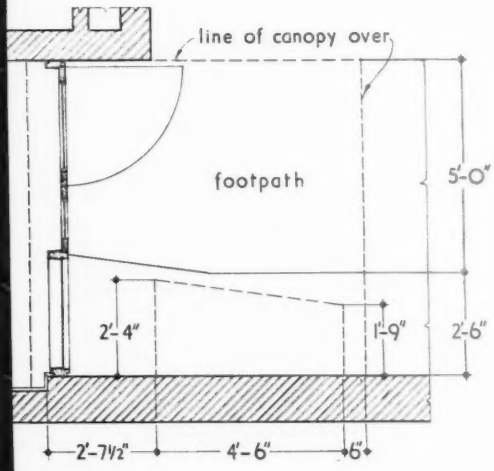
WORKING DETAIL **COVERED WAYS AND CANOPIES: 5**

CANOPY OVER ENTRANCE DOOR: FLATS AT STEVENAGE

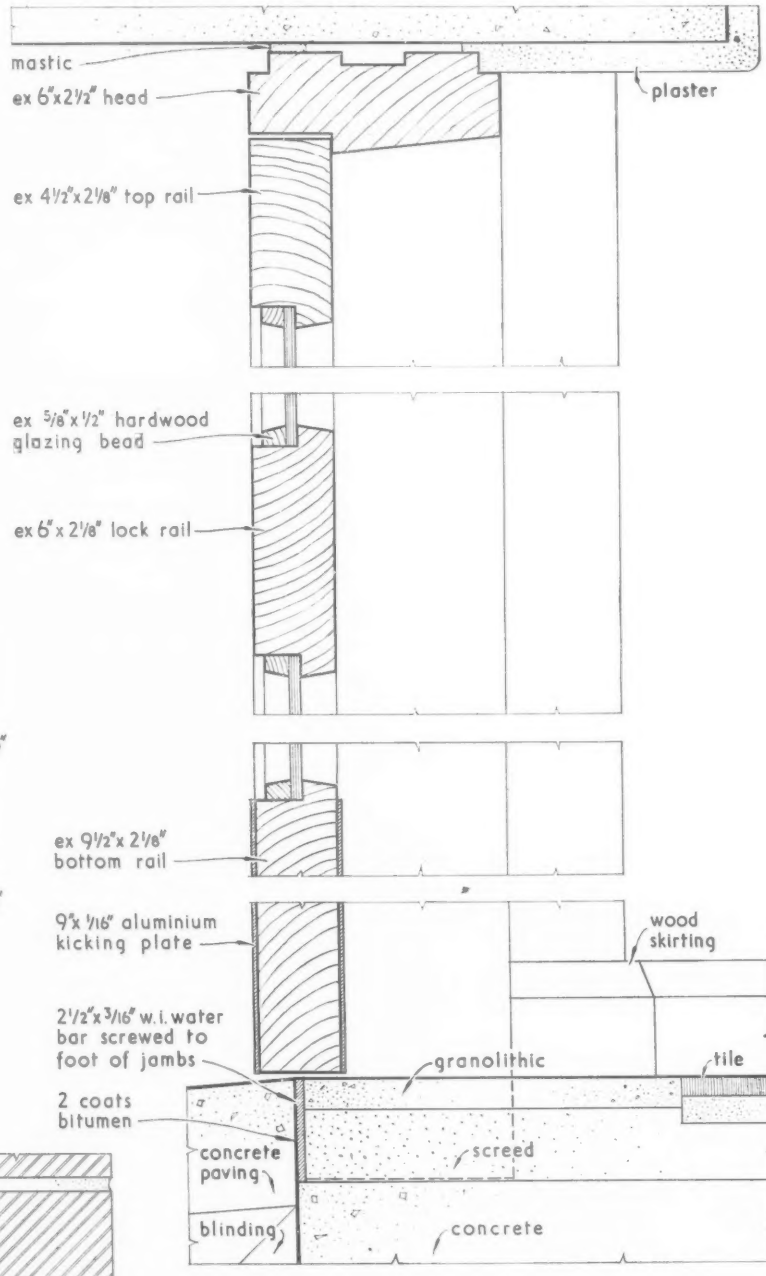
F. R. S. Yorke, E. Rosenberg and C. S. Mardall in collaboration with C. Holliday, architects



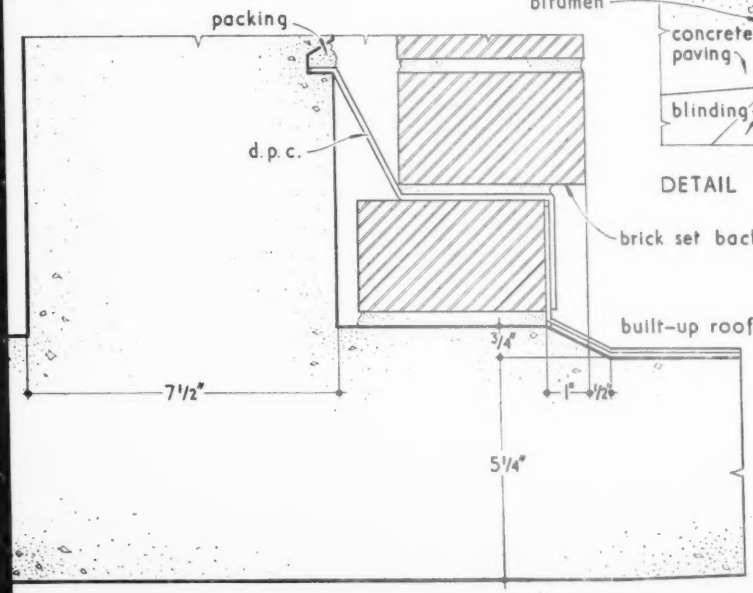
SECTION THRO' DOOR.
scale ¼"= 1'-0"



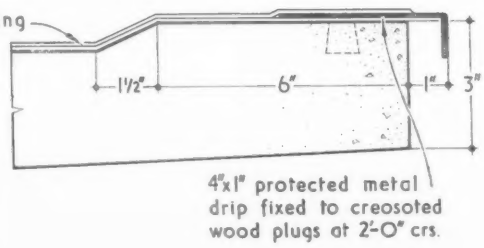
PLAN.
scale ¼" = 1'-0"



DETAIL THRO' DOOR. scale ¼ full size



DETAIL AT A. scale ¼ full size



DETAIL AT B. scale ¼ full size

Architects' Journal 4.12.52

WORKING DETAIL **WALLS AND PARTITIONS: 5**

ACOUSTIC PARTITION: OFFICES IN LONDON, W.1.

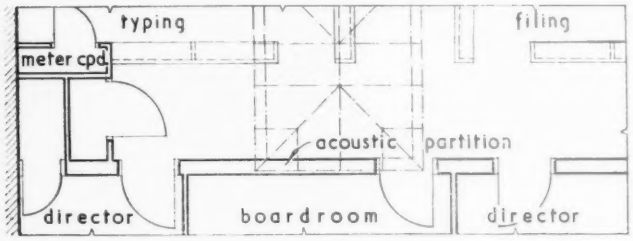
J. M. Austin-Smith and Partner, architects.

The partition consists of two skins of breeze blocks with a layer of glass silk in the cavity between.

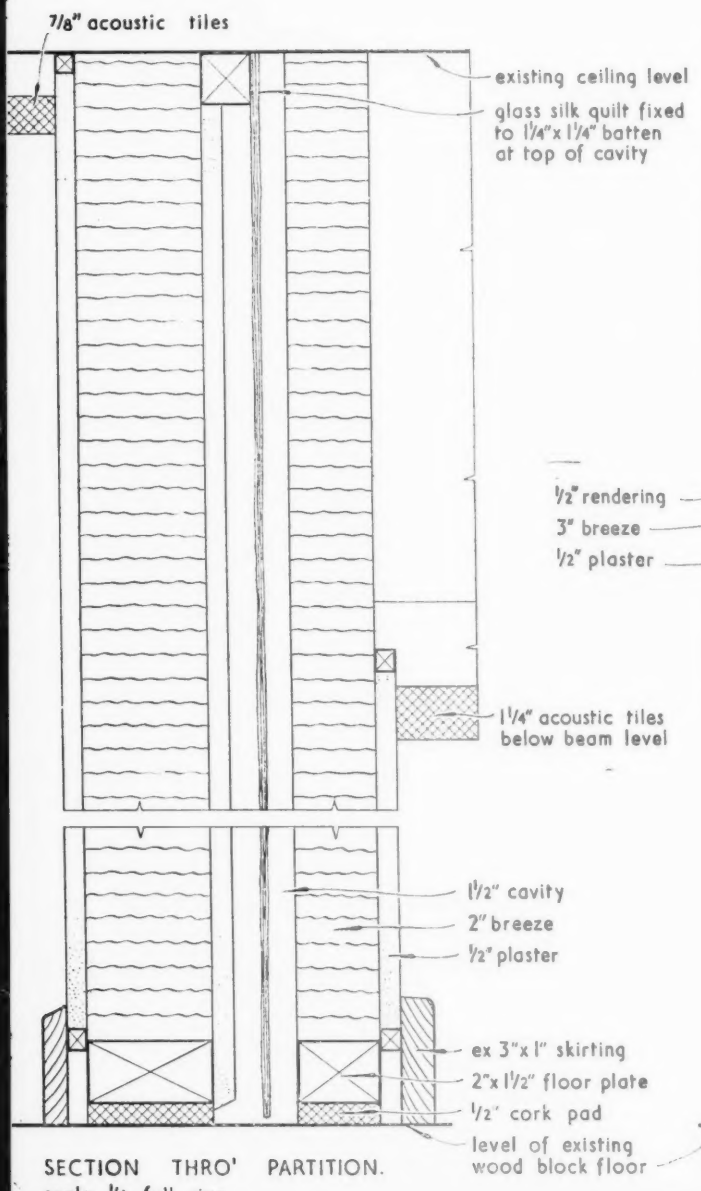
WORKING DETAIL

ACOUSTIC PARTITION: OFFICES IN LONDON, W.1.

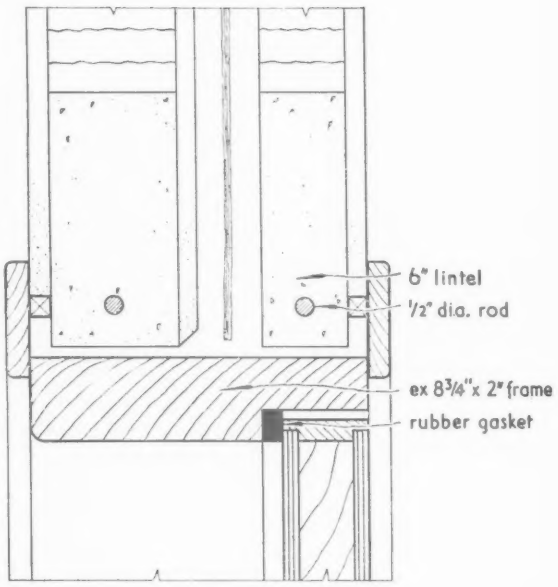
J. M. Austin-Smith and Partner, architects.



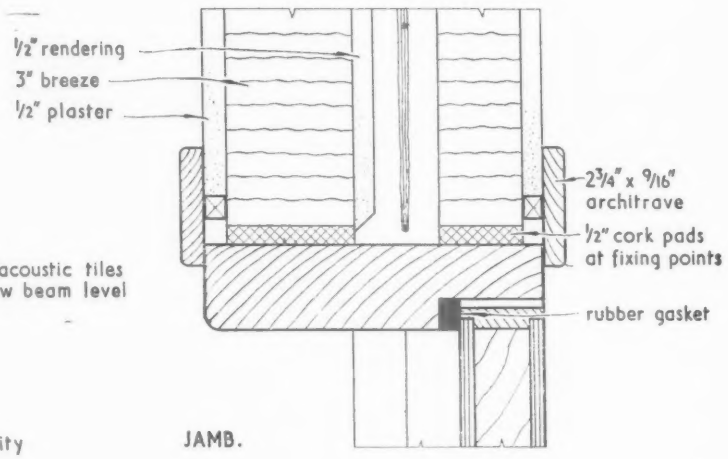
LAYOUT PLAN SHOWING ACOUSTIC PARTITION.
scale 1/8" = 1'-0"



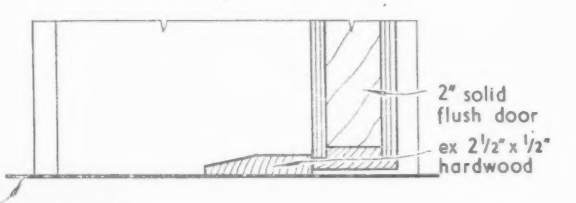
SECTION THRO' PARTITION.
scale ¼ full size



HEAD.



JAMB.



THRESHOLD

DETAILS OF DOOR.
scale ¼ full size

This
cour
supp
boil

FACTORY

in KING GEORGE'S WAY, DOVERCOURT BAY, ESSEX

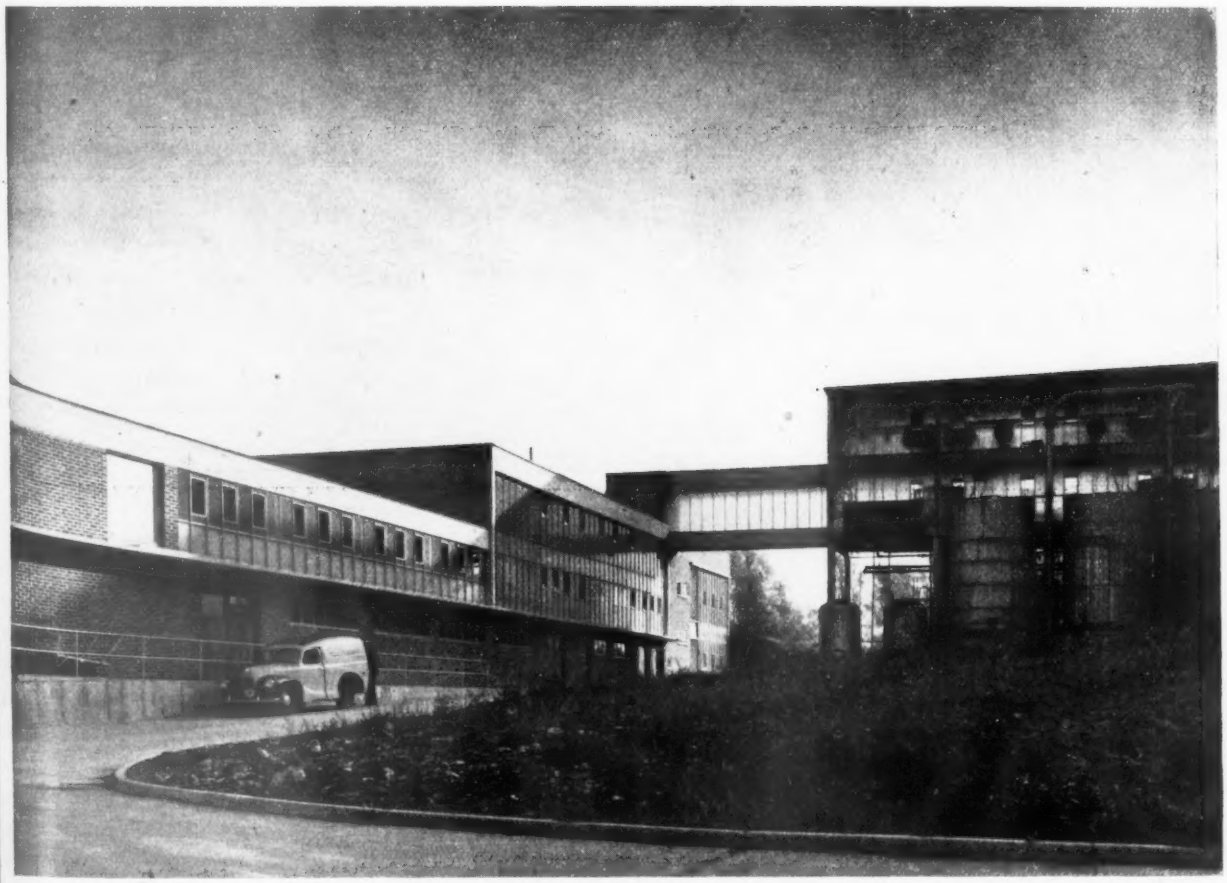
designed by OVE ARUP AND PARTNERS

consulting architect DAVID DU R. ABERDEEN

architect-in-charge PETER HATTON

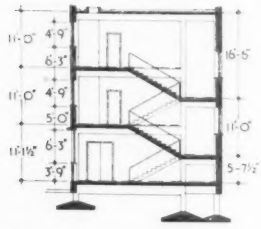
This factory for the Standard Yeast Company has been built on a site on the Stour estuary at Dovercourt Bay. It includes plant for dealing with the considerable effluent, bulk cold water storage supplied from the site's own boreholes, administrative offices and laboratories, fitting shop and stores, boilerhouse, packing and despatch department and gatekeeper's house.

The two factory blocks from the north-west.



FACTORY

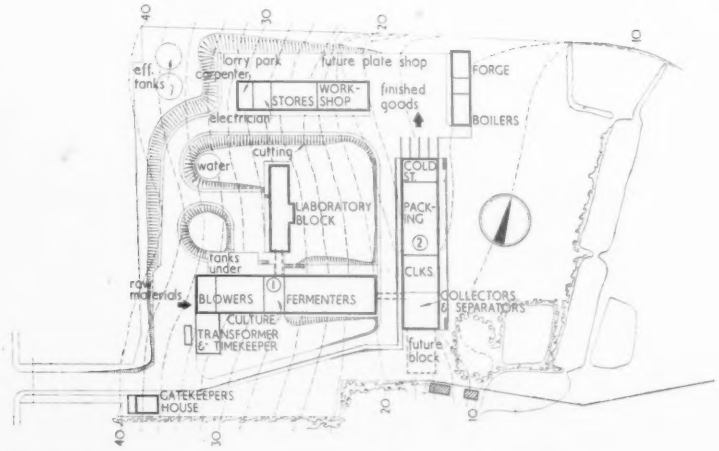
in KING GEORGE'S WAY, DOVERCOURT BAY, ESSEX
designed by OVE ARUP and PARTNERS and DAVID DU R. ABERDEEN



Section A-A

Laboratory block, ground, first and second floors [Scale : $\frac{1}{16}$" = 1' 0"]

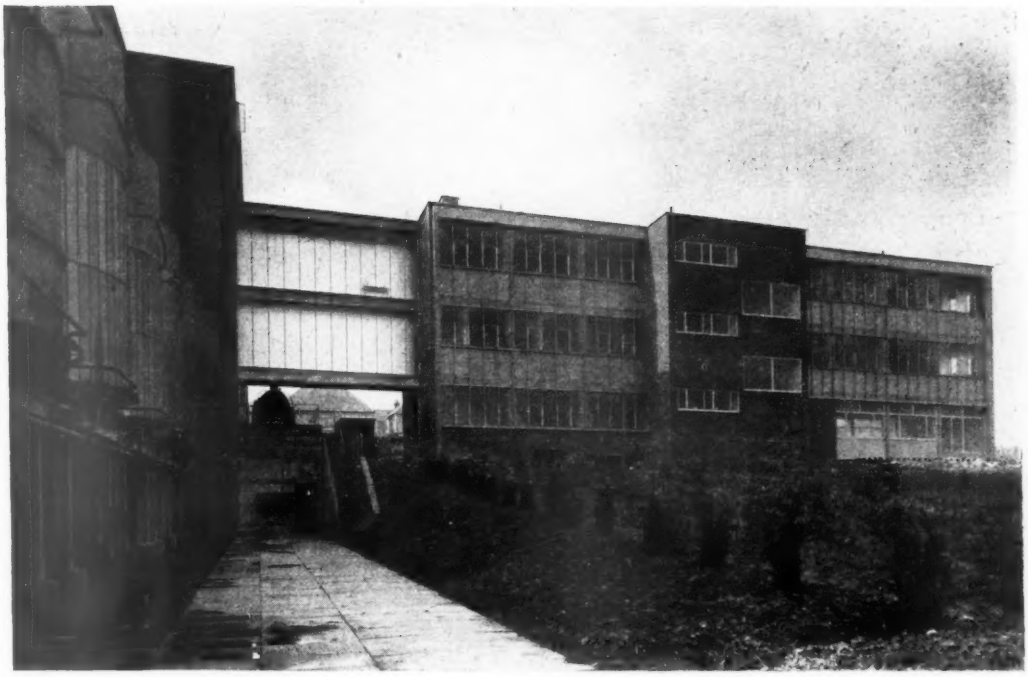
The laboratories from the south-west.



Site plan

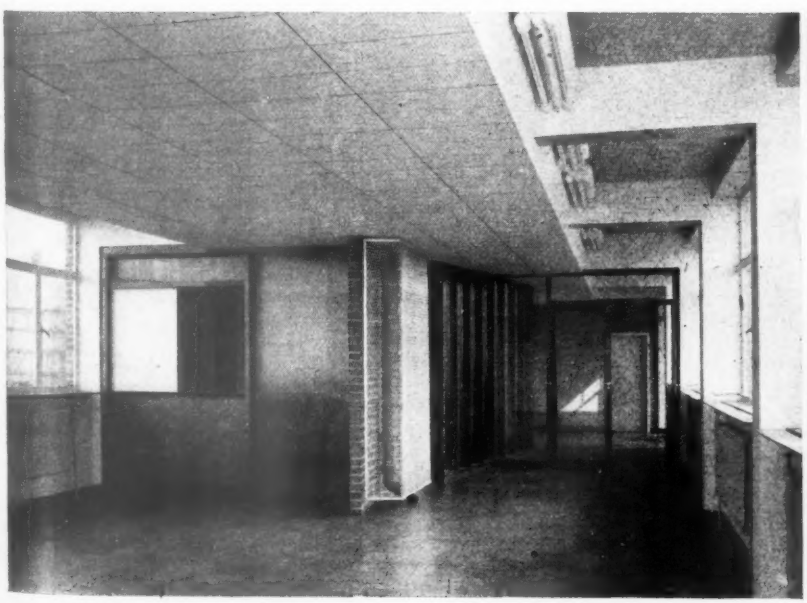
SITE.—The site is an open one overlooking the Stour estuary to the north. The ground falls steeply from the entrance at the south-west corner to the north and east. The subsoil is of clay. It is intended to plant many trees about and between the buildings.

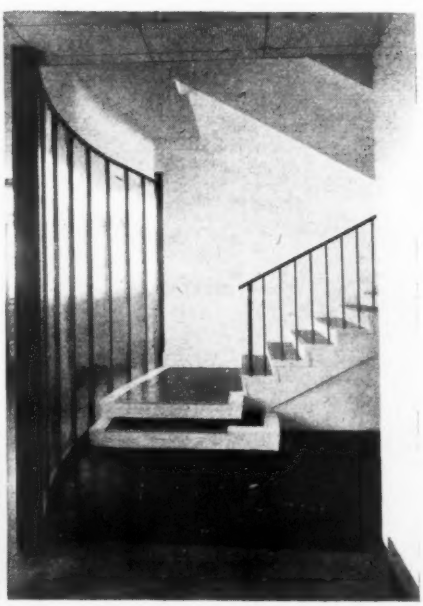
PLAN.—The factory comprises three major buildings linked together by bridges. The main building (block 1) runs east-west from the entry on to the site, with the secondary factory building (block 2) at right angles at its eastern end. The laboratory and office building runs out northwards from the middle of block 1. A ring road within the site serves all the buildings as well as the smaller ancillaries. The part of block 1 nearest the main entrance is the preparation area of the factory. Four storeys in height, with molasses cellars and bulk storage tanks for cold water at roof level, this section houses the plant for generation of air to the fermenters, yeast culture rooms, chemical stores and equipment and associated stores on upper floors. The further part is the heart of the factory. Here, the molasses (the main raw material in the manufacture of yeast) are fermented. The fermenting vats of insulated stainless steel are free standing and fully exposed along the flanks of the galleries which run between them at high level. These galleries contain all the controls for the vats. The laboratory and office building is linked to block 1 at two levels.

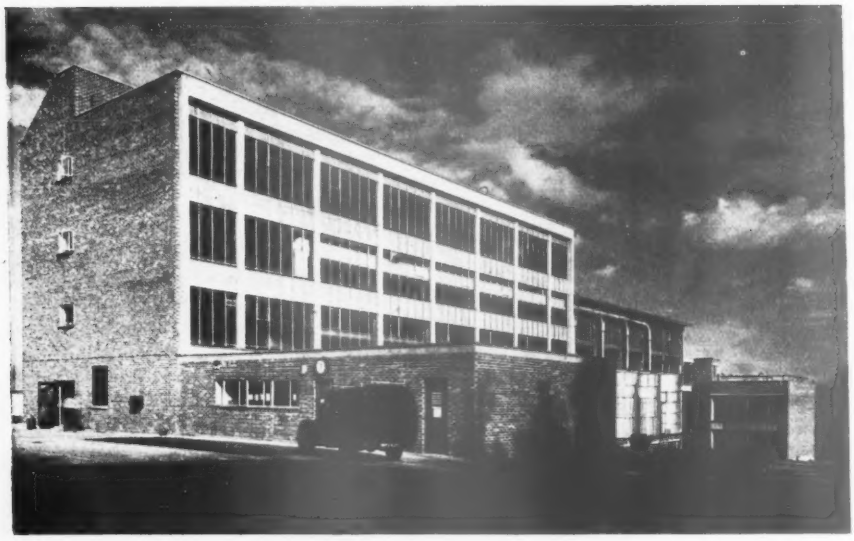


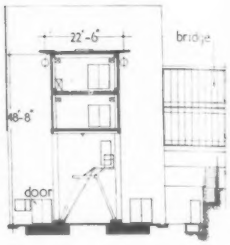
This building is used for checking all the ingredients, testing samples and supervising the production flow. Block 2 houses the processing plant. Separators, at the top of the building, extract the yeast from the fermented product. The press room, in which excess moisture is withdrawn, is immediately below. Also contained in the block are cloakrooms and lavatories. Despatch bays for the covered loading of refrigerated vehicles are arranged at the north end. This latter section also incorporates a large cold holding store. The bulk molasses are stored in cellars beneath blocks 1 and 2. All these underground tanks are interconnected and fed from the off-loading bay on the north side of block 1, from

Above, the laboratory block from the east. Below left, the entrance hall and anteroom seen from the reception room Below right, the staircase.



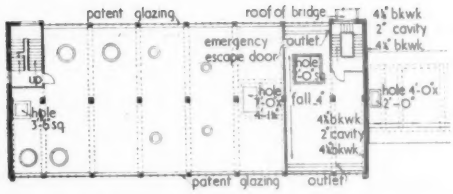




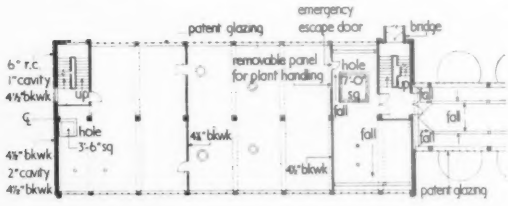


Section B-B

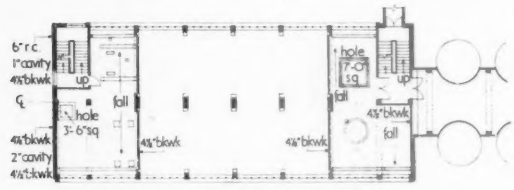
Left, block 1 from the south-west. Below, from the south-east.



Third floor plan



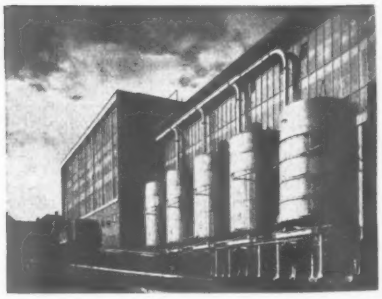
Second floor plan

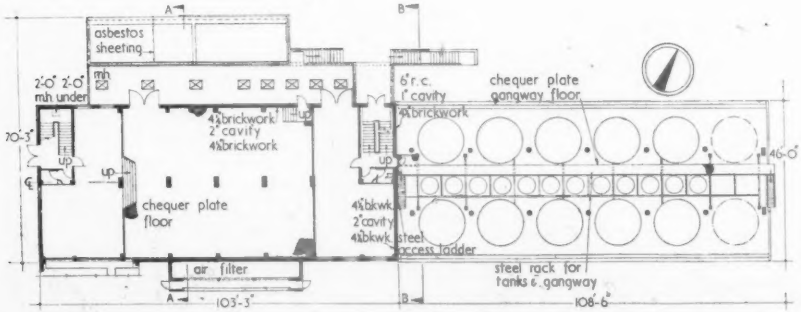


First floor plan

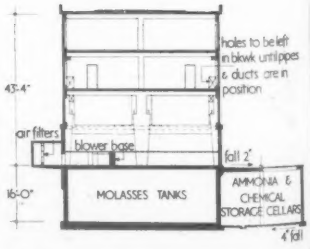
which point the molasses can be distributed to any part of the cellarage.

CONSTRUCTION.—The molasses tanks form the foundation raft for the main factory buildings. They were constructed of thin sheet steel, for the most part site welded and then used as permanent shuttering to the poured external r.c. walls. All buildings have r.c. skeleton frames. External walls

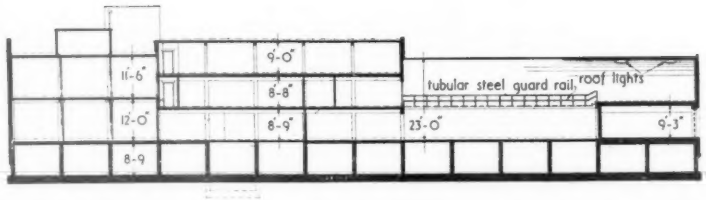




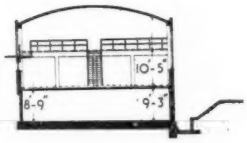
Block 1. Ground floor plan [Scale : $\frac{1}{16}$" = 1' 0"]



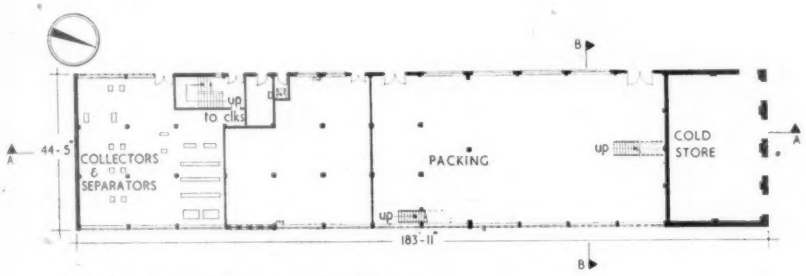
Section A-A



Section A-A



Section B-B



Block 2. Ground floor plan [Scale : $\frac{1}{16}$" = 1' 0"]

FACTORY

in KING GEORGE'S WAY, DOVERCOURT BAY, ESSEX

designed by OVE ARUP AND PARTNERS and DAVID DU R. ABERDEEN

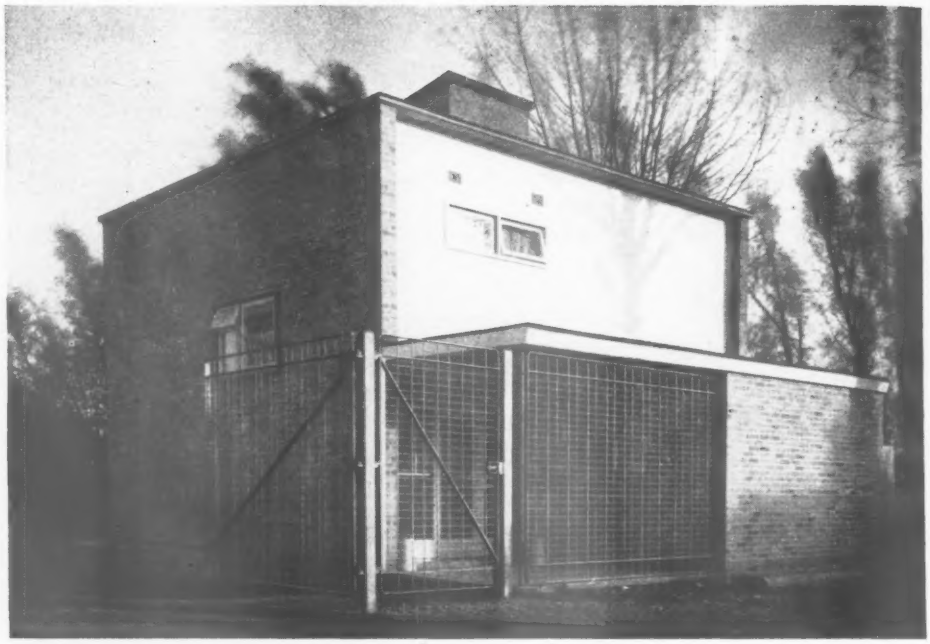
are either of brick with moler block backing or fully glazed with wired glass in aluminium patent glazing. To a considerable extent the r.c. frame is exposed, and in view of the first class surface from the shuttering it is left untreated. The aluminium patent glazing bars are so far unpainted and will only be treated should this be desirable later on. The circular columns supporting the elevated galleries between the fermenting vats are built up of pre-cast concrete drainage sections used as permanent shuttering for a poured r.c. core. A barrel vault shell roof covers the packing section; dome lights are introduced to augment the side lighting. The laboratory building is of particular interest in view of the considerable extent to which pre-stressing and post-tensioning of reinforced concrete has been employed, together with the patent "Shishkoff" floor units (see page 685). The

Block 2 from the south. The bridge connects it with block 1 on the left.

FACTORY

in KING GEORGE'S WAY, DOVERCOURT BAY, ESSEX

designed by OVE ARUP and PARTNERS and DAVID DU R. ABERDEEN

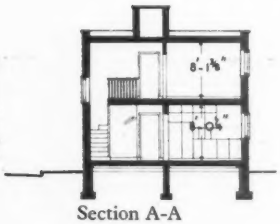


The gatekeeper's house from the the north-west.

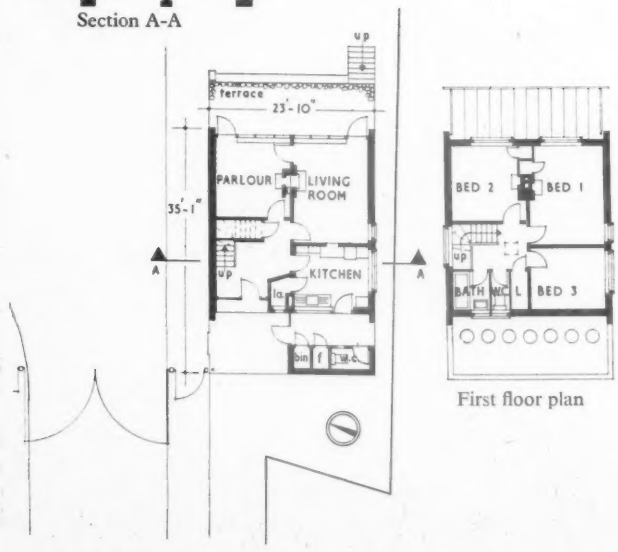
change in structural technique was largely necessitated by lack of steel bar for more orthodox construction.

FINISHES.—The design problem has been to impart to the group of buildings, each of different function and scale, a coherence which would make of them an architectural whole to which they all contribute sympathetically. For this reason, the utmost restraint has been exercised in the detailing of the elevations. Walls throughout are treated as simple planes of pierced brickwork or overall patent glazing, the latter introducing a consistent rhythm throughout the group.

The general contractors were Bovis, Ltd. For sub-contractors, see page 690.



Section A-A



First floor plan

Gatekeeper's house: Ground floor plan [Scale : ¼" = 1' 0"]

The house from the north-east.

TECHNICAL SECTION

The latest of the excellent series of symposia held at the AA was devoted to an interchange of information and opinion on secondary modern schools—their requirements and how they can best be satisfied within the limits of current financial restrictions. Thoroughly and efficiently organized by Barbara Price and Denis Clarke Hall, in conjunction with the AA, the symposium was held on November 12. A report on part of the discussions was published in the JOURNAL for November 20 (page 608) ; the following commentary is by John Stillman and J. Eastwick-Field, who are writing the series of articles on the MOE development work, the second of which appears on pages 670-676 of this issue.

The principal papers of this symposium were printed well in advance and interleaved with plain sheets of paper for note-taking--a useful procedure which other organizers of symposia might well copy. One criticism : much was said at this particular symposium about " visual aids " ; it would be helpful if, at future symposia, some drawings and photographs could be displayed of the type of building under discussion.

This week's special feature

10 DESIGN : BUILDING TYPES
secondary modern schools

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

The problem of school design today is very similar to that of designing houses today—the architect has to decide, after seeking his clients' advice, what economies he can make that will mean the least sacrifice of essential services. There is, however, in the design both of schools and of houses, a limit to the economies that can reasonably be made. When this point is reached it is the architect's duty to insist on being allowed to spend more.

The symposia at the AA have already become an established means of interchanging ideas between the architect and client. The last symposium, held on Nov. 12, was on Secondary Modern Schools; previous subjects were Hospitals and Colleges for Further Education. For all these buildings the client is not a single person, and, even where the client is nominally a committee, there are likely to be other influences exerted on the architect—by the users of the building, and by various government departments.

The architect for a school building may be instructed by the chief education officer of a county council, acting for the education committee, but he may have to consult also the local education officer, the headmaster or headmistress, if the latter have been appointed, and specialist teachers. In addition he is expected to know the relevant statutory regulations, and to be able to interpret the advice given in the *Building Bulletins* in the light of the particular requirements of the authority for whom he is working. Finally he must be able to satisfy Her Majesty's Inspectorate for Schools, one

of whose contributions is to expound developments in teaching, and explain their effect on planning and design.

Speakers, representing each of these requirements, stated their points of view during the first section of the symposium; the second section was devoted to discussions of the architectural interpretation of present educational and economic influences.

To give a resumé of each of the papers given at the Symposium* is impossible in a short article; we have, therefore, chosen two or three of the main arguments to comment on.

PLANNING—HOW COMPACT ?

There was much controversy—particularly amongst educationalists—as to the form a secondary school building should take. Some thought it should still be a loosely knit open plan, mainly on one floor, with South-East orientation for classrooms; others that this did not give sufficient unity and involved too much corridor space, and that a number of unconnected blocks, for classrooms, hall and administration, physical training, and practical rooms, would be more suitable, and would, some fondly thought, give the Public School or University atmosphere.

A number of architects, wishing to make full economies in design, proposed that a school could once again be planned for the most part as a single block, but in a different form from those older schools where the classrooms were grouped round the hall and entered from it. The educationalists present were inclined to doubt the wisdom of this suggestion, regretting the apparent loss of individuality in the various parts of the school, and recalling the unsatisfactory lighting, ventilation and sound insulation of the older buildings. The supporters of the " compact " plan claimed that modern technical developments could overcome these objections, and that the economy in structure, external walling and services would make it possible to retain a reasonable standard of finish within the present limits of cost.

A representative from the Ministry, whilst not wishing to be dogmatic on the form that a school should take, suggested that, if it became impossible to continue to build educationally suitable schools within the present limit, the Ministry would be forced to reconsider the allowable cost per place. In spite of the evident controversy over the " compact " plan, there is no doubt that many architects consider it solves the present economic difficulties without detriment to educational standards. Several such schools are already being built, notably in Middlesex, where the idea originated, and it remains to be seen whether the atmosphere created, when all the parts of a school are brought together in a single block and interpreted in the modern æsthetic, cannot satisfy the educationist.

THE ASSEMBLY HALL

By law, all the pupils in a school must be assembled for religious observance once a day and, for this reason, schools have always been provided with a large hall. Although the existence of the hall has always encouraged development of activities such as drama and music, which are recognized as of educational value, the hall has never been thought of as essentially a teaching space. Despite the fact that it is often used by a single class for, say, physical training and dancing, it is usually unsuitable for the teaching of more academic subjects.

The Ministry has commented: " In many existing schools in which other accommodation is adequate, the hall does not earn its keep, and is the most lightly used of all the teaching spaces." They suggest that for this reason there should be two halls separated by a movable screen, so that each of the two spaces so formed can be used independently for class teaching. It is also now thought that it is undesirable for children to perform drama in a hall more than 40 ft. in depth, and this dimension is usually exceeded in a single hall.

On the other hand, one headmaster present voiced the opinion, which was supported by others, that the sense of unity which was so important to the school, could best be achieved in a single and perhaps more formal hall, specially designed for hearing and seeing in, with a properly designed permanent stage. To some extent this attitude may be due to doubts as to the practicability of providing sound-proof movable partitions, which most people would consider necessary to the proper working of the newer conception of the hall.

FLEXIBILITY

The word " flexible " was much used at the Symposium, but the precise meaning, in the various contexts in which it was used, was not always clear. When educationists spoke of " flexibility " they appeared to have particularly in mind a flexibility of " teaching method." This in turn was interpreted either as meaning the ability to make minor changes in organization and disposition of classes, or the ability to make radical changes in organization which would require quite different kinds of school building than those to which we are accustomed. These would be designed so that there could be experiments in teaching; for instance, discarding the notion of the " class " as such and organizing the children, for some of the time at least, in larger groups so as to make better use of films and television and other technical aids. Such buildings would have to be much more adaptable than any are at present, certainly until such time as the theoretical conception of secondary modern education has been more definitely interpreted in practice.

Architects, on the other hand, were more concerned with finding a solution to the problems of providing a sound-proof and reasonably cheap system of partitioning which could be easily taken down and re-erected in different positions; and also a sound-proof movable screen, such as would be required to divide two halls.

PREFABRICATION

Strong expressions of opinion as to which module would be the best to adopt suggested that many of the members of the Symposium assumed that prefabrication had come to stay, but it was also suggested that, if the Government were to alter its present attitude to " housing," and traditional labour and materials became more plentiful, " prefabrication " would no longer be competitive and would cease to be used. Needless to say, this invoked protests since it seemed very unlikely that the Government would change its attitude to the housing programme in the foreseeable future, and that whether or not it did, further progress in the mechanization of the industry would inevitably lead to higher efficiency and economy over traditional site methods. It was also felt that one could not continue to ignore the growing production of materials relatively new to the building industry.

COMMENTS

Some of the comments made during the course of the Symposium are worth recording even out of their context; they give a good idea of the lively and controversial atmosphere of the day's proceedings: " We must not build monuments to Civic Pride. . . . The date of completion is more important than the date of starting. . . . Informality or any other method of teaching must not be enforced on the teacher by the school. . . . We must put more trust and faith in adolescents to behave themselves. . . . An 11-per cent. saving in capital cost of the heating installation can be made by the use of double glazing. . . . Avoid a Piccadilly Circus. . . . Radiant heat is better than convected heat. . . . A maximum temperature of 55 degrees and compulsory cross ventilation (without draughts) would prevent infection. . . . We may, in future, look to the textile industry to provide sound-proof curtains—don't be old fashioned. . . ."

J. STILLMAN AND J. EASTWICK-FIELD

* The day's proceedings are to be published in full by the AA shortly. Price to members, 5s.; to non-members, 10s. 6d.

THE DERBY ARMS *EPSOM DOWNS*

The two illustrations show the DERBY ARMS *public house before and after renovation.*

Architect & Surveyors:
Leonard Chignall & Son, F.I.A.A., M.Inst.R.A. of Romford, Essex.

Contractors:
Piling & Construction Co., Ltd. of Croydon, Surrey.

THIS old and famous landmark, standing high on the Epsom Downs facing the Grand Stand, is extremely exposed and stands alone without protection from other buildings. In carrying out alterations and war damage repairs, the Architects decided to re-face the damaged and weather worn external walls and at the same time to make them impervious to penetration by severe driving rain. This was accomplished by the simple addition of 5 lbs. of 'PUDLO' Brand Powder to each 100 lbs. of cement in the 2 to 1 sand and cement rendering coats.

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We describe below a new patented precast concrete floor unit, still in the early stages of development, but already used successfully, in combination with prestressing, in part of the factory at Dovercourt Bay described and illustrated on pages 677-682.

THE SHISHKOFF FLOOR CONSTRUCTION SYSTEM

Four advantages are claimed for the Shishkoff (patented) floor system: strength, economy, lightness, and speed. The first results from the T-beam formation of the units; the second from the fact that the units can be made on the site, instead of in a factory, and because only simple plant is required; the third from the large cavities in the units; the fourth from the fact that no shuttering is required and because the units are light and therefore easy to handle.

As seen in the cross section, right, the complete Shishkoff beam consists, in effect, of a T-beam of reinforced 1:2:4 concrete (this can be foamed slag concrete) 1¼ in. thick, 11 in. wide and 4½ in. deep. (One M.S. rod placed near the bottom of the web of the T gives the equivalent of a lower flange, and sometimes another rod is used near the top of the web.) A permanent former for the T-beam is provided by a hollow unit, the shape of a letter B on its side, made of 1:3 cement mortar partly ½ in. and partly ⅜ in. thick. Thus the complete beam is a trapezium with a base 12 in. wide, a top 11 in. wide and a height of 5 in. It can be made any desired length.

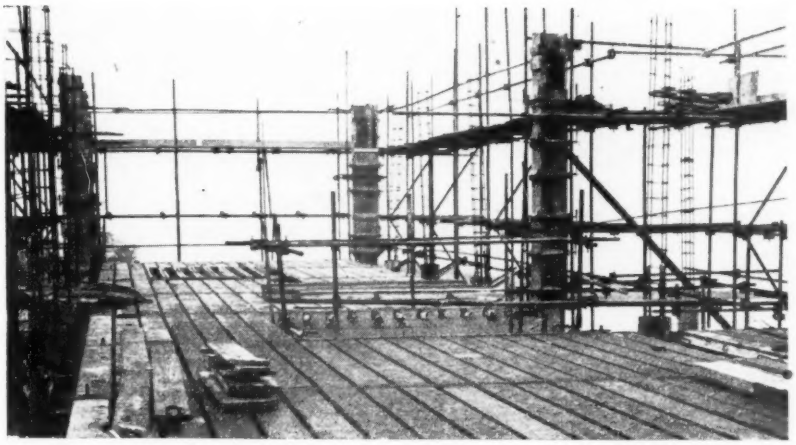
The method of manufacture (now superseded by a better method, similar in principle) was as follows: a layer of cement mortar was laid (by a plasterer) fairly dry on kraft paper; this was then *folded* into the required shape around two pairs of timber wedges, which were withdrawn within a few hours (as compared with about 24 hours for moulded hollow units). The second stage in the manufacture of the complete beam takes place after the units have been allowed about a week in which to harden.

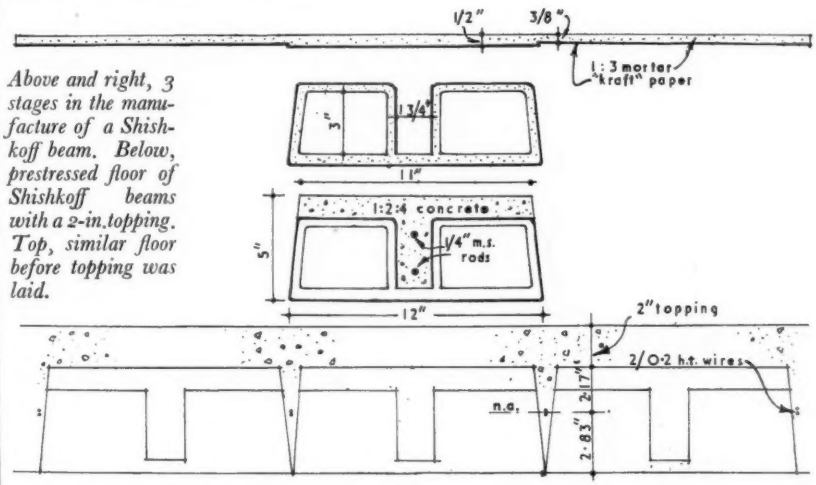
In the laboratory block on the factory at Dovercourt described on pages 677-682, three units were laid in line, with a ½-in. gap between them, and the bottom of the joints filled with mortar. Reinforcement, as required, was then placed in position; a frame placed over the units; and the filling of concrete poured, very dry, and well tamped. After 48 hours the beams were stacked and they could be used after about three days.

The beams used at Dovercourt are just over 10 ft. long (consisting of three 3-ft. 4-in. units). The concrete used consists of 1 part rapid hardening Portland cement, 2 parts sharp sand and 4 parts ¾ in. down natural gravel. The water:cement ratio was 0·50 (by weight). The beams are reinforced with a ½-in. rod, ¾ in. from the bottom of the unit, and a ¼-in. rod, only 7 ft. long, 1 in. down from the top. The air temperature during manufacture and curing was between 32° and 45° F., so the water was pre-heated to 150° F. and the beams were covered with tarpaulins while they hardened.

These beams were used to span between main cross beams at 11-ft. centres. In the V-shaped grooves between the beams two 0·2-in. high tensile wires were placed the entire length of the building. These were post-tensioned by the Freysinnet system and grouted in when the 2-in. topping of 1:2:4 concrete was laid.

A stressed test panel (working stress of each wire 5,600 lb.) was tested 7 days after the topping was laid. The panel, designed for a dead load (allowance being made for floor finish) of 75 lb./sq. ft. and a live load of 100 lb./sq. ft., was first loaded to twice the design load; maximum deflection was 0·028 in. The load was removed and the panel loaded again, this time to twice the design total load. Maximum deflection was then 0·177 in. (1:750). It is claimed that there was no sign of cracking at any time during the tests. Recovery after the first loading was over 90 per cent.; after the second loading, over 98 per cent. A single un-stressed beam was tested when 5 days old. It was supported at each end, with an effective span of 10 ft. Cracks first appeared at a load of 136 lb./sq. ft. At this load deflection was ⅛ in. Recovery was 67 per cent.





Above and right, 3 stages in the manufacture of a Shishkoff beam. Below, prestressed floor of Shishkoff beams with a 2-in. topping. Top, similar floor before topping was laid.

Specialist Editor No. 13 gives below a second report on the test to destruction of the prestressed footbridge at South Bank. The breaking up of the structure has revealed much of interest to all users of prestressed concrete.

SOUTH BANK FOOTBRIDGE: 2nd REPORT

The results of the consulting engineers' investigation into the test to failure of the prestressed footbridge on the South Bank (described in JOURNAL for July 17) have not yet been issued, but the demolition of the structure is nearing completion and further information has recently become available as a result of the breaking-up of parts of the collapsed structure.

The quality of the concrete in the structure appears to have been very good, and failure occurred by fracture rather than by dislodgement of the aggregate. The concrete had been well consolidated and excellent adhesion had been obtained between the main section and the topping which was laid some hours later. The cables were found to have been misplaced at midspan and over the support, where maximum eccentricities were required; this is attributed to movement of the rubber cores during concreting. This movement reduced the eccentricity and, therefore, reduced the internal moment, and it may account for the crack which developed near midspan at working load. It is also understood that the friction developed during the stressing was appreciable and, while it must be remembered that great progress has been made in the two years since the bridge was constructed, every opportunity should be taken to investigate the effects of friction and information should be made available to all designers of prestressed work. The

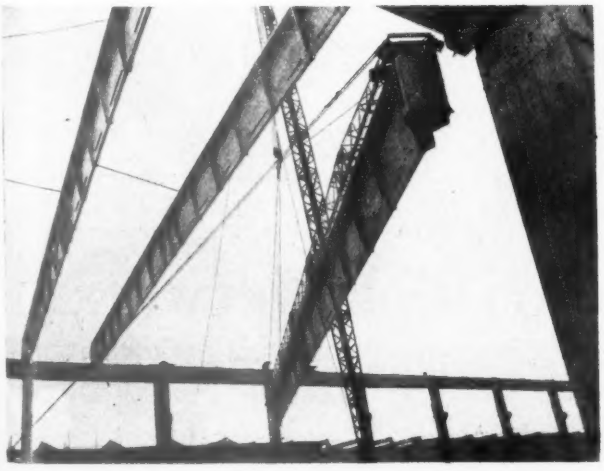
methods employed to hold the rubber cores were not, in this case, adequate, and it is emphasized that the attempted undulation, due to the buoyancy of the core in the wet concrete, must be overcome by rigid fixings at close centres.

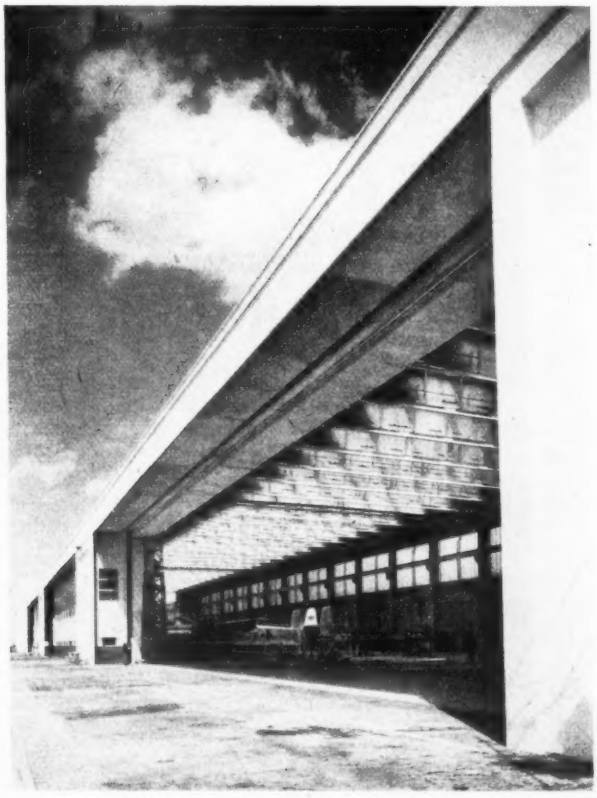
The grouting of the cables was an unsatisfactory feature and in no case could it be said that a core hole was completely filled, while no grout at all had been injected into some core. This is a point which may readily be seized upon by the opponents of prestressing, and it must be admitted that, with the small area of steel employed, corrosion could mean serious loss of section. Also a lack of grout destroys the advantage a fully-bonded cable has when a beam is resisting overloading.

It is suggested that no failure occurred in the anchorages of the deck cables or in the wires but, considering the evidence of the loss of friction and the lack of bond, it seems probable that ultimate failure was due to elongation of the wires causing the neutral axis to rise, thus reducing the area of concrete resisting the compressive force and leading to crushing of the concrete.

PRESTRESSED CONCRETE HANGARS AT LONDON AIRPORT

Twenty contractors competed for the contract for these hangars, at London Airport. The winning design, submitted by Holland & Hannen and Cubitts, Ltd., combines the use of prestressed, precast and in situ *concrete with small amounts of aluminium and structural steel. The buildings, roughly* 1,000 *ft. long and* 465 *ft. wide, cover an area of about* 100 *acres. In plan they are U-shaped. The two arms of the U, each* 900 *ft. long and* 211 *ft. wide, consist of hangars and workshops. The base of the U, the link block, contains stores ; it is* 465 *ft. long and* 100 *ft. deep. There are five main hangars in each arm of the U, each* 180 *ft. wide,* 110 *ft. deep and* 43 *ft. high to the underside of the roof beam, but there are no divisions between them, so that there is a clear space* 900 *ft. by* 110 *ft. Each hangar has a* 150*-ft. wide entrance, closed by power-operated sliding-folding doors. The reinforced-concrete foundations vary in depth between* 4 *ft. and* 7 *ft. below ground level. Where possible they rest on natural gravel, elsewhere on mass concrete. The* 150*-ft. openings in the main hangars are spanned by composite beams, consisting of prestressed* in situ *concrete, stiffened with precast prestressed diaphragms. The beams have a hollow section,* 14 *ft. deep,* 5 *ft.* 3 *in. wide, with side walls* 4 *in. thick, bottom slab* 5½ *in. thick and top slab* 8 *in. thick. A total of forty-one* 5*-mm. diameter* 12*-wire prestressing cables were used in each of these beams ; arranged parabolically in the side walls and horizontally in the bottom slab. The rear walls of the hangars consist of reinforced-concrete columns at* 30*-ft. centres, carrying reinforced-concrete eaves beams, and an infilling of* 6*-in. reinforced-concrete panels to a height of* 24 *ft.* 9 *in., with glazing above. Spanning between this and the beams across the openings are T-shaped secondary beams at* 15*-ft. centres. These consist of precast stiffened sections,* 7 *ft. long, which were assembled on the ground and post-tensioned by the Freyssinet method to produce prestressed beams* 110 *ft. long, each weighing approximately* 27 *tons. The top flanges are* 3 *ft. wide, the webs* 6 *ft. deep, all members being only* 4 *in. thick. Spanning between these beams are concrete purlins precast and pretensioned on the "long-line" system in the factory. These purlins carry the aluminium roof decking. Roof lights are carried on precast reinforced-concrete beams. The photograph below left, shows the erection of the secondary beams. The photograph below shows one completed hangar wing, with the sliding-folding doors to one bay open. A view of the interior was published in the* JOURNAL *for September* 18, *p.* 359. (*For list of sub-contractors, see page* 690.)





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.

6.39 planning: social and recreational
ATMOSPHERIC POLLUTION

Atmospheric Pollution, Its Origins and Prevention. A. R. Meetham. (Pergamon Press Ltd. 1952. 35s.)

An interesting book on a subject of importance and fairly wide general interest. 268 pp., 81 illustrations.

Although a rather specialised subject, atmospheric pollution is of great importance both to architects and to the general public. This book deals with it in a straightforward and authoritative manner. It is as free as possible from technical jargon. It begins with a description of fuels, boilers, furnaces and fires.

Atmospheric pollution and its measurement is then described, and an explanation given of how changes in its distribution take place. The effects of pollution on health, animals, plants and materials, the increase in fog, and the cost of pollution, make interesting, if rather grim, reading. Finally, there are two chapters on the prevention of pollution and the law relating to it. Notes on anti-smoke laws in the USA are also given.

18.115 construction: theory
SKIN STRUCTURES

Skin Structures and Shell Roofs with Particular Reference to Industrial Buildings. F. J. Samuely. (Architectural Design. Sept., 1952. pp. 242-256.)

Lengthy and copiously illustrated article on skin structures, of interest to architects and engineers.

Mr. Samuely gave a lecture to the RIBA early this year on the possibilities in skin structures and space frame design. This article will be of great interest to those who were present at the lecture and, in fact, to all progressive members of the architectural and engineering professions. From the recent symposium on shell concrete (see JOURNALS for August 7 and 14, 1952), one might have concluded that future generations will live in a world of concrete barrel vault roofs. Mr. Samuely, however, finds so much other scope for roof design that he does not mention shell roofs until over halfway through his article.

The types of structures Mr. Samuely deals with are grouped into roofs, chimneys and cooling towers, tanks and silos, etc., and many illustrations are included to make the article both instructive and interesting. The statement that "the art of skin structures is, therefore, to make arrangements so that forces that occur at right angles to the skin can be resolved into components which act in the same plane as the skin" seems to be somewhat of a mathematical paradox, but diagrams reveal the author's meaning. Hardly any mention of economy of materials or cost is made and these structures are essentially of the type for which early advice from a consulting engineer should be obtained.

23.162 heating and ventilation
DOMESTIC HEATING

Economical Domestic Heating. H. G. Goddard. (Spon's Buildings and Architectural Series. 1952. 21s.)

The vast amount of research and development on house heating and ventilation carried out in recent years in this country, on the Continent and in America, has, so far, only been available in specialized research papers. Mr. Goddard has gathered together the results of this work and, with firm attention to the economic practicability of the various proposals, has produced an account which is both commonsense, readable and full of reliable data. 160 pp. Illustrated.

The fundamentals of heat loss, effects of planning and requirements for ventilation are discussed, together with methods of heating low-rental houses where the emphasis must be largely on minimal first costs and running costs. Larger dwellings, where central heating or its newer variants in this country—warm air and radiant panel heating—are used, are also dealt with. It is a pleasure to see that the open fire is not wholly dismissed as a space heater, but the need for and possibility of its improvement are indicated; with a large back boiler supplying domestic hot water as well as heat to radiators, the open fire is undoubtedly a useful way of heating the small house.

The book includes work up to about 1950; possibly the enthusiasm shown for whole house and district heating would need to be more restrained in the light of recent work. This is, however, a minor criticism of a book which merits careful consideration by architects, builders and local authorities and will have also an appeal to the individual prospective householder.

23.163 heating: ventilation
VENTILATION

Noise in Ventilating Systems. H. J. Purkis. (*Journal of IHVE.* Vol. 20, No. 206. Oct., 1952.)

A useful review of the subject with the salient points well stressed.

Many ventilation plant manufacturers and, apparently, some ventilating engineers appear to have a very sketchy knowledge of the problems of noise in ventilating systems. This article provides a good introduction to the subject and just enough of the theoretical bases of noise measurement are included to give the reader a proper appreciation of the technical data which follows.

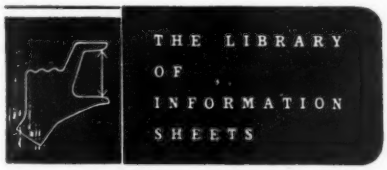
An interesting suggestion is made that the use of low-speed fans, the sounds from which are mainly of a low frequency, may not be the best way to keep noise levels down. High-speed fans, which produce most of their noise at higher frequencies may be better, as normal types of absorbent treatment used for lining ducts are more efficient in dealing with noise of high frequency. The advantages of the reduced size and cost both of fans and ducts for high-velocity systems will appeal to architects.

The notes on the planning of systems and on permissible noise levels in different types of building are valuable. Nothing is said about acoustical filters for noise reduction, perhaps because there is as yet little general experience of this technique, but some of the books given in the small but useful bibliography make reference to the subject.

25.87 water supply and sanitation
ASBESTOS PRESSURE PIPES

A Survey of the Behaviour in Use of Asbestos-Cement Pressure Pipes. National Building Studies Special Report No. 15. (HMSO. 1952. 2s. 6d.)

Specialist paper, of interest chiefly to water engineers, describing investigation into behaviour of asbestos-cement pressure pipes in various types of soil, when used for conveying water supplies. In general, the suitability of these pipes, under many circumstances, is confirmed, provided reasonable care is taken.



11.C1 and 20.B1 *REFERENCE BACK*

Readers are asked to note the following amendments and to correct their copies of the Information Sheet in question:

11.C1 *Face of Sheet.—In the column under "Teco" shear-plate timber connectors the size of washers should be 3 in. by 3 in. by ¼ in. thick.*

Reverse of Sheet.—In the three tables the allowable loads given are for one timber connector in each case.

20.B1 *Reverse of Sheet.*—At the end *of the paragraph headed "Sizes and Loadings" the following words should be added "The floor can also be designed for continuity."*

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

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4.12.52

THE INDUSTRY

From the Industry this week, Brian Grant reports on fire-resistant insulation board; an all-glass prismatic lighting unit; the use of "Ductube" for floor beams; and changes taking place in supply voltages in the USA.

FIRE-RESISTANT INSULATING BOARD

Since the publication of the Egerton Report focused attention on the advantages of insulation, there has been an increasing use of fibre insulating board for lining factory ceilings and the rooms of houses. The increased insulation, as we all know, gives a considerable saving in fuel, but for some time the various authorities concerned with fire risks have been worried about the high rate of flame spread from which most of these boards suffer.

This particular difficulty seems to have been completely overcome in a new "Celotex" board named "Celobestos," which consists of a core of cane fibre insulation, to both faces of which is bonded an asbestos compound. The bonding medium used is resistant to both fire and water. As a result, the board is placed in Class I, under the Elstree Fire Testing Station's standard spread-of-flame test, which allows a flame spread of 6 in., whereas most fibre boards are in Class IV. In the standard test, a sample is placed at right angles to a radiating surface, and is subjected to heat varying from 500° C. at the near edge down to 160° C. at the far edge. The "Celobestos" board showed no flame spread at all at the end of the ten-minute test.

At a further demonstration carried out recently at the "Celotex" works, a foot-square sample was held upright in a frame, and a petrol blowlamp was played on it for about twenty minutes. (The blowlamp flame probably had a temperature of about 900° C.) Soon after the test started, the surface of the board started to darken and the asbestos face started to bulge slightly, owing to the expansion of the air in the cellular structure of the board. After about a quarter of an hour, a small dark patch appeared on the back of the board, presumably due to smoke from the fibre core, and only then did the back of the board (it was ½ in. thick) become unpleasantly hot to the touch. The board was subsequently sawn in half across the heated area and it could be seen that the core had been affected only in the heated area. During the test, there was no smoke whatever—a point which would please fire brigade experts, as would the fact that the heated board does not shatter if water is played on it.

At present "Celobestos" is made in 8-ft. by 2-ft. sheets, ½ in. thick. There is no difficulty in cutting or handling and the asbestos surface is pale in colour and should, therefore, be a good light reflector: it will also take any normal type of decoration. Price is about £1 more per 100 sq. ft. than plain insulating board. (*Celotex Ltd., North Circular Road, Stonebridge Park, London, N.W.*10.)

PRISMATIC LIGHTING UNITS

An entirely translucent all-glass unit, embodying a glass canopy and based on the "Holophane" system of prisms, has been developed by Holophane Limited for use in schools, offices and other commercial buildings. The units, known as "Lumilux," have clean lines, the patterns of the prisms being chosen to give a desirable degree of sparkle when the lamp is lit, while the luminance of the fitting as a whole has been controlled to eliminate glare under all normal conditions.

An interesting feature of the fittings is the combined glass canopy and reflector which forms one moulding and not only eliminates the normal separate canopy, but gives added strength to the unit. The diffusing glass cover is clipped on to the reflector unit, the diffusing pattern consisting of flutes and cross prisms. The reflector may be white or "Correctalite," while the cover glass is white only. Both glasses are normally velvet finished.

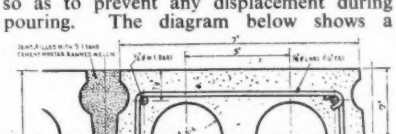
To support the glass a rectangular die-casting, carrying the porcelain E.S. lampholder, is passed through a rectangular hole in the top of the glass, turned to register across the aperture and then locked in position by a top cover plate. Two soft pads attached to the die-casting prevent glass-to-metal contact on the load-bearing surfaces. The units are available in white or "Correctalite" glass, for use with 150 W. or 200 W. filament lamps and are made for chain or tube suspension. (*Holophane Ltd., Elverton Street, Westminster, London, S.W.*1.)

GLASS IN THE SCHOOLS

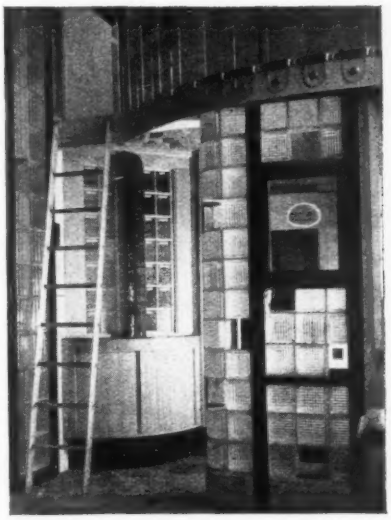
The photograph top right shows part of a permanent glass exhibit recently completed by Pilkingtons in the Materials Gallery of the Liverpool School of Architecture. It is built in two storeys, and is designed to show various samples of different types of glass, as well as methods of fixing glass blocks and "Vitrolite." Many different types of figured and prismatic glass are shown, and this sort of exhibit by manufacturers seems just the thing for any school of architecture, particularly at a time when a common criticism is that there is far too much drawing and not enough practical knowledge of how a job is really built. (*Pilkington Bros. Ltd., St. Helen's, Lancs.*)

DUCTS IN CONCRETE

The inflatable rubber tubing known as "Ductube" has been referred to before in these notes, but the firm has recently produced a new booklet which contains quite a lot of useful information. It is fairly safe to say that "Ductube" is now widely accepted as the cheapest and simplest way of casting all sizes of duct in concrete, but the booklet contains some very useful hints on the fixing of the tube inside shuttering so as to prevent any displacement during pouring. The diagram below shows a



section through one of a series of floor and roof beams which the firm has had designed. These may be used by anyone interested, but it should be made clear that the firm does not manufacture them for sale. The one shown (the smallest) is suitable for spans up to 18 ft.; larger sizes, with 4-in. diameter voids, are for spans up to 28 ft. (*The Ductube Co. Ltd.*, 233/341, *Regent Street, London, W.*1.)



Above, part of the permanent glass exhibit at Liverpool School of Architecture. Below, the "Lumilux" all-glass prismatic lighting unit.

SUPPLY VOLTAGES

Although before the war there were still a few companies left that were supplying DC at low voltages of 100 or 110, virtually the whole country now has 230 volts AC. Most supplies in America, however, are at 110 volts AC, which has meant that imported equipment has had to be modified for the higher voltages here, and that our exporters of such things as irons and radios have to produce special models. The disadvantage of using a low voltage is that it means larger cable sizes for a given current, and several American companies are now supplying 277 volts AC, switches being controlled by magnetic relays and push buttons. In general, the higher voltages go only to the fittings, the wiring between relays and push buttons being in cheap bell wire carrying only 24 volts.

Given an adequate wiring code, such as our own IEE wiring regulations, there seems no reason why 277 volts should not be as safe as our own 230. So far, the new supply seems to be confined to shops and other public buildings, but it will, presumably, spread in time to the home. It seems a pity that, if they *are* changing over, the Americans should not have adopted our own 230-volt standard and, perhaps, made even their own lives a little simpler.

E

Buildings Illustrated

MOE Development Work: Wokingham. (Pages 670-676.) Manufacturers of components described: structural steel frame, wall slabs, upper floor slabs, Hills (West Bromwich) Ltd.; internal partition panels, Bellrock Gypsum Industries Ltd.; ceiling panels, Meta Mica Ltd., and John Kent Ltd. (this firm has developed an alternative type of fibrous plaster ceiling panel which will be described in a later article); roof panels, Thermacoust Ltd. Figs. 3, 4 and 5 are published by courtesy of Bellrock Gypsum Industries Ltd.; Figs. 21, 26 and 30 by courtesy of Messrs. Hills (West Bromwich) Ltd.; Figs. 8, 9 and 13 by courtesy of the Architects and Building Branch, Ministry of Education. Figs. 10, 16, 17, 18, 20, 22, 27 and 29 are reproduced from Building Bulletin No. 8 (HMSO) by permission of the Ministry of Education.

Factory for The Standard Yeast Company, Dovercourt Bay, Essex. (Pages 677-682.) Engineers: Ove Arup & Partners. Consulting architect: David du R. Aberdeen, B.A., F.R.I.B.A., A.M.T.P.I. Architect in charge: Peter Hatton, A.R.I.B.A. Quantity surveyors: Josling & Hamlyn. General contractors: Bovis Ltd. Sub-contractors: chain link fencing, Astolat Co. Ltd.; steel lining to molasses tanks, structural steelwork, The English Bridge & Structural Engineering Co. Ltd.; scaffolding, Scaffolding (Great Britain) Ltd.; driven piles and effluent pipeline, J. T. Mackinley & Co. Ltd.; asphalt and felt roofing, asphalt lining to water tanks, Ragusa Asphalte Paving Co. Ltd.; metal windows and roof glazing, Williams & Williams Ltd.; asbestos roofing to workshop, Manchester Slate Co. Ltd.; patent glazing, British Challenge Glazing Co. Ltd.; cold store installation, T. Smith & Co.; window glazing, Faulkner Greene & Co. Ltd.; asbestos roofing to boiler house, L. Whittaker & Co. (London) Ltd.; cork flooring, Gabriel, Wade & English Ltd.; roflex flooring, L. Fishburn; granolithic paving, Stuarts Granolithic Co. Ltd.; light weight concrete screeds, Meta Mica Ltd.; roller shutters, steel doors, balustrading, Haskins; floor tiling, Acalor (1948) Ltd., H. V. Smith & Co. Ltd., Holmes (Norwich) Ltd.; electrical installation, Carlin Engineering Co. Ltd.; acoustic tiles, Horace W. Cullum & Co. Ltd.; plumbing and plastering, Proops & Partners Ltd.; supplier of prestressing equipment, P.S.C. Equipment Ltd.

Prestressed Concrete Hangars, at London Airport, for British European Airways. (Page 686.) Architect: Keith Murray, F.R.I.B.A., of Ramsey, Murray & White. Consulting engineers for British European Airways: Scott & Wilson. Consulting structural engineer: A. E. Beer, A.C.G.I., M.I.STRUCT.E. Quantity surveyor: Philip Evans. General contractors: Holland & Hannen and Cubitts, Ltd., in collaboration with the Concrete Development Co. Ltd., and the Prestressed Concrete Co. Ltd. Sub-contractors: prestressed beams and purlins, Concrete Development Co. Ltd.; gatic covers, Dover Engineering Works Ltd.; cement, Cement Marketing Co. Ltd.; precast secondary beam elements, Girlings' Ferro-Concrete Co. Ltd.; high tensile steel, Richard Johnson & Nephew Ltd.; bricks, Uxbridge Flint Brick Co. Ltd.; iron and steel, Whitehead Iron & Steel Co. Ltd.; metal windows and steel partitioning, John Williams & Sons (Cardiff) Ltd.; sand and gravel, Wraysbury Sand & Gravel Co. Ltd.; prestressed concrete floors, Pierhead Ltd.; structural steel and asbestos pent houses, Morris Hill, Ltd.; patent glazing, lantern lights and glazing, Aygee Ltd.; "Bison" floors, Concrete Ltd.; aluminium roof decking and roof felting, D. Anderson & Sons Ltd.; steel doors, staircases and balustrades, Allen & Greaves Ltd.; erection of precast beams, Caswell Crane & Erections Ltd.; hangar doors, Esavian Ltd.; internal sanitation and external plumbing, E.S.I.; plastering, Alan Milne Ltd.; crane rails and structural steel framing to temporary floors, Lindsay's Paddington Iron Works (1948) Ltd.; precast roof lights, J. A. King & Co. Ltd.; roller shutters, Mather & Platt Ltd.; scaffolding, Scaffolding (Gt. Britain) Ltd.; steel runways for travelling cradles, Palmers Travelling Cradle & Scaffolding Ltd.; painting, South London Decorators Ltd.; granolithic flooring, Stuart's Granolithic Co. Ltd.; "Triad" roof, Triad Floors Ltd.; "Aqualite" damp-proofing, Wm. Briggs & Sons Ltd.; tiling, Carter & Co. Ltd.; terrazzo, Art Pavements & Decorations Ltd.; heating and hot water, ventilating installations, J. Jeffreys & Co. Ltd.; acid-resisting and coloured asphalt, tarmac pavings, Limmer & Trinidad Lake Asphalt Co. Ltd.; installation of substation and ring main, Johnston & Phillips Ltd.; partitioning, Holoplast Ltd.; deluge and sprinkler installations, Mather & Platt; acid-resisting floors, Prodorite Ltd.; cork and lino flooring, V. G. (London) Ltd.; overhead travelling cranes, The Vaughan Crane Co. Ltd.; electrical installations, Rashleigh Phipps & Co. Ltd.; metal partitions, John Williams & Sons (Cardiff) Ltd.; sanitary fittings, Adamsez Ltd.; ironmongery, N. F. Ramsey & Co. Ltd.; cloakroom fittings, Cloak Room Equipment Co. Ltd.; paint, British Paints Ltd.; external finish on concrete, Stic B. Sales Ltd.; hardwood and softwood frames and doors, P. H. Barker & Son Ltd.

Correction

In last week's issue of the JOURNAL (page 636) we published a letter from Michael J. F. Secrett, F.R.I.B.A. We regret that his affix was incorrectly printed as L.R.I.B.A.

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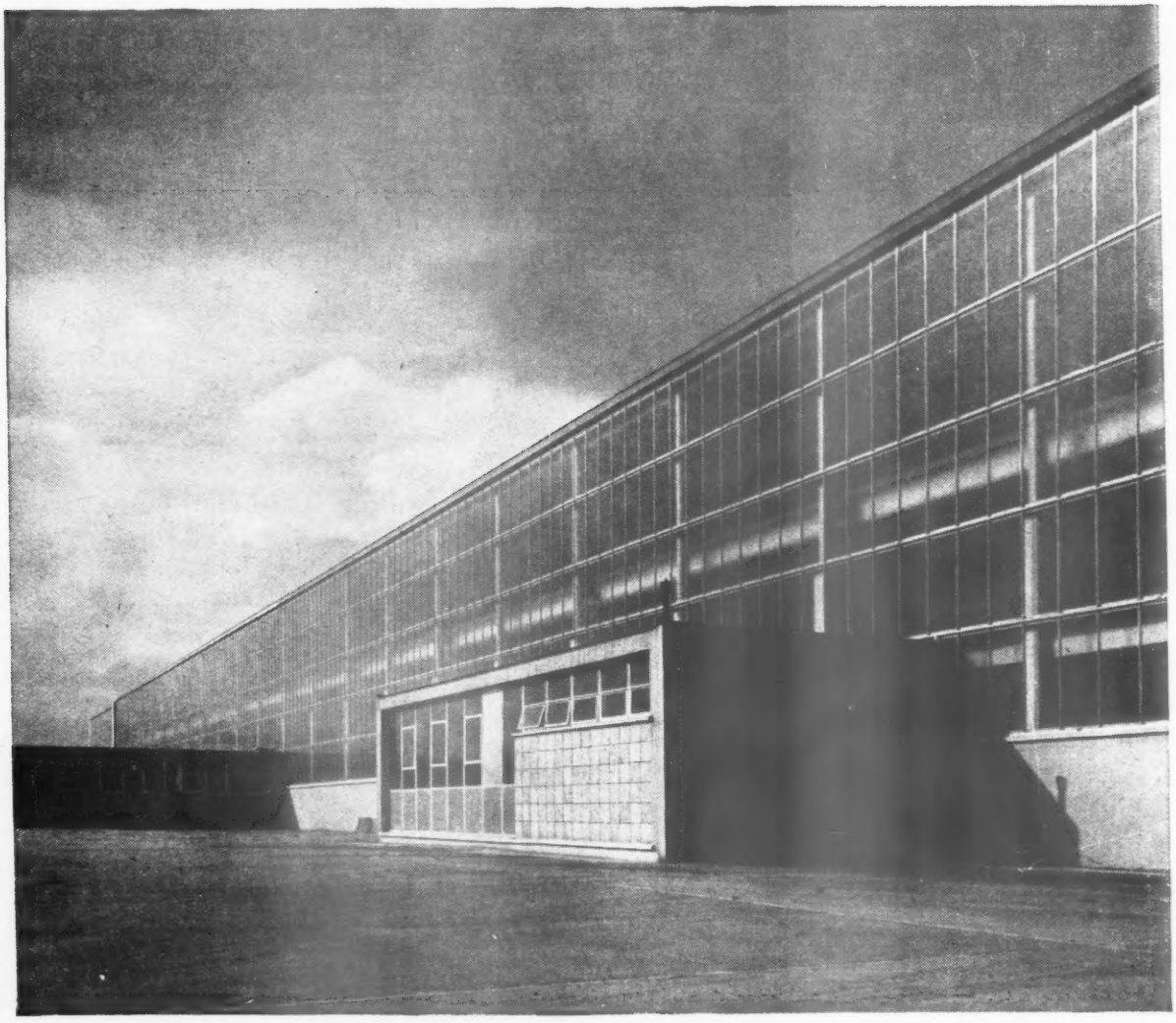


FULL DAYLIGHT FOR FACTORY OPERATIVES

In both the designs featured — the Coras Iompair Eireann factory in Inchicore, Dublin, and the new steel furniture warehouse for Joseph Sankey & Sons in Wellington, Shropshire — the architects faced the problem of providing ceiling to floor daylight without impairing structural strength and graceful design. Each architect specified Aluminex Patent Glazing and the results have proved how completely successful Aluminex is in this kind of construction. Its slim bars and horizontal weathering members give the buildings clean simple lines and reduce light obstructions to an absolute minimum, giving the factory operatives full daylight for working.

Aluminex at Inchicore

The architect, Michael Scott, wished to provide full daylight within this factory, and at the same time to protect concrete cased structural members from the effects of weather. This was achieved by an Aluminex glass wall 254ft. long × 22ft. high holding ¼ rough cast glass and attached to the outer faces of the stanchions. In addition to the advantages of daylight and weather protection, this glass wall reveals the simple and impressive structural framework of the building.

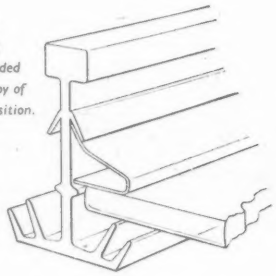
Continuous Opening Lights with Positive Action

An interesting aspect of the 390 foot glass wall in Joseph Sankey & Sons' factory at Wellington is the use of opening lights 100 feet long (Aluminex continuous opening lights can be made of indefinite length but are generally limited to 200 feet both for convenience and by gear limitations). The moving frame is hung on a continuous hinge running the full length of the light that cannot bind or warp (see diagram). The full 100 feet rises like a single pane. The lights are operated from a few remote control points by Teleflex gearing. This threaded cable system exerts a steady even pressure all along the light so that the hundredth foot gets the same pressure as the first foot. The light will stay steadily open at any desired position from 1″ to 18″ so that ventilation can be quickly and accurately controlled.

Coras Iompair — Eireann, Inchicore, Dublin.
Architect: MICHAEL SCOTT F.R.I.A.I.
Engineers: OVE ARUP & PARTNERS.
Contractors: MESSRS. G. & T. CRAMPTON LTD., *Dublin.*

The Aluminex Patent Glazing System

A word about the Aluminex Patent Glazing system (see diagram). The glazing bar is an example of good functional design. Its main web consists of a strengthening ridge at the top, with ribs on each side

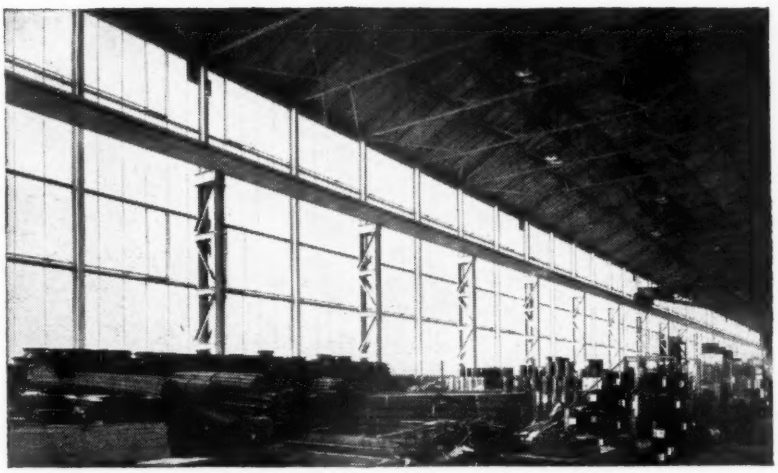


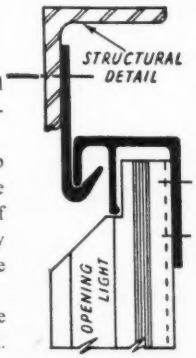
This Aluminex patent glazing bar is of extruded aluminium alloy of special composition. Here is seen one glazing cover strip holding a pane of glass in position on the bar.

to hold a continuous cover strip. Internal condensation is carried outside the building by the integrated channels in the bar.

The continuous aluminium cover strip is scientifically profiled to fit between the rib of the glazing bar and the surface of the glass. It fits tightly but gives sufficiently in response to thermal movements to make a firm and safe glass grip in all conditions.

Economy is a strong factor in the ever increasing popularity of Aluminex.





This drawing shows the design of the continuous hinge used on the Aluminex opening lights. The head weathering makes flashings unnecessary.

Weathering produces a permanent protective patina on the surface of the aluminium alloy. Thus it does not rust or corrode. It needs neither initial painting, or subsequent repainting. Broken glass can be replaced quickly and without difficulty.

The architect who turns to Aluminex Patent Glazing has at his service a method of architectural cladding capable of versatile applications. It is an accepted system yet remains susceptible to imaginative development. The company extends its fullest co-operation to all architects who wish to discuss new applications of Aluminex.

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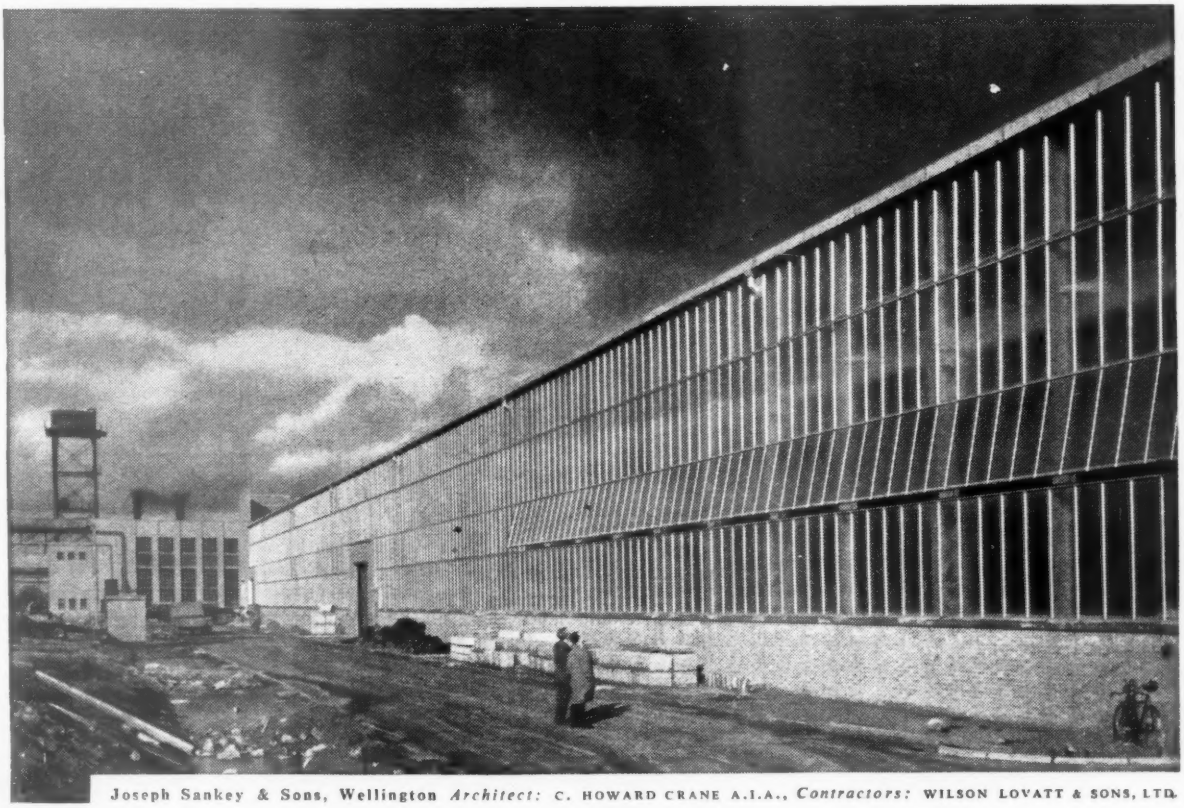
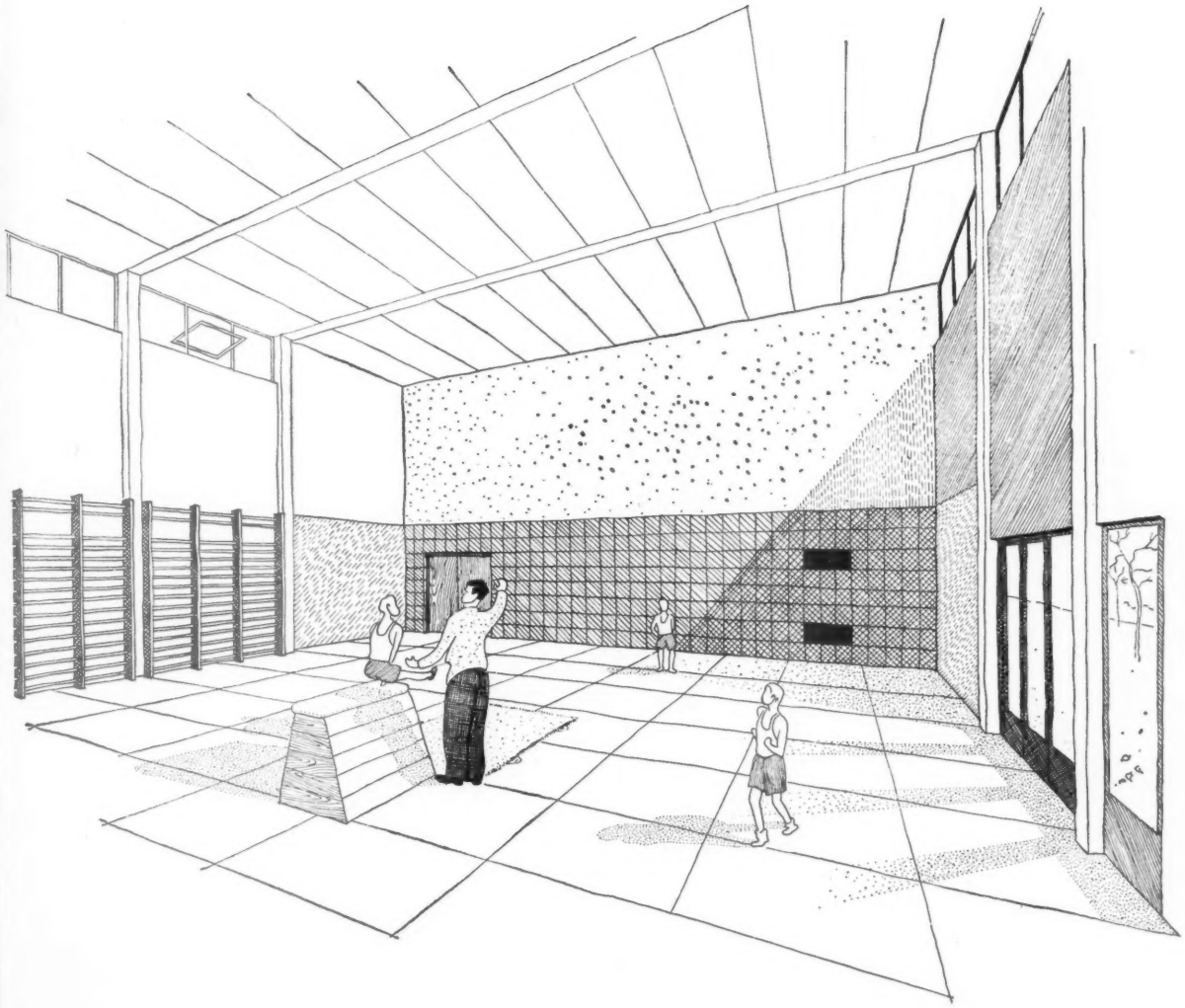


Joseph Sankey & Sons, Wellington *Architect:* C. HOWARD CRANE A.I.A., *Contractors:* WILSON LOVATT & SONS, LTD.



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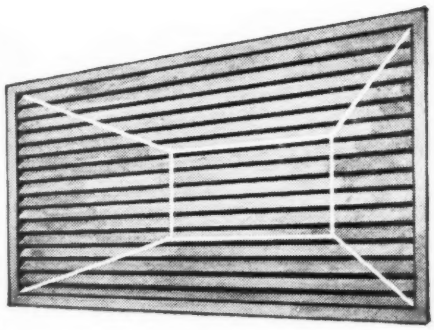

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CLASSIFIED ADVERTISEMENTS

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.

BUCKS COUNTY COUNCIL.

Applications are invited for the appointment of an ASSISTANT HEATING ENGINEER, Grade VI, £670-£735 p.a., on the staff of the County Architect.

Applicants should be Graduate or Associate Members of the Institute of Heating and Ventilating Engineers or equivalent. They must be experienced in the design of schemes for heating and hot water supply installations, capable draughtsmen, and able to prepare specifications, etc. A sound knowledge of electrical installations will be an advantage.

This appointment is superannuable and subject to medical examination.

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

Further particulars and form of application may be obtained from the County Architect, County Offices, Aylesbury, to whom applications must be delivered by 22nd December, 1952. 7760

LONDON COUNTY COUNCIL.

Vacancies for PLANNING OFFICERS, Grade III (up to £857 10s.). Prof. quals.: A.R.I.B.A., A.R.I.C.S. and/or A.M.T.P.I. required. Application forms and particulars from Architect, County Hall, S.E.1, quoting AR/EK/P.3/4. (1235) 7746

BUCKS COUNTY COUNCIL.

Applications are invited from qualified ASSISTANT ARCHITECTS for posts in the undermentioned grades on the staff of the County Architect:—

Special, Grade II (£950-£1,150 p.a.)
A.P.T., Grade VII (£710-£785 p.a.).
A.P.T., Grade V (£595-£645 p.a.).

The posts offer scope for initiative and enthusiasm. Applicants should preferably have been trained at a recognised School of Architecture.

The appointments are superannuable and subject to medical examination.

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

Further particulars and form of application may be obtained from the County Architect, County Offices, Aylesbury, to whom applications must be delivered by 22nd December, 1952. 7759

BOROUGH OF GRANTHAM.
SECOND ARCHITECTURAL ASSISTANT.

Applications are invited for the above appointment in the department of the Borough Engineer and Surveyor, at a salary in accordance with Grade V (£595-£645), A.P.T., of the National Scheme of Conditions of Service.

Applicants should have had good general experience, especially with regard to housing, and previous service with a local authority is desirable.

The appointment is subject to the Local Government Superannuation Act, 1937, and the National Scheme of Conditions of Service, and will be terminable by one month's notice on either side.

Housing accommodation will be made available if required.

Applications, stating age, qualifications, present and past employment and experience, together with the names of three persons to whom reference can be made, should be sent to Trevor J. Livesey A.M.I.C.E., A.M.I.Struct.E., A.M.I.Mun.E., Borough Engineer and Surveyor, Guildhall, Grantham, to arrive not later than 10th December, 1952.

JOHN F. GUILE,
Town Clerk
Guildhall, Grantham, Lincs. 7768

AMENDED.
METROPOLITAN BOROUGH OF FULHAM.
ASSISTANT ARCHITECT.

Housing and Public Buildings Dept., to assist in the planning, design and execution of large schemes of flats and buildings. A.P.T., IV/V, £555-£645, plus London weighting £20/£30 p.a., acc. age). Commencing salary according to qualifications and experience. Applicants should have passed R.I.B.A. Inter. Exam. or equivalent and have worked at least 2 years in an architectural office, or be Registered Architects. Local Government experience not essential. Closing date 15th December. Applications from me.

CYRIL F. THATCHER,
Town Clerk
Town Hall, Fulham, S.W.6. 7798

BEESTON AND STAPLEFORD URBAN DISTRICT COUNCIL.
SURVEYOR AND HOUSING ARCHITECT'S DEPARTMENT.

Applications are invited for the following appointments:—

(*a*) ARCHITECTURAL ASSISTANT, Grade A.P.T., V (£595-£645 per annum).

Applicants should be Associates of the R.I.B.A. or hold a similar qualification, and have had considerable experience in the design and construction of dwelling houses.

(*b*) JUNIOR ARCHITECTURAL ASSISTANT, Grade A.P.T., II (£495-£540 per annum).

Both the appointments will be in accordance with the National Scheme of Conditions of Service.

Applications, together with the names of two persons to whom reference may be made, should be sent to the Surveyor and Housing Architect, Town Hall, Beeston, Nottingham, not later than Saturday, 13th December, 1952.

Candidates must disclose whether to their knowledge they are related to any member or senior officer of the Council. Canvassing, directly or indirectly, will be a disqualification.

H. D. JEFFRIES,
Clerk of the Council.
Town Hall, Beeston, Nottingham. 7776

CITY AND COUNTY OF KINGSTON UPON HULL.—Appointment of ASSISTANT ARCHITECT, Grade VI, A.P.T. Division, £670-£735 per annum. Applications are invited for this appointment from Architects, preferably having experience in modern school design and construction. The appointment will be subject to one month's notice on either side; to the National Scheme of Conditions of Service and to the Local Government Superannuation Act, 1937. Application forms can be obtained from Andrew Rankine, A.R.I.B.A., City Architect, Guildhall, Kingston upon Hull, and should be returned complete on or before the 15th December, 1952. 7777

COUNTY BOROUGH OF GREAT YARMOUTH EDUCATION COMMITTEE.
APPOINTMENT OF CLERK OF WORKS.

Applications are invited for the appointment of a Clerk of Works to supervise the erection of the new Secondary Technical School.

The appointment will be temporary, for approximately 21 months, and subject to one month's notice on either side.

The salary will be £12 10s. per week.

Applicants must have a thorough knowledge of the building trade, including experience in connection with steel-framed buildings. They must be conversant with plans, specifications, bills of quantities, and competent to set out work, give levels, and keep all necessary records and progress reports.

Applications, stating age, qualifications, present employment and previous experience, accompanied by copies of not more than three testimonials, should be enclosed in an envelope endorsed "Clerk of Works, Schools," and must be received by me not later than 15th December, 1952.

Canvassing, directly or indirectly, will be deemed a disqualification, and candidates must disclose in writing whether, to their knowledge, they are related to any member, or holder of any senior office, under the Council. Candidates who fail to do so will be disqualified and, if appointed, will be liable to dismissal without notice.

D. G. FARROW,
Chief Education Officer.
22, Euston Road, Great Yarmouth.
28th November, 1952. 7782

HERTFORDSHIRE COUNTY COUNCIL.
HATFIELD TECHNICAL COLLEGE.

Applications are invited for the post of ASSISTANT, Grade B, for General Building subjects in this new College. Applicants should have a professional qualification. Ability to teach Trade Theory would be a recommendation. Application forms obtainable from the Registrar, Roe Green, Hatfield, to whom they should be returned within 14 days of this advertisement. 7784

STAFFORDSHIRE COUNTY COUNCIL.
EDUCATION COMMITTEE.

Applications are invited for the appointments of HEATING ENGINEERING ASSISTANTS on the Staff of the Education Architect's Department at salaries in accordance with A.P.T., Grades IV to VI, according to qualifications and experience. Applicants should have experience in the design and installation of low pressure hot water heating apparatus, domestic hot water supplies, etc., in all types of school buildings, and be competent draughtsmen.

Applications should be submitted to Mr. A. C. H. Stillman, F.R.I.B.A., Education Architect, Green Hall, Lichfield Road, Stafford, stating qualifications and experience, and accompanied by copies of two recent testimonials, to be received as soon as possible.

T. H. EVANS,
Clerk of the County Council.
7789

STAFFORDSHIRE COUNTY COUNCIL.
COUNTY ARCHITECT'S DEPARTMENT.
APPOINTMENT OF ARCHITECTURAL STAFF.

Experienced ARCHITECTURAL ASSISTANTS are invited to apply for the above, stating salary required, and giving full details of experience, qualifications, age, present salary and position, etc. Applications, together with copies of three recent testimonials, should be forwarded as soon as possible to C. M. Coombs, F.R.I.B.A., County Architect, Martin Street, Stafford.

T. H. EVANS,
Clerk of the County Council.
County Buildings, Stafford.
25th November, 1952. 7800

BANFF COUNTY COUNCIL requires ARCHITECTURAL ASSISTANT for County Architect's Department, Buckie; salary scale, £675-£740 (A.P.T., Grade VI); travelling allowance for own car; post superannuable; medical examination. Apply to County Clerk, Banff, by 29th December, 1952, giving age, qualifications, past and present posts, with copies of 3 recent testimonials. 7788

CITY AND COUNTY OF CANTERBURY.
CITY ARCHITECT'S DEPARTMENT.

The City Architect invites applications for the appointment of a SECOND ASSISTANT ARCHITECT. Salary scale: A.P.T., Va (£625 per annum, rising to £685).

Applicants must be Associates of the Royal Institute of British Architects. A keen interest and some experience in contemporary design is essential, and previous experience of housing work is desirable.

The appointment will be subject to one month's notice in writing on either side, and to the terms of the National Joint Council's Scheme of Conditions of Service, and the provisions of the Local Government Superannuation Act, 1937. The successful applicant will be required to pass a medical examination.

Applications, giving age, qualifications and experience, and the names and addresses of two persons to whom reference may be made, should be sent to L. Hugh Wilson, O.B.E., A.R.I.B.A., A.M.T.P.I., City Architect and Planning Officer, Municipal Buildings, Canterbury, not later than Thursday, 1st January, 1953.

Canvassing, directly or indirectly, will be a disqualification.

J. BOYLE,
Town Clerk.
Municipal Buildings, Dane John, Canterbury. 7796

BOROUGH OF ROYAL LEAMINGTON SPA.
BOROUGH ENGINEER AND SURVEYOR'S DEPARTMENT.
ARCHITECTURAL ASSISTANT, GRADE A.P.T., IV (£555-£600).

Applications are invited for the above appointment. Applicants should have passed the Intermediate Examination of the R.I.B.A., and should have good general experience in building works and in the preparation of plans, specifications and detail drawings.

Application forms can be obtained from C. O. Innes Jones, B.Sc., A.M.I.C.E., Borough Engineer, Town Hall, Leamington Spa, and the completed forms must be returned to him not later than Wednesday, 10th December, 1952.

JAMES N. STOTHERT,
Town Clerk
Town Hall, Leamington Spa.
November, 1952. 7803

WESTMINSTER CITY COUNCIL requires CLERK OF WORKS (Temp.). Salary £15 per week, for Housing Scheme of 182 centrally heated flats in six-storey blocks, to be constructed with reinforced concrete frame and brick enclosing walls. Extensive practical experience essential.

Applications, stating age and present and past appointments, with copies of three recent testimonials, to Town Clerk, City Hall, Charing Cross Road, W.C.2, by 13th December, 1952. 7795

THE NORTH WESTERN ELECTRICITY BOARD.
APPOINTMENT OF ARCHITECTURAL ASSISTANT (THIRD ASSISTANT ENGINEER)—CONSTRUCTION ENGINEER'S SECTION, CHIEF ENGINEER'S DEPARTMENT, AREA BOARD HEADQUARTERS, MANCHESTER.

Applicants should at least have passed the Intermediate Examination of the R.I.B.A., and preference will be given to Associates of this Institute. They must have had experience in the design and construction of modern buildings, and be capable of site surveying, preparation of sketch schemes, working drawings and details for large office and depot projects, and have some experience of site supervision and contract administration. They will be required to work under the immediate direction of an Architect.

Ability in contemporary design and sound constructional knowledge are essential, and applicants should be capable of giving instructions in specification form for the taking off of Quantities.

Salary scale: £649/£883, with starting range £649/£790 p.a. Class AX/EX, Grade V. N.J.B. Conditions.

Applications to Establishment Officer, The North Western Electricity Board, Cheetwood Road, Manchester, 8, by 20th December, 1952. 7797

THE LONDON COUNTY COUNCIL invites applications for the appointment of DEPUTY ARCHITECT to the Council. Commencing salary in accordance with qualifications and experience, within scale £2,400×£250 biennially—£2,900. Permanent and pensionable. The Council's Architect is responsible for the erection and maintenance of all buildings and architectural works of the Council, with certain exceptions, and for general advice on town planning.

Forms and full particulars from Clerk of the Council (CL/G), County Hall, S.E.1, returnable by 10th January, 1953. (1262) 7799

LONDON COUNTY COUNCIL.—ARCHITECT, Grade II (£837 10s.-£1,002), in Historic Records Section of Architect's Dept. Should be qualified Architect, with specialised knowledge architectural and decorative styles all periods, and have experience preservation of buildings of historic and architectural interest. For application forms, to be returned by 20th December, send s.a.e. to Architect (AR/EK/HR/3), County Hall, S.E.1. (1257) 7806

CITY OF BIRMINGHAM EDUCATION COMMITTEE.
APPOINTMENT OF ARCHITECTURAL ASSISTANT.

Applications are invited for the post of Architectural Assistant, in the Architect's Branch of the Birmingham Education Department (Architect to the Committee: Mr. J. R. Sheridan-Shedden, A.R.I.B.A.). Salary: A.P.T., Grade III (£525-£570). Experience in educational buildings although desirable is not essential.

Applicants should either (i) have attended a full-time course in Architecture, passed the R.I.B.A. Intermediate Examination or its equivalent, and subsequently worked one year in an architectural office, or (ii) have served or be serving articles of pupilage or worked in an architectural office for three years and have passed the R.I.B.A. Intermediate Examination or its equivalent.

Application forms, which may be obtained from the undersigned on receipt of a stamped, addressed envelope, must be returned not later than 22nd December, 1952.

E. L. RUSSELL,
Chief Education Officer.

Education Office,
General Purposes Branch,
Margaret Street, Birmingham, 3. 7808

COUNTY BOROUGH OF SMETHWICK.
BOROUGH ENGINEER AND SURVEYOR'S DEPARTMENT.
APPOINTMENT OF ARCHITECT.

Applications are invited for the position of Architect on the staff of the Borough Engineer and Surveyor.

The commencing salary will be £935 per annum, and a car allowance in accordance with the N.J.C. scales will be paid.

Preference will be given to applicants who are Associates of the R.I.B.A. The successful candidate will be required to supervise the design and construction of housing redevelopment schemes, including multi-storeyed buildings, schools and other public buildings.

The appointment, which will be terminable by one month's notice on either side, will be subject to the provisions of the Local Government Superannuation Act, 1937, and to the passing, by the successful candidate, of a medical examination.

Forms of application may be obtained from the Borough Engineer and Surveyor, Council House, Smethwick, 40, and should be returned suitably endorsed, to reach him not later than 22nd December, 1952.

E. L. TWYCROSS.
Town Clerk.

Council House, Smethwick.
28th November, 1952. 7805

METROPOLITAN BOROUGH OF WANDSWORTH.
ARCHITECTURAL ASSISTANT.

Applications invited for established appointment of Architectural Assistant, in the Borough Engineer, Surveyor and Architect's Department, A.P.T., Va-VI (£655-£765 p.a.).

Applicants should be Associates of the R.I.B.A. and have had considerable experience in design and planning of housing estates, particularly multi-storey blocks of flats or other framed buildings and supervision of their erection.

Application forms obtainable from Borough Engineer, at this address, must be returned to me by 31st December, 1952.

R. H. JERMAN,
Town Clerk

Municipal Buildings, Wandsworth, S.W.18. 7810

NORTHERN IRELAND HOUSING TRUST.
ARCHITECT.

The Trust invites applications from suitably qualified men for the following post:

ASSISTANT ARCHITECT, Grade I. Salary scale: £800×£25—£875.

Candidates must be Associate Members of the Royal Institution of British Architects, and should have experience of housing projects.

Preference will be given to ex-Service candidates.

The person appointed will be required to participate in a Contributory Superannuation Scheme, allowing for the reciprocal transfer of benefit in Local Government Superannuation Schemes in suitable cases.

Assistance in obtaining housing accommodation may be given to the successful candidate.

Please apply as soon as possible, giving full details of age, education, qualifications and experience, including present post and salary, to the General Manager, Northern Ireland Housing Trust, 12, Hope Street, Belfast. 7809

BOROUGH OF REDCAR.
APPOINTMENT OF ARCHITECTURAL ASSISTANT.

Applications are invited for the above permanent appointment on the staff of the Borough Engineer, on Grade A.P.T., IV (£555-£600 p.a.).

Candidates must have passed the Intermediate of the R.I.B.A. or equivalent examination, and have had general architectural and housing experience.

Suitable council house will be provided at normal rental, if required.

Forms of application obtainable from the Borough Engineer, at this address, to reach me by the 19th December, 1952.

Canvassing, in any form, will disqualify.

HUGH CALDWELL,
Town Clerk

Municipal Buildings, Redcar, Yorks. 7811

LONDON COUNTY COUNCIL.

Vacancy in Housing Division for SITES MANAGER, £1,190-£1,425. Form and particulars from Architect, AR/EK/HTJ/3, County Hall, S.E.1. (1238) 7807

CITY OF LEEDS.
CITY ARCHITECT'S DEPT.

Applications are invited for the following appointments:—

1. ASSISTANT ARCHITECT. Grade A.P.T., VI. Salary scale: £670-£735 p.a.

Candidates should have had experience of or be interested in one or more of the following types of work:

(*a*) Schools.
(*b*) Furniture and equipment.
(*c*) Multi-storey flats.
(*d*) General.

2. ASSISTANT ARCHITECTS. Grade A.P.T., V. Salary scale: £595-£645 p.a.

3. ARCHITECTURAL ASSISTANTS. Grade A.P.T., IV. Salary scale: £555-£600 p.a.

Candidates should have had experience of or be interested in one or more of the following types of work:

(*a*) Schools.
(*b*) Housing.
(*c*) General.

4. ASSISTANT QUANTITY SURVEYOR. Grade A.P.T., VII. Salary scale: £710-£785 p.a.

Candidates should have had experience in the preparation of Bills of Quantities for Schools, Housing, or other work either with a Local Authority or a private quantity surveyor.

5. ASSISTANT LAND SURVEYOR. Grade A.P.T., V-VI. Salary scale: £595-£735 p.a.

6. ASSISTANT LAND SURVEYOR. Grade A.P.T., IV. Salary scale: £555-£600 p.a.

Candidates should have had experience in the advance preparation of housing estates.

7. CLERK OF WORKS. Grade A.P.T., II. Salary scale: £495-£540 p.a.

8. CLERK OF WORKS. Grade A.P.T., I. Salary scale: £465-£510 p.a.

Candidates should have had experience in the supervision of large housing contracts or schools.

The payment of salary increments will be subject to satisfactory service, and will be granted normally with effect from the 1st April following the completion of 6 months' service.

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

Application forms may be obtained from the City Architect, Priestley House, Quarry Hill, Leeds, 9, to whom they should be returned, together with copies of three recent testimonials, not later than 10 a.m. on Wednesday, the 24th December 1952.

Canvassing in any form, either directly or indirectly, will be a disqualification.

R. A. H. LIVETT, A.R.I.B.A.,
City Architect.

7812

COUNTY BOROUGH OF MERTHYR TYDFIL.
APPOINTMENT OF ARCHITECTS.

Applications are invited for the following permanent appointments in the Architectural Section of the Borough Engineer's Department:—

(*a*) CHIEF ARCHITECTURAL ASSISTANT. Salary: A.P.T., Grade VIII.

(*b*) SENIOR ARCHITECTURAL ASSISTANT. Salary: A.P.T., Grade VI.

Candidates for post (*a*) must be Associate Members of the R.I.B.A. and have had considerable architectural experience, particularly in housing and school works, adaptations of and alterations to existing buildings, preparation of schedules of dilapidations, and in preparing bills of quantities and estimates in connection therewith.

Candidates for post (*b*) should be Associate Members of the R.I.B.A. or the R.I.C.S., or possess equivalent qualifications and have had good architectural experience, particularly in the design of new schools and in the preparation of bills of quantities therefor.

The appointments will be subject to:

(1) The National Scheme and Conditions of Service.

(2) Provisions of the Local Government Superannuation Act.

(3) Passing of a satisfactory medical examination.

(4) One month's written notice on either side.

Applications, stating age, qualifications and experience, together with copies of three recent testimonials, should be delivered to the undersigned not later than 17th December, 1952.

Canvassing in any form will be deemed a disqualification. Applicants must disclose in writing whether they are related to any members or senior officers of the Council.

T. S. EVANS,
Town Clerk.

27th November, 1952. 7813

Tenders for Contracts

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

WELSH JOINT EDUCATION COMMITTEE.
Y CYD BWYLLGOR ADDYSG CYMREIG.
LLANDRINDOD WELLS RESIDENTIAL SCHOOL.

Tenders are invited by the Welsh Joint Education Committee for carrying out work in respect of adaptations, repairs, etc., at Llandrindod Wells Residential School.

Plans, Specifications and Bills of Quantities, prepared by H. Carr, O.B.E., F.R.I.B.A., F.R.I.C.S., may be obtained from the office of the undersigned on receipt of a deposit of two guineas, which is returnable upon receipt of the form of tender and return of documents.

Tenders to be delivered on the form provided and in plain sealed envelopes endorsed "Llandrindod Residential School," before 12 noon on Monday, 22nd December, 1952.

The lowest or any tender not necessarily accepted.

H. WYN JONES, M.A., B.Sc.
30, Cathedral Road, Cardiff. 7785

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.

QUALIFIED ASSISTANT required for industrial work. Applicants must have had considerable recent experience in factory buildings, including full responsibility for site supervision. Also required, a JUNIOR SURVEYING ASSISTANT, for preparing specifications and supervising war damage and other repairs to Churches. Applications in writing, giving age, training experience and salary required, to Llewellyn Smith & Waters, F./F.R.I.B.A., 103, Old Brompton Road, S.W.7. 7742

REQUIRED for office recently opened by F.R.I.B.A., in small West Country town, an ASSISTANT, experienced in Housing. Reliability essential. Salary by arrangement. Single man preferred. Send full particulars to Box 7781.

JUNIOR ARCHITECTURAL ASSISTANT required, up to Intermediate standard. Details of experience and salary required to W. S. Hattrell & Partners, F./A.R.I.B.A., 1, Queen's Road, Coventry. 7787

THE RAILWAY EXECUTIVE (SCOTTISH REGION).—Applications are invited for post of PRINCIPAL ASSISTANT ARCHITECT in Civil Engineer's Department in Glasgow. Design ability, keen interest in modern architectural developments, administrative ability, and practical experience essential. Applicants must be A.R.I.B.A. Commencing salary in the region of £1,000 per annum. Apply to Civil Engineer, The Railway Executive, Scottish Region, St. Enoch Station, Glasgow. 7779

ARCHITECT requires part- or spare-time Assistance on Working Drawings, Surveys, etc., on Georgian restoration work. London area. Remuneration by arrangement. Box 7801.

FREQUENT Assistance required by London Surveyor, mainly for conversions and new industrial schemes, both large and also very small. Also work under London Building Acts. Essential that Architect should have "artistic" flair and be able to produce attractive coloured perspectives. Box 7792.

JUNIOR ARCHITECTURAL ASSISTANT wanted urgently for general private practice in N.W. Kent town. Salary £300-£350, according to experience and ability. Reply, stating usual details and when available, to Box 7794.

ARCHITECTURAL ASSISTANT required to work in Architect's Department of Consulting Engineers, London office. Good draughtsmanship with sound knowledge of construction essential. Salary starting at £400, 5-day week. Apply Box 7793.

SENIOR ARCHITECTURAL ASSISTANT required, E. London office, to work on schemes of a varying nature, mainly commercial and industrial. Write age, experience, and salary required. Box 7791.

EXPERIENCED Architectural Assistants required for Works Engineer's Department of large Midland Aero Engine Manufacturers. Capable of surveying, designing and detailing all types of industrial buildings and with experience of factory services. Only first class men need apply. Applications giving details to Ref.: HRH2. Box 7816.

ARCHITECTS' ASSISTANT required, up to Inter R.I.B.A. standard, in Architect's office at Croydon. Write stating age, training, experience, and salary required to Box 7815.

ASSISTANT required for busy Architect's office in Devizes. Should be of Final R.I.B.A. standard, able to prepare drawings and specifications for domestic work and run jobs with overall supervision from principal. Commencing salary £400-£450. Permanent and progressive post for man with initiative. Apply by letter giving full particulars.—Edwards & Webster, 10, St. Mary Street, Chippenham, Wilts. 7817

Architectural Appointments Wanted

ASSISTANT, R.I.B.A. Intermediate Exam., 3½ years' office experience, seeks post, London. Box 618.

ARCHITECT, A.R.I.B.A., Dipl. Arch. (Dist.), age 30, with 4 years' experience in flats and school construction, seeks position with Architect or other interested person where intellect and endeavour are appreciated and of use. Box 615.

ASSISTANT, 2 years' office experience, awaiting results of R.I.B.A. Intermediate Exam., seeks post, London area. Box 617.

LADY ARCHITECTURAL ASSISTANT, Intermediate standard, 3 years' office experience, requires post, preferably with chance of visiting sites. Car driver. Box 616.

ARCHITECTURAL ASSISTANT (21), released H.M. Forces, 2 years' office training, requires position, London-Guildford area. Good references. Keen worker. Available immediately. Box 614.

ARCHITECTURAL ASSISTANT (31), 7 years' experience in domestic work, seeks part-time appointment (4 to 4½ days a week) in London. Studying for Final. Box 7785.

A.R.I.B.A. (35), distinction in Thesis Contemporary outlook, seeks position one year with Architect—London area. 6 years architectural, 2½ years planning experience. Housing, business, industrial, studying for A.M.T.P.I. Present salary £575 p.a.—Box 620.

ASSOCIATE (33), seventeen years' office experience, domestic, industrial and hospitals; seeks senior position with private or commercial firm in the London area or Home Counties.—Box 619.

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.

MANAGER, estate, Western Isles, Scotland; experienced practical builder, pre-cast concrete and block work, prepare plans, specifications, drawings; labour, forestry, sawmill, woodworking, land drainage, block-making plant, agriculture, fishing, transport, correspondence, negotiations, buying and costing records, stores, tenancies; good house.—Write, stating experience, qualifications, if any, salary, Box 7765.

THE RAILWAY EXECUTIVE (SCOTTISH REGION).—Applications are invited for post of SENIOR QUANTITY SURVEYOR in the Civil Engineer's Department in Glasgow. Applicants must be A.R.I.C.S., have considerable experience in quantity surveying and knowledge of Scottish Mode of Measurement and Scottish Building practice generally. Commencing salary range around £950 per annum. Apply to Civil Engineer, The Railway Executive, Scottish Region, St. Enoch Station, Glasgow. 7778

DRAUGHTSMAN (M. or F.), with knowledge joinery, able to prepare layouts, perspectives, etc. Peerless Built-in Furniture, Ltd., Perivale. 7790

EXPERIENCED Shop Fitting Draughtsman required. Pay £7 a week or more according to experience.—Apply Dept. of Personnel, John Lewis & Co. Ltd., 32, Cavendish Square, W.1.

DESIGN DRAUGHTSMAN required in January by leading manufacturers of prefabricated timber buildings. London drawing office is concerned with development of projects for home and overseas. Experience in the design and detailing of prefabricated structures is essential, preferably in timber. Write, giving age, education, and full details of career and experience, with present salary, to Box 7804.

Services Offered

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

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

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 AND TYPEWRITING, Bills of Quantities, Specifications, etc. All grades of Office Staff supplied. Trinity Bureau, 50, Bedford Street, Strand, W.C.2. TEM. 3002. 7606

SURVEYING and Levelling of Building Sites and Measured Drawings undertaken by experienced Surveyor at moderate charges. Box 6583.

ARTIST, specialising in Architectural Perspectives, any medium, seeks new contacts. Postal service outside London, Kent and Sussex area. B. Neil, 9, Warrior Square Terrace, St. Leonards, Sussex. Tel.: Hastings 6. 7515

TEMPORARY ASSISTANT, L.R.I.B.A., with own office facilities, undertakes full- or part-time commissions for preparation of Plans, Sketches, Working Drawings, Details, Building Surveys, etc. Reliable work. Work reasonable charges. Tel.: FRObisher 1363. 7802

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

WANTED.—Copies of "The Architectural Review." March and May, 1948; February, 1949; March and November, 1951; March and May, 1952. Box 7748.

OFFERS wanted for quantity of Oak Panelling, to be removed from gentleman's country residence. Also approximately 32 yds. Oak Parquet Flooring and number of internal fittings and fixtures. All above in a very good state of preservation. Permission to view from Eniffer's Garage (Mountnessing), Ltd. (Ref-Dunn), Chelmsford Road, Mountnessing, Essex. 'Phones: Ingatestone 250 and 394. 7776

STEEL Strong Room Doors and Vestibules, 6 ft. 6 in. overall, in one pair. Excellent condition. Weight approximately 2 tons. Client's Architects, Northampton 3249. 7780

FOR SALE. — Old - established Architect's Practice, in well-known popular South Coast town. The offices and position are excellent, and the price very reasonable. Write Box 7786.

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.

ELECTRICALLY-HEATED Copper Comb. Cylinders. 30. gall. cap. Guaranteed 20 gall. hot water 40 mins. £18 10s. Delivered free.—Plow & Co., 6, Newport Road, Cardiff. 7758

Educational Announcements

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

R.I.C.S., I.A.A.S., and I.Q.S. Exams.—Postal Courses conducted by the Ellis School (Principal: A. R. 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

R.I.B.A. and T.P.I. EXAMS.—Stuart Stanley (Tuton 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.

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