THE ARCHITECTS' JOURNAL

standard contents

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

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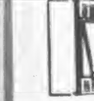
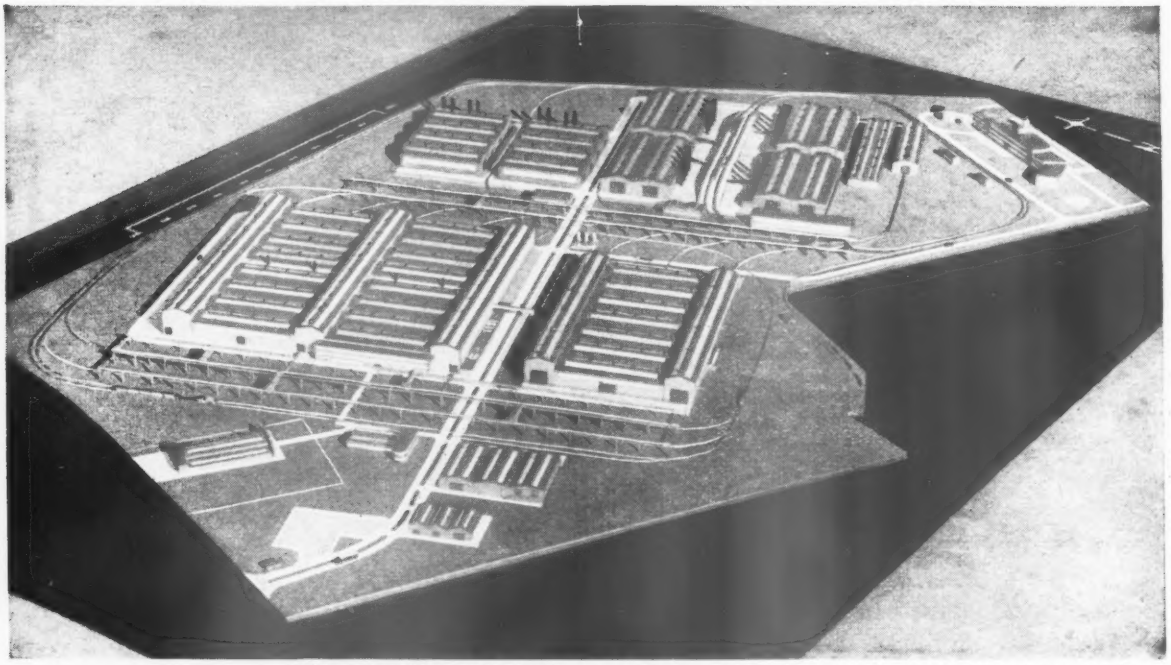
Registered as a Newspaper.

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

AA	Architectural Association, 34/6, Bedford Square, W.C.1.	Museum 0974
AAI	Association of Art Institutions. Secy.: W. Marlborough Whitehead, " Dyneley," Castle Hill Avenue, Berkhampstead, Herts.	
ABS	Architects' Benevolent Society. 66, Portland Place, W.1.	Langham 5721
ABT	Association of Building Technicians. 5, Ashley Place, S.W.1.	Victoria 0447-8
ACGB	Arts Council of Great Britain. 4, St. James' Square, S.W.1.	Whitehall 9737
ADA	Aluminium Development Association. 33, Grosvenor Street, W.1.	Mayfair 7501/8
APRR	Association for Planning and Regional Reconstruction. 34, Gordon Square, W.C.1.	Euston 2158-9
ArchSA	Architectural Students' Association. 34/36, Bedford Square, W.C.1	
ARCUK	Architects' Registration Council. 68, Portland Place, W.1.	Welbeck 9738
ASB	Architectural Science Board of the Royal Institute of British Architects, 66, Portland Place, W.1.	Langham 5721
AScW	Association of Scientific Workers. 15, Half Moon Street, Piccadilly, W.1.	Grosvenor 4761
BAE	Board of Architectural Education. 66, Portland Place, W.1.	Langham 5721
BATC	Building Apprenticeship and Training Council. Lambeth Bridge House, S.E.1.	Reliance 7611, Ext. 1706
BC	Building Centre. 9, Conduit Street, W.1.	Mayfair 8641/6
BCC	British Colour Council. 13, Portman Square, W.1.	Welbeck 4185
BCCF	British Cast Concrete Federation. 17, Amherst Road, Ealing, W.13.	Perivale 6869
BCIRA	British Cast Iron Research Association. Alvechurch, Birmingham.	Redditch 716
BDA	British Door Association. 10, The Boltons, S.W.10.	Flaxman 7766
BEDA	British Electrical Development Association. 2, Savoy Hill, W.C.2.	Temple Bar 9434
BIA	British Ironfounders' Association. 145, Vincent Street, Glasgow, C.2.	Glasgow Central 2891
BIAE	British Institute of Adult Education. 29, Tavistock Square, W.C.1.	Euston 5385
BID	Building Industries Distributors. 52, High Holborn, W.C.1.	Chancery 7772
BINC	Building Industries National Council. 11, Weymouth Street, W.1.	Langham 2785
BOT	Board of Trade. Millbank, S.W.1.	Whitehall 5140
BRS	Building Research Station. Bucknalls Lane, Watford.	Garston 2246
BSA	Building Societies Association. 14, Park Street, W.1.	Mayfair 0515
BSI	British Standards Institution. 28, Victoria Street, S.W.1.	Abbey 3333
BTE	Building Trades Exhibition. 4, Vernon Place, W.C.1.	Holborn 8146/7
CABAS	City and Borough Architects Society. C/o Johnson Blackett, F.R.I.B.A., Borough Architect, Town Hall, Newport, Mon.	Newport 3111
CAS	County Architects Society. C/o F. R. Steele, F.R.I.B.A., County Hall, Chichester.	Chichester 3001
CCA	Cement and Concrete Association. 52, Grosvenor Gardens, S.W.1.	Sloane 5255
CCP	Council for Codes of Practice. Lambeth Bridge House, S.E.1.	Reliance 7611
CDA	Copper Development Association. Kendals Hall, Radlett, Herts.	Radlett 5616
CIAM	Congrès Internationaux d'Architecture Moderne. Doldertal, 7. Zurich, Switzerland.	
COID	Council of Industrial Design. Tilbury House, Petty France, S.W.1.	Whitehall 6322
CPRE	Council for the Preservation of Rural England. 4, Hobart Place, S.W.	Sloane 4280
CUJC	Coal Utilization Joint Council. 3, Upper Belgrave Street, London, S.W.1.	Sloane 9116
CVE	Council for Visual Education. 13, Suffolk Street, Haymarket, S.W.1.	Reading 72255
DGW	Directorate General of Works, Ministry of Works, Lambeth Bridge House, S.E.1.	Reliance 7611
DIA	Design and Industries Association. 13, Suffolk Street, S.W.1.	Whitehall 0540
DOT	Department of Overseas Trade. 35, Old Queen Street, S.W.1.	Victoria 9040
EJMA	English Joinery Manufacturers' Association (Incorporated). Sackville House, 40, Piccadilly, W.1.	Regent 4448
EPNS	English Place-Name Society. 7, Selwyn Gardens, Cambridge.	
FAS	Faculty of Architects and Surveyors. 8, Buckingham Palace Gdns., S.W.1.	Sloane 2837
FASSC	Federation of Association of Specialists and Sub-Contractors. 5, Arundel Street, Strand.	Temple Bar 6633
FBI	Federation of British Industries. 21, Tothill Street, S.W.1.	Whitehall 6711
FC	Forestry Commission. 25, Savile Row, W.1.	
FCMI	Federation of Coated Macadam Industries. 37, Chester Square, S.W.1.	Sloane 1002
FDMA	The Flush Door Manufacturers Association Ltd. Trowell, Nottingham.	Ilkeston 623
FLD	Friends of the Lake District. Pennington House, nr. Ulverston, Lancs.	Ulverston 201
FMB	Federation of Master Builders. 26, Great Ormond Street, Holborn, W.C.1.	Chancery 7583
FOB 1951	Festival of Britain 1951. 2, Savoy Court, Strand, W.C.2.	Waterloo 1951
FPC	The Federation of Painting Contractors, St. Stephen's House, S.W.1.	Whitehall 3902
FRHB	Federation of Registered House Builders. 82, New Cavendish Street, W.1.	Langham 4041
FS (Eng.)	Faculty of Surveyors of England. Buckingham Palace Gdns., S.W.1.	Sloane 2837
GC	Gas Council. 1, Grosvenor Place, S.W.1.	Sloane 4554
GG	Georgian Group. 27, Grosvenor Place, S.W.1.	Sloane 2844
HC	Housing Centre. 13, Suffolk Street, Pall Mall, S.W.1.	Whitehall 2881
IAAS	Incorporated Association of Architects and Surveyors. 75, Eaton Place, S.W.1.	Sloane 5615
ICA	Institute of Contemporary Arts, 17-18, Dover Street, Piccadilly, W.1.	Grosvenor 6186
ICE	Institution of Civil Engineers. Great George Street, S.W.1.	Whitehall 4577
IEE	Institution of Electrical Engineers. Savoy Place, W.C.2.	Temple Bar 7676
IES	Illuminating Engineering Society. 32, Victoria Street, S.W.1.	Abbey 5215

Pe





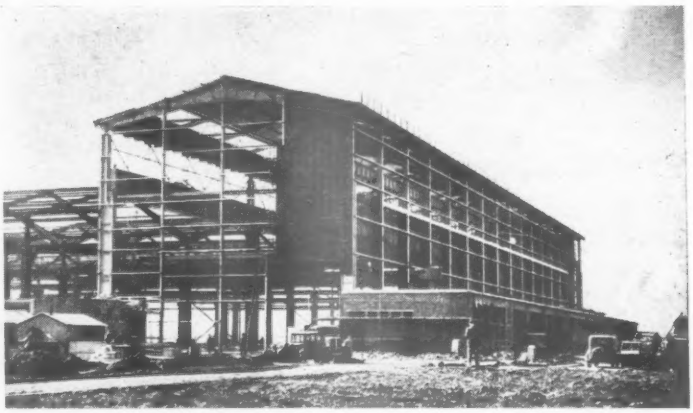
The Projected New "South Works" for Messrs. Ashmore, Benson, Pease & Co., Stockton-on-Tees.

STAGE I — *Constructional Shop with ancillary services and buildings.*

STEELWORK BY CARGO FLEET

From start to finish you get sound planning, economical use of materials, and a high standard of workmanship on every contract undertaken by Cargo Fleet. This first phase of 132,000 square feet floor area of the extensive new factory for Messrs. Ashmore, Benson, Pease & Co. Gas, Chemical, Iron Works Plant and General Engineers, now nears completion at Stockton-on-Tees.

Stanchions of a transverse bay, 30 feet high to the crane track. Crane tracks of the low bays are cantilevered out beneath those of the high bays giving easy transfer of material from the high bays to the low bays and vice-versa.



The Shop consists of four transverse bays 85 feet wide by 250 feet long and 30 feet high to the crane tracks, and two longitudinal bays 65 feet wide by 340 feet long and 50 feet high to the crane tracks, served by twelve overhead cranes, the heaviest being 50 tons capacity.

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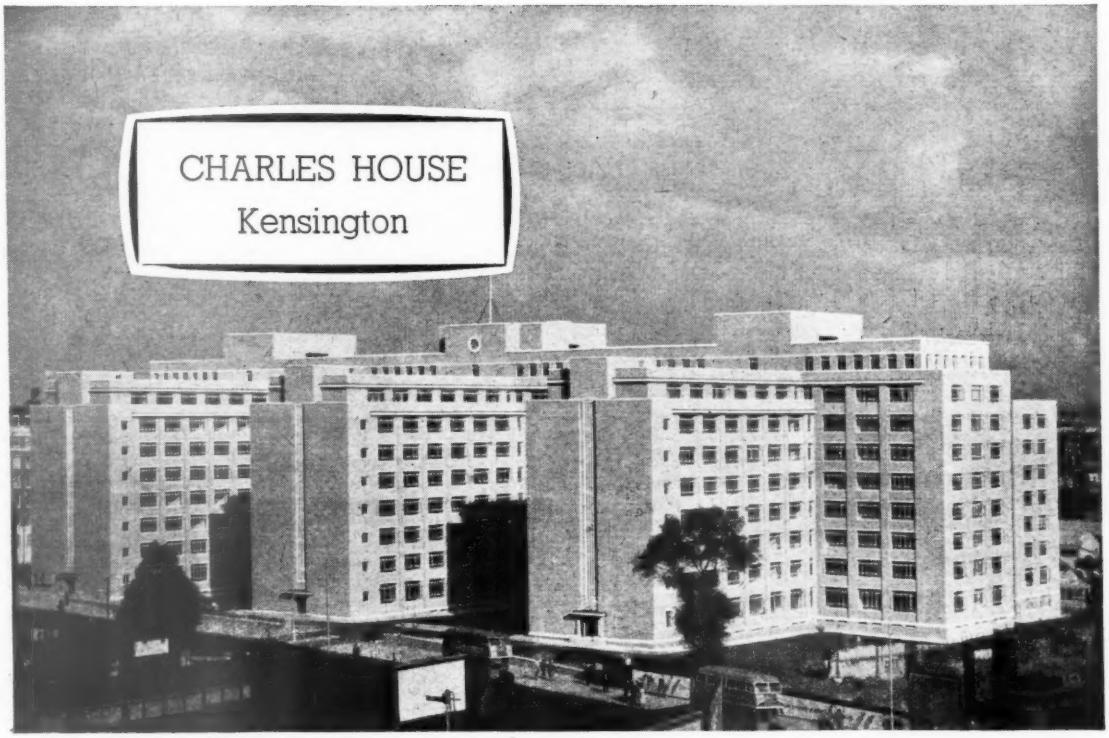

Architect · Arthur S. Ash, F.R.I.B.A.

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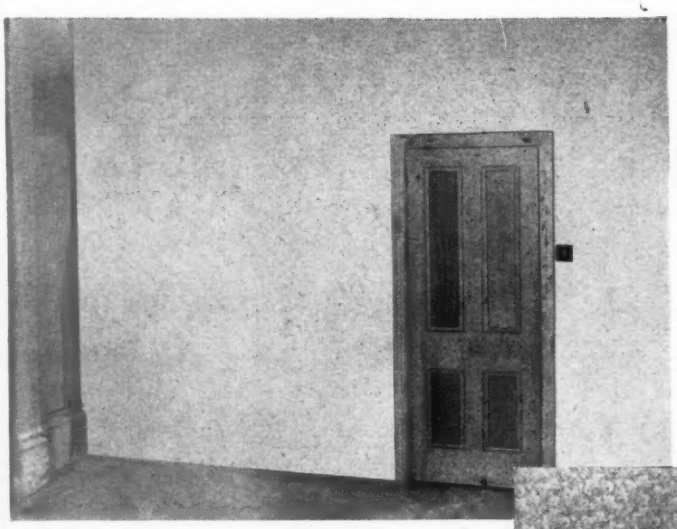
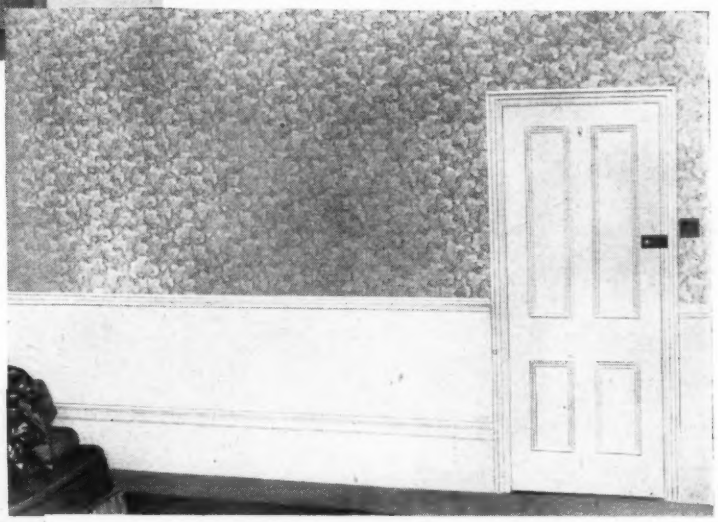


CONVERSION work



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The contract illustrated, Cadogan Court Hotel, Queens Gate Gardens, S.W.7., Architect Leslie T. George L.R.I.B.A., is typical of the many "Bellrock" conversion jobs now being carried out, and shows panels erected, wall papered and painted, and the skirting made from "White Heather" plaster, all executed by Subtrades Ltd., 44 Upper Berkeley Street, W.1.

"Bellrock" is extensively specified for schools, hospitals, offices, factories, houses etc. Adaptable to any architectural design or to any type of construction . . . easily and speedily erected . . . reduces site man-hours . . . effects economies in building costs . . . allows earlier occupation.

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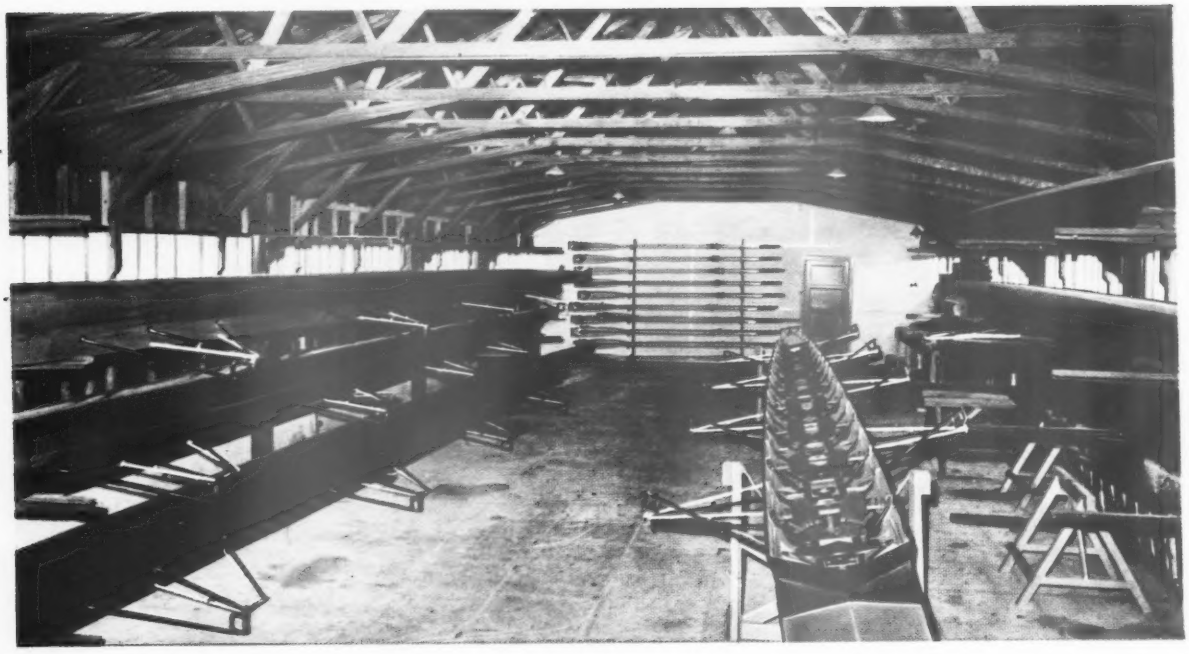

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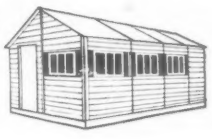

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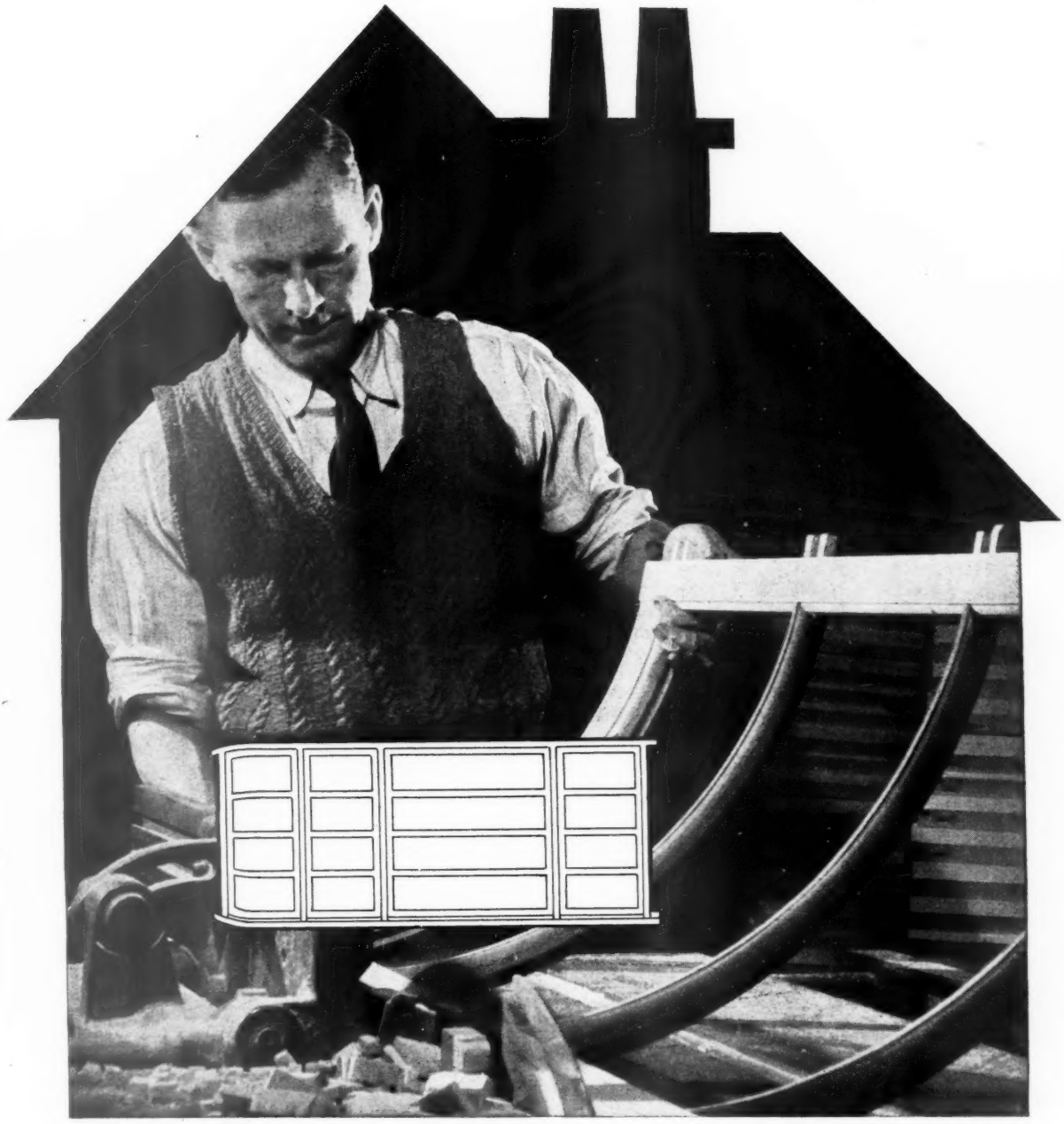

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CRC 7

Tangible Proof

(Photograph by courtesy of F. W. Winchester Ltd.)

The accompanying photograph shows one of the tiles recently removed during work on a Tunbridge Wells hotel. Its face is inscribed: "Thomas Rack his tile June the 21, 1777" and on the back it bears the name of the burner. The tiles were replaced for a further period of service.

In every town and village there is ample proof of the unrivalled durability of the Clay Roofing Tile. The picturesque old roofs of the English countryside are a constant reminder that the roofing tile tradition was founded on the unique physical properties of burnt clay.

When considering Roofing Tiles, remember Thomas Rack, and the materials and craftsmanship which have been handed down to the present day.

For Beauty, Durability and ultimate Economy, specify—

Clay Roofing Tiles

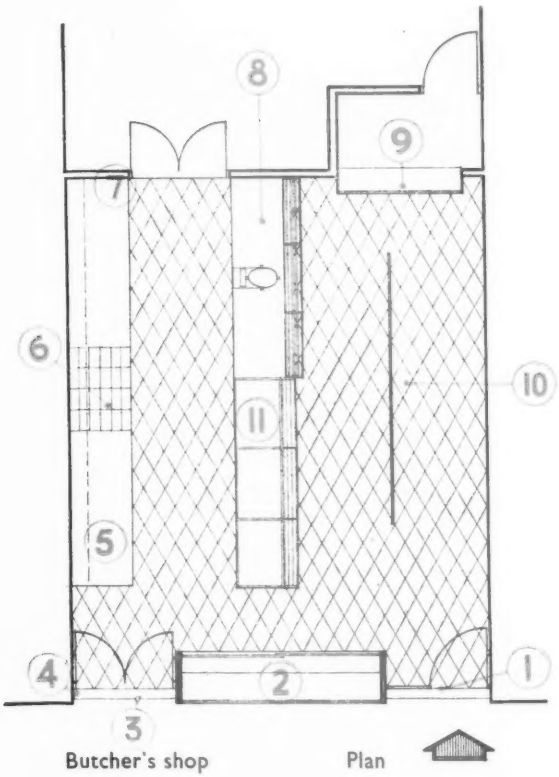
"The Clay Tile Bulletin", published quarterly, post free on request. The National Federation of Clay Industries, Drayton House, W.C.1

DESIGN FOR

NEW TYPE OF BUTCHER'S SHOP

THE problem of protecting foodstuffs that are displayed and stored in shops is basically an architectural problem, which may be solved by good design and the use of appropriate materials. Here is one solution, which provides new standards of hygiene: a butcher's shop designed by Edward D. Mills, F.R.I.B.A.

Specification of Materials



Butcher's shop Plan

SCALE 1/8 = 1 - 0

1. Entrance doors, standard frameless "ARMOURPLATE" glass door with "ARMOURPLATE" glass side panel.
2. Terrazzo shop window surround glazed with "INSULIGHT" Double Glazing. Base covered with "VITROLITE" laid to fall. Lower sliding doors on shop side, frameless "ARMOURPLATE" glass, upper sliding doors, wood frame with flyscreen mesh infilling.
3. Service doors and shop front stall board faced with vertical hardwood boarding. Hardwood transome glazed with polished plate glass.
4. Reveals to shop front surround faced with white "VITROLITE".
5. "ARMOURPLATE" glass shelves on brackets at 4 foot centres.
6. Hardwood chopping block cutting bench, and storage unit.
7. All walls faced with white "VITROLITE" in standard ashlar sizes.
8. Weighing and wrapping counter, ½" rough cast glass top, timber substructure with "VITROLITE" facing, and tubular metal bag rail.
9. Cashier's desk glazed with "ARMOURPLATE" glass louvres and one-way striped silvered polished plate.
10. Barrier rail in tubular metal with georgian polished wired glass panels.
11. Refrigerated display cabinet faced on top and sides with white "VITROLITE". Front "INSULIGHT" triple glazing unit. Insulated doors at rear, polished plate glass shelves. Refrigeration unit housed under adjoining counter (8).

LINCOLN DIOCESAN TRAINING COLLEGE
Constance Stewart Hall of Residence
Architects: Watkins, Coombes & Barrell, F.I.A.R.I.BA.

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Harmonious and Serviceable

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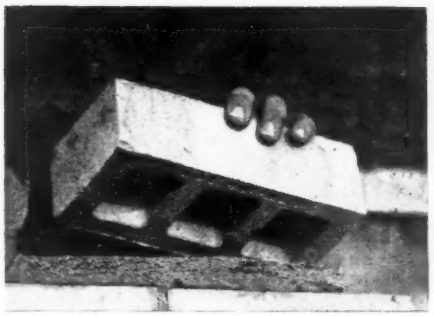
F23

STANDARD PRACTICE

Typical of the problems with which architects are constantly being faced is that of balancing such conflicting factors as desirable strength and undesirable dead weight. It was to meet the very real need for a brick which, while retaining adequate strength for normal building purposes, was some 25% lighter in weight that the Phorpres Cellular brick was introduced in 1928. For use with steel construction and in many other cases where it is desirable to save weight, improve heat insulation and increase resistance to moisture penetration, it has become standard practice to specify



Phorpres bricks are available in a very wide range of standard specials. Particulars of these may be obtained from the Technical and Research Department, who are at your service for information or advice on brickwork problems.

the PHORPRES cellular brick

PHORPRES

LONDON BRICK COMPANY LTD *Head Office:* AFRICA HOUSE, KINGSWAY, LONDON, W.C.2
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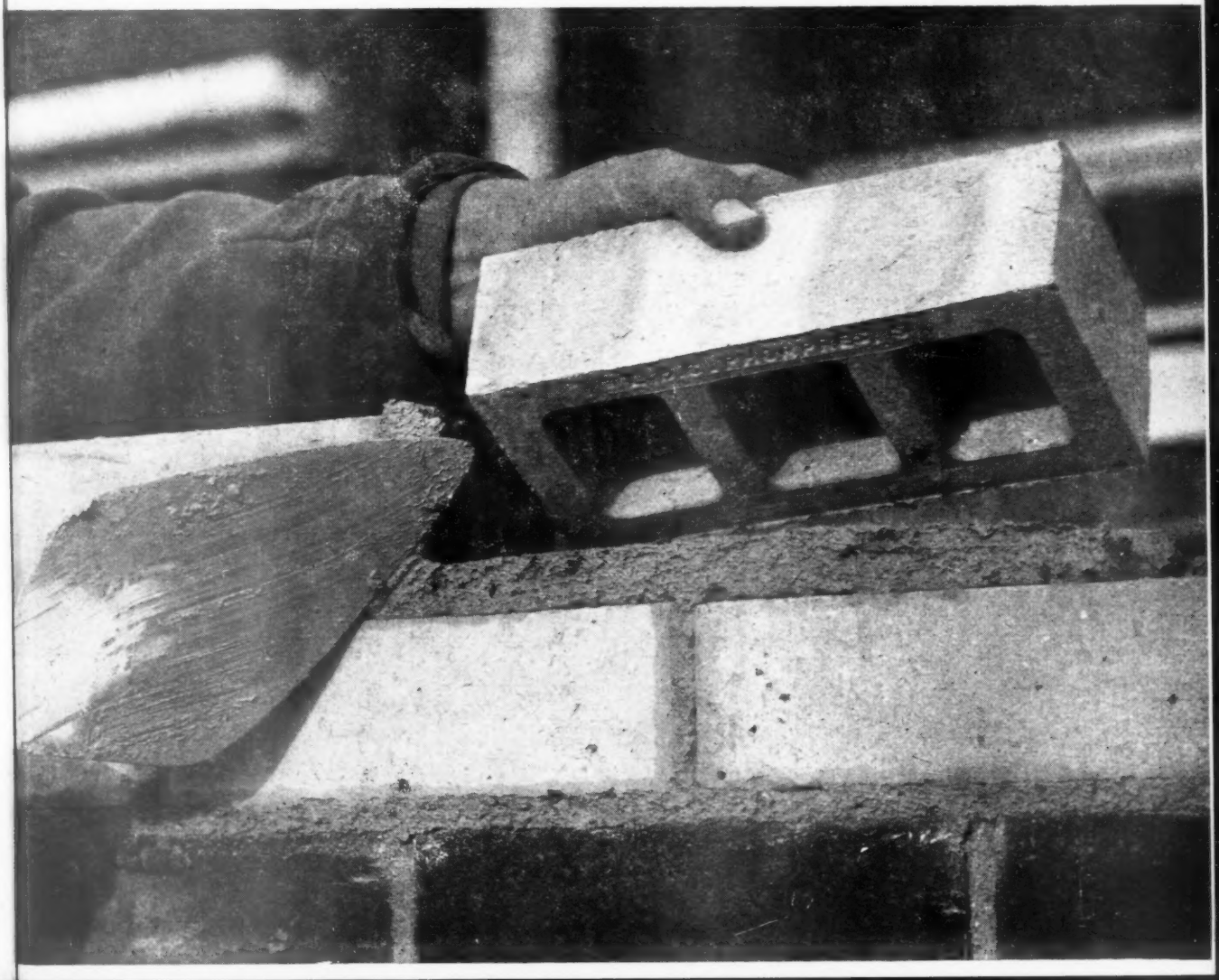
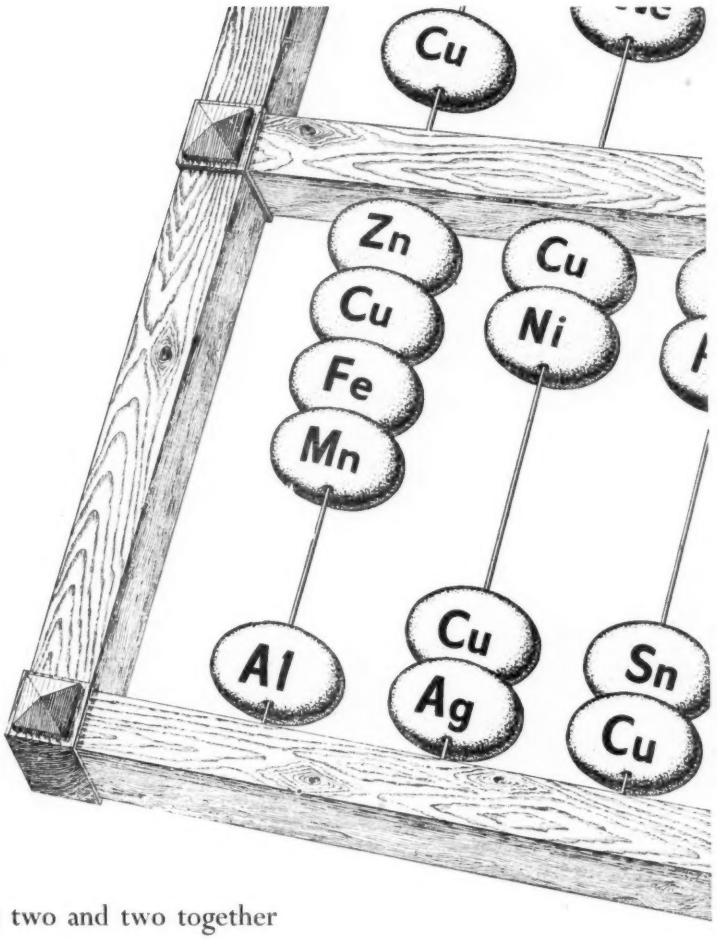
Telephone: Colmore 4141. *South Western District Office:* 11 Orchard Street, Bristol, 1 Telephone: Bristol 23004/5.
Northern District Office: Gascoigne Street, Boar Lane, Leeds 1 Telephone: Leeds 20771.

BY APPOINTMENT
BRICKMAKERS TO
H.M. THE KING



Putting two and two together with COPPER



So successfully have metallurgists put two and two together that copper and its alloys have become indispensable materials in almost every branch of industry. Putting two and two together in a different sense is also the task of the Copper Development Association. By appraising the results of experience and research and advising on their practical application in industry, the C.D.A. helps to ensure the most efficient and economical use of the metal and its alloys. Backed by the full resources of the British copper industry, the Association is a non-trading organisation from which you can obtain, without charge or obligation, full advice on what copper and its alloys can or cannot do.

COPPER DEVELOPMENT ASSOCIATION

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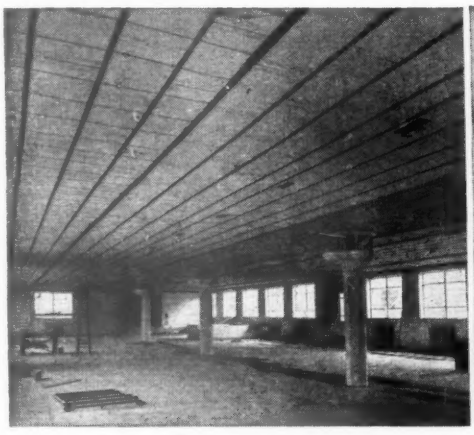
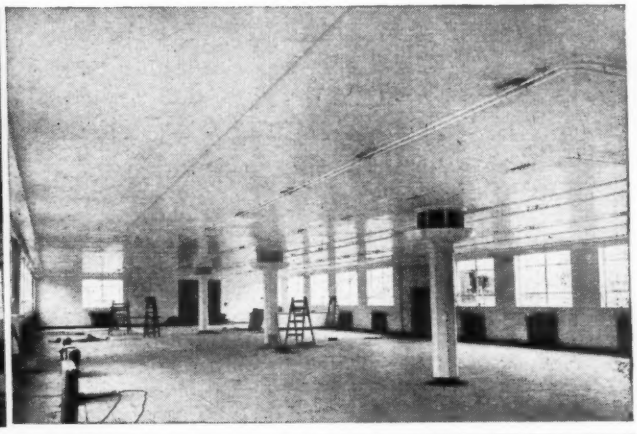
The "**Plaxstele**" suspended ceiling has a substantial plaster finish *with high fire resisting properties*

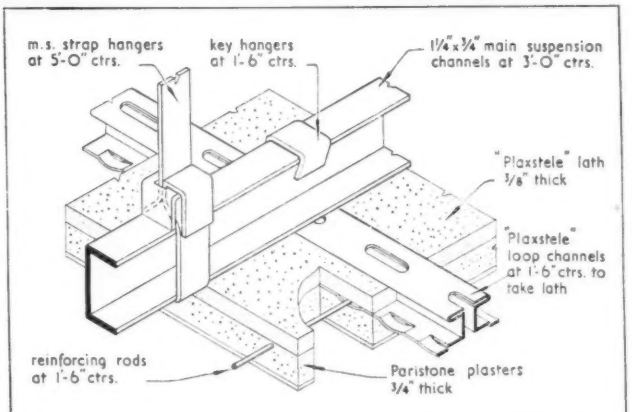




The "PLAXSTELE" ceiling system is adaptable to any type of building construction and can be suspended horizontally at any level below the main roof structure. It provides a suspended ceiling with a substantial, smooth plaster finish having high fire resisting properties.

The system combines the use of "PLAXSTELE" lath, specially designed for plastering with "PARISTONE" plaster, with metal patented suspension and jointing members which hold the lath rigid and at the same time anchor metal reinforcing rods in the plaster finish.

Advantages of the system include simplification of plastering work, saving of time, elimination of timber framing, superior strength, improved thermal insulation and high fire resistance (B.R.S. One hour. Grade D). Further information about this and other "GYPROC" products or systems will gladly be supplied.



The photographs show
a large area of PLAXSTELE *ceiling before and after plastering, decorating and fixing strip lighting.*

The isometric sketch shows
the general assembly of the component parts.

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"PARISTONE" *Wall Finishing Plaster,*
"CRETESTONE" *Concrete Bonding Plaster,*
"GYPSTONE" *Board Finishing Plaster.*

G.P.5

About Aluminium . . . 6

MECHANICAL PROPERTIES · *concluded*

IN all metals and alloys, protracted static loading may cause "creep", and repeated dynamic loading, "fatigue"; either of these phenomena can cause failure at quite low nominal stress levels.

Fortunately, the ordinary user of the structural alloys of aluminium is very unlikely to meet creep in practice, and fatigue is usually important only where stress levels are high, as in aircraft structures.

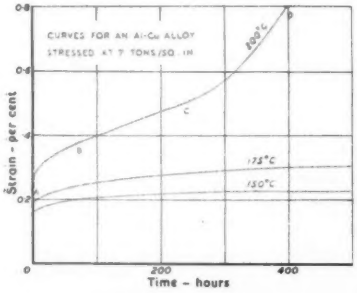
This is one of a series of articles on the characteristics of the metal and its structural alloys, written for the interest of students and others.

Creep

It seems likely that all metals flow under stress, though in the great majority of engineering applications this process is extremely slow at normal temperatures, and can be disregarded.

This is so with the structural alloys of aluminium; only the nearly-pure metal, in its soft state, shows significant creep at room temperature. If the working temperature is raised, however, the creep characteristics of the selected alloy may have to be considered by the designer.

The information available to him is generally the result of tests on tensile specimens subjected to constant stress at a carefully controlled temperature. By loading a number of specimens at different stress levels and constant temperature, or at different temperatures and a constant stress, perhaps for some thousands of hours, a family of curves can be obtained of the form shown in the graph below. In each of these curves, deformation increases in four stages: first elastically, on loading (O to A on the top curve); secondly (A to B), at a decreasing rate; thirdly (B to C), at an almost constant rate, which may be negligibly small at low stresses and temperatures; and lastly (C to D), at an increasing rate which leads to failure. In this example, only the top curve has entered the final stage.



Creep Curves

The designer, faced with a known operating temperature, must limit the working stress to a level at which the final stage of the creep curve will not be entered during the intended life of the product, and at which the total deformation at the end of this time will be within acceptable limits.

It is necessary to curtail ordinary creep tests to a practicable duration, usually to a point where the creep rate has settled down to a steady value. For the aluminium alloys a typical period is 1,000 hours.

Fatigue

When discussing work-hardening in a previous article, mention was made of the internal movements in the structure of plastically deformed metal, which take place as slip in or at the surface of individual crystals.

Even when a metal is stressed within its elastic range, this slip is not entirely absent, though for steady or occasional loading it is quite innocuous. If, however, the load is removed and reapplied (or varied in magnitude) a great number of times, repeated slipping may at length cause a definite separation, or fatigue crack, in the plane of slip. This will spread until the part fails.

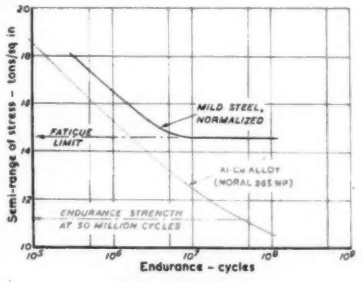
Ability to withstand fatigue may best be determined by repeated loading of the actual part, if this is convenient, but more often standardized test-pieces have to be used. The cycle of loading may be from zero to a predetermined tensile or compressive stress, or consist of a variation about a steady stress, or entail a reversal from tension to compression. Bending, shear, or torsion may be applied instead of (or as well as) tension or compression. In short, an attempt is made to reproduce the conditions of service.

Machines have been developed to apply these various types of loading. A simple and well-known example is the Wöhler machine, in which a cylindrical specimen is arranged as a beam or as a cantilever under a steady load. Rotation of the specimen subjects it to sinusoidally reversed bending.

Unlike creep testing, fatigue testing can be speeded up; the results are not prejudiced until frequencies of the order of 500 cycles per second are approached. This enables many millions of cycles to be applied in a practicable time, and resonance, mechanically or electrically excited, can often be used to save power.

The usual procedure in fatigue testing is to test a number of specimens at different stress levels. By plotting, in each case, the stress against the number of cycles necessary to cause failure, a stress/number (S/N) curve is obtained of the type illustrated below.

It will be seen that the S/N curve for the mild steel flattens out eventually, implying that there is a level of stress below which the material will never fail. This stress is its "fatigue limit." Most of the aluminium alloys, like other non-ferrous metals, do not show this limit (exceptions are provided by the aluminium-magnesium alloys), so it is necessary to quote the maximum stress permissible for a specified life: 50 million cycles is a widely used figure for aluminium alloys.



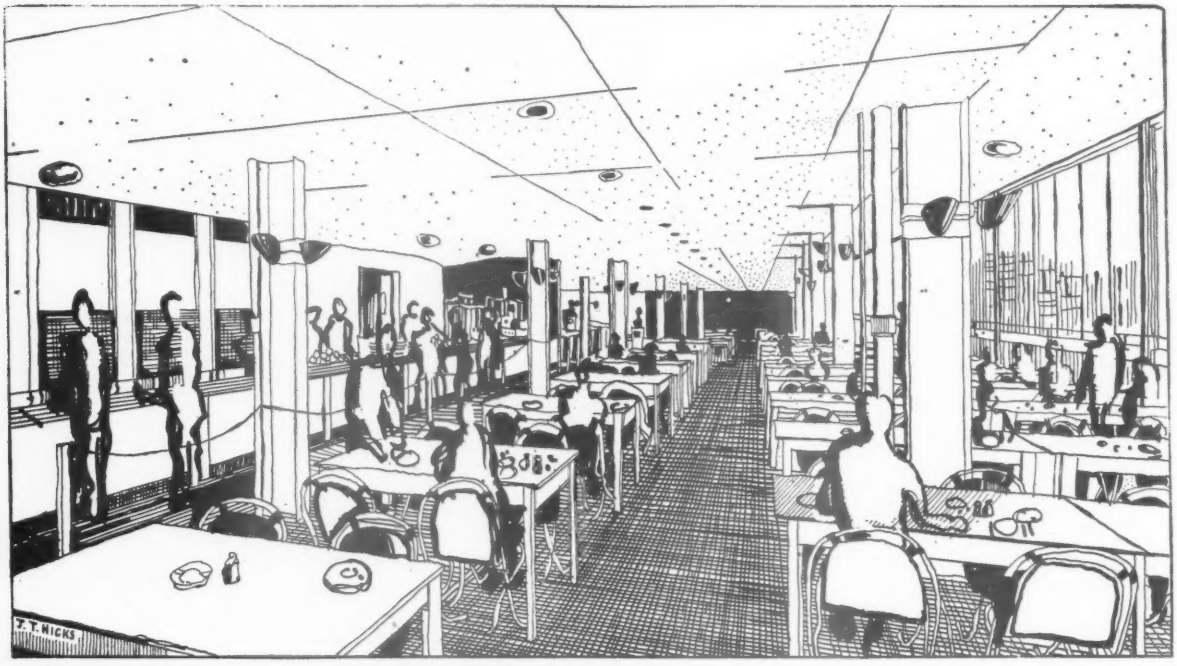
S/N Curves

At this number of cycles, the endurance strengths, based on rotating cantilever tests, of two diverse aluminium alloys in extruded form are: Noral 2SM (commercially pure aluminium), 3 tons per sq. in. or 60% of the U.T.S.; and Noral 26 SWP (a heat treated aluminium-copper alloy), 11 tons per sq. in. or 33% of the U.T.S. These figures illustrate the tendency of the "fatigue ratio" (endurance strength/U.T.S.) to fall with increasing strength and hardness.

Fatigue resistance may be much reduced by surface irregularities, even machining marks, which, by producing small zones of intensified stress, promote cracking. It is usual, except in tests on actual parts or representations of them, to polish fatigue test-pieces. The designer must, therefore, in using data from conventional fatigue tests, make allowance for the probably inferior form and finish of his product. Improved life can often be realized by shot blasting or otherwise peening surfaces that will be under tensile load, so as to develop residual compressive stresses in the skin.

These discussions are necessarily in general terms, and there is no room to give, except as isolated examples, quantitative properties of the aluminium alloys.

We shall, however, be pleased to send you a copy of our Data Sheet, listing mechanical and physical properties of Noral wrought and cast alloys. When writing, please mention the name of this journal.



An impression of the Staff Canteen in the South Bank Administration Building.
Architect: Edward D. Mills, F.R.I.B.A., F.R.S.A.

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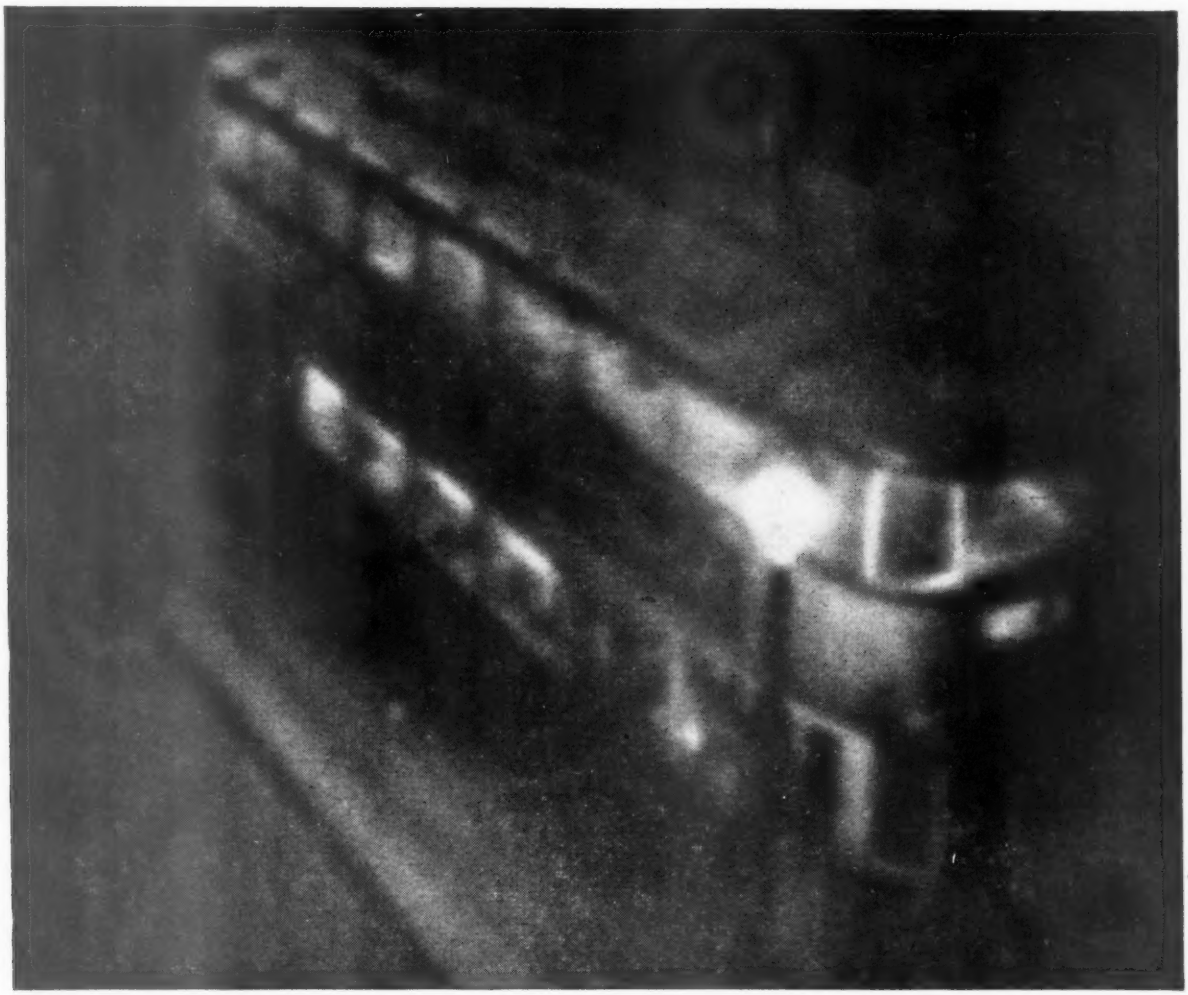

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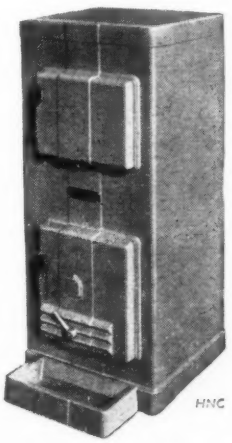

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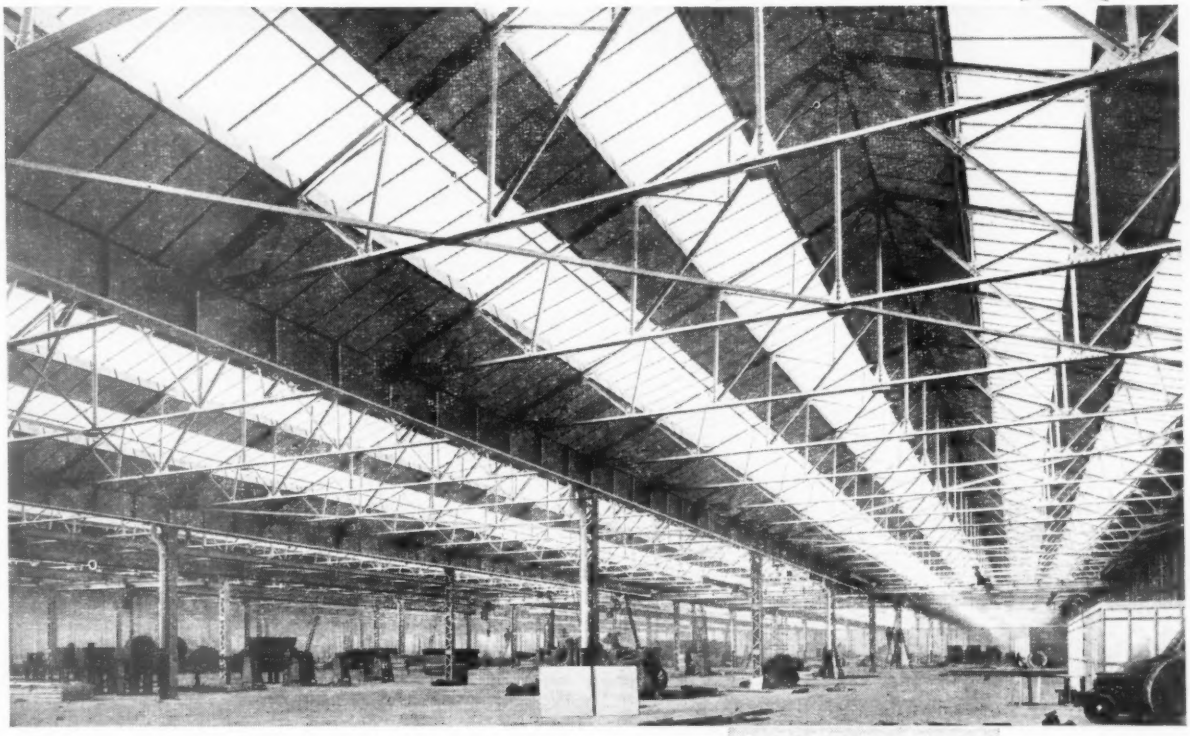

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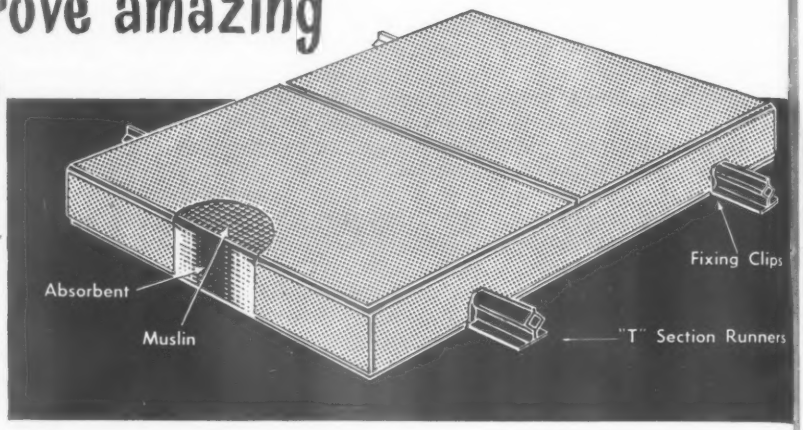

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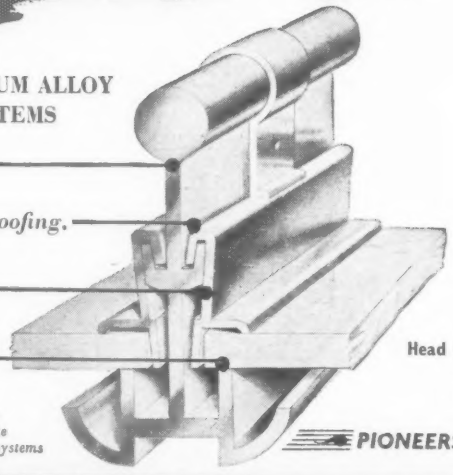

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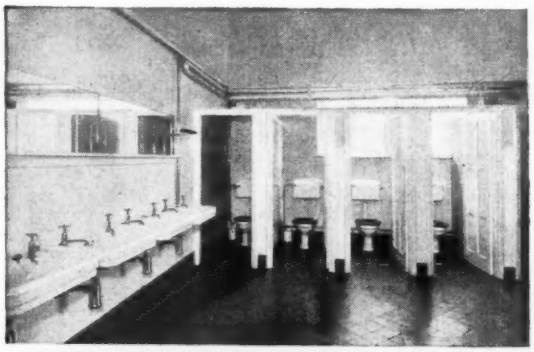

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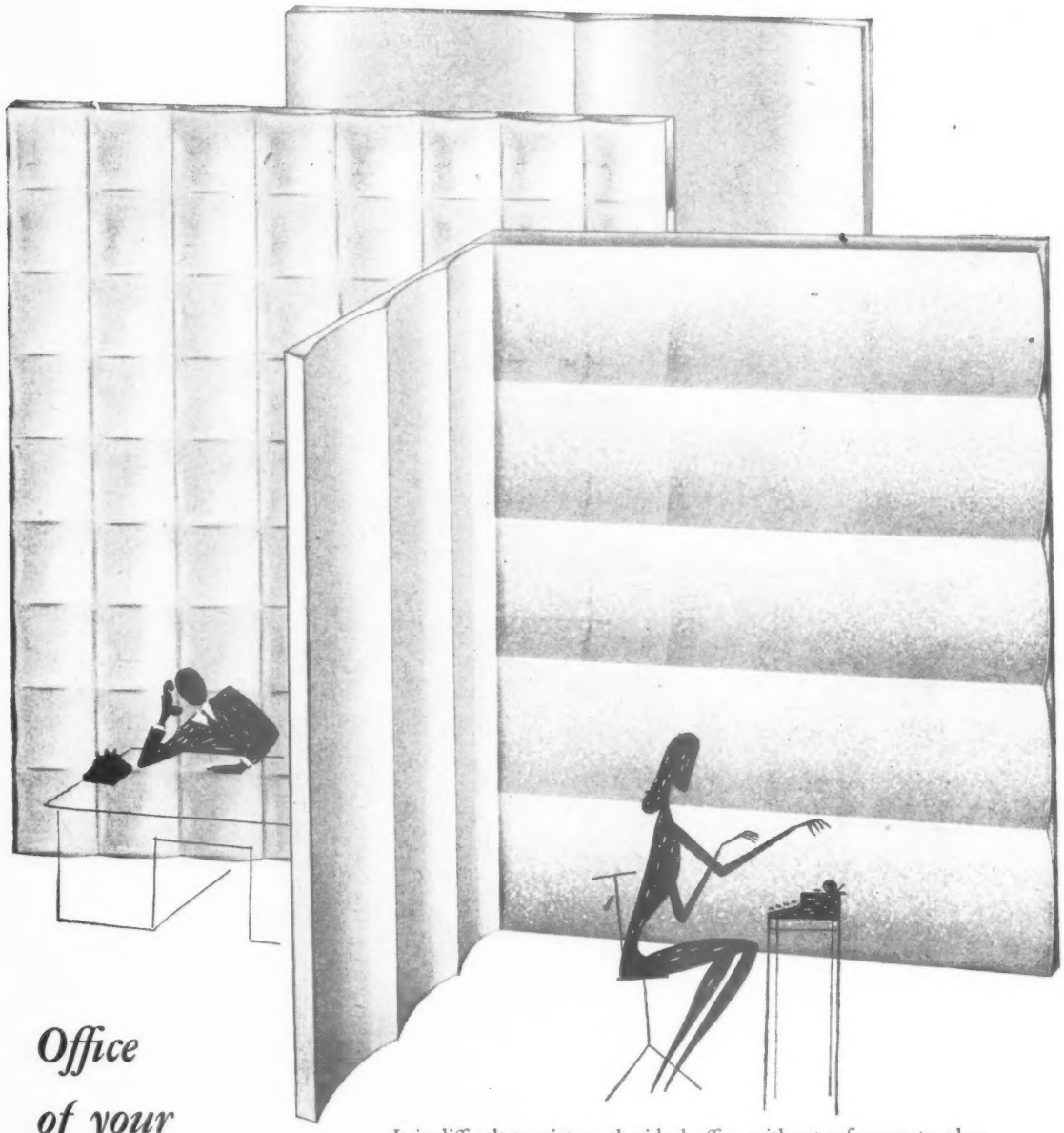

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THE ARCHITECTS' JOURNAL

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SLEEP ON, SLEEP SOUND

It has always been my contention that the architect should be free to exercise his æsthetic sense as he fancies. The dangers inherent in any system of æsthetic control over the qualified are obvious. For while the greater horrors may be avoided, with equal certainty the creation of a masterpiece will be hampered. We have not a sufficient number of wise and great minds to administer such control without running the risk of losing more than we might gain.

*

However, a brief study of the designs submitted for the Coventry Cathedral competition has all but made me change my mind. We most certainly need every society for the prevention and protection of this that and the other which exists, and more. A whole new statute book of legislation on æsthetics would not be too much if it would prevent the building of some of the designs submitted by " qualified " architects. I do not exaggerate. It is not for nothing that the gentle, kindly assessors are moved to write in their report that they consider the general level of the designs disappointing.

*

We deride the architecture of totalitarian countries—such naivities as the hundred-foot statue of the Great Man standing on a wedding-cake skyscraper. We have, never fear, fully qualified architects in this country who, given the opportunity could match with ease the vulgarity, pomposity, and crudity of the dictators' sycophant. No exhibition of architectural designs which I have seen for many a year so nearly prompts me to beg the RIBA to raise its standard of entry and to weed out the pitiful specimens amongst its members which its great authority protects.

*

It is discouraging, but understandable, in this hypocritical and faithless age that a large number of competitors should design so obviously to please what they imagined was the assessors' taste. (Little good though it did them, save to give them healthy exercise in traditional construction). Not quite so despicable, however, but bad enough, were those few who sought to imitate the work of Auguste Perret or of those Swiss and Scandinavian architects whose graceful, small churches have appeared in the pages of the architectural glossies for many a year. When originality was attempted the result was, with one exception, either vulgar, insipid or banal. More frequently the designers put their faith in past styles or in certain shapes, the parabola, the hexagon, the shallow dome, or the profound significance of a taut wire.

*

On the winning design I feel ill-equipped to comment. As regards contemporary architectural expression I feel it makes little contribution. However, I have complete confidence that the assessors have selected the most appropriate design. A design which is in sympathy, both in traditional form and symbolism, with the requirements of the Church authorities and the humblest church-goer. I am most worried by the attempt to keep, on such an enclosed site two large structures side by side. One a ruin, full of historic associations, and the other its would-be successor. The presence of the fourteenth century Holy Trinity Church only a hundred yards away does little to relieve the tension.

*

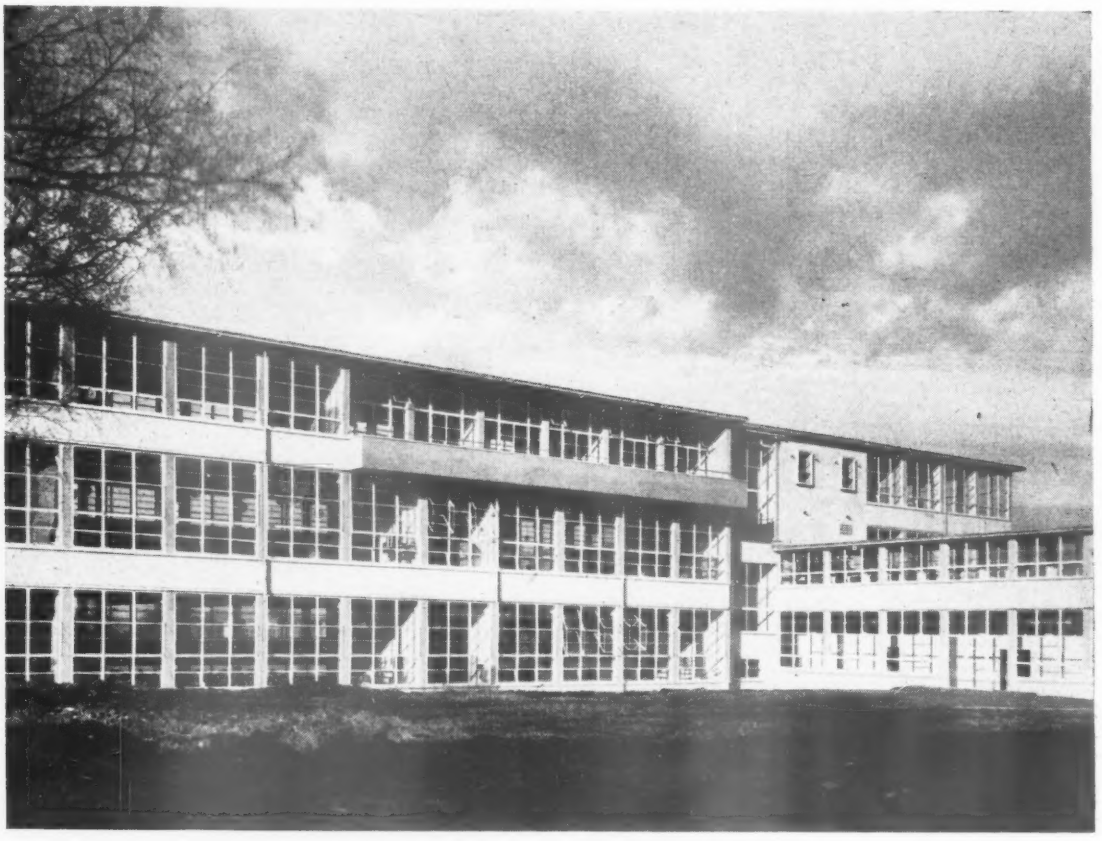
And now one final odd point. The sloping line of the roof is, to my eyes, at least, reminiscent of a coffin. There is a similar suggestion in the shape of the transoms in the windows. The motif of the bent line occurs also in the designs of several other competitors who were, no doubt, struggling to avoid the criticism of creating " packing-case " architecture. There is here a striking case of unconsciously produced symbolism which I find strangely disconcerting.

THE NEW BY-LAW STREETS

All roads should be clearly differentiated according to the purpose they are intended to serve. . . . Thus any of the dozen reports on road safety and design during the past decade.

*

Architects and planners took this point. They had a clear picture of a



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car turning off a Class A road (dual carriageway) on to a local distributive road (30 or 24 ft. carriageway) and slowing as it did so from 50 m.p.h. to 30. Then it would turn off into a development road with a 13 ft. carriageway and 15 ft. radius corners, slowing again to 10 or even 7 m.p.h.; and all would be reasonably quiet and safe for the toddlers.

*

But all this is vanishing before it is well started—squeezed out of real life on to students' drawing-boards between MOT above and the embattled Counties and UDCs below. MOT, having now no money to speak of, has outed all dual carriageways and is cutting principal local roads down to 24 or 22 ft. carriageways.

*

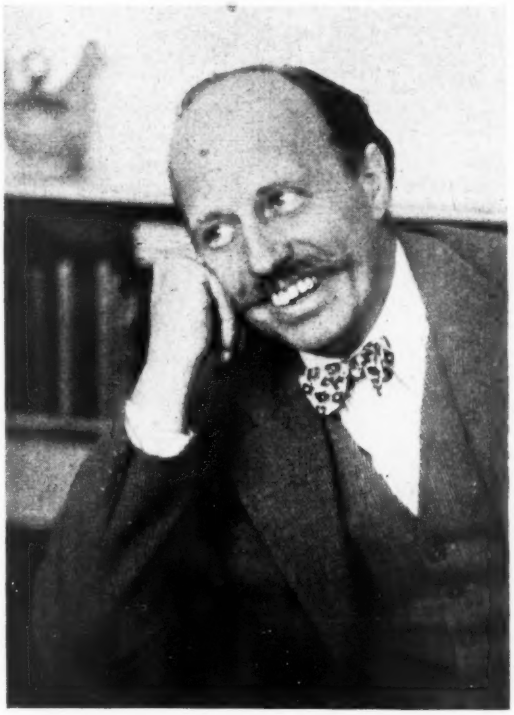
The Counties and UDCs are equally determined to finish off this 13 ft. road and cul-de-sac stuff. They say the modern van driver won't stand it. This unit of modern distribution (almost invariably driving a 6-ton coal lorry) rollicks round all corners and if there is not a 30 ft. radius, he makes one. Two kerbstones and a flowering cherry go down. If he sees a car ahead, up on to the verge again. And of course a turning-space at the end of a cul-de-sac really rouses him. If we had fences nowadays he would bring down the lot. As a result of his activities Highway Authorities are against cul-de-sacs and demand that no access road should have a carriageway of less than 16 ft. and that every turn should have a 25 ft. radius.

*

And so one sees the new by-law street and the new by-law layout creeping over the land, as standardized, as dangerous and just about as charming as its predecessors. One reckons that if the levelling down and up process continues until 1960, all roads whatsoever will have 30 ft. carriageways. Is this where we came in?

BOOKS AND MORE BOOKS

New books about architecture continue to pile up in the shops and on Astragal's already overcrowded desk. Here are some thoughts about some of the more recent.



Basil Spence, the winner of the Coventry Cathedral competition, trained at the Schools of Architecture at London and Edinburgh Universities and worked with Lutyens for a year before starting his private practice in 1930. *He was an RIBA Silver Medallist a year later. His pre-war work included three large country houses, Scottish pavilions at the Empire Exhibition in* 1938 *(in collaboration with T. S. Tait). Exhibition work includes "Britain Can Make It," for which he was chief architect. Present work includes housing estates at Sunbury-on-Thames, Dunbar and Selkirk and secondary schools at Stirlingshire, West Riding and East Kilbride. His main office (he has three) is in Moray Place, Edinburgh.*

First, because most topical, *Royal Festival Hall: the Official Record*.[1] The contents of this include an appreciation of the building by Clough Williams-Ellis, drawings by Gordon Cullen, Donald Dewar Mills and Pearl Falconer, reproductions of the signatures of Sir Malcolm Sargent and the Leader of the LCC, and thirty pages of advertisements. For all that it seems to me to fall between two stools, being neither detailed enough to be of permanent reference value for architects, nor cheap enough for people who want a memento of an architectural and musical experience.

*

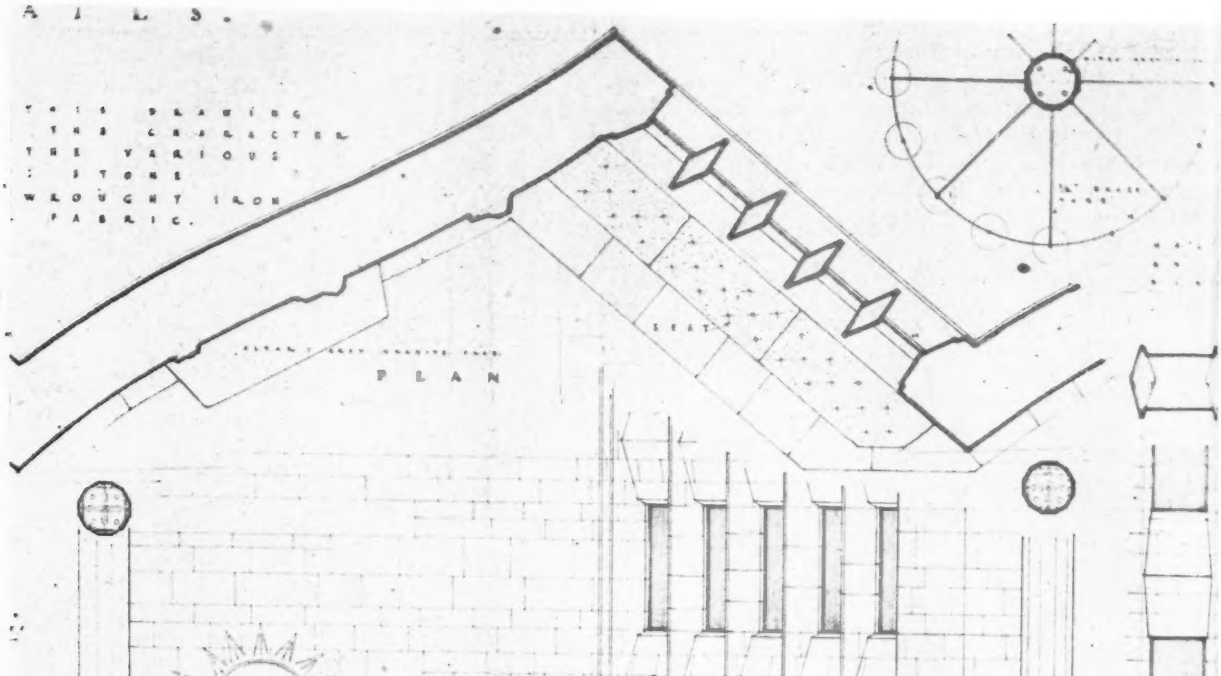
From modern to mediæval. Hugh Braun's *An Introduction to English Mediæval Architecture*[2] is a substantial volume of some 290 pages illustrated with 214 photographs. Mr. Braun, who favours the structural (as opposed to the æsthetic) theory of the development of architectural design, would like to see the end of the E.E.-Dec.-Perp. terminology and also—more surprisingly—of the terms Norman and Romanesque. Odd, in a book of this kind, is the fact that nowhere, from foreword to index, is there a mention of any other modern book or author.

Miss M. D. Anderson, on the other hand, in her *Looking for History in British Churches*,[3] provides a useful bibliography. This book is concerned with architecture only so far as it is part of the documentation of history, but I found every page of it interesting, and it should enrich the travels of many church-gazers.

*

In the first paragraph of his *Tudor Renaissance*[4] James Lees-Milne states that "for every European culture to flourish its exponents must all the while be steadfastly directing one of their two eyes backwards over their shoulders at imperial Rome." Unfortunately, the Elizabethan's optical equipment was not much more like that of a lobster than yours or mine is, and his spare eye was apt to stray round in the direction of the Low Countries (home of a "bastard vogue" in architecture) more often than Mr. Lees-Milne can approve. It cannot be said that *Tudor Renaissance* is an easy book to read, but since it contains the first sizeable study of Elizabethan architecture for half a century or so it deserves a special effort.

[1] Max Parrish. 30s.
[2] Faber & Faber. 42s.
[3] John Murray. 25s.
[4] B. T. Batsford. 21s.



Detail of a New Cathedral

In this week's issue we illustrate the winning design, by Basil Spence, of the Coventry Cathedral competition. Above is part of his sheet of half-inch scale details, which illustrates clearly an essential element of this design: the salient wall. One arm of this wall contains a window of coloured glass, which directs light towards the altar and also onto the sculpture carried by the other arm of the salient. The whole forms one of the Hallowing Places, as required in the competition conditions, each of which symbolizes "the sacredness of one of the fields of activity which makes up our daily human life." This detail drawing shows clearly the simple symbolism which pervades the whole design and the assessors state that it also shows that the author is "capable of most skilled and sensitive design." It does, in addition, reveal how closely Mr. Spence has conformed to the tradition of church design.

A CIREN CALL

The term "Cotswold," as applied to a contemporary building, has for many years been regarded by the *avant garde* and moderately *avant garde* as a term of vicious abuse expressing contempt for sentimentality and worn out clichés. Nevertheless, the Cotswold area still exercises a powerful attraction for large numbers of devotees all over the world. For these devotees a small exhibition "The Cotswold Tradition" has been opened in Cirencester. (Designed by Oliver Hill; John Betjeman wrote the captions.) Here, the visitor can thread his way between tightly packed exhibits of many characteristic products of the limestone belt. These range from modern woollen cloth through primitive hand tools to photographs of Belas Knap, with its dry stone walling some four thousand years old.

*

I am afraid that the visitor will come away with the impression that architecturally the tradition is dead and that, apart from various textiles some tools and basket work, the last flourish of the region was in the first decade of the century, with Gimson and his colleagues. None the less there can be no doubt that the exhibition is of great interest to many people, for during the short time I was there I counted at least a hundred visitors who all paid their 1s. 6d.

HAVE YOU BEEN?

With this in mind it is sad to see in *The Times* that only a thousand have attended the RIBA's "One Hundred Years of British Architecture" during the first month of opening. Even assuming that the *public* hasn't turned up I wondered how many architects there are in the London area—five thousand? On inquiry I find that the thousand represents only those visitors who have signed the book and there must be plenty more who don't bother. I confess I sin this way myself but even if the right figure is double the thousand I still think it's deplorably low. I know there isn't any spare money for advertising the show in a big way but can't even *members* make an effort? It seems little more than an elementary civility to turn up and see what the Institute is doing. So make it if you can, before September 4, and SIGN THE BOOK.

ASTRAGAL

The Editors

TWENTIETH CENTURY ANACHRONISM?

IF a cathedral is the hardest task for the architect to design, it is also the hardest kind of building to assess critically from the designer's drawings. There are, of course, far too many essential factors which are unknown, and virtually undiscoverable, to both critic and architect. Basil Spence's winning design for the Coventry Cathedral competition marks, in this mid-century year, the first break, and a relatively small one, in our tradition of church building. A study of the drawings published on pages 219-224 of this issue will reveal how slight this break is. The nave, separated from the side aisles by rows of columns dates, in conception, from the early Christian basilica. The roof, of concrete groined vaults on slender twelve-sided columns, is strongly gothic in feeling, and it is with these two structural elements, roof and columns, that one of the major factors of the design is introduced ; the gradual lowering of the roof of the nave as it nears the altar, together with a narrowing of the nave. In other words, the introduction of forced lines of perspective. This ensures that the eye is drawn towards the altar, an emphasis which is backed by another unusual feature : the saw-tooth walls which cause light to be directed towards the altar and form a repetitious pattern of splayed surfaces all forcing attention towards the "east" end.

There remains one other notable departure from tradition, and that is the partial opening up, by means of a glazed wall, of the "west" end (in reality, of course, the south end) so as to include a large porch and allow a view from the open-air pulpit, situated in the ruins of the old cathedral, right through the new cathedral to the altar.

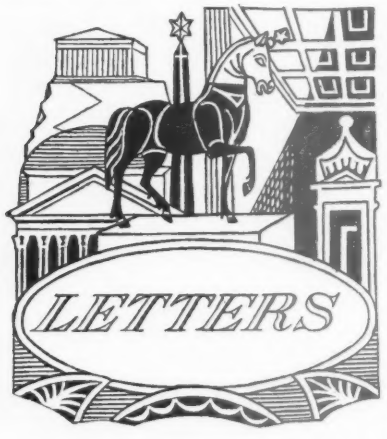
No other major spatial effect appears to be attempted. The whole design, therefore, is basically a very simple one which can be readily comprehended by the eye. From the huge opening in the west end, apart from a slight cross play of emphasis caused by the curved wall behind the font and the opening in the opposite wall which leads to the circular Chapel of Unity, the whole structure is moulded to forcing the attention on the east end. The only slight respite from this driving emphasis is to be found in the recesses of the saw-tooth walls.

There is, therefore, little to suggest that this design will provide any fresh or intricate relationships of space, or unusual play of solids and voids. The architect has not attempted to express his Christian beliefs in any forms suggestive of the contemporary world. Rather has he adjusted contemporary techniques to provide another, basically Gothic, conception of the form to be taken by a shrine to the glory of God. He has also adopted simple, almost naive, symbolism : stained glass windows depicting with colour the ages of man, a chapel shaped like a Crusader's tent, and so on.

The subtleties of the design are to be found more in the

symbolism, such as it is, in the richness, colour and textures of the floor and wall surfaces, and in the sculptures, tapestries and decorative screens. It is, in fact, a building of high emotional rather than intellectual content. The appeal tends to be more towards the senses than towards the mind. When culture today is not based, as was the mediæval culture, on religious faith, it becomes doubtful whether a satisfactory design for a cathedral in the eyes of both the artist *and* the practising Christian, could be produced. We cannot today express monumentality in buildings. We cannot express emotion in architecture, secular or religious, without a tendency towards being derivative, vulgar or banal. Our energies today are not directed towards enriching the House of God, but towards enriching ourselves. The mediæval architect was building earthly palaces for God. His conception of the building required was designed from the basilica, the royal palace which he was enlarging and enriching for the greatest King of all. Today, the *modern* architect would be equally at a loss to design a palace for a king or for God.

It would be interesting to know whether the demand for a cathedral for Coventry was supported by broad popular demand from the citizens on purely religious grounds or whether in part, at least, because the citizens wished to see the city rebuilt, and the cathedral symbolizes an essential part of it. The answer to that would indicate if the criticism made here of the winning design was mere intellectual caprice on the part of an irreligionist, or if the design was the logical interpretation by a sincere artist of intense demand from church and laity.



Michael Collins

J. E. Barlow, A.R.I.B.A., A.M.T.P.I.

W. MacDonald

Beware the Victorians

SIR,—"Much Ado about Nothing" is as good a title for what appears to be a future, or ever-present Victorian Renaissance. That a thing should become fine, whether it be good or bad, by virtue of its age, quaintness and eccentricity shows an appalling lack of something better to do. It is, in fact, a similar state, in this case, to that which produced the original. Then, it was too much money to be spent; now, is it too much thought?

Explore new fields, but if there is some further meaning in this particular field, we must not fall into the trap of trying to copy it. Remember, the Victorians did that too.

Middlesex MICHAEL COLLINS

Aberdonian Enthusiasm

SIR,—As a footnote to your reference to the recent exhibition in Aberdeen in the editorial of the JOURNAL for August 9, may I add that the total number of people who visited the exhibition during the three weeks it was open was estimated at between 55,000 and 60,000. Such extensive interest as this in a City where the summer population is about 200,000 is, I think, notable.

The exhibition was originally designed to display the work of the City's town planning consultants on the civic survey and advisory development plan, which was completed at the end of 1949, but it was subsequently thought desirable to include exhibits dealing with housing and health and welfare, in order to show their close relation with town planning. Public interest was further stimulated by daily film shows dealing with these subjects as well as by five lectures on various aspects of town planning with specific reference to the Advisory Plan.

The City's Statutory Development Plan is now in an advanced state of preparation but was not exhibited as it is still under consideration by the City Council.

Aberdeen J. E. BARLOW

Better than the South Bank

SIR.—ASTRAGAL'S notes in your issues of August 9 and 16 refer to the exhibition by the Institute of Registered Architects at Croydon town hall. I have paid two visits to this exhibition because there is much to be seen, and I consider it one of the best I have seen for many years. The entrance to the town hall and the stairs are palatially carpeted and the surroundings of marble in the Ionic Order are a striking and pleasing feature quite different from the prison appearance of County Hall, Westminster.

The display boards supported by gilded posts with red ball caps, and with beautifully worded and highly polished direction flags detailing the various works by architects, are an attraction to anyone who likes to look at good things, and the number of drawings and photographs occupied much of my time; in fact, I enjoyed myself more at this exhibition than I did at the Festival of Britain.

London W. MACDONALD

The EDITORS reserve the right to shorten letters from readers. Whenever possible, however, they are published in full.

DIARY

Exhibition of Architecture. Sponsored by the Institute of Registered Architects.

The above exhibition will be on view at the following places:—Lambeth Town Hall (until September 1); Mile End Library, Stepney (Sept. 10-22); East Finchley Library (Sept. 24-Oct. 6); Thomas Parsons Showrooms, 70, Grosvenor Street, W.1. (Oct. 8-19); Council Office, Surbiton (Oct. 22-27); Building Exhibition, Olympia (Nov. 14-28.)

Impressions of Soviet Architecture in Moscow and Tashkent. By F. W. B. Charles. At 14, Kensington Square, W.8. (Sponsor, SCR.) 6.45 p.m. AUGUST 23

Exhibition of One Hundred Years of British Architecture, 1851-1951. At RIBA. Weekdays, 10 a.m. to 6 p.m. Saturdays, 10 a.m. to 5.30 p.m. UNTIL SEPT. 4

London: An Adventure in Town Planning. Exhibition of work by Assist. Professor Smigielski, staff and students of the School of Architecture, Polish University College. At ICA, 17-18 Dover Street, Piccadilly, W.1. Weekdays 10 a.m. to 6 p.m. SEPT. 13-OCT. 6

"Living Traditions" Exhibition. At Royal Scottish Museum, Edinburgh. 10 a.m. to 10 p.m. Sundays, 2 p.m. to 6 p.m. UNTIL SEPT. 15

Festival Exhibition of Contemporary Furniture and Furnishings. At the Mansard Gallery, Heal and Sons, 196, Tottenham Court Road, W.1. Open shopping hours. UNTIL SEPT. 30

London Transport Poster Exhibition, 1908-1951. In subway linking South Kensington Station with museums. (Sponsor, LTE.) Open station hours. UNTIL SEPT. 30

South Bank, Past and Present Exhibition. At Royal Festival Hall, Waterloo. (Sponsor, LCC.) Daily: 10.30 a.m. to 6.30 p.m. UNTIL SEPT. 30

Festival of Education and the Arts. 33 new primary schools in Herts. open to public. Full details from County Education Officer, County Hall, Hertford. UNTIL SEPT. 30

COVENTRY CATHEDRAL COMPETITION

WINNING DESIGN BY BASIL SPENCE

The first prize of £2,000 in the competition organized by the Coventry Cathedral Reconstruction Committee for the new Coventry Cathedral has been won by Basil Spence, of 40, Moray Place, Edinburgh. *(For second and third prize-winners see page* 225.) *Following is the report of the assessors, Sir Percy Thomas, Edward Maufe and Howard Robertson :—*

" We have examined the 219 designs which have been submitted in this competition. Although we consider the general level of the designs is disappointing, yet we are very happy to report our conviction that the competition has succeeded in bringing forth several designs of great merit, and one of outstanding excellence. In selecting this design we not only feel that it is the best design submitted, but that it is one which shows that the author has qualities of spirit and imagination of the highest order. He lets the conditions grow under his hand to produce a splendid cathedral, and as the conditions are unusual, the resulting conception is unusual ; revealing the author's ability to solve the problem of designing a cathedral in terms of contemporary architecture. The author, in his report, stresses the beauty of the existing destroyed cathedral as an eloquent memorial to the courage of the people of Coventry, and states it as his opinion that the major part of it should be allowed to stand as a garden of rest, treating it as an atrium to the new Cathedral which should grow out of the old Cathedral and be incomplete without it. The interior fully meets the requirements of liturgical movement. The altar is not narrowly confined within the usual chancel but is open on its sides to the full width of the nave. The hallowing places are admirably treated, being recesses canted toward the congregation from the wide passage aisles with lighting which falls only from the side onto beautifully designed sculpture appropriate to each hallowing place, avoiding all glare to the eyes. The Chapel of Unity is not a mere adjunct to the Cathedral but a building elemental in form and of great significance. It is independent of, yet an integral part of, the Cathedral ; separated from the nave only by an open metal screen. The author strongly advocates that this chapel should have its axis on the font and this is what he has devised, making the font in the cathedral of special importance. The shape of the New Cathedral is impressively simple, the existing tower being an essential part of the design. The vaulting of the interior is of reinforced concrete ; the walls externally and internally are of pink-grey stone. The half-inch details show that the author is capable of most skilled and sensitive design. The Chapter House, the Christian Service Centre, Warden's and Caretaker's Houses, have much architectural merit, in keeping with the Cathedral itself. The estimate of cost, clearly set out in the able report, is in our opinion reasonable."

THE WINNER'S REPORT

THE IDEA

Following is the report of the winning competitor, Basil Spence: Through the ordeal of bombing, Coventry was given a beautiful ruin, the tower and spire reveal themselves for the first time in an arresting new aspect from the ruined nave. As the Cathedral stands now, it is an eloquent memorial to the courage of the people of Coventry. It is felt that the ruin should be preserved as a garden of rest, embracing the open-air pulpit and stage, and the new Cathedral should grow from the old and be incomplete without it. The altar is the heart of the new building, it can be seen from the ruined nave. The five glass screens dividing the porch from the nave are of clear glass, and, on great occasions and on warm summer evenings, can be lowered so that the Cathedral is open. There is no physical obstruction, on occasions such as these, between the whole population of Coventry and the altar. Saint Michael's Avenue, the traditional right of way, remains, except that it passes under the Cathedral porch, within sight of the altar.

THE MEANING OF THE PLAN

As the life of Our Lord commenced with a star, the first element of the Cathedral plan is the Chapel of Unity, star-shaped, and on the axis of the font. Then, turning towards the altar, the nave is flanked by the Hallowing Places and the windows shining towards the altar and representing the phases of life. This sequence culminates with the altar built by Mr. Forbes after the bombing of the Cathedral, it is surmounted by the charred cross, and backed by a great modern tapestry representing the crucifixion.

Much thought has been given to the position of the Chapel of Unity in the Cathedral plan. It must express Unity, and is the Chapel of the Holy Spirit; it has its place in Pentecost, and, if Baptists and Methodists are to worship according to their consciences and with sincerity, it may be wrong to be completely within sight of the altar. The Act of Baptism, however, is another matter, and, as unity is a primary consideration, the chapel is on the axis of the font. During combined Services, those

COVENTRY CATHEDRAL COMPETITION

THE WINNER'S REPORT

wishing to be within sight of the altar can sit near the grille which is the limit of the Chapel of Unity, though it must be stressed that the primary object in the design of this Chapel is a room of prayer.

The Chapel's shape represents Christian Unity; in elevation it is shaped like a Crusader's tent, as Christian Unity is a modern Crusade, and an attempt has been made to use dynamic crystalline forms which are contemporary, yet have their roots deep in the past.

The air breathed in the Cathedral is the same as in the Chapel of Unity, as no glass or solid material divides the Chapel from the open nave; the legal division is represented by the open grille. Entering from the porch, the first important incident is the axis of the Chapel of Unity and the font. In the case of Coventry, the font has great significance; the desire to perpetuate in the Church the youthful faith and courage of the people of Coventry can be expressed here. The font cover is conceived in a light steel sheet; a tall tapering form designed after the manner of a fir cone. The parts resembling ploughshares getting smaller as they near the point. Behind the font is the Baptistry window composed of 195 lights, 172 of which are of uniform size, and the stained glass panels would not be too expensive as donations from the Public.

As suggested in the Conditions, the Hallowing Places are on the outer walls of the Cathedral. These are sculptured recessed with ideal lighting for bold relief.

Great importance is given to the stained glass windows; with the exception of the Baptistry windows and those lights over the entrance to the Chapel of Unity, all windows shine towards the altar. Behind the font the glass is very pale, almost white, with a slight tint of rose and pale blue, and, moving towards the altar, the next windows are composed in tones of green and yellow representing youth. The next pink and red, representing puberty, the next—the age of experience—are multi-coloured, then the age of wisdom—the windows are deep blue and purple—and, finally, the altar windows of golden glass. As in life, the colour of the windows is revealed only as you reach each stage—the past is known, the future is not. Only when the altar is reached the whole range of colour is seen for the first time.

The author of this design does not see this building as a planning problem, but the opportunity to create a Shrine to the Glory of God.

THE PLAN

The plan divides itself simply into four distinct elements: the Old Cathedral, the Cathedral Porch, the New Cathedral containing the Chapel of Unity, Guild Chapel, Lady Chapel, Children's Chapel, and the Chapel of the Resurrection, with all the attendant rooms, and finally, the Christian Service Centre Group, which includes the Warden's House and the Caretaker's House.

Vehicle access is centrally placed off Priory Row, and the service road leads from Priory Street to the yard which serves the Heating Chamber and all three kitchens (The Christian Service Centre, the Warden's Kitchen and the Caretaker's Kitchen). Foot access to the Christian Service Centre is obtained from both the car park as well as Hill Top.

Access to the crypts is from under the Cathedral Porch.

GENERAL STRUCTURE

Structurally, this building is planned on simple lines. A reinforced concrete vault, designed as lightly as possible, supported by tall elegant columns of steel cased in concrete, or post stressed concrete units. Walls are of solid stone construction pierced with windows. The floor is concrete with a finished surface of patterned stone, and the foundations are of concrete.

It is proposed that the vaulting should be shell concrete approximately 2½ in. minimum thickness. Each vault to have reinforced concrete edge trimming beams for restraint, and these are to extend above the vault, and will constitute a grid of continuous beams extending from wall to wall and longitudinally down the building with point supports from columns.

The shuttering of the soffits is to be very carefully lined with narrow boarding to leave a regular and permanent pattern of board marking.

The infilling between ribs and over the vault is to be of Vermiculite screed (minimum depth 2 in.) topped with 1½ in. of cement screed.

The roofing is of copper properly laid on roofing felt (if copper is available).

It is hoped that it may be permissible to use a slenderness ratio of not less than 200 in view of the support obtainable from the walls. Compound stanchions are proposed of heavily-plated cruciform sections to provide the required radius of gyration. Should it be necessary to work to a ratio of 150, the diameter of the columns—at present shown as 20 in. overall for a height of 60 ft.—will require to be somewhat increased. This would, of course, require to be the subject of detailed calculations. The compound stanchions would be completely encased (minimum cover 1½ in.) in concrete of minimum test cube strength of 6,250 lb. per sq. in. at 28 days, which should be compacted by external vibration.

It is proposed to reuse for all columns, in lifts of approximately 6 ft., a standard metal drum shuttering faceted on the internal faces. The final column finish is to be bush hammering.

The use of columns constructed of pre-cast drums reinforced and stressed after erection has also been considered, but this requires detailed analysis relative to the use of steel stanchions which would, at present, be premature.

The slightly corrugated shape of the stone side walls, and their angled setting to the main roof vault in conjunction with the mesh of stone window heads and cills which connect the ends of bays produces an immensely strong saw-toothed wall in which the window sections tend to act as integral buttresses.

This wall provides maximum lateral support to the vault to meet both live and dead lateral loadings, and, in view of its strength, it may also be used to relieve the columns of a proportion of the vertical roof component through the grid of continuous beams, thus permitting a relatively light column section to be used.

It was considered essential that the same stone, or a similar variety to that of the Old Cathedral, be used. Where possible, mouldings and other expensive Masons' carvings have been eliminated. Simple chamfers are used, and decoration is in the form of sculpture which is not much more expensive than an elaborately moulded wall surface carried out by masons. This stone is used for the Christian Service Centre as well.

The walling below the main floor level, as appears on both East and West elevations, is in grey granite blocks backed by brick. On the West elevation, this embraces the Choir Vestry, and ceases where it joins the Warden's House. On the East elevation, it butts on to the Guild Chapel corridor.

The floor slab carries the heating elements. The finished surface is composed of a pattern of stone slabs of varying cool colours to contrast with the pinky-grey walls. Under the Porch, however, cobbles are interspersed with stone slabs to catch surface water which may permeate from the outside.

Foundations are normal, being constructed of concrete.

DETAILED DESCRIPTION

In order to establish which parts of the Cathedral can be left standing a detailed examination will be required. It is the intention to preserve as much of the old as possible, and it will be necessary to protect the upper surfaces by some method of damp-proofing (preferably lead if obtainable) to prevent deterioration through the years. The old Cathedral should then be planted out with trees, shrubs, and flowers, and certain creepers should be encouraged to grow over the old walls, and the large paved area adjacent to the Porch would serve for the congregation during open-air services.

A cross of English oak replaces the charred cross, and a new altar of grey granite replaces Mr. Forbes' altar. The pulpit and canopy are of concrete with exposed aggregate.

The open-air stage is unaltered from its existing position, as this has the ideal orientation, and gives an excellent setting for religious plays.

The Porch grows from the old Cathedral, and it has been designed in the lightest and most unobtrusive way as an introduction to the new building. The spacing of the five bays which form the mathematical unit on which the whole plan has been designed are taken from the old Cathedral.

The concrete groined vault is supported on concrete pillars which are clothed in stone. Access to the crypts is from the south-west corner of the Porch.

The five glass screens dividing the Porch from the Nave are capable of being lowered into the floor. This has been done successfully in the Crematorium at Stockholm, and assurance has been given by engineers here that this is not a difficult task, and relatively low power is required to lower and raise these screens by the careful use of counter-balanced weights. Each Screen has a set of doors which come into operation when the Screens are in the raised position.

The Nave accommodates the seating. The area is indicated on the plan is the extent of the heated floor slab. The total number of chairs accommodated on this slab is 1,374, and, as the aisles are 18 ft. wide, there should be no difficulty in adding the 250 extra seats asked for in the conditions; a method has been shown on the main plan. The spacing for the chairs has been taken as 2ft. 10 in. back to back by 1 ft. 8 in. wide.

The Choir Stalls are designed to accommodate 40 choir and an organist and console; on the opposite side, stalls for 24 Clergy and a Bishop's Throne. They are constructed in laminated wood moulded to shape, and the ornamented areas are fretted out and carved by hand. Brass fittings are introduced as con-

Site plan and Sections.

THE PLAN

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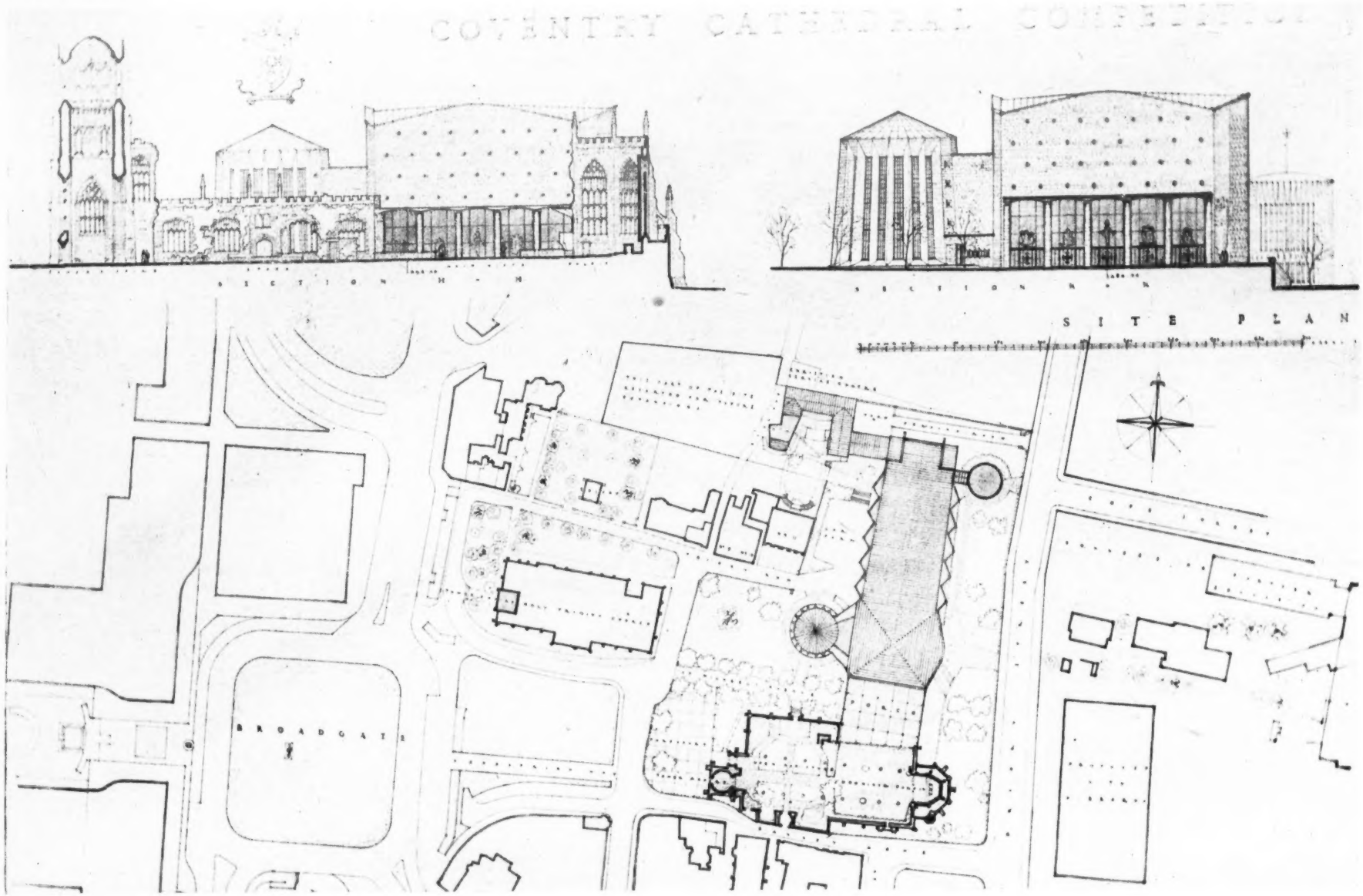

COVENTRY CATHEDRAL COMPETITION

THE WINNER'S REPORT

nections. These should not be brightly finished but have a protective dull finish.

Looking towards the Altar, the Pulpit is on the left and the Lectern on the right. The Pulpit is constructed of Portland stone with a laminated wood sounding board designed to be acoustically correct. The Lectern is the traditional brass eagle.

The Bishop's Throne is designed for fabric probably a brocade, cobalt blue in colour, and the details of the embroidery are shown on the half inch detail.

As already mentioned, the altar is the existing one which is carried into the Cathedral along with the Charred Cross and the Cross of Nails, as relics.

The tapestry is backed by a stone wall, and is hanging from great bronze pins built into the wall. This tapestry, for which £30,000 has been allowed in the estimate, could be designed by a great contemporary artist, or a competition might be organized, and the firm who exhibited modern tapestries in the recent Arts Council Exhibition in London have been approached, and have the necessary scope to undertake this commission. This would be the largest tapestry in the world, and would be the most beautiful background for the altar and the Charred Cross. The subject of the tapestry is the Crucifixion.

Ten Hallowing Places are shown on the plan, each one is a sculptured recess, but the stained glass windows, casting their different colours over the sculpture, would make them slightly different from each other. An altar slab is included on each Hallowing Place for the placing of flowers.

Space for the Organ is allowed for over the ways to the Children's Chapel and the Chapel of the Resurrection.

The Chapel of Unity is simply constructed on a concrete foundation with large diamond-shaped mullions of stone which support the roof of concrete. Attention is drawn to the fact that the floor is slightly dished, and the star pattern should be of golden stone and the remaining infilling of blue marble. The central symbol of the Holy Spirit is of mosaic.

A small vestry has been incorporated within the boundaries of the Chapel of Unity, and this is provided with a small cupboard and a lavatory.

To create the correct atmosphere for the children the wrought iron screen in the Children's Chapel, which is detailed on ¼ in., is composed of a pattern of flowers and animals, and, above the transom, the firmament, with the Virgin Mary and the Infant Christ set in an area of golden stars. The Chapel itself may be decorated with a mural in a simple understanding technique. This Chapel seats 30.

The Lady Chapel, which seats 70, is placed in its traditional position behind the altar, and the large window which is shown on the North elevation, lights the interior. The walls are of stone, and the roof of deep concrete beams which should be brightly coloured in rich mediaeval colours of green, red, white, black and gold. Adjacent to the Chapel is a small room for the preparation of altar flowers.

The Chapel of the Resurrection balances the Children's Chapel, and seats 30. Behind the altar is an incised carving on Portland stone developing the idea of the three crosses which are in the existing Chapel of the Resurrection.

The Guild Chapel, which can accommodate 80 people, gets its character from the tall mullioned walls. A feature of this design is that the windows can represent all the Trades, and the stained glass designs can incorporate the Arms of the various Guilds.

The lower ground floor is designed as a working adjunct to the main Cathedral above. It accommodates the Chapter House, the Provost's Vestry and his Secretary, the Muniment Room and the Sacristy, the Choir Vestry, which is provided with lockers on one end wall, and also with the necessary cloaks and lavatories. A large assembly area is also provided. The Provost's Vestry has an excellent out-look towards the new City Library and Art Gallery, and has a south-easterly aspect. The Secretary's room is conveniently placed in relation to the Provost's Vestry; a small cloakroom and lavatory are provided.

The Chapter House is designed to accommodate 30 members of the Chapter, seats being provided correctly upholstered, in the window recesses. Thirty-seven recesses are shown on the plan.

The Muniment Room is of fireproof construction. The exact requirements of the Muniment Room and Sacristy are not stated in the conditions, but attention is drawn to the fact that this part of the plan is flexible, and allows of latitude in design and any special requirements within reason can be provided once these are known.

Entrances to the lower ground floor are by two doors—one from the East and the other from the West. The Eastern door is marked on the plan as Canon's door; the Western door is shown as the Choir door.

Access to the main Cathedral floor is by a staircase which is 4 ft. 6 in. wide and three landings are provided; the tread is 10 in. and the rise 6 in.

Provision has been made on the lower ground floor on the East side of the Cathedral for the storage of chairs, access from the Cathedral is obtained by a small stair, and also by a lift. The lift is a goods type, which is intended for the movement of furniture, etc.

One group embraces the Warden's House, the Caretaker's House, and the Christian Service Centre itself. An attempt has been made to create a building of friendly secluded and domestic character which people would enjoy using, and make a habit of visiting. The position was considered carefully, as it allows of future extension on to the spare ground to the extreme North-West of the Cathedral site. It groups happily with No. 11, Priory Row, which is a beautiful building, and which is to be restored and brought into the Cathedral plan. A suggestion is shown on the main plan as to how this building could group with the Christian Service Centre. The car park is convenient, and an intimate foot approach can be made through Hill Top.

The building is planned so that all the kitchens face on to the yard, the main kitchen serving the Meeting Room, the Warden's Kitchen and also the Caretaker's Kitchen.

The Warden's House has been planned as an integral part of the Christian Service Centre, but his house is conveniently placed in relation to the Cathedral. The accommodation asked for has been provided, and the total area of the house is 1,760 sq. ft. The Warden has direct access to the Christian Service Centre.

The Caretaker, who, it is understood, is to control the feeding arrangements, has his 1,300-sq. ft. flat over the main Meeting Room. He has direct access to the main kitchen, which has been shown small and easy to run with a small staff, as it is assumed that light snacks and teas will be the type of meal provided. It is possible, however, to provide a larger kitchen on a lower level, using the existing one as a Servery, if this is thought necessary.

The Meeting Room occupies a central position on the plan, and overlooks a garden and a pool through a verandah which faces due South. There is a small entrance hall with a staircase feeding the cloakroom at half basement level; the upper floors are occupied by a Social Room and two other rooms asked for in the conditions. The Reading Room is placed on the end of the circulation, with a Southern balcony for those wishing peace and quiet. Two administrative rooms are placed off the entrance hall.

It is proposed to use an accelerated low-pressure hot water system with floor coils set in the floor slab. These will be divided into approximately five separate sections for control purposes.

It has been decided to use the building fabric, and particularly the heavy slab floor, for thermal storage, thus eliminating the expense of and the space required for thermal storage tanks, etc.

Calculations indicate that a temperature drop of not more than 1° per hour can be expected once the heating is turned off, and it is, therefore, practicable to run the boilers during the off-peak period only when advantage can be taken of the cheaper rates and the certainty of supply.

Present costs indicate that gas-fired boilers will be the most economical, and especially so if cheap off-peak rates now under discussion become available. Should electricity become an economical proposition while the Cathedral is being built, this method of heating can readily be installed, using electrode boilers in preference to gas-fired ones. The lower ground floor and the Christian Service Centres are heated by low-pressure radiators off the same system.

The position of the gas flue is shown on plan, and the fumes are dispersed from an opening behind the parapet at roof level.

Straightforward tungsten lighting is suggested. The type of fitting is indicated on the half-inch detail—the only departure from this method is the illumination of the tapestry, which should be discretely floodlit.

ESTIMATE OF COST

In order to arrive at a cube, quantities were taken out and priced at the rates current as at October 30, 1950. In a building such as this, it is impossible to guess a cube, and the reinforced concrete vault, the stone work, floor slab and heating, the furnishing of the Cathedral, and also its decoration, were all accounted for in arriving at a cube figure. The only part that has been cubed without quantities is the Christian Service Centre and the one-storey link with the Cathedral. The sum of £30,000 is allowed for the great tapestry and a contingency sum of £10,000 has also been provided for. Cubing at 5s. 6d. for the main Cathedral, and 5s. 4d. for the Christian Service Centre, the cost is estimated at £801,103 16s. 4d. (eight hundred and one thousand, one hundred and three pounds, sixteen shillings and fourpence stg.); this excludes the cost of the organ and the cost of the layout. It does include, however, for the terrace, the paving in the porch, and the steps leading to the old Cathedral, and the formation of the new walls which form part of the old Cathedral.

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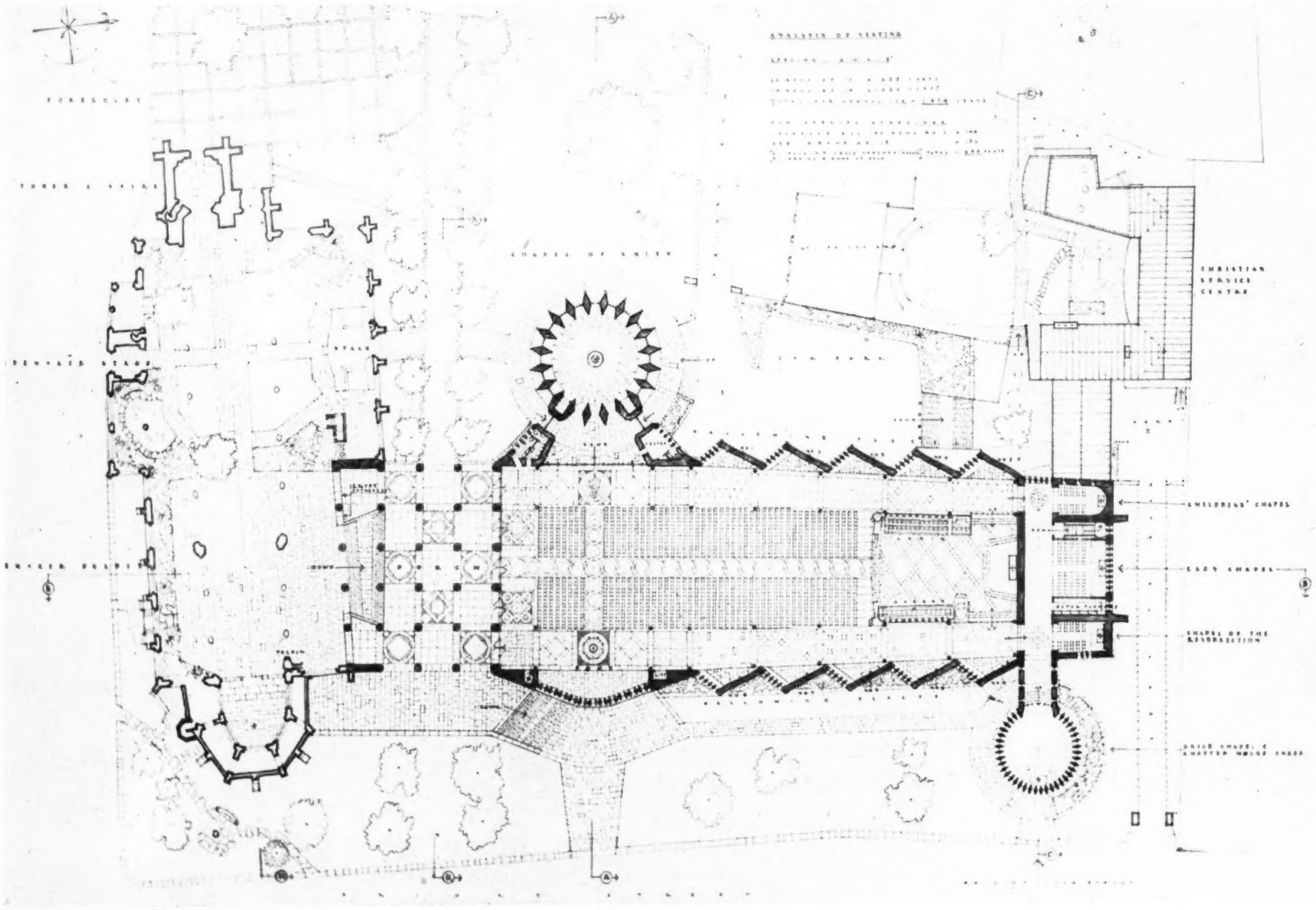
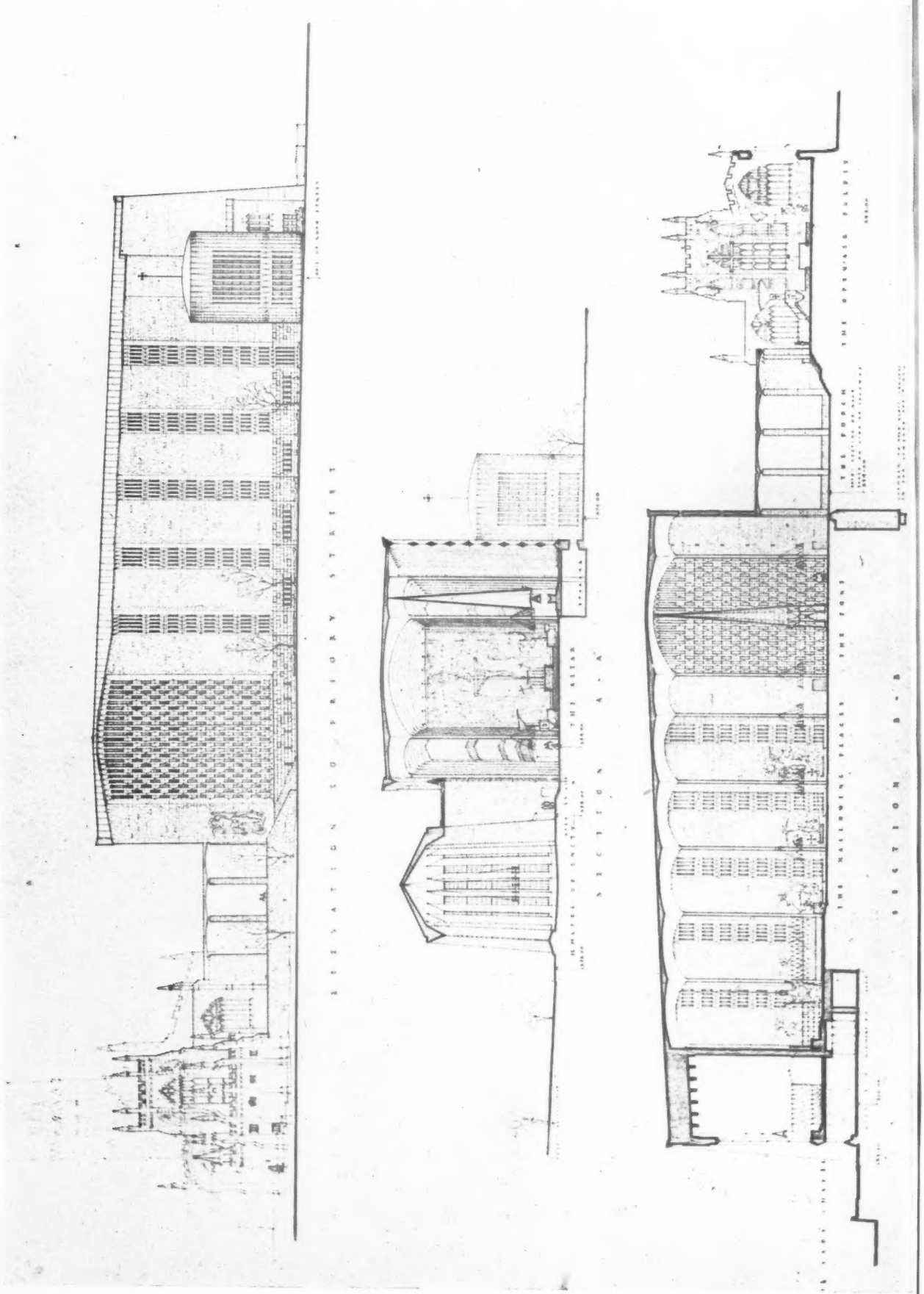
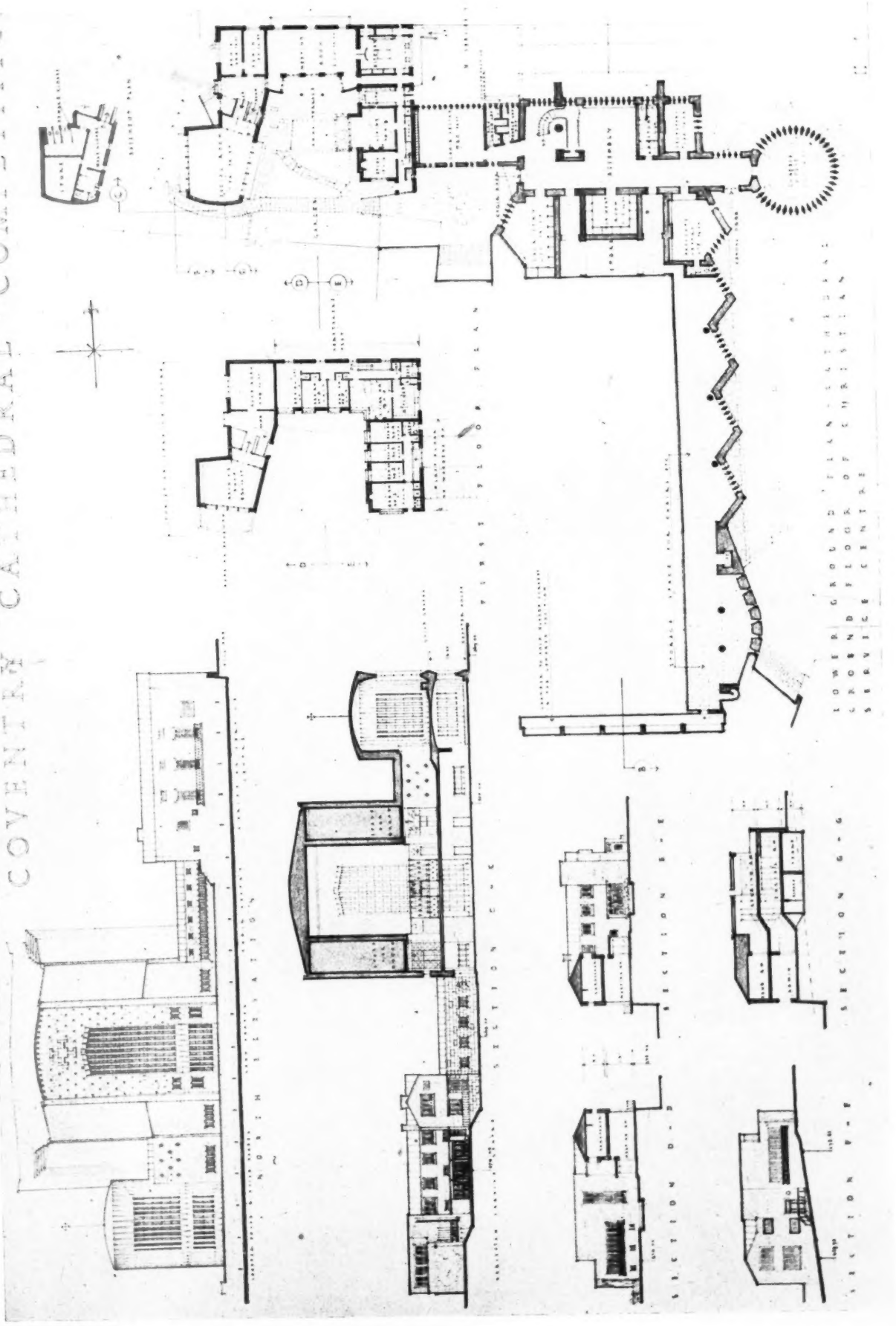
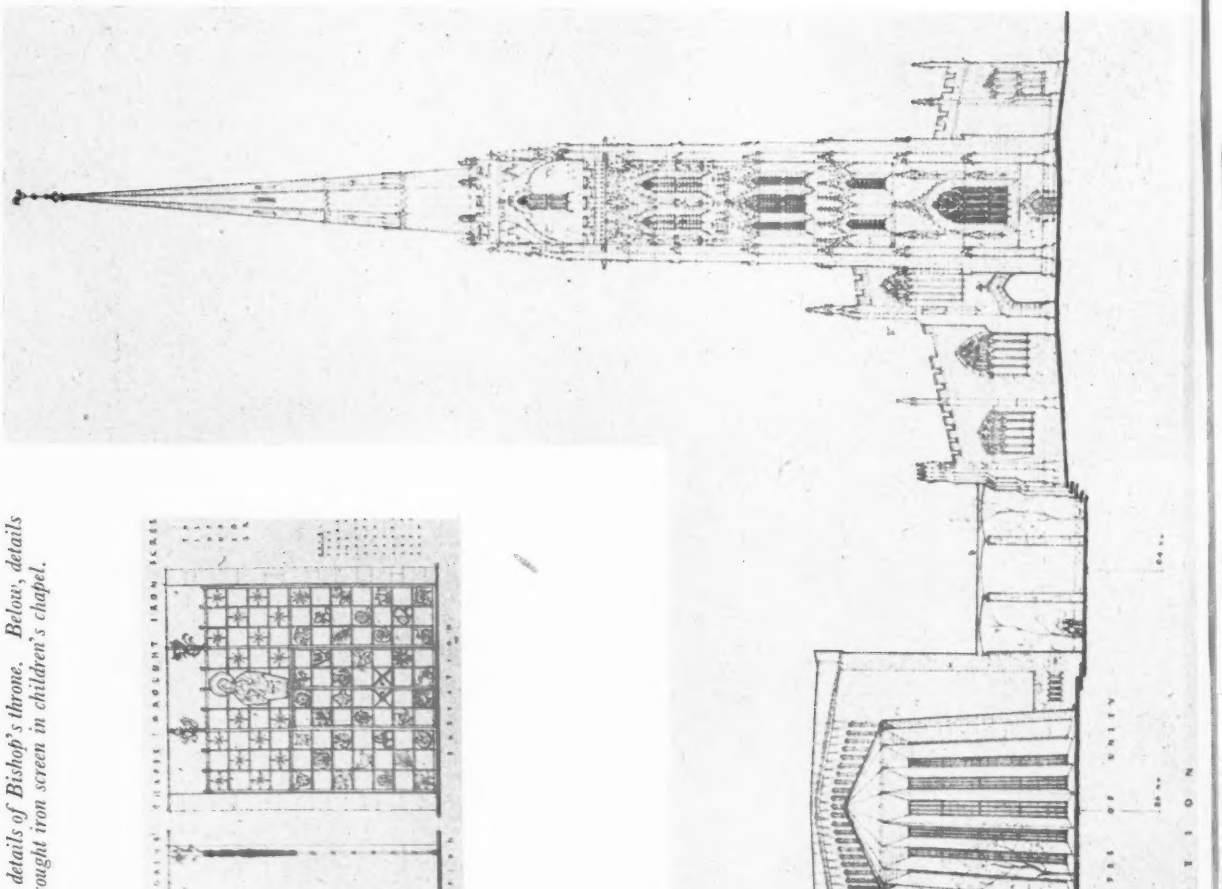
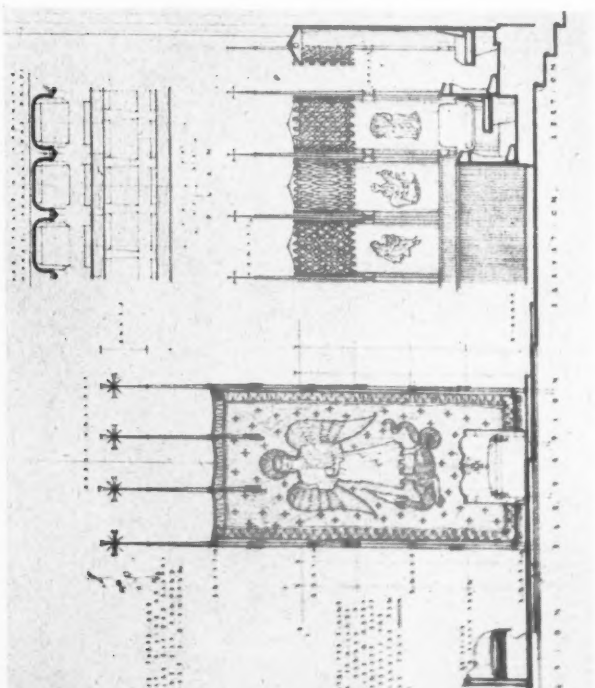



ELEVATION TO PRIORY STREET
SECTION A-A
SECTION B-B


COVENTRY CATHEDRAL COMPETITIO
LOWER GROUND PLAN
GROUND FLOOR PLAN
SECTION A-A
SECTION B-B
SECTION C-C
SECTION D-D
SECTION E-E
SECTION F-F
SECTION G-G



Left, details of Bishop's throne. Below, details of wrought iron screen in children's chapel.



COMPETITIONS

Coventry Cathedral

The first prize of £2,000 in the competition for a new Coventry Cathedral, sponsored by the Coventry Cathedral Reconstruction Committee, has been awarded to Basil Spence of Edinburgh; the second prize of £1,500 to W. P. Hunt of Cambridge; and the third prize of £1,000 to A. D. Kirby of Swindon. The assessors were Sir Percy Thomas, Edward Maufe and Howard Robertson. Two hundred and nineteen designs were submitted. Special commendations were given to designs by Rolf Hellberg and Tischler & Hildebrand. Designs by the following were also commended: A. D. Cordiner; D. A. Lumsden & H. Gibberd, A. E. Richardson, E. A. S. Houfe, S. P. A. Holland and J. R. Stammers; Terence Carr; the Peter Dunham Group (Peter Dunham, Macfarlane Widdup, Gurney Burgess and M. C. Harrison); G. Charlewood & Alan Fitch; and T. Mellor & J. A. Ashworth. Concerning the design by Rolf Hellberg, the assessors said it had great merit, an inspiring interior and an original and interesting conception of structure. Unfortunately, failure adequately to comply with certain of the planning conditions, precluded it from being considered for an award. Of the design by Tischler & Hildebrand, the assessors remarked on its well devised scheme, carefully worked out in detail with attractive features, but noted its lack of architectural character and atmosphere essential to a cathedral. The assessors concluded that the other seven designs showed considerable merit and presented special points of interest. Among the remaining 207 entries, the majority of competitors found the problem a difficult one, and a large number failed to appreciate the requirements. Many were able to produce satisfactory plans but few were able to build these up to form satisfactory cathedrals.

All the designs submitted in the competition will be on exhibition at the King Henry VIII School, Warwick Road, Coventry until Saturday next.

From August 29 until September 8, the first, second, third and the two highly commended designs will be exhibited at the Building Centre, 9, Conduit Street, W.1.

South Shields

The first prize of £500 in the competition for a proposed Marine and Technical College at South Shields, sponsored by the

TOWN PLANNING EXHIBITION AT PETERLEE

As a contribution to the FOB the Peterlee Development Corporation is holding a town planning exhibition at Shotton Hall, Co. Durham. The object of the exhibition, which was designed by J. I. S. Gray, is to show the people of south-east Durham why and how a new town is being built. The exhibition shell and the centre partition consists almost entirely of uncut 8-ft. by 4-ft. hardboard sheets. The first section illustrates the need for the new town, a new district centre and for alternative forms of employment to coalmining. Models and maps show coal workings and the planning difficulties which are encountered due to subsiding land. On the right of the photograph immediately below, a map shows how land for building will become available in stages during the next fourteen years. The bottom photograph shows the final section which

deals with the master plan, plans for the town centre and ward centres, together with schemes for windbreaking and landscaping. To coincide with the exhibition, the Corporation has arranged for two of its one hundred completed houses and flats to be furnished and decorated by a representative of the CID and shown to the public.

county borough of South Shields, has been awarded to Meade, Taylor & Wilson of London; the second prize of £250 to C. W. H. Wright of Folkestone; the third prize of £150 to Harris & Gard of Birmingham. Those commended were A. G. Price and Mitchell & Radford.

The following is the assessor's report in full: "I have to report that I have now completed a very careful examination of the 17 designs submitted by competitors. Although the entry is not large, I would like to congratulate the council upon receiving so many brilliant solutions to the difficult problem which was set."

For first winning designs see page 230.

Eisteddfod of Wales, 1951

The first prize of £25 in the architectural competition in the Arts and Crafts section of the Royal National Eisteddfod of Wales has been awarded to E. Langford Lewis, the second prize of £15 to I. F. Lewis, and the third prize of £10 to L. A. Williams. The subject set was: A home (or homes) for 20 or 30 elderly people to include rooms for various social activities. For winning designs see page 228.

LONDON AIRPORT

Misha Black to Advise on Design of Equipment

Misha Black has been appointed to advise BOAC on the design of the equipment which will be housed in their Central Maintenance Base now being constructed at London Airport.

This arrangement includes the detailed design of individual units such as instrument repair benches, the visual co-ordination of test equipment and requires a close collaboration with BOAC staff on the planning of the workshops. This is probably the first time in Great Britain that an industrial designer has been retained to advise on the visual implications of the technical planning of workshops and ancillary services.

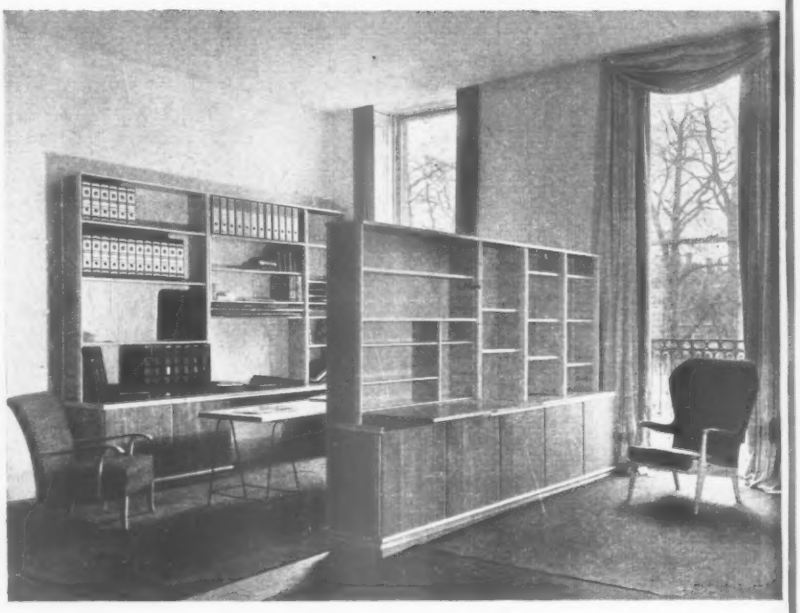
RIBA

Maintenance Scholarships

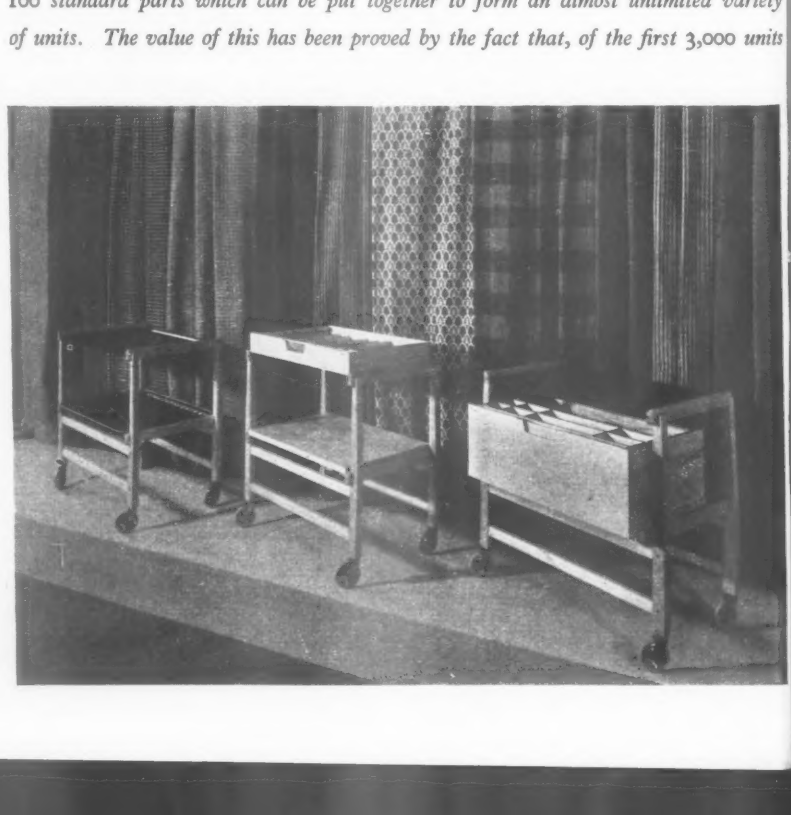
The RIBA announce that the following maintenance scholarships in architecture have been awarded for the year 1951-1952. Four RIBA Houston Maintenance Scholarships to: Duncan S. Bremner, Bryon E. Clack, Alexander G. H. Morrow and William B. Sidnell.

The Maintenance Scholarships previously awarded to the following candidates have been renewed:—J. F. Vergette (Welsh School of Architecture, The Technical College, Cardiff—Howe Green 4th and 5th Year Maintenance Scholarship of £40 per annum); C. E. I. Nops (RIBA 4th and 5th Year Maintenance Scholarship of £60 per annum); A. G. Diprose (Ralph Knott Memorial Maintenance Scholarship of £45 per annum); Geoffrey Hill (Leeds School of Architecture—Hartley Hogarth Maintenance Scholarship of £21 per annum); J. B. Crowther (Welsh School of Architecture, The Technical College, Cardiff—RIBA Houston Maintenance Scholarship of £125 per annum); D. G. Potter (School of Architecture, The Polytechnic, Regent Street, London—RIBA Houston Maintenance Scholarship of £125 per annum); H. R. Brady (Bartlett School of Architecture, University of London—*The Builder* Maintenance Scholarship of £68 per annum).

EXHIBITION OF SWEDISH UN



An exhibition was held recently at No. 7, Bedford Square, of textiles designed by Mme. Gullberg and unit furniture designed by her son, Johan Gullberg. M. Gullberg has an unusual attitude to the subject of furniture design. He believes that furniture should be impersonal—"part of the background"—just as the walls, doors and windows of a room are. And he claims that his furniture, because it is designed in this way, is equally suitable for homes, shops or offices. That is not to say that he is a functionalist—much attention has been paid to the proportions of the units and to the design of the few simple mouldings of the framing—but M. Gullberg does not wish his furniture to "force itself on the attention." The furniture is prefabricated in Sweden in a highly mechanized factory using semi-skilled labour. These are roughly 100 standard parts which can be put together to form an almost unlimited variety of units. The value of this has been proved by the fact that, of the first 3,000 units



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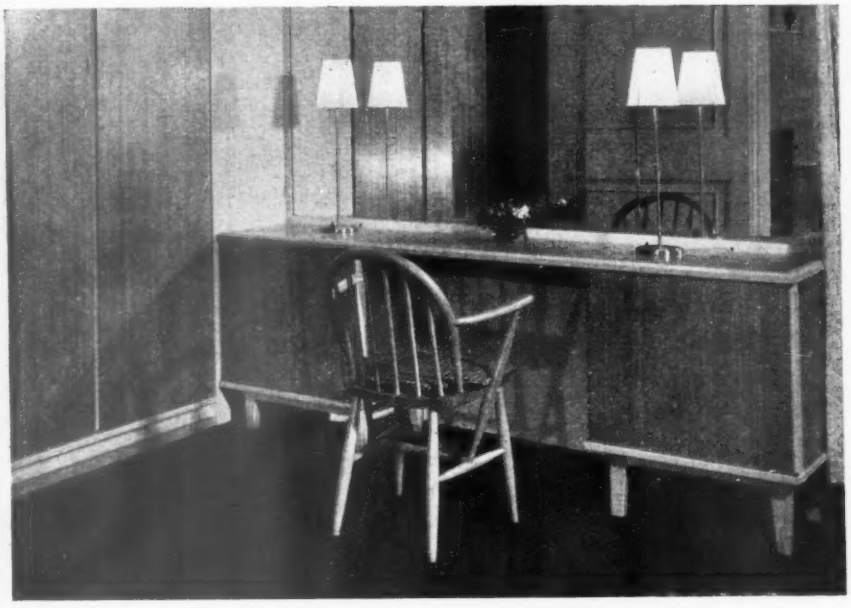
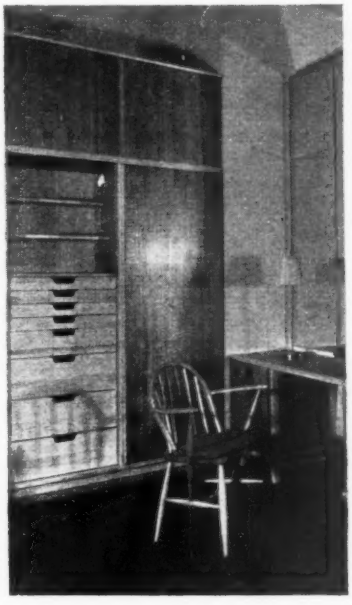
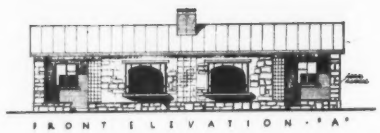
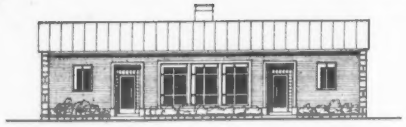
UNIT FURNITURE AND FABRICS



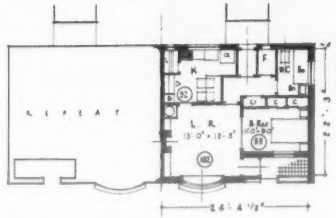


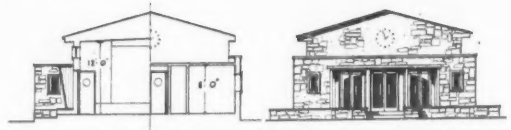
sold, all but five were different. Skilled craftsmen are required for assembly and the standard of finish is high. Two woods of contrasting hue are used, very lightly polished. Adjustable, pivot-type hinges and ball catches are used for the doors; these are fitted to all units so that doors can be installed even if not required in the first instance. The rebating of the doors and drawers eliminates the need for handles, thereby contributing towards the simplicity of the furniture's appearance. The vertical members have very shallow bearers, glued on under pressure, every 3 in. in height, so that any combination of drawers or shelves may be inserted at will. The layout at the exhibition suggested, firstly, an office (opposite page, top), secondly, a bedroom (above) and, thirdly, a dining room (right). The photograph at the bottom of the opposite page shows three prefabricated trolleys, sold in small parcels about 30 in. by 20 in. by 2 in. to be assembled by the purchaser. These trolleys, each adapted for a different purpose, are shown against a background of eleven of Mme. Gullberg's fabrics, the originals of which she weaves on a hand loom. Many of these are now being manufactured in England and are sold at reasonably low prices, but the unit furniture is not, at present, available in this country, although it is hoped that it will be soon. (N.B. The chairs have no connection with the exhibition; they were solely for the convenience of visitors.)

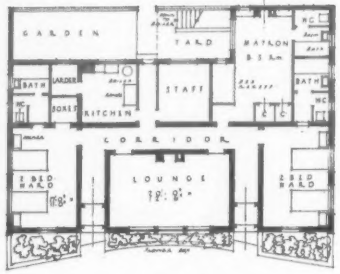




TYPE 'A'
2 PERSON
BED-RECESS

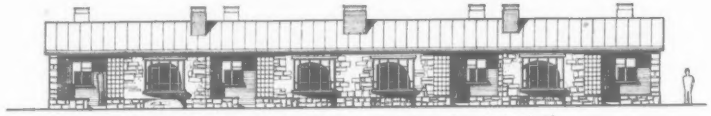




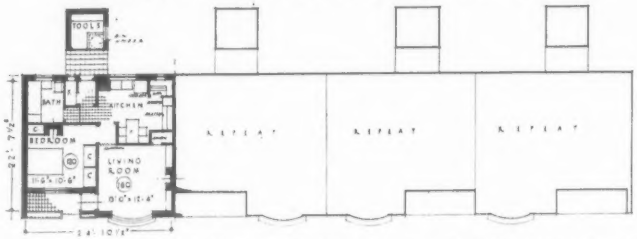


PLAN

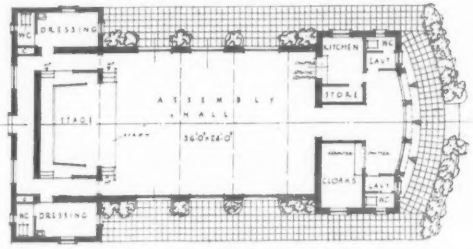
NURSING COTTAGE



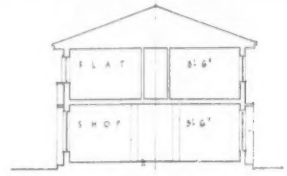
ASSEMBLY HALL

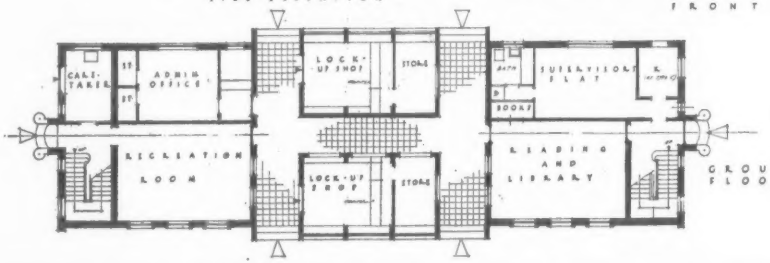


TYPE 'B' - 2 PERSON - TOTAL AREA (incl Porches) 560 sq ft

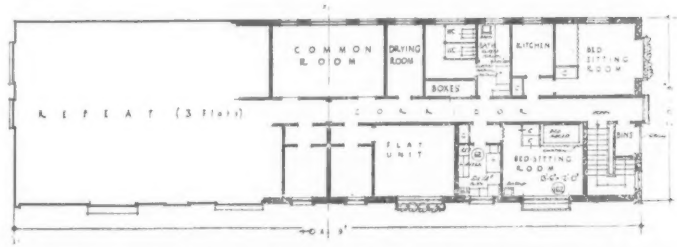


PLAN OF ASSEMBLY HALL





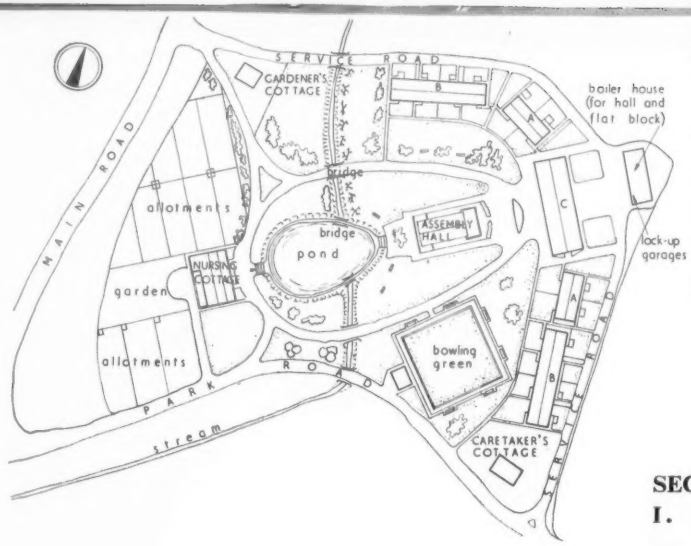
TYPE 'C'
FLATS FOR
SINGLE PERSONS



ROYAL NATIONAL EISTEDDFOD COMPETITION

FIRST PRIZE: E. LANGFORD LEWIS (above and left)

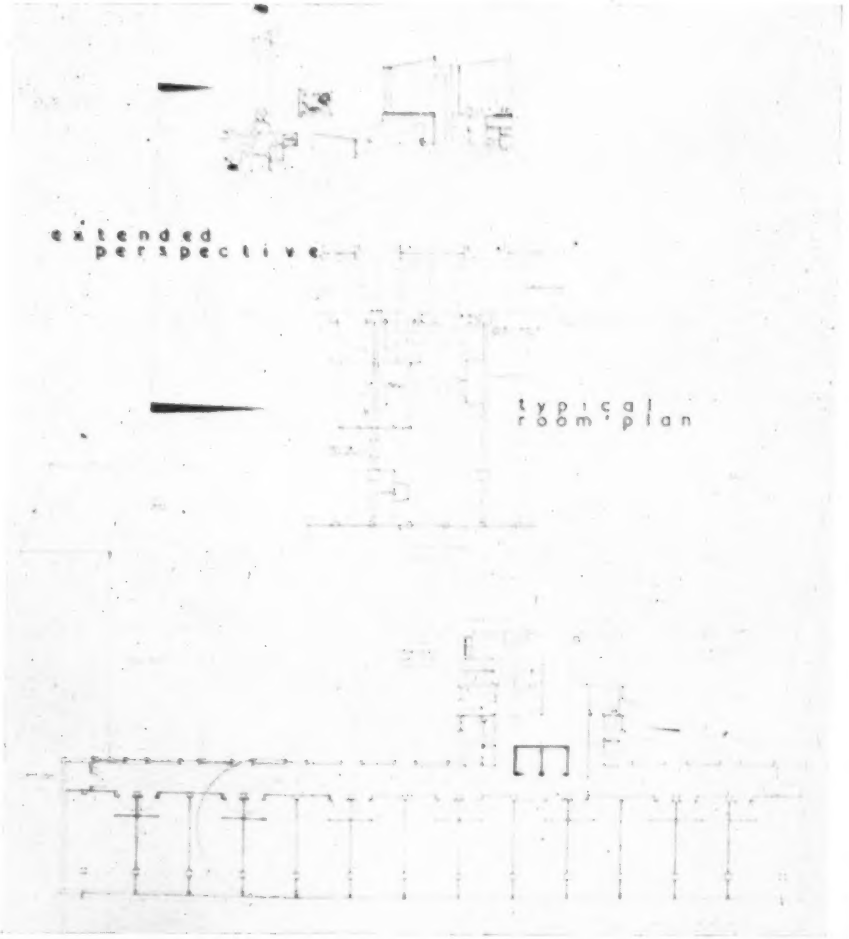
The subject for the competition was: A home (or homes) for 20 or 30 elderly people, to include rooms for various social



ROYAL NATIONAL EISTEDDFOD COMPETITION

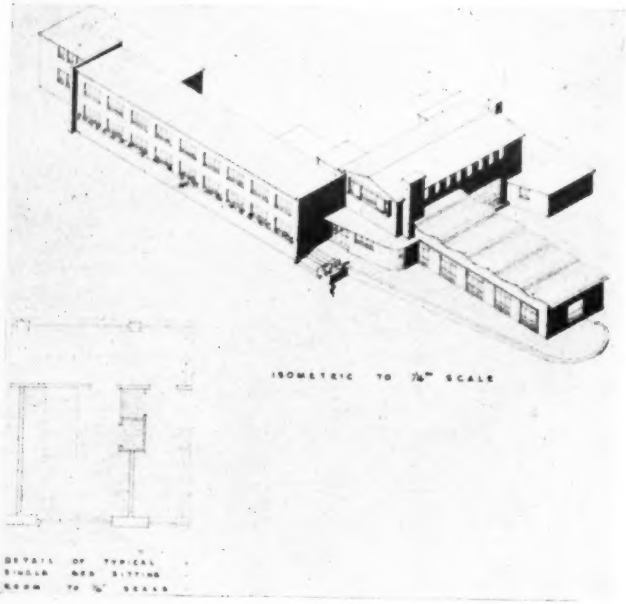
FIRST PRIZE: E. LANGFORD LEWIS (above and left)

The subject for the competition was: A home (or homes) for 20 or 30 elderly people, to include rooms for various social activities. The assessor was John Hughes and the prizes awarded were: first prize £25; second prize £15; third prize £10. The site for the competition had a southerly aspect in pleasant natural surroundings, including a stream. Regard had to be given to the recommendations contained in the Housing Manual. In his report the assessor commended the grouping of the first prize design. Accommodation is in 5 separate blocks, together with assembly hall and nursing cottage. The elevations are mainly in local stone.



SECOND PRIZE: I. F. LEWIS

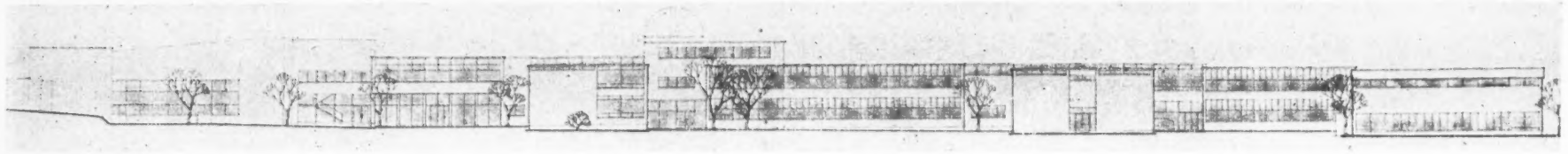
The assessor said the design did not convey a domestic building where people lived. The bed-sitting rooms have central heating, and no fireplaces.



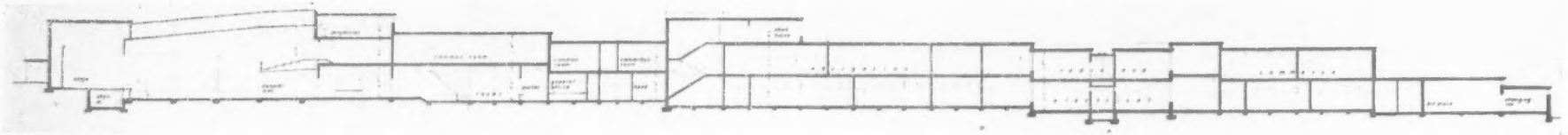
THIRD PRIZE: L. A. WILLIAMS

The block is in three storeys, which the assessor thought was a disadvantage for elderly people. Too much window space is provided in the bed-sitting rooms.

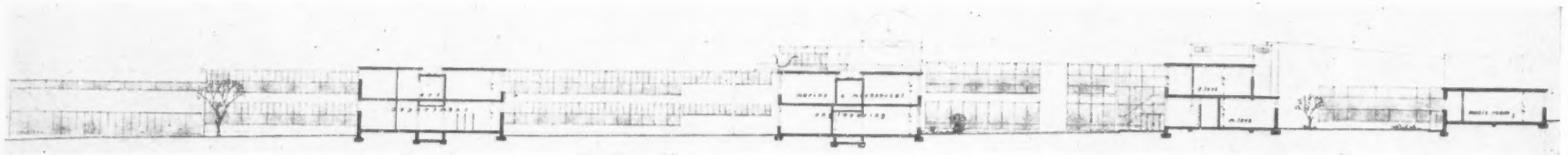
MARINE AND TECHNICAL COLLEGE, SOUTH SHIELDS: FIRST WINNING DESIGN



South-west elevation



Section A-A



Section B-B

Section C-C

Following is an account of the first prize-winning design by its authors, Meade, Taylor and Wilson, of London. (See page 225 for further details):—

The main entrance and approach way is located opposite the future road which connects with the Sunderland road and the service road is constructed round the north and east perimeter of the site where it serves kitchens, workshops and boiler houses. The first stage is planned in one connected group which can be extended in the second stage with the minimum of interference to the work and running of the college. The second stage development takes the form of separate wings for each department each of which can if necessary be built in separate stages and yet still be attached to the first group. The centre hall is a general purpose hall with its own lavatory and cloakroom accommodation and is designed so it may be closed off from the main college and made available for cultural activities in the town. The other elements with a social function, *i.e.*, common rooms and refectory are grouped near it. The main source of noise, the workshop area, is placed as far from the classrooms as possible and is buffered from them by a corridor and a Hydraulic and Naval architectural building. It was not found necessary to exceed two storeys in order to fulfil the requirements of the college and since it appears from the conditions that this would be preferred no third storey is provided except for the observatory, one caretaker's flat, floor and the projection room. A rigid structural steel frame is recommended as being the most economical in materials and the most suitable for the particular conditions on this site with the possibility of subsidence. The building is designed to stand on a series of reinforced rafts which are strengthened by beams and ribs to withstand collapse of the surface formation. The standard structural bay is 9 ft. 8 in. in width (centre to centre of columns) with a clear room width of 21 ft. The area is arranged with centre mullion between columns to allow flexibility for repositioning partitions in the future if required. The workshops are a standard width of 50 ft. with north light bays of 15 ft. 3 in. External walls in general consist of an outer leaf of 4½ in. facing bricks and an inner leaf of firm slag or cellular concrete blocks. The floors and roof are of hollow tiles or precast concrete slabs. Classrooms and the workshops and laboratories are finished with plaster or fair face brickwork and floors are of fleximers or thermo-plastic tiles. A low temperature hot water heating system is provided with sub-floor heating by embedded steel coils. Surfaces to laboratories, practical rooms and other work rooms are housed in horizontal ducts in corridor floors with access panels in the floors. Economic considerations necessitate a very limited scale of landscaping and planning and will be mainly confined to areas round the main entrance. If it appears from the plans that such limits are exceeded, *e.g.*, centre hall patio, this has been done more with the intention of showing what could be done if funds were available. In the main, lawns, trees and shrubs are relied on to provide an attractive setting for the buildings.

MARINE AND TECHNICAL COLLEGE, SOUTH SHIELDS: FIRST WINNING DESIGN

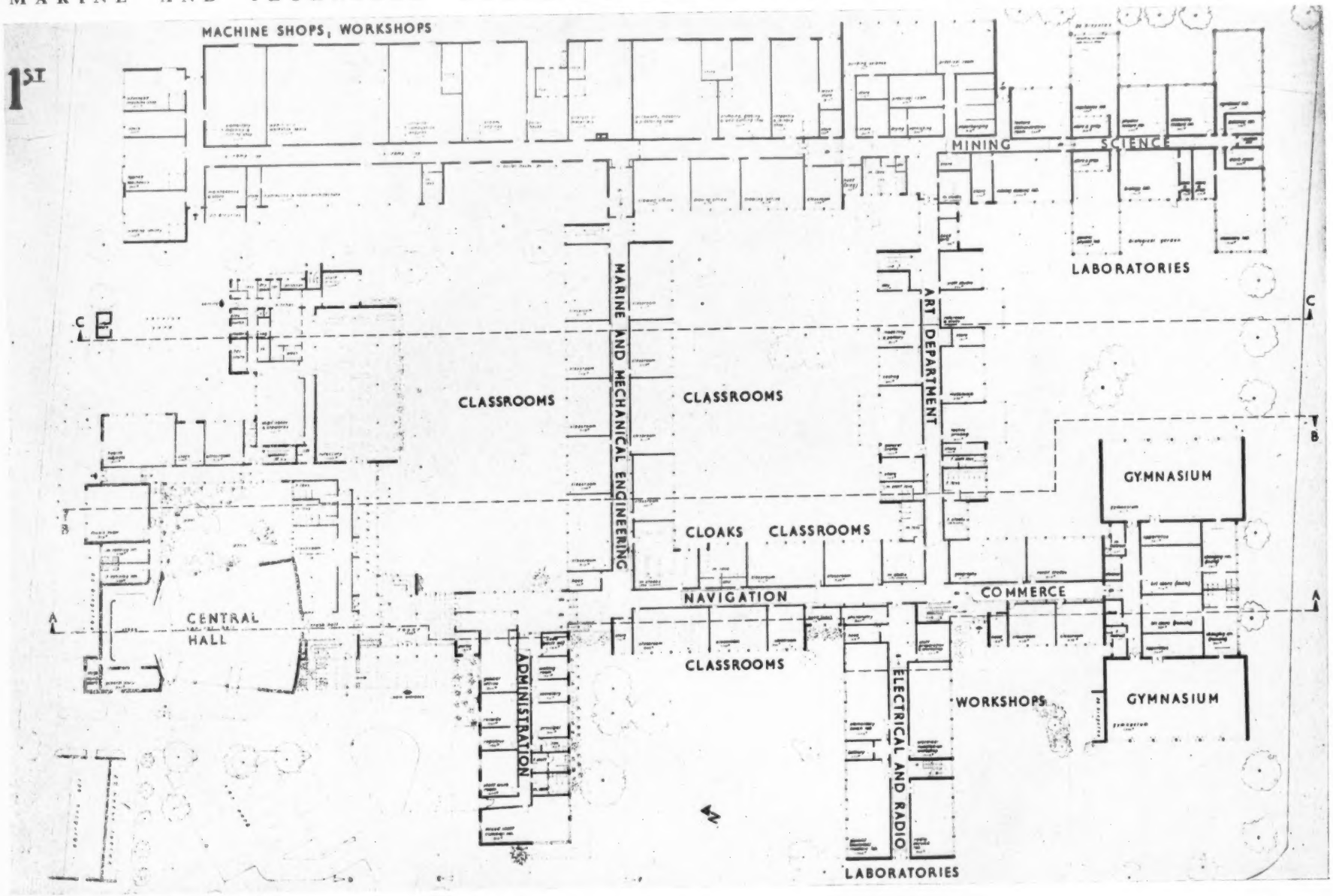
built in separate stages and yet still be attached to the first group. The centre hall is a general

the projection room. A rigid structural steel frame is recommended as being the most

The floors and roof are of hollow tiles or pre-cast concrete slabs. Classrooms and the work-

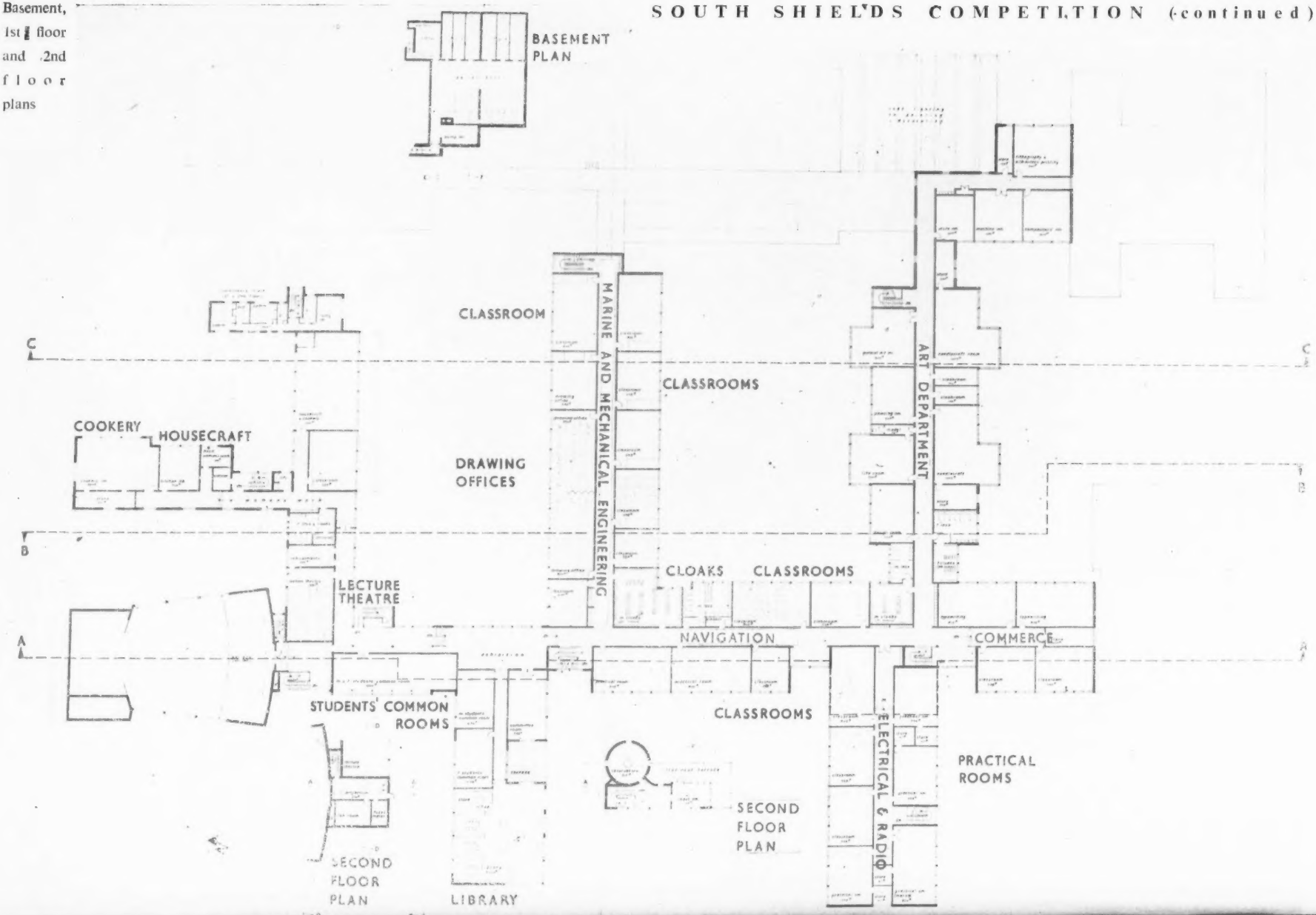
an attractive setting for the buildings.

MARINE AND TECHNICAL COLLEGE, SOUTH SHIELDS: FIRST WINNING DESIGN



Ground Floor Plan (Relettered, in part.)

Basement, 1st & 2nd floor plans



FLOOR PLAN

LIBRARY

BUILDING BOARD | GENERAL DATA

The Architects' Journal Library of Information Sheets 325. Editor : Cotterell Butler, A.R.I.B.A.

REVISED 23.8.51

TRADE NAME	DESCRIPTION AND APPLICATIONS	THICKNESS	WEIGHT PER SQ. FT.	STANDARD SIZES
Lloyd insulating board	made from long, tough wood fibres—cellular construction internal use only for sound and heat insulation	½ in.	0·7 lb.	6 ft., 8 ft., 9 ft., 10 ft., 12 ft. and 14 ft. long x 4 ft. wide
Lloyd building board	similar material to insulating board but thinner internal use only for sound and heat insulation	5/16 in.	0·45 lb.	6 ft., 8 ft., 9 ft., 10 ft., 12 ft. and 14 ft. long x 4 ft. wide
Lloyd medium hardboard	made from long, tough wood fibres into a homogeneous material having a high strength / weight ratio internal use for furniture and fittings, panels and linings generally	4 mm. (5/32 in.) 6 mm. (¼ in.) 8 mm. (5/16 in.) 10 mm. (⅜ in.) 12 mm. (½ in.)	0·6 lb. 0·8 lb. 0·9 lb. 1·05 lb. 1·2 lb.	8 ft. long x 5 ft. wide
Lloyd hardboard	a highly compressed fibre board of greater strength than medium hardboard for internal use only	⅛ in. 3/16 in.	0·68 lb. 0·90 lb.	8 ft. long x 5 ft. wide
Lignatex	as for Lloyd hardboard	⅛ in. 3/16 in.	0·75 lb. 0·95 lb.	6 ft., 8 ft., 9 ft., 10 ft. and 12 ft. long x 4 ft. wide
Lloyd super hardboard	similar material to hardboard but hardened by a special process to give superior strength and surface internal or external use for concrete form lining, floor covering etc.	⅛ in. 3/16 in.	0·68 lb. 0·90 lb.	8 ft. long x 5 ft. wide
Lloyd bituminous board	similar material to insulating board but with a bituminous coating applied to the fibres before they are manufactured in board form internal or external use in damp and/or unventilated spaces eg. cellars, roof sarking, concrete work and for expansion joints	⅜ in. ½ in.	0·6 lb. 0·75 lb.	6 ft. long x 4 ft. wide or in strips of specified width for expansion joints

LLOYD BOARDS: RANGE, STANDARD SIZES AND TYPICAL APPLICATIONS.
Compiled by C.W. Glover and Partners for Bowater Building Boards Limited.

15.B1 LLOYD BOARDS : RANGE, STANDARD SIZES AND TYPICAL APPLICATIONS

This Sheet tabulates the range of Lloyd building and insulating boards and gives standard sizes, properties and typical applications for each type.

Lloyd insulating boards have a low thermal transmission value (conductivity k = 0·34 B.Th.U./sq. ft./hr./1° F./1 in. thickness) and high sound absorption value. The sound absorption coefficient is 0·35 (average) on 2 in. by 1 in. nominal battens at 1 ft. 4 in. centres. As a base for plaster these boards minimise drumming. The following tables give the results of tests carried out at the National Physical Laboratory:

TABLE 1.
SOUND ABSORPTION COEFFICIENTS OF LLOYD INSULATING BOARD. REPORT S.258—18th JANUARY, 1935.

Material as tested.	Absorption coefficients (to nearest 0·05) for frequency bands in region (cycles per second).			
	250	500	1,000	2,000
Insulating board ½ in. thick approx. Nailed to 1¾ in. by ⅞ in. vertical battens on 16 in. centres, and 1⅞ in. by ⅞ in. horizontal battens on 10 ft. centres. Nails spaced at 4 in. centres round edges of boards, and at 8 in. centres on remaining battens.	0·40	0·35	0·35	0·40

TABLE 2.
OF THE TRANSMISSION OF AIR-BORNE SOUND THROUGH A SAMPLE OF LLOYD ½ in. INSULATING BOARD. REPORT S.258—23rd JANUARY, 1935.

Description.	Frequency (cycles per second).	Sound reduction factor (R).	Sound reduction in decibels ($10 \log_{10} R$)
Insulating board, ½ in. thick. Weight 0·77 lb. per sq. ft.	200	80	19
	300	160	22
	500	160	22
	700	125	21
	1,000	1,600	32
	1,600	2,000	33
	2,000	1,250	31
	4,000	2,500	34

TABLE 3.
ON THE THERMAL CONDUCTIVITY OF A SAMPLE OF LLOYD ½ in. INSULATING BOARD. REPORT No. H.1496—PHYSICS DEPT.—29th JANUARY, 1935. Insulating Board (approximate density 16½ lb. per cu. ft.).

Cold face temperature.		Hot face temperature.		Thermal conductivity.	
				Gram. cals. per sq. cm. per second for 1 cm. thickness and 1° C. difference in temperature.	B.Th.U. per sq. ft. per hour for 1 in. thickness and 1° F. difference in temperature.
°C.	°F.	°C.	°F.		
18	64	30	86	0·00012	0·34

Lloyd building boards : The texture and density of these boards is equivalent to that of the insulating board and the thermal conductivity is the same.

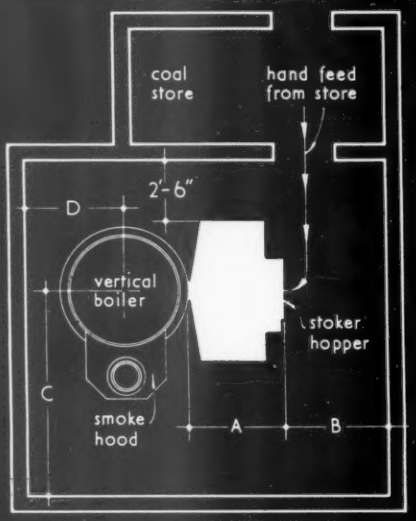
Lloyd hardboards have a higher resistance to moisture penetration than insulating board. One surface of these boards is smooth and requires no finishing treatment, the other is textured. To ensure dimensional stability, hardboards should be kept on site as long as possible before fixing—under conditions as similar as possible to their final environment.

Lloyd bituminous boards are moisture-proof and will not rot. They may be painted, distempered or plastered if adequately primed with a petrifying liquid and an undercoat appropriate to the finish. Under normal conditions of use exposure to heat does not cause bleeding.

This Series of Sheets on Lloyd boards covers general data, applications, fixing, thermal and sound insulation.

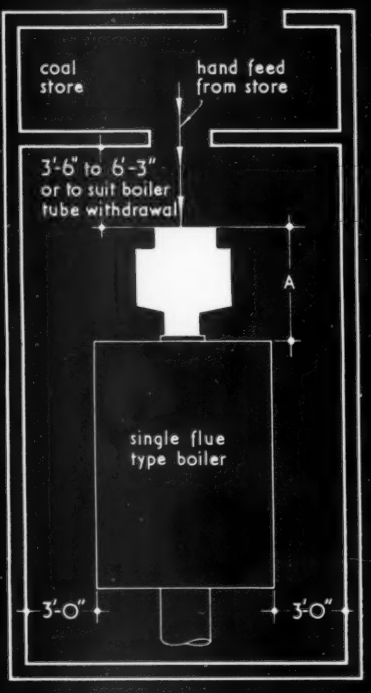
Compiled from information supplied by :

Bowaters Building Boards Limited.
Address : Harewood House, Hanover Square, London, W.1.
Telephone : Mayfair 9266.
Irish Wallboard Co., Limited.
Address : Athy, County Kildare.
Telephone : Athy 80.



model	boiler rating B.Th.U/hr	A	B	C	D
10	3,750,000	5'-2¼"	4'-6"	10'-6"	6'-3"
11	5,250,000	5'-2¼"	4'-6"	12'-0"	6'-9"
12	7,500,000	5'-3¾"	5'-0"	14'-0"	7'-6"
12A	9,000,000	5'-3¾"	5'-0"	14'-0"	7'-6"

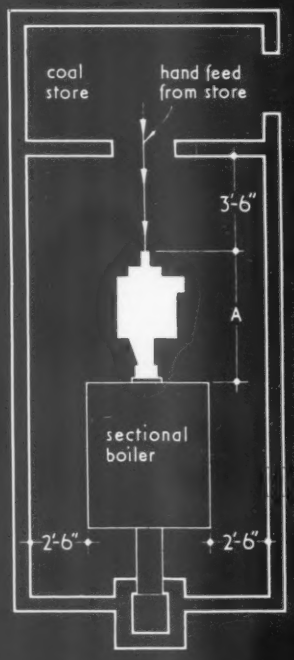
● INDUSTRIAL ROBOT.



CLASS B SELF-CONTAINED.

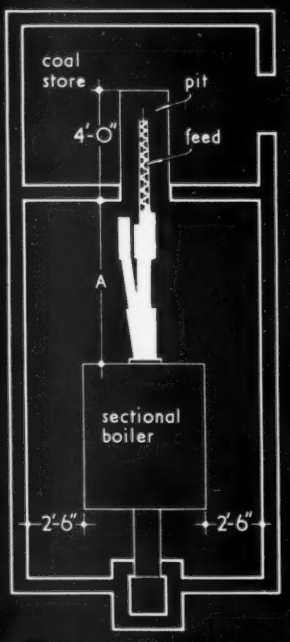
note: dimension A is given in each case for standard stokers

model	boiler rating B.Th.U/hr	A
B1	2,575,000	4'-6"
B3	3,525,000	4'-6"
B5	5,075,000	4'-8"
B7	6,625,000	4'-8"
B9	9,350,000	5'-1"



ROBOT.

model	boiler rating B.Th.U/hr	A
BABY ROBOT	100,000	3'-3"
1	200,000	5'-0"
2	325,000	5'-0"
3	410,000	5'-4"
4	625,000	5'-8"
5	825,000	5'-11"
6	1,000,000	5'-11"
6A	1,200,000	5'-11"
7	1,400,000	6'-5"
8	2,000,000	6'-5"
9	2,700,000	6'-5"



DIREKTO.

model	boiler rating B.Th.U/hr	A	
		b	c
1	200,000	6'-6¾"	7'-1¾"
2	325,000	6'-6¾"	7'-1¾"
3	410,000	6'-0¾"	6'-7¾"
4	625,000	6'-5"	7'-5"
5	825,000	7'-2½"	8'-5½"
6	1,000,000	7'-2½"	8'-5½"
6A	1,200,000	7'-3¼"	9'-0¼"
7	1,400,000	7'-3¼"	9'-0¼"
8	2,000,000	7'-0¾"	8'-11¾"
9	2,700,000	7'-6¾"	9'-5¾"

b = minimum
c = recommended minimum

RILEY STOKERS: LAYOUT DIMENSIONS FOR TYPICAL INSTALLATIONS.

Manufacturer: Riley Stoker Co. Ltd.

29.J11 RILEY STOKERS : LAYOUT DIMENSIONS FOR TYPICAL INSTALLATIONS

This Sheet gives layout dimensions for Riley stokers feeding various types of boiler of capacities from 100,000 B.Th.U./hr. to 9,000,000 B.Th.U./hr. For full details of the operation and general design of the stokers see Sheet 29.J10.

Applications

The diagrams on the face of this Sheet show the types of boiler to which these stokers are generally fitted. Each stoker, however, may be fitted to boilers other than the particular type shown and, in addition, to billet and ingot heating furnaces, annealing furnaces, core-drying ovens, bakers' ovens, etc.

Compiled from information supplied by :

Riley Stoker Co., Ltd.
Address : 19, Woburn Place, London, W.C.1.
Telephone : Terminus 2622.
Telegrams : Ristokers, Westcent, London.

INFORMATION CENTRE · INFORMATION SHEETS
QUESTIONS AND ANSWERS · CURRENT TECHNIQUE
THE INDUSTRY · PRICES · TECHNICAL ARTICLES

TECHNICAL SECTION

The cracking of concrete floor finishes is a common trouble, not prevented by the arbitrary use of expansion joints. The following article explains why this is so and how contraction joints should be placed.

THE PREVENTION OF CRACKS IN CONCRETE FLOOR FINISHES

Taking the whole range of finishes available, we find that concrete floor finishes in one form or another serve for a very great variety of purposes. One has on the one hand highly serviceable and hard wearing materials such as granolithic, and on the other, very handsome highly decorative materials such as terrazzo. Both kinds of finish are used in very large quantities and, on the whole, very successfully, but it is to be regretted that, in spite of a great deal of care in laying, there is in practice rather a lot of cracking. The purpose of this note is to suggest a slightly different approach to the problem of preventing cracks from that which is sometimes adopted.

The first requirement of concrete finishes for floors is that there should be a first-class bond between the finish and the supporting base. There has been a great deal written on this subject and the advice given is undoubtedly sound. If the bond between finish and base is not good, hollow areas and cracking will form and the relatively thin finish is almost certain to curl and break up. This is the type of failure which above all is to be avoided. It is not proposed to suggest here any modifications of the recognized methods of obtaining a good bond with the base. The subject has been well covered.

NORMAL METHOD OF CONTROLLING CRACKS

The normal method of controlling shrinkage cracking is to provide a system of contraction joints limiting the area of the finish in a way which experience has shown to be beneficial. Various methods of forming these joints are recognized and are well known. In the case of a solid concrete slab on the ground, very often without reinforcement, the problem is fairly easy because it is possible to provide contraction joints in the slab coincident with the joints in the finish. The concrete base and the finish then act as one and shrink as one, and, by judicious arrangement of the contraction joints, the shrinkage can be concentrated at the joints and so give freedom from crack formation elsewhere. However, in the case of suspended concrete floors and reinforced floors on the ground, it is not possible to provide contraction joints at the spacings which are often deemed desirable for concrete finishes, and it is the object of this note to show what should be done in such cases. It is quite fallacious to suppose that an arbitrary system of contraction joints formed in the finish alone, without relation to the supporting structural floor, will overcome the problem of crack formation. So often in practice, one sees an apparently excellent system of contraction joints, but the cracking has obstinately refused to follow the joints provided for it and has taken the form of large irregular cracks in different positions in the panels. Actually, if one reflects a little, one sees that it is inevitable that this should be so. The essential point is that although the finish and the structural floor are often provided by different sub-contractors, they act as one, and this means that the control of cracking in the finish can only be effective if it is related to the conditions existing in the structural base.

WHY CRACKS OCCUR

What are the conditions that matter? The concrete in the structural base is subject to constantly varying conditions of stress across the floor, due to the loads of the floor itself and anything supported on the floor. On the upper surfaces the stress condition will vary from high compression in the centre of the various spans to a considerable value of tension over the supporting members in continuous slabs. We know that in an efficiently designed floor, where ordinary steel reinforcement is working up to its full value, the concrete surrounding the steel is at or near its failing stress in tension, and the reinforced concrete designer accepts the possibility that there must be some cracking of the concrete in the zones of maximum tensile stress, *i.e.*, in the area immediately surrounding the steel. Provided the reinforcement is well distributed, such cracking is usually quite fine and it has not given rise to any troubles in practice.

Consider, now, what happens when we put on such a floor a finish which itself tries to shrink. It is restrained by adhesion to the concrete base and, as a result, it becomes highly stressed in tension. So what happens is that, if the stresses due to loading are tensile they are added to those due to shrinkage and cracking of the concrete ceases to be a possibility—it becomes a certainty. Conversely, if the stresses due to loading are compressive, the stresses due to shrinkage are subtracted from them and the resulting stress becomes innocuous. It is certain that cracking will occur where tensile stresses are greatest and that there will not be any cracking in the areas where compressive stresses are greatest.

ADHESION AND THE EFFECT OF "CREEP"

There are two main ways of laying concrete finishes. In order to obtain a good bond to the base the best results can be obtained if the floor layers follow closely after the gang concreting the structural slab, so that the finish is laid before the base has hardened. Where this practice is followed the finish and the base act together as one material and the finish must take its share of the stresses in the structural base. But it may be impracticable for the finishers to follow immediately after the concreting gang, or it may be some weeks before the finish is actually applied. During this time the shuttering will have been withdrawn and the structural floor slab will be supporting its full load. It might be argued that in such a case it is impossible for the finish to assume its share of stress due to loading. However, this is not true. It is known that for periods up to five years concrete undergoes progressive but decreasing "creep" or plastic flow under load. This is at its maximum during the concrete's early life but is appreciable up to an age of a year. Therefore, even if the application of the floor finish is deferred, the creep of the concrete will ultimately cause the finish to assume a share of the stresses due to loading, though, naturally, not its full share. There is also the superimposed load to be considered. This may not be present until the builders have left the building. There-

Case 1, slab simply supported over beams.

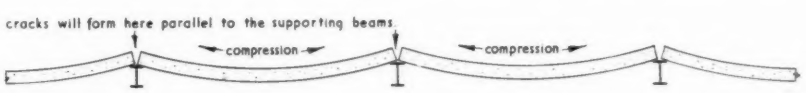


Fig. 1.

Case 2, slab continuous over supporting beams.

Fig. 2.

Case 3, slab continuous over secondary beams but not continuous over main beams.

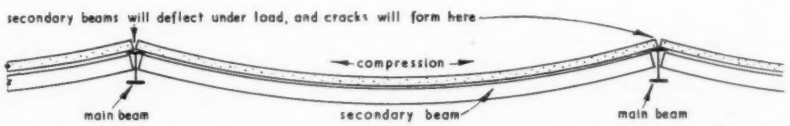


Fig. 3.

fore, whether the finish follows immediately the concreting of the structural base or not, it is still desirable to take the same precaution and to apply the same principles in laying out the contraction joints.

EXAMPLES

The simplest method of visualizing the disposition of contraction joints is to look at a few examples. As a rule a decision on the pattern of jointing at right angles to the axis of the span of the floors is relatively simple. It is not so easy, however, to decide where the joints should be placed parallel with the axis of the span.

Case 1 (Fig. 1) shows the simplest possible type of concrete floor—a plain slab, supported on beams, with bottom reinforcement only. This is, in effect, a series of simply-supported slabs, which will deflect in the manner shown. At mid span the concrete will be in compression on the top of the slab. Over the supports, due to the form of deflection, a crack is inevitable and, therefore, this is the point where the contraction joint must be introduced. In the other direction there is nothing in the structural floor system to determine where the crack should form, and contraction joints would be provided at suitable intervals to deal with drying shrinkage, which will be the main cause of crack formation. There is no reason why the supporting floor and the finish should not both be laid in bays with a contraction joint right through the thickness of the floor. One would be inclined to suggest that the contraction joints should be at roughly 10- to 15-ft. centres.

Case 2 (Fig. 2) shows the floor slab continuous over the secondary beams. It will be seen that the maximum tension in the upper surface occurs over each secondary beam. The centre of each span of the slab is in compression, so no cracks are likely to form in this area. The arrangement of the contraction joints should be as above. There must be a joint over every secondary beam.

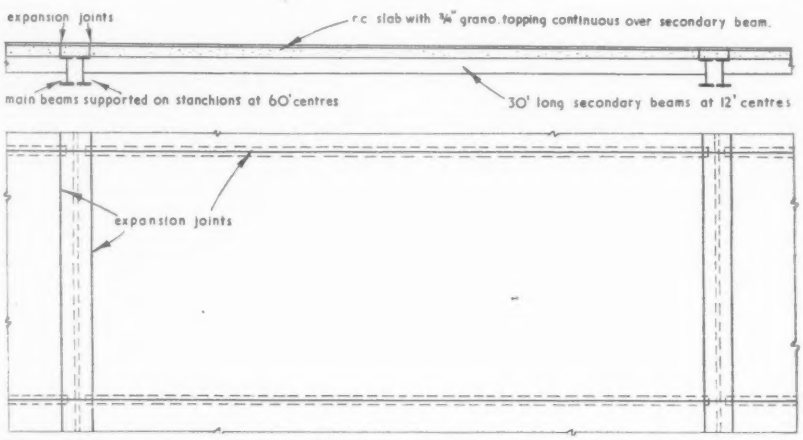
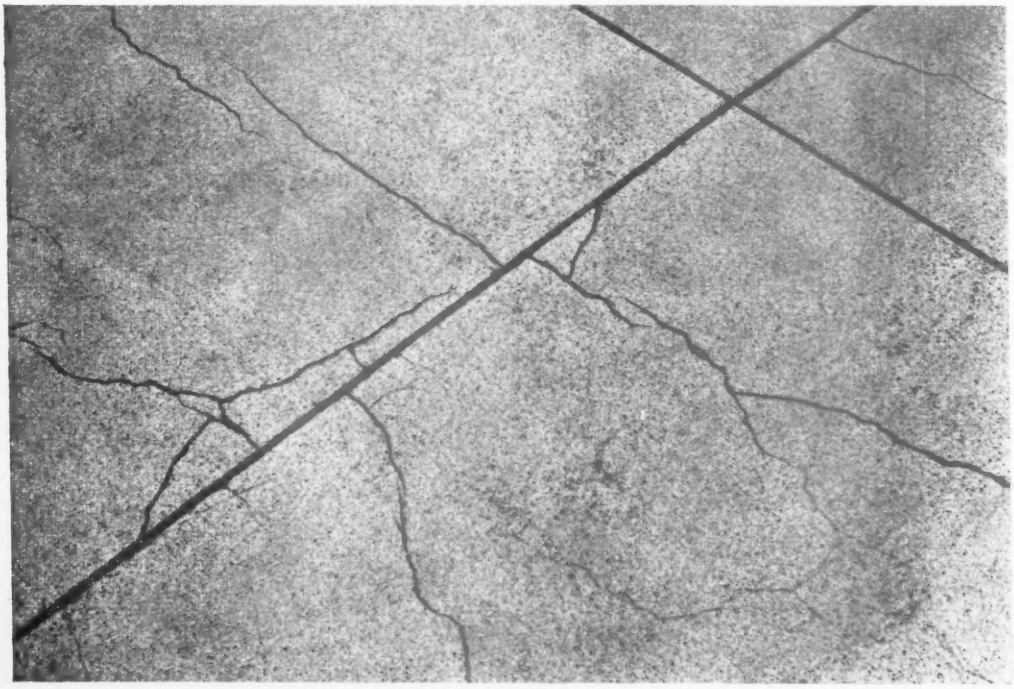


Fig. 4, the arrangement of "expansion" joints for a typical concrete floor slab carried on secondary beams and double main beams. The joints, correctly speaking, are for contraction. The word expansion is a misnomer.

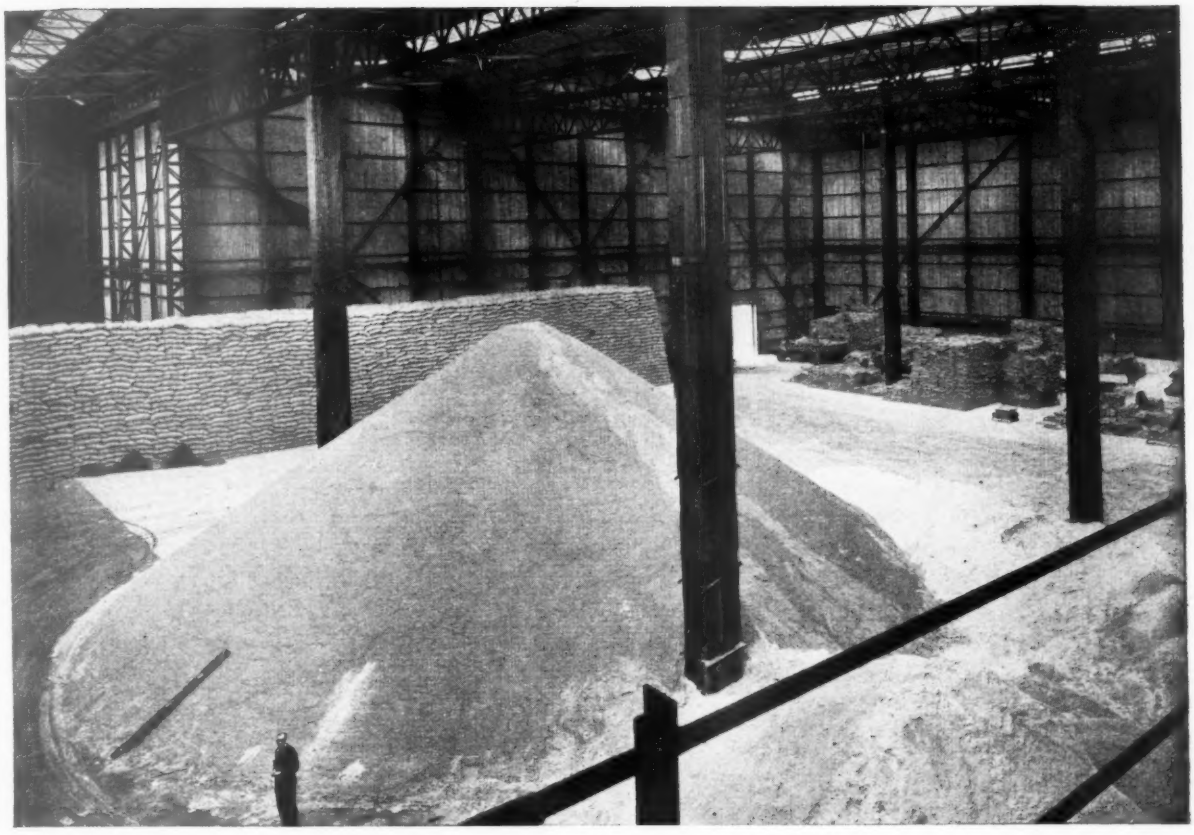
Case 3 (Fig. 3). This is a typical floor of an industrial building, where a concrete slab floor is designed as a continous member over a series of secondary beams, which in turn are supported on main beams. The deflections in the concrete slab and in the secondary beams will be as shown, and it will be necessary to provide a contraction joint over each of the main beams. In the other direction it will be seen that there is a zone of tensile stress in the surface of the slab over every secondary beam, and this is the position for the contraction joints. There is no advantage in putting contraction joints at mid-span, the floor is not going to crack there. Where the sign of the bending moment changes, which is at $\frac{1}{4}$ to $\frac{1}{5}$ of the span, the stress due to loading should be nil, and the shrinkage stresses alone are operative. As one approaches the centre of the span the compression stress increases and must be subtracted from the tensile stress due to shrinkage. It is open to doubt whether there would be any advantage in putting a contraction joint at the point of contraflexure and there is certainly no advantage in putting a joint anywhere in the middle of the span.

Fig. 4 shows the arrangement of contraction joints for a typical concrete floor slab carried on secondary beams and double main beams.

Clearly there are almost unlimited combinations of loading and arrangement of supports, but the principles above are capable of general application and are much more likely to give freedom from unwanted cracking than any system of jointing in the floor finish only, which fails to take account of the stress conditions in the structural floor underneath.



Typical cracking of terrazzo floor, where contraction joints have been placed arbitrarily.



A mountain of raw sugar lying on Messrs. Tate & Lyle's new warehouse floor at Thames Refinery kept dry by—

COLEMANOID

LIQUID WATERPROOFER & HARDENER

The floor of this Warehouse, which is within a few feet of the Thames, was constructed with Colemanoid in the mass concrete mix, so that in spite of its proximity to the river it is bone dry. Incidentally Colemanoid has been used for many years throughout Messrs. Tate and Lyle's factories in other Warehouses to ensure dry floors. For further details as to how Colemanoid can help you with your flooring, waterproofing, acid, oil and alkali problems, write to me.

Cecil Kahn

THE ADAMITE COMPANY LTD., Manfield House, Strand, W.C.2. Tem. Bar 6233/6

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INFORMATION CENTRE

8.27 surveying and specification
SPECIFICATION HEADINGS

Sequence of Trade Headings and Specification Items for Building Work. BS 685:1951 (British Standards Institution, 2s. 6d.)

Revised version of earlier BS. Quite a useful check list.

Specification writing, one tends to feel, is a thing based, above all else, on tradition. One would be pleased to find a really good mind attacking the subject in an entirely fresh way. This BS serves as a useful check list, while, at the same time, making one wonder why asphalt is sandwiched between drains and pavings, and plaster between metalwork and sheet metalwork. There is a careful note at the beginning saying that the BS does not purport to include all the items which may appear in a building specification as it has been prepared solely as a guide; in other words, you must still think of the difficult bits yourself and you have no complete check list covering those items which, because they are seldom met with, are most apt to be overlooked.

10.86 design : building types
HAY BARNS

All-steel Hay Barns with Curved Roofs. BS 1754:1951. (British Standards Institution, 2s.)

Standardizes bay dimensions but not heights. Describes materials, sizes of stanchions and types of roof sheeting and fixing. Painting. Note on concrete foundations.

10.87 design : building types
HOUSING

Housing Manual 1941. *Technical Appendices.* MOW and MOLGP. (HMSO, 1951. 2s.)

Enlarged and improved version of earlier document. Much valuable information, a good deal of which applies to other buildings as well as houses and flats.

This new version of the well known Technical Appendices contains a wealth of information on standards, materials and construction. A thorough knowledge of its contents is essential to all concerned with the design of small houses and flats, and much of it is useful also to those working other fields.

Two appendices, dealing with width of streets and with space standards of dwellings, were included in the 1949 Manual. The present appendices cover functional standards, materials and construction, finishes to walls and ceilings, heat installation, protection of plumbing against frost, electrical installations, small sewage disposal works, building costs and British Standards and British Standard Codes of Practice. The publication, which includes a good index, has 86 pages. It is written in a concise and direct manner and it is, therefore, impossible to summarize briefly. All concerned should buy and read the full document.

12.51 materials : metal
PAINTING

Practical Aspects of Protective Painting. John Hurst (Building Topics, July, 1951.)

The difficulty of following common recommendations for preparation of steel painting. Good common-sense article.

In this article the author discusses how difficult it is in practice to follow the methods which recent research has shown to be so desirable for the preparation of steel before painting. There is a useful description of mill scale and bloom which may help the inexperienced to recognize them. Methods of cleaning are discussed, including a new American grit-blasting outfit with vacuum attached for grit recovery.

Although the article leaves one feeling there is no really satisfactory practical answer at the moment, it does serve as a most useful warning—especially in drawing attention to the increased risks which are taken under present conditions when quick delivery of steel from mills to site makes the removal of scale more difficult.

13.71 materials : timber
FLOORING

Resistance to Wear of Muhuhu as Flooring. F. H. Armstrong. (Wood, June, 1951.)

Fourth of series on recently introduced hardwoods. Results of FPRL tests. Very hard wearing indeed, comparable to Rhodesian Teak and Rock Maple. Short lengths only available, therefore mainly suited for use in block form.

13.72 materials : timber
FLOORING

Resistance to Wear of Musine as Flooring. F. H. Armstrong. (Wood, July, 1951.)

Fifth of series of reports on FPRL tests. Wood comparable to Canadian birch showed smooth wearing and high resistance to abrasion. Can be used as strip or block, for heavy duty and other flooring.

14.47 materials: concrete
SLAG AGGREGATE IN REINFORCED CONCRETE

Reinforcement in Slag Concrete. (Concrete and Constructional Engineering, July, 1951, p. 224.)

Five-span reinforced concrete open spandrel arch bridge at Akron, Ohio, recently demolished, showed twisted square bar reinforcement in good condition after having been embedded in blast-furnace slag aggregate concrete for 35 years.

18.86 construction: theory
PRESTRESSED CONCRETE

Prestressed Concrete. Prof. G. Magnel. (Concrete Publications Ltd. 2nd Edn. 1950. 15s.)

Enlarged and revised edition of the well-known book which first appeared in 1948. Useful to designers. 300 pp., 268 illustrations.

It is a measure of the general interest in prestressed concrete that the new edition of this book had to follow its first publication (of 6,000 copies) after only two years. Pro-

Focus on Floors

A well-known architect remarked recently that he had experienced as many failures or partial failures in flooring as in all other finishes put together. His assessment of the reason for this state of affairs was the absolute economic necessity for trying out new materials coupled with the difficulty of getting really accurate and impartial information on the performance of the materials. It was largely to overcome this difficulty that the Semtex Flooring Service was brought into being. Briefly stated, the Service aims to make available for the solution of a given problem, a knowledge of flooring problems more complete than could possibly come within the experience of any architect or firm of architects; to supply and install any of the floor finishes listed below: and, if desired, to maintain by contract in good condition any floor finish installed by the Company. If you would be interested in such a service, why not discuss your next flooring problem with us? Semtex Floor Surfacings include: SEMASTIC DECORATIVE TILES · SEMASTIC DOMESTIC TILES · DUNLOP RUBBER FLOORS HIGH-GRADE LINOLEUM · FLEXIMERS · CORK, CERAMIC & TERRAZZO TILES.

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ISE/CS

gress in recent years has been rapid, both in the theory and the practice of prestressed concrete construction, and the additional material in the new edition brings it up to date. Multi-storey buildings and continuous beams are now covered in relation to structures actually built (including the warehouse at Edinburgh). Further additions refer to the vital end-blocks for the prestressing wires, to the creep of steel and to fatigue tests, and to the danger of buckling during prestressing. Results of tests, both in the laboratory and with full-size components, are given, included those on the 155-ft. span beam at Philadelphia.

Whilst most of the photographs are of work done by Prof. Magnel in Belgium, there is in this new edition a considerable number of examples from Gt. Britain, including the floor beams at Queen Mary College, London, the textile factory at Tiverton, the Edinburgh warehouse, and work done by the Ministries and by British Railways.

The book is obviously meant for structural engineers, but the architect will find it useful, because it shows, at a glance, the poshibilities of prestressed concrete construction, and the great variety of its applications.

18.87 construction: theory

WIND EFFECTS ON STRUCTURES

Les Effets du Vent sur les Constructions (*Wind effects on structures*). Conference at Poitiers (Cashiers du Centre Scientifique et Technique du Batiment, No. 98, 1950, Paris [France])

Report on experimental study of wind effects on structures, principles involved and their application. 40 pp., illustrated.

There are four main contributions in this report, dealing with the following aspects of the subject: the meteorological and aerodynamic principles, the experimental study of wind effects on structures, the application of the codes and regulations regarding wind loads as a basis of design, and the relationships between test results and the design of structures. Experimental work in Great Britain by the DSIR is also discussed. A table with sketches of a 25-ft. span building gives an interesting comparison of wind loads based on different sets of regulations. More wind tunnel tests on models of structures are advocated. To readers here it may be of interest to know that the new draft of Chapter V Loading, BS Code of Practice (1950) is, in this respect, already based on the results of model tests in a 3-ft. square wind tunnel of the NPL type.

19.127 construction : details

REINFORCED CONCRETE PRECAST STRUCTURE

Precast Concrete in Government Offices. (Concrete and Constructional Engineering, Nov. 1950, pp. 399-403.)

Precast and prestressed concrete members for single-storey Government temporary offices, 180 ft. long by 36 ft. wide, erected and designed by MOW.

In the first type of building described, the precast reinforced concrete frames consist of columns on a 12-ft. grid, capped by three beams, making up the 36-ft. span. Low slump vibrated 1:2:4 concrete was employed using ordinary portland cement in the summer and rapid hardening in the winter. The columns are 9 in. by 7 in. in section and 11 ft. long, with a splayed head for carrying the beams. Wall columns have ribs projecting on two sides to receive the concrete bricks forming the inner leaf of the cavity walls. The beams are 12 ft. long and 9 in. wide at the top, with a 5-in. web. Their total depth is 14 in. Lifting links project from the upper face. The columns are lowered into recesses in the concrete foundations, and wedged and grouted into position. Beams are hoisted and located, and secured by means of bolts cast into the column caps. The small members, 6-cwt. columns and 10-cwt. beams, are handled by mobile crane. The roof is of hollow blocks placed *in situ*. The second type of building described is similar in size. It has prestressed beams at 12-ft. centres, spanning 26 ft. and supported on padstones on brick piers. The beams have an I-section with a depth of 27 in. at mid-span and 18 in. at each end. The roof fall is thus provided by the shape of the beams. The flanges are 9 in. wide and the overall length is 37 ft. 4 in. The beams are constructed on the "long-line process," with 187 No. 14-gauge wires tensioned to 90 tons per sq. in. before the concrete (a 1:1.5:2.45 mix, giving strength after 7 days of 6,000 lb./sq. in.) is placed. Extra reinforcement, in the form of a helical cage, is provided at each end of the beam. Under dead load there is a compressive stress at mid-span of 2,400 lb./sq. in. in the bottom flange. Under maximum live load the bottom flange is in compression, except for the centre 10 ft., where slight tension may occur. Test loading indicates that the concrete starts to crack at a tensile stress of 900-1,200 lb./sq. in., cracks being visible at the equivalent of 1,500 lb./sq. in. The beams are erected by mobile crane and have a central ridge on the top flange for locating hollow prestressed roof beams 4½ in. thick. Both types of structure cost approximately the same, but the prestressed type has the advantage of spanning the full 36 ft. It is quicker to erect and saves foundations.

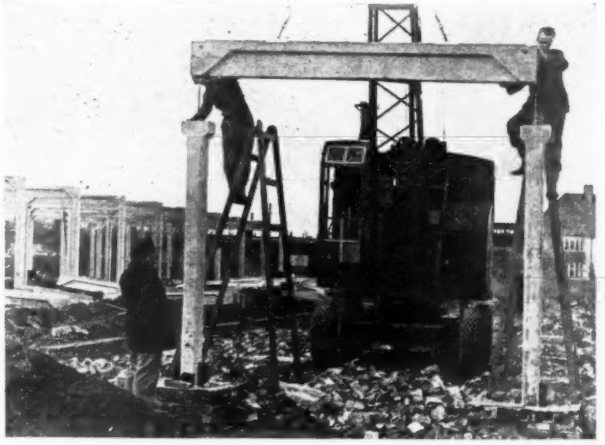
20.203 construction: complete structures

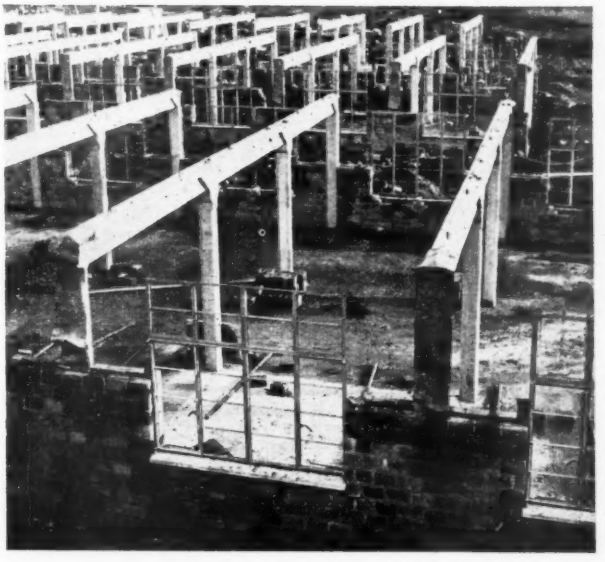
REINFORCED CONCRETE FRAMED BUILDING

A New Concrete Laboratory. (Architects' Journal, June 7, 1951, and other journals.)

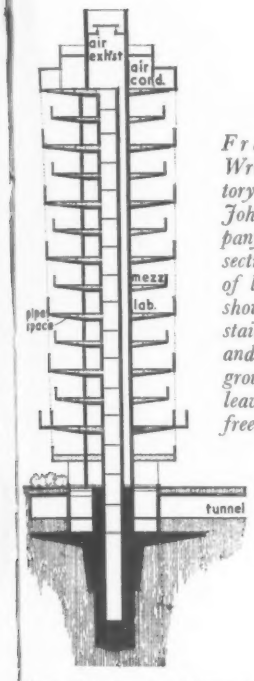
Research laboratory for the Cement and Concrete Association at Wexham Springs, Bucks.

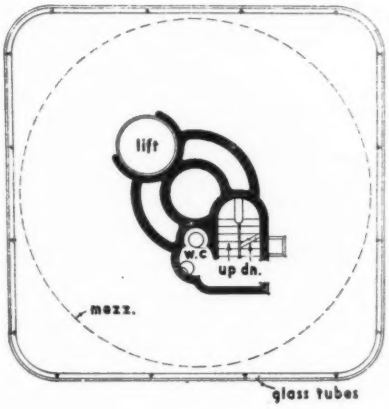
It is very fitting that this building, which may contribute considerably to progress in the use of concrete, itself embodies many examples of modern uses of concrete. Its main parts are a testing hall, 100 ft. long, 30 ft. wide and 26 ft. high, and an adjoining room, 30 ft. square and 14 ft. 3 in. high, for research into the use of precast concrete. In the large hall, main beams of 29 ft. 6 in. span (prestressed on the Hoyer system) are supported on *in situ* columns at 10 ft. centres, an *in situ* joint being made at the head of each column to bond in the reinforcement projecting from the ends of the beams. Precast prestressed T-section purlins span between the main beams and support filler blocks of plain concrete. The columns support a 5-ton overhead crane which runs on a concrete runway, 15 ft. 5 in.





Precast concrete frame for MOW single-storey temporary offices. Top photo shows precast beam being placed in position. (*See* 19.127)





Frank Lloyd Wright's laboratory tower for the Johnson Wax Company. Left, key section; right, plan of laboratory floor, showing how lift, stairs, cloakroom and services are grouped in centre to leave floor space free. (*See* 20.205)

above floor level. Above this, the columns, which are reduced in size, rise to support the roof beams and the cantilevered concrete eaves.

The test floor is 40 ft. long, 27 ft. wide and 2 ft. 6 in. thick, reinforced by 1-in. bars at 6-in. centres each way in the bottom, and at 21-in. centres in the top. Ducts are provided within the slab to allow the floor to be poststressed to provide resistance against sagging. 263 sockets, arranged on an equilateral grid, allow the test rig to be placed in any position.

The walls are carried on ground beams spanning between column foundations. The north wall is of brick, with precast concrete window frames, and the south wall is of hollow concrete blocks, with glass wool insulation and outer skin of asbestos cement cladding.

The surface finishes used throughout demonstrate the pleasing effects which can be produced by renderings, precast slabs of different texture, reconstructed stone and concrete blocks.

20.204 construction: complete structures

WELDED STEEL FRAMED STRUCTURE

Allen County War Memorial Coliseum, Fort Wayne, Indiana. (Engineering News-Record [USA], July 12, 1951; pp. 28-32.)

Welded-framed structure of record span, for multi-purpose covered arena. Overall size, 400 ft. by 258 ft.; seating capacity, 11,000. Article mainly describes erection and splicing of the frame.

The frames span 224 ft. and are spaced at 27-ft. intervals. The apex rises 88 ft. above the floor of the arena and 33 ft. above the knees of the portal frames. The frames are built up entirely of plates, both shop and field connections and splices being welded. They were delivered from shops 1½ miles away in five sections—two columns, two 80-ft. rafters and a crown. The columns were erected first, then the remaining three units, mounted on independent moving towers, were brought into alignment with the columns and spliced, and the complete beam was lifted vertically and spliced to the column knees. Intermediate vertical bracing is at 30-ft. centres in the direction of the span; horizontal bracing being located in alternate bays. The crown and knees are braced laterally for stability. The columns are set on piers 36 in. by 76 in., portal thrust being carried by two 2-in. dia. rods tieing opposing baseplates and cast into the floor slab.

The arena floor consists of a 9-in. flat slab, with 18-in. dia. columns at 27-ft. centres. It is designed for a live load of 330 lb. per sq. ft. plus the weight of an ice rink, consisting of 4-in. cork, waterproofing, and 6-in. lightweight concrete in which brine pipes are embedded. The area beneath the arena floor is to be used as an exhibition hall.

Seating accommodation is provided on a sloping tier of beam and slab construction supported every 27 ft. by two columns and a link attached to the main frame, which allows the leg of the portal to sway under wind load. Mezzanine floor beams beneath the tier are treated similarly. The roof consists of 4-in. thick precast concrete slabs, with purlins at 6-ft. centres. Exterior walls are mainly of 4-in. facing brickwork, bonded to a backing of 8 in. of lightweight concrete.

20.205 construction: complete structures

REINFORCED CONCRETE STRUCTURE

An Unusual Reinforced Concrete Building. (Concrete and Constructional Engineering, Jan. 1951, pp. 35-36, and Concrete Quarterly, March, 1951, pp. 7-11.)

Frank Lloyd Wright's tower for Johnson Wax Company research laboratory at Racine, Wisconsin.

The 15-storey reinforced concrete tower is 154 ft. high and the floors, alternately circular (38 ft. in diameter) and square (40 ft.), are cantilevered from a 13-ft. diameter central core, which houses lifts, stairs and services. The core is carried down into a reinforced concrete cone extending 50 ft. into stiff clay to provide a foundation "root." The ratio of 1 ton of reinforcement to 9 cu. yd. of concrete reflects the unusual character of the design. The building tapers from top to bottom in order to give extra space on the upper floors and to avoid drip staining of the cladding.

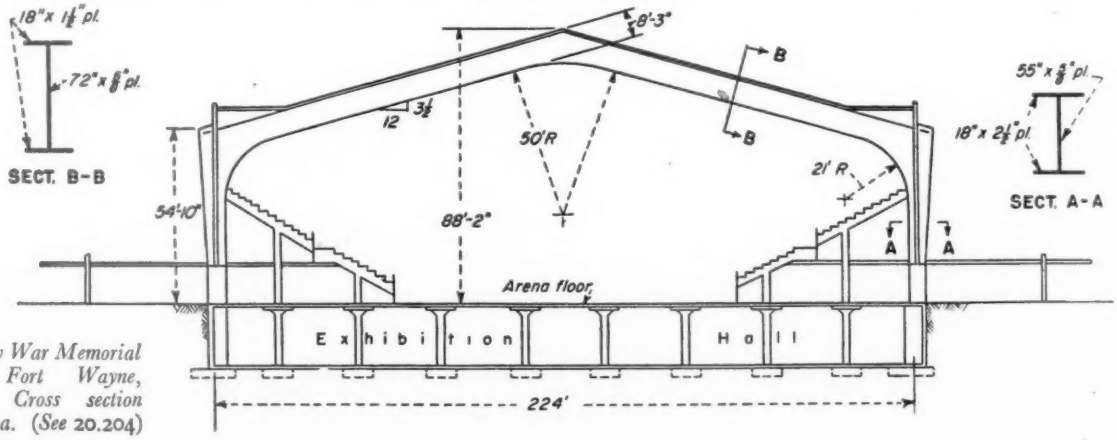
The construction of each cantilever floor, with trunk support, took 3 weeks, once the workmen had accustomed themselves to the structure. Building operations were in progress during two winter seasons, and, to ensure uninterrupted work, the building was sheathed with composition board, fixed to the inside of the outer scaffolding, and lighting and steam heating were installed within.

THE LIBRARY OF INFORMATION SHEETS

15.C1, 15.C2, 22.D1, 22.D2, 27.F1, 28.D1, *and* 28.E10

REFERENCE BACK

Readers are asked to note the following revisions and to amend their copies of the Information Sheets in question: The address of Bowaters Building Boards Limited is now Harewood House, Hanover Square, London, W.1. Telephone: Mayfair 9266.



Allen County War Memorial Coliseum, Fort Wayne, Indiana. Cross section through arena. (*See* 20.204)

This feature covers both the production and marketing of new materials and designs of equipment, as well as the general trend of developments within the Building Industry.

THE INDUSTRY

By Brian Grant

CONCRETE MIXER IMPROVEMENTS

The hopper of the average concrete mixer often has a short life. The ingredients of the mix often stick to it and are then loosened by the simple process of "bashing with a hammer"—a simple, though rather brutal, technique. Working in collaboration with the makers of Red Circle mixers, the Dunlop Rubber Co. have produced an experimental hopper made up of thick sheet rubber, held in a framework of welded strip steel. The rubber does not, of course, corrode and remains fairly smooth, so that the mix is transferred rapidly to the mixing drum. If materials are left in the hopper, any set concrete can be flaked off by pushing on the outside of the hopper. At the Chester Building Exhibition I saw a hopper which had been in use for 18 months and it seemed to have suffered remarkably little damage.

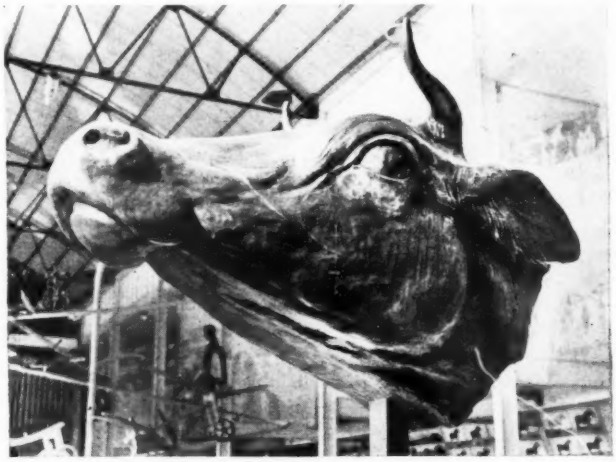
BRONZE SCULPTURE

The somewhat formidable looking bronze cow's head in the photograph on the right appears in the South Bank Country Pavilion. The sculptor was George Erlich, and the founders were the Morris Singer Company, who were able to carry out the work before the rearmament programme prevented the use of bronze. The finished work is a hollow sand casting (horns and ears separate) and one of the problems which had to be solved was that of providing, with only a single point of support, a head capable of withstanding any possible ill-treatment, such as children climbing over it. The casting itself weighs 12 cwt. and is carried on a solid bronze armature, 3 in. sq. where it leaves the casting, and 5 in. in section where it enters the stone block on which the head is mounted. (*The Morris Singer Co., Dorset Road, S.W.*8.)

A NEW ALLOY FOR ELECTRO-PLATING

Until recently chromium was almost the only base metal capable of providing a polished finish with a high degree of resistance to atmospheric tarnishing. Its introduction in, I think, the late 1920's, had an adverse influence on the then current habit of nickel plating. The Tin Research Institute, however, after several years of work, has produced an alloy containing 65 per cent. tin and 35 per cent. of nickel which, it is claimed, will retain its lustre permanently. The finish has a faintly pink tint which is quite attractive and it certainly does not have the rather cold look of chromium plate.

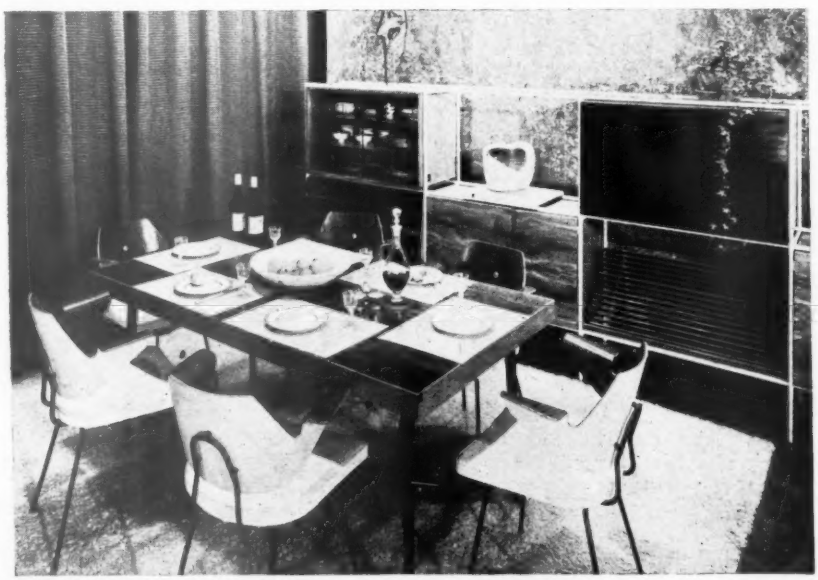
The new process is only in the early stages of commercial development and it is somewhat restricted by the scarcity of nickel chloride, though two commercial plants are now being installed. This new alloy can replace nickel plus chromium on a thickness for thickness basis, and saves 65 per cent. of the nickel. Although tin is more expensive, the higher cost of the tin-nickel coating, as compared with the nickel plus chromium finish, is largely compensated for by the complete elimination of the chromium plating operation. In any plating process the actual cost of the metal deposited is only a small proportion of the total cost of the plating operation and it is believed that this new alloy will be able to compete successfully with nickel plus chromium finishes. (*The Tin Research Institute, Fraser Road, Greenford, Middx.*)



Bronze head of a cow, as exhibited in the Country Pavilion at the South Bank Exhibition.

WIRED TELEVISION

The Rediffusion Group have for a number of years been providing a broadcast service by means of land lines from a central receiving station. They are now applying the same idea to a television station. So far, there is one system in operation (at Margate) and the cost of this to the consumer is about 8s. to 8s. 6d. a week. (The ordinary sound service costs about 2s. 3d.) The television service must, inevitably, have the same cathode ray tube as the ordinary television set, but the rest of the equipment is much less complicated and the user can be guaranteed a distortion-free service, as the main receiving station will nearly always be on high and remote ground where local interference is unlikely. As a secondary detail it will, of course, be unnecessary for the user to have any external aerial, which should improve considerably the appearance of housing estates. In order to provide this service more rapidly and efficiently, the Rediffusion Group have recently entered into an agreement with Electrical and Musical Instruments of Hayes, the company which controls the HMV group, so that the organization will have considerable manufacturing resources and the advantage of pooled research. (*Broadcast Relay Services Ltd., Carlton House, Regent Street, London, S.W.*1.)



Part of the Homes and Gardens Section at the South **Bank; the chairs,** *as used in The Royal Festival Hall, are now in production.*

CHAIRS FROM THE FESTIVAL HALL

The photograph on the left shows a small section of the South Bank Homes and Gardens Section, designed by Robin Day. The chairs shown in the illustration have been used in the Royal Festival Hall and are now being produced under licence by S. Hille & Co. They sell at £7 15s. each, not including purchase tax, and are upholstered with foamed rubber, covered in leather. The back is veneered in two different woods to customers' requirements, and the metal work is stove enamelled. (*S. Hille & Co. Ltd.*, 439-451, *Lea Bridge Road, Leyton, E.*10.)

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

ENQUIRY FORM

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

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Please ask manufacturers to send further particulars to:—

NAME.....

PROFESSION or TRADE

.....

ADDRESS.....

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A.J. 23.8.51

Correction

The canteen at Bromley-by-Bow, London, E.3, illustrated in our issue of August 2, was designed by Elie Mayorcas *in association* with P. H. Laurence, A.R.I.B.A., assistant R. H. Britcher.

Announcements

A Symposium on the Corrosion of Buried Metals, organized by the Iron and Steel Institute in conjunction with the British Iron and Steel Research Association and the Corrosion Group of the Society of Chemical Industry, will be held at the offices of the Iron and Steel Institute, 4, Grosvenor Gardens, London, S.W.1, on Wednesday, December 12, 1951; Sir Charles Goodeve, Director of the British Iron and Steel Research Association, will be in the chair. The sessions will begin at 10 a.m. and 2.30 p.m. and will be open to all interested in the subject under discussion. Papers will be given in brief individually and discussed in groups, as indicated in the programme:—10.05 a.m.—(i) Joint discussion on Tests on the Corrosion of Buried Iron and Steel Pipes, by J. C. Hudson and G. P. Acock; Investigations on Underground Corrosion, by K. R. Butlin, W. H. J. Vernon and L. C. Whiskin. 11.45 a.m.—(ii) Joint discussion on Cathodic Protection, by K. A. Spencer; Cathodic Protection of Buried Metal Structures, by M. R. de Brouwer, 2.30 p.m.—(iii) Joint discussion on Corrosion of Buried Copper and Ferrous Strip in Natural and Salted Soils, by G. Mole; Tests on the Corrosion of Buried Aluminium, Copper and Lead, by P. T. Gilbert and F. C. Porter.

There will be no charge for admission to the meeting, but intending participants are requested to complete Part A of a reply form to be obtained from the Secretary of the Iron and Steel Institute. The papers presented and the discussion at the meeting will be issued as a single bound volume (No. 45 in the Special Report Series of the Iron and Steel Institute), the published price of which will be 15s. (post free). Orders received before the meeting, if accompanied by a remittance, will be supplied at the reduced rate of 10s. (post free), and one set of advance copies of the papers will be provided in respect of each volume so ordered, without extra charge.

Messrs. W. H. Saunders and Son, architects and surveyors, of Bank Chambers, 1, Carlton Crescent, Southampton, are opening a Midlands branch at Roslyn Chambers, 47, Warwick Road, Coventry, on September 10. They will be glad to receive technical data and catalogues.

Messrs. Trehearne & Norman, Preston & Partners, of Windsor House, 83 Kingsway, London, W.C.2, have taken Mr. H. Mortimer, L.R.I.B.A., into the partnership. The style of the firm will continue as at present.

Mather & Crowther Ltd. have taken extra offices at 9, Savoy Street, on the South side of Brettenham House. This new accommodation has absorbed the overflow of staff which now numbers 220.

The Cozy Stove Company has joined the selling organization of Radiation Group Sales Ltd., Solid Fuel Division. The Cozy stoves are being produced at the Radiation Production Centre, Belper, near Derby.

For the fourth year the LCC is publishing its pocket-size booklet, "Facts and Figures" about the Council's services. Its form and content have been improved and extended. The first issue contained eight pages only. The 1951 issue has 48 pages "of useful information for all concerned with London's local government." Hitherto "Facts and Figures" has been for internal circulation among members and officers of the Council, although copies have been available to the Press on request. But this year, in addition to the previous internal distribution, a special edition with four pages of illustrations has been available to the public from August 3, price 6d. (by post 7½d.), and it can be obtained direct or through any bookseller from Staples Press Ltd., Mandeville Place, W.1, as well as from the Information Bureau at County Hall (South Block), Westminster Bridge, S.E.1.

High Victorian Design

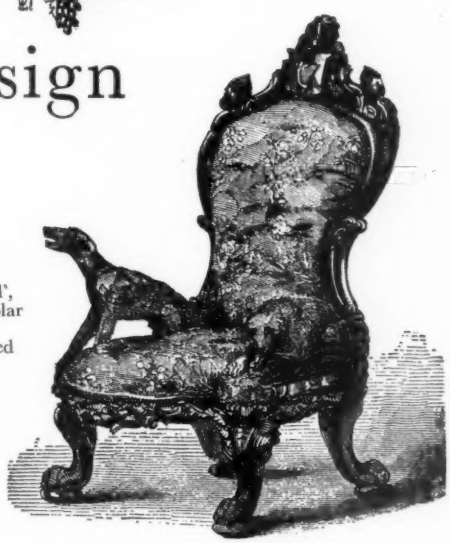
a study of the exhibits of 1851

by NIKOLAUS PEVSNER

TO RUSKIN the Crystal Palace was no more than 'a greenhouse larger than ever greenhouse was built', to Tennyson the objects shown within it were 'shapes and hues of Art divine, all of beauty, all of use'. Today the exhibits are considered outrageous 'examples of the hideous and the debased', but the building cannot be too highly praised; it is 'a precept inspiring as the Parthenon, an exemplar vital as the Pont du Gard'.

This complete changeabout in taste, and the contrast in the reaction to the *architecture* as opposed to the *design* of 1851 amongst critics of 100 years ago is as puzzling as that amongst critics of today. Obviously there is a problem here, and it is that problem which Dr Pevsner, our most eminent critic of both architecture and design, attempts to solve in the present volume. He finds his solution in a penetrating and detailed examination of a selected 120 1851 exhibits. Why did, for instance, some of the most intelligent critics admire unreservedly the machine carving of Gothic ornaments on a church screen? What frame of mind can explain the Irish bog-oak chair with its two arms formed by wolf-dogs, one at ease and recumbent, the other infuriated and sitting up so that nobody could use the chair in comfort? In answering many such questions Dr Pevsner arrives at certain conclusions which go far in explaining the mentality of the mid-nineteenth century, not only in matters aesthetic, but also in many other matters.

Size, crown 8vo., bound in full cloth boards, with 162 pages containing over 120 illustrations, and with a jacket in colour designed by Gordon Cullen. Price 12s. 6d. net, postage 4½d.



From Dr Pevsner's book: the Irish bog-oak chair.

THE ARCHITECTURAL PRESS 9-13 QUEEN ANNE'S GATE WESTMINSTER SW1

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.

LONDON COUNTY COUNCIL.

Applications are invited for positions of ARCHITECTURAL ASSISTANT (salaries up to £580 basic a year) in the Housing and Valuation Department. Commencing salaries will be determined according to qualifications and experience. Engagement will be subject to the Local Government Superannuation Acts, and successful candidates will be eligible for consideration for appointment to the permanent staff on the occurrence of vacancies.

All rates of pay up to £600 a year (basic) are at present subject to an addition of 10 per cent.

Successful candidates will be required to assist in the design, layout and preparation of working drawings for housing schemes, cottages and multi-storey flats), and will be employed in the Housing Architect's Division.

Forms of application may be obtained from the Director of Housing, The County Hall, Westminster Bridge, S.E.1 (stamped addressed envelope required and quote reference A.A.1). Canvassing disqualifies. (816) 2615

LONDON ELECTRICITY BOARD.
DRAUGHTSMEN.

Applications are invited for positions as Draughtsmen in the Architect's Section of the Chief Engineer's Department in Central London.

Applicants should be neat draughtsmen, and preferably have had several years' experience in an Architect's office.

Pending grading of the posts under the national agreement of the appropriate negotiating body, the commencing salary will be from £400 per annum inclusive, according to qualifications and experience.

Application forms obtainable from Establishments Officer, 46, New Broad Street, E.C.2, to be returned completed within 10 days. Please enclose addressed foolscap envelope and quote Ref. EST/V/1256/A on all correspondence. 4158

WELWYN GARDEN CITY AND HATFIELD DEVELOPMENT CORPORATION.
ASSISTANT QUANTITY SURVEYOR.

Applications are invited for the appointment of Assistant Quantity Surveyor, at a salary of £800 per annum.

Applicants should be experienced in taking-off quantities for housing schemes, commercial, industrial and public building, and in the preparation of Bills of Quantities, Estimates, Certificate Valuations and Final Accounts.

Preference will be given to Members of the Royal Institution of Chartered Surveyors.

The appointment is superannuable and terminable by one month's notice on either side.

The successful applicant will be assisted in obtaining housing accommodation if required.

Applications, giving age, qualifications and full details of present and past experience, salaries and appointments held, together with the names of three persons to whom reference may be made, should be addressed to the General Manager at Midland Bank Chambers, Welwyn Garden City, Herts., and be received by 4th September, 1951. 4078

MODELLER. DEPARTMENT OF HEALTH FOR SCOTLAND invite applications for a post (unestablished) of Assistant Modeller. Applicants must have experience of model-making and also basic training in wood-working with pattern-making experience. Work mainly concerned with architectural, town planning and landscape models. Salary within range £250 to £500. Form of application from Establishment Officer (Room 30), St. Andrew's House, Edinburgh, 1, must be returned by 8th September, 1951. 4159

HEMEL HEMPSTEAD DEVELOPMENT CORPORATION.
CHIEF ARCHITECT'S DEPARTMENT.

SENIOR ASSISTANTS. Salary scale: £610 × £30—£810.

Applicants should be qualified Associates of the R.I.B.A., and have had several years' experience in an Architect's office, with particular experience in preparation of layouts and working drawings for extensive housing contracts.

ASSISTANT ARCHITECTS. Salary scale: £460 × £25—£585.

Applicants must have qualified in the Intermediate Examination of the R.I.B.A.

The appointments will be subject to the Development Corporation's staff rules and conditions of service, which are broadly similar to Local Government Officers' "Charter," and to contributory superannuation with opportunity of entering or continuing in Local Government Superannuation Fund.

Housing accommodation may be provided.

Forms of applications (to be applied for in an envelope marked "Architect"), which should be returned by 3rd September, 1951, may be obtained from the undersigned.

W. O. HART,
General Manager.
Westbrook Hay, Hemel Hempstead, Herts. 4184

LIVERPOOL REGIONAL HOSPITAL BOARD.

Applications are invited from suitably qualified persons for the appointment of SENIOR ASSISTANT ARCHITECT, in the Regional Architect's Department, situated at 88, Church Street, Liverpool, 1.

Salary: £750 × £25—£850 per annum.

Applicants must be Associates of the Royal Institute of British Architects, and preferably have had experience in the design and construction of hospitals, and must be capable of carrying out and advising on large building contracts.

The appointment is pensionable and the successful candidate may be required to pass a medical examination.

Applications, stating age, education, qualifications, experience, present and previous appointments, salary, together with the names and addresses of three referees, should be sent to the undersigned at 19, James Street, Liverpool, 2, to be received not later than 30th August, 1951.

VINCENT COLLINGE,
Secretary to the Board.
4110

BURGH OF ALLOA.
APPOINTMENT OF SENIOR ARCHITECTURAL ASSISTANT.

Applications are invited for the appointment of Senior Assistant Architect, on the staff of the Council's Architect, at a salary of £490-£536, placing on grade according to experience.

Applicants must be Registered Architects. Preference will be given to candidates who are Members of the R.I.B.A., and who have knowledge of Local Authority Housing Design. Experience in Quantities is essential.

The post will be superannuable, and the successful applicant will be required to pass a medical examination.

Applications, giving age, qualifications and experience, accompanied with the names and addresses of two persons to whom reference may be made, should be sent to Mr. W. H. Gillespie, L.R.I.B.A., Burgh Architect, Municipal Buildings, Alloa, not later than 31st August.

WILLIAM MALTMAN,
Town Clerk.
4109

COUNTY BOROUGH OF HUDDERSFIELD
BOROUGH ARCHITECT'S DEPARTMENT.
APPOINTMENT OF QUANTITY SURVEYOR.

Applications are invited for the above appointment at a salary in accordance with Grade VI of the National Scales of Salaries, commencing at £645 per annum and rising to £710 per annum.

Housing accommodation will be provided for the successful candidate if required.

Applicants must have experience in the preparation of Bills of Quantities, Specifications, Estimates and the settlement of final accounts and preference will be given to Associates of the Royal Institution of Chartered Surveyors.

Conditions of service are those formulated by the National Joint Council, and the appointment is subject to the provisions of the Local Government Superannuation Act, 1937. The successful candidate will be required to pass a medical examination.

Applications endorsed, "Quantity Surveyor" together with the names and addresses of two persons to whom reference may be made should be delivered to the Borough Architect, High Street Buildings, Huddersfield, not later than 3rd September, 1951.

HARRY BANN,
Town Clerk.
Town Hall, Huddersfield. 4146

LIVERPOOL REGIONAL HOSPITAL BOARD.

Applications are invited for the appointment of DRAUGHTSMAN in the Regional Architect's Department situated at 88, Church Street, Liverpool, 1.

Applicants must be competent Draughtsmen, with a knowledge of building construction, and must have had previous experience in an Architect's office.

Salary: Grade A.P.T., I, £390 × £15—£435 per annum. (The salary scales are at present under review.)

The appointment is pensionable, and the successful candidate may be required to pass a medical examination.

Applications, stating age, education, qualifications, experience, present and previous appointments and salary, together with the names and addresses of three referees, should be sent to the undersigned at 19, James Street, Liverpool, 2, to be received not later than 30th August, 1951.

VINCENT COLLINGE,
Secretary to the Board.
4111

CRAWLEY DEVELOPMENT CORPORATION.
ARCHITECTURAL VACANCIES.

Applications are invited for vacancies in the Chief Architect's Department in (*a*) Grade IV (salary £605—£825 p.a.) and (*b*) Grade V (salary £440—£580 p.a.). Commencing salaries will be determined by qualifications, age and experience. Contributory superannuation.

Applicants for (*a*) should be fully qualified and have good general experience in design, construction and planning, and for (*b*) should have reached the R.I.B.A. Intermediate Examination standard and have had good general experience.

Application form and particulars should be obtained from the Chief Architect, A. G. Sheppard Fidler, Esq., M.A., B.Arch., F.R.I.B.A., A.M.T.P.I., Broadfield, Crawley, Sussex, and returned to him by the 1st September, 1951.

C. A. C. TURNER,
Chief Executive.
4156

LONDON COUNTY COUNCIL.
ARCHITECT'S DEPARTMENT.

Applications are invited for positions of ARCHITECT, Grade III (£550-£700) and TECHNICAL ASSISTANT (up to £580) for architectural work on new housing, schools and other public buildings. The positions are superannuable, and the above rates are subject to an addition of 10 per cent. on the first £600 and 7½ per cent. on any remainders. Application forms from the Architect, The County Hall, S.E.1, enclosing stamped addressed foolscap envelope and quoting AR/EK/A. Canvassing disqualifies. (514) 3914

MINISTRY OF WORKS.

There are vacancies in the Chief Architect's Division for ARCHITECTURAL ASSISTANTS, with recognised training and fair experience. Successful candidates will be employed in London and elsewhere on a wide variety of Public Buildings, including Atomic Energy and other Research Establishments, Telephone Exchanges, and Housing.

Salary: Architectural Assistants, £300-£525 per annum. Starting pay will be assessed according to age, qualifications and experience. These rates are for London; a small deduction is made in the Provinces.

Although these are not established posts, some of them have long term possibilities, and competitions are held periodically to fill established vacancies.

Apply in writing, stating age, nationality, full details of experience, and locality preferred, to Chief Architect, Ministry of Works, Abell House, John Islip Street, London, S.W.1, quoting reference WG10/BC. 2914

ISLE OF ELY COUNTY COUNCIL.
COUNTY PLANNING DEPARTMENT.

Applications are invited for the appointment of a PLANNING ASSISTANT. Salary A.P.T., Grade I, £440-£485, the commencing salary to be fixed according to qualifications and experience. The person appointed will be required to work on the Development Plan, and applicants should therefore have had experience in the preparation of a Development Plan for a rural county.

The appointment is subject to the provisions of the Local Government Superannuation Act, 1937, and the passing of a medical examination. Application forms may be obtained from the County Planning Officer at this address, and should be sent to him not later than Saturday, 8th September, 1951.

R. F. G. THURLOW,
Clerk of the County Council.
County Hall, March.
2nd August, 1951. 4106

LIVERPOOL REGIONAL HOSPITAL BOARD.
ERECTION OF NEW MENTAL DEFICIENCY HOSPITAL—1,000 BEDS.
APPOINTMENT OF TECHNICAL STAFF.

The Board wish to engage Architectural Staff to design and supervise the erection of a new hospital near Southport, to accommodate 1,000 mental deficiency patients; the first major scheme for the construction of an entirely new hospital approved since the inception of the National Health Service. The work will be of a most interesting character.

The preliminary and constructional stages of this important project are expected to take from 4 to 7 years, and applications are invited from suitably qualified persons wishing to accept employment of a limited duration. Those persons engaged will be employed solely on the new scheme, and will be responsible to the Regional Architect (T. N. Mitchell, B.Arch., A.R.I.B.A.).

(*a*) SENIOR ASSISTANT ARCHITECT. Salary £750 × £25—£850 per annum, to supervise the technical administrative work of the project. Applicants must be Associates of the R.I.B.A. and possess considerable experience in carrying out substantial building projects. Some experience of hospital work an advantage.

(*b*) SENIOR ASSISTANT ARCHITECT, for work on design. Salary £750 × £25—£850 per annum. Applicants must be Associates of the R.I.B.A., and preferably have a University qualification, and should have experience of the design and layout of large projects. Some experience of hospital work an advantage.

(*c*) ASSISTANT ARCHITECTS (THREE). Salary £520 × £15 (2) × £20—£570 per annum. Applicants must have passed the Intermediate Examination of the Royal Institute of British Architects and have a good general experience in design and construction.

(*d*) BUILDING SURVEYOR. Salary £635 × £25—£710 per annum, to supervise setting out of site, surveying, levelling and drainage works, etc. Applicants must be Associates of the Royal Institute of Chartered Surveyors (Sub-division III Building), and should have considerable experience in work of this character.

(*e*) JUNIOR ASSISTANT. Salary £375 × £15—£420 per annum, for tracing and general work.

All appointments will be of limited duration, extending to possibly 5 years, or 7 years in some cases, and will be terminable at any time within the period stated (by 3 months' notice on either side in the case of appointments at salary of £520 and over).

Applications, giving age, technical experience and qualifications, present and previous appointments with salary, and clearly indicating the post in respect of which the application is submitted, together with the names of three referees, should be forwarded to reach the undersigned at 19, James Street, Liverpool, 2, not later than 20th September, 1951.

VINCENT COLLINGE,
Secretary to the Board.
4193

COUNTY OF BANFF.
ARCHITECTURAL AND PLANNING DEPARTMENT.

Applications are invited for the undermentioned posts in the County Architect and Planning Officer's Department, Cluny Square, Buckie:—

(*a*) CHIEF ASSISTANT PLANNING OFFICER. Salary £700, rising by annual increments of £25 to £800.

(*b*) SENIOR QUANTITY SURVEYOR. Salary £700, rising by annual increments of £25 to £800.

(*c*) ARCHITECTURAL ASSISTANT. Grade VI or VII, depending upon qualifications and experience. Salary £645-£710 or £685-£760.

Applicants for post (*a*) must be A.M.T.P.I. with architectural or engineering qualifications, and experience in the preparation of Development Plans; (*b*) must have extensive experience of Local Authority work, and (*c*) must be Members of R.I.B.A.

The appointments will be subject to the Local Government Superannuation Act, 1937, and the successful applicants will require to provide a car, for which allowances will be paid on the scale approved by the County Council.

Applications, stating post applied for, age, particulars of training, qualifications, experience, and present and past appointments, together with copies of two recent testimonials, should be submitted to the undersigned by 3rd September, 1951.

R. J. CUMMING,
County Clerk.

County Buildings, Banff. 4113

WEST SUFFOLK COUNTY COUNCIL.
COUNTY ARCHITECT'S DEPARTMENT.

Applications are invited for the following appointments in the County Architect's Department. Salaries as indicated in accordance with the National Joint Council Salary Scales, position on scales according to qualifications and experience, viz.:—

(*a*) ASSISTANT COUNTY ARCHITECT. A.P.T., Grade VIII (£735-£810).

(*b*) ARCHITECTURAL ASSISTANT. A.P.T., Grade V (£570-£620).

(*c*) ASSISTANT HEATING ENGINEER. A.P.T., Grades III-IV (£500-£575).

Applicants in respect of (*a*), who should note that the appointment of Deputy is at present vacant, should be fully qualified and have had considerable experience in architectural design, construction and preparation of specifications, and be capable of assuming full responsibility and supervision of the day-to-day work of the Department, which is mainly concerned with new school, police and health building work, and general maintenance and improvements to County Buildings.

This appointment will be terminable by two months' notice in writing on either side.

Applicants in respect of (*b*) should preferably be Associates of the Royal Institute of British Architects.

Applicants in respect of (*c*) should be capable of calculating heat losses, preparing schemes and working drawings under supervision, and a knowledge of electrical work would be an advantage.

The latter appointments will be terminable by one month's notice in writing on either side.

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

Forms of application may be obtained from the County Architect, 13, Westgate Street, Bury St. Edmunds, by whom applications, together with the names of two referees, should be received not later than the 14th September, 1951.

L. G. H. MUNSEY,
Clerk of the County Council.

Shire Hall, Bury St. Edmunds.
August, 1951. 4134

MIDDLESEX COUNTY COUNCIL COUNTY ARCHITECT'S DEPARTMENT.

CLERK OF WORKS required to supervise erection of extensions to Ealing Technical College. Salary £550 p.a. inclusive. Unestablished for period initially not exceeding 2 years. Subject to medical assessment and prescribed conditions. Written applications, giving details age, experience, etc., to County Architect, 10, Great George Street, S.W.1, by 15th September (quoting J.739 A.J.). Canvassing disqualifies.

C. W. RADCLIFFE,
Clerk of the County Council.
4178

CORPORATION OF THE CITY OF ABERDEEN.
TOWN PLANNING DEPARTMENT.

Applications are invited for the following posts:—

(*a*) TECHNICAL ASSISTANT (Development Control). Salary scale £645, rising to £710 per annum.

(*b*) TECHNICAL ASSISTANT (Planning). Salary scale £430, rising to £620 per annum, with initial placing in accordance with qualifications and experience.

(*c*) DEVELOPMENT INSPECTOR. Salary scale £415, rising to £460 per annum.

Application forms and further particulars of the appointments are obtainable from the Director of Town Planning, 5, Accord Crescent, Aberdeen.

Completed application forms (which should be submitted in duplicate) should be returned to the Director on or before 10th September, 1951.

J. C. RENNIE.
Town Clerk.

Town House, Aberdeen.
8th August, 1951. 4161

BOROUGH OF WILLESDEN.
BOROUGH ENGINEER AND SURVEYOR'S DEPARTMENT.
APPOINTMENT OF ARCHITECTURAL STAFF.

Applications are invited for the following appointments:—

(1) ARCHITECTURAL ASSISTANT, Grade A.P.T., VI. The appointment will, in the first instance, be on the Temporary Establishment, with prospects of transfer to the Permanent Establishment.

Candidates must be Associates of the Royal Institute of British Architects or hold an equivalent qualification. Preference will be given to those having a general knowledge and experience of Architectural work in the service of a Local Authority.

(2) ARCHITECTURAL ASSISTANT, Grade A.P.T., V. The appointment will be on the Permanent Establishment. Candidates must be Associates of the Royal Institute of British Architects or hold an equivalent qualification, and preferably have a general knowledge and experience of Architectural work in the service of a Local Authority.

Both appointments will be terminable by one month's notice on either side, and are subject to the provisions of the Local Government Superannuation Act, 1937, and the successful candidates will be required to pass a medical examination.

Applications, stating age, qualifications and experience, accompanied by copies of not more than three testimonials, should be addressed to the undersigned, endorsed "Architectural Staff," not later than 10 a.m. on Monday, 10th September, 1951.

It will be necessary for the successful candidates to provide their own housing accommodation, as the Council is not in a position to assist.

Canvassing, directly or indirectly, will be deemed a disqualification.

(Sgd.) R. S. FORSTER,
Town Clerk.

Town Hall, Dyne Road, Kilburn, N.W.6.
8th August, 1951. 4176

ARCHITECTS, MAINTENANCE SURVEYORS, QUANTITY SURVEYORS, AND LANDS OFFICERS.

THE CIVIL SERVICE COMMISSIONERS invite applications for permanent appointments to the basic (Assistant) grades given above in a number of Departments in England and Scotland. Applications will be accepted at any time up to and including 31st December, 1951. Selected candidates will be interviewed as soon as possible after the receipt of their application forms. Successful candidates may expect early appointments. Candidates are advised to apply as early as possible.

All candidates must be at least 25 and under 35 years of age on 1st January, 1951, with extension for regular service in H.M. Forces, and up to two years for permanent Civil Servants. All candidates must have the appropriate professional qualifications and experience.

The London salary scale for men aged 30 and over is £600×£25—£750. Lower starting salary for younger entrants (from £475 at age 25).

(The next higher grades are:—Main Grade, £750×£25—£1,000; Senior Grade, £1,050×£35—£1,270.)

Salaries for women and for officers appointed to the provinces will be somewhat lower.

Forms of application and copies of the regulations, with full details of qualifications, required from the Civil Service Commission, Scientific Branch, Trinidad House, Old Burlington Street, London, W.1, quoting No. 3405/TA. Completed application forms should be returned as soon as possible. 4174

HIS MAJESTY'S COLONIAL SERVICE.

Applications are invited for the following post:—

ASSISTANT ARCHITECT, in the Public Works Department, Nyasaland, in the salary scale £550-£1,320 per annum, point of entry depending upon War service and approved experience. A cost-of-living allowance is also payable. Appointment is on three years' probation for pensionable employment. Passages are granted, once each way each tour, to the officer, his wife, and children up to the cost of one adult passage. Quarters, if available, are provided at a maximum rent of 10 per cent. of salary, and leave is granted at the rate of five days for each completed month of service after a tour of 2-3 years. Candidates between the ages of 25 and 35, preferably single, must be A.R.I.B.A. or L.R.I.B.A., with good general experience.

Intending candidates should apply in writing to the Director of Recruitment (Colonial Service), Colonial Office, Sanctuary Buildings, Great Smith Street, S.W.1, giving brief details of their age, qualifications and experience. They should mention this paper and quote the reference number (27301/36). 4162

COUNTY BOROUGH OF READING.
BOROUGH ARCHITECT'S DEPARTMENT.

Applications are invited for the appointment of an ARCHITECTURAL ASSISTANT, Grade IV (£530-£575 p.a.). Applicants for this post must be Students of the Royal Institute of British Architects and have had two years' drawing office experience.

Applications should be received by the Borough Architect, Town Hall, Reading, by Saturday, the 8th September, 1951, from whom Application Forms can now be obtained.

G. F. DARLOW,
Town Clerk.

Town Hall, Reading.
August, 1951. 4199

COUNTY BOROUGH OF IPSWICH.
APPOINTMENT OF ARCHITECTURAL ASSISTANT.

Applications are invited for the appointment of Architectural Assistant in the Borough Engineer and Surveyor's Department.

The appointment is subject to the provisions of the Local Government Superannuation Act, 1937, and to the passing of a medical examination.

The salary will be in accordance with Grade A.P.T., VI, i.e., £645 p.a., rising by annual increments to a maximum of £710 p.a.

Candidates should have passed the Final Examination of the R.I.B.A. (or hold a similar qualification), and have had experience in General Architectural work and possess a sound knowledge of design and construction.

There is no form of application, but candidates must state age, experience, and any other relevant details, and submit the names and addresses of three referees. Applications must be received by the Borough Engineer and Surveyor, 19, Tower Street, Ipswich, not later than Monday, 10th September, 1951.

Canvassing will disqualify. If the applicant is to his knowledge related to any member or senior officer of the Council, he must disclose that fact in writing when submitting his application.

Town Clerk.

Town Hall, Ipswich.
24th August, 1951. 4192

NATIONAL COAL BOARD (SCOTTISH DIVISION). Vacancies exist in Edinburgh for qualified and unqualified Architectural Staff. There are exceptional opportunities for gaining experience in a wide field of contemporary design and construction, as well as building administration. Details of the vacancies are given hereunder. The point of entry into the relevant salary scales will depend on the qualifications and experience of the successful applicants. Applications, giving full details of age, qualifications, experience (in chronological order), present post and salary, should be forwarded to the Establishments Officer, 1, Eglinton Crescent, Edinburgh, within 7 days, together with copies of three testimonials.

ARCHITECT, Grade II. Salary scale, £450×£25 to £700. Required qualification: A.R.I.B.A.

ARCHITECTURAL ASSISTANT, Grade I. Salary scale, £410×£20 to £550.

Candidates for the Assistant's posts should have passed Inter. R.I.B.A. Examination and have some office experience. 4200

UNIVERSITY OF CAMBRIDGE: DEPARTMENT OF ARCHITECTURE.

Applications are invited for the post of UNIVERSITY LECTURER. The duties will include the teaching of Theory of Structures, Building Construction, and their application to Architectural Design. The pensionable stipend is £750 per annum, rising by annual increments of £50 to £1,250.

A candidate must send his application, together with the names of not more than two referees, to the Secretary of the Faculty Board of Fine Arts, 1, Scroope Terrace, Cambridge, from whom further particulars may also be obtained. Applications must reach Cambridge not later than 1st October, 1951, and should be accompanied by particulars of the candidate's academic career, architectural practice and publications, if any. 4201

COUNTY BOROUGH OF DARLINGTON.
BOROUGH ARCHITECT'S DEPARTMENT.
APPOINTMENT OF ASSISTANT ARCHITECT.

Applications are invited for the permanent appointment of an Assistant Architect. Salary Grade A.P.T., IV-V, according to qualification.

The Department is dealing with a large programme of Education work, including large Secondary Schools and a new Technical College, Housing, Welfare Buildings and other general work, and candidates who have had previous experience and are Members of the R.I.B.A. will receive preference.

Applications, giving full particulars of age, qualifications, present appointment with salary, previous experience with dates, and the names of three referees, to be sent to E. A. Tornbohm, A.R.I.B.A., A.M.T.P.I., Borough Architect, Central Buildings, Darlington, not later than Monday, the 17th September, 1951.

H. HOPKINS,
Town Clerk.
4183

CITY OF PORTSMOUTH.
CITY PLANNING DEPARTMENT.

Applications are invited for the following appointments:—

(*a*) PLANNING ASSISTANT. Grades II-IV (£470-£575 per annum).

(*b*) GENERAL ASSISTANT. Grade I (£440-£485 per annum).

The commencing salary in respect of appointment (*a*) will be according to qualifications and experience.

A special subsistence allowance may be paid to a married applicant for a period of up to six months after taking up the appointment if he is unable to secure housing accommodation immediately.

Applications, stating age, present position, qualifications and experience, together with names of two referees, must be delivered to the undersigned, marked "City Planning Appointment," not later than 10th September, 1951.

Canvassing will disqualify.

V. BLANCHARD,
Town Clerk.

City Council Chambers, Portsmouth.
11th August, 1951. 4177

SUDAN GOVERNMENT.

The Public Works Department require THREE ARCHITECTURAL ASSISTANTS, aged 24-36, for service in the Sudan under the Chief Architect, for the preparation of working drawings for general building work.

Candidates should have a sound Architectural training and experience of general building work, and be capable of the preparation of working drawings required.

Appointment will be on Short Term Contract for an initial period of two years, with or without bonus as may be agreed.

Salary for Short Term Contract with bonus ranges from £E.593 to £E.860 per annum, and for Short Term Contract without bonus ranges from £E.632 to £E.917.

Starting rate will be determined according to age, qualifications and experience.

A cost-of-living allowance is at present payable from £E.142 to £E.352 per annum, according to the number of dependents.

An outfit allowance of £E.40 is payable when the contract is signed in certain circumstances.

No income tax is at present payable in the Sudan.

Further information and application form may be obtained on written application, from the Sudan Agent in London, Wellington House, Buckingham Gate, London, S.W.1.

Please mark envelopes "Architectural Assistant 4/140." 4160

KENT COUNTY COUNCIL.
PLANNING DEPARTMENT.

Applications are invited for posts of PLANNING ASSISTANT in the Planning Department. The salary scale is £470-£575 per annum. The commencing point in the scale will be fixed in each case according to qualifications and experience.

Applicants should be competent draughtsmen. Preference will be given to those who have passed the Intermediate Examination of the Town Planning Institute; for one post experience of development control will be an advantage.

The posts are superannuable, and the successful candidates will be required to pass a medical examination.

Applications in own handwriting, stating age, education, qualifications, experience, present position and salary, together with the names and addresses of two persons to whom reference may be made, and endorsed "Planning Assistant," must reach the County Planning Officer, County Hall, Maidstone, Kent, not later than 6th September, 1951.

W. L. PLATTS,
Clerk of the County Council.

County Hall, Maidstone.
8th August, 1951. 4185

MIDDLESEX COUNTY COUNCIL ARCHITECT'S DEPARTMENT.

Registered ASSISTANT ARCHITECT, A.P.T., VIII, required, at a commencing salary of £765 p.a. if 26 years or over. Established, pensionable, subject to medical assessment and prescribed conditions. Application forms from County Architect, 10, Great George Street, Westminster, S.W.1 (stamped addressed foolscap envelope), to be returned by 10th September (quoting J.765 A.J.). Canvassing disqualifies.

C. W. RADCLIFFE,
Clerk of the County Council. 4214

LONDON ELECTRICITY BOARD.
ENGINEER (CONSTRUCTION).

Applications are invited for the above position in the Construction Branch of the Chief Engineer's Department at Lesco House, Stamford Street, London, S.E.1.

Applicants are required to have considerable experience in the design and detailing of a wide variety of reinforced concrete structures and also of structural and building work in general. Preference will be given to fully qualified structural engineers.

The post is graded under Schedule "C" of the National Joint Board agreement (17th February, 1950) as Grade V. Salary range: £607 19s. to £814 16s. per annum inclusive. The commencing salary will be dependent upon qualifications and experience.

Application forms obtainable from Establishments Officer, 46, New Broad Street, E.C.2, to be returned duly completed within 10 days. Please enclose addressed foolscap envelope and quote Ref. EST/V/1228/A. on all correspondence. 4210

BOROUGH OF ILFORD.
BOROUGH ENGINEER AND SURVEYOR'S DEPARTMENT.
APPOINTMENT OF TEMPORARY CLERK OF WORKS.

Applications are invited for the position of Clerk of Works on the temporary staff of the Borough Engineer's Department, at the maximum salary of A.P.T., Grade II, namely £515 per annum, plus London weighting.

Applicants must have had considerable experience in a similar capacity, and should possess a sound knowledge of building construction. Experience of concrete and steel School construction will be considered an advantage.

The appointment will be subject to one month's notice on either side, to the provisions of the Local Government Superannuation Acts, the National Conditions of Service, and to medical examination.

Forms of application are obtainable from, and should be returned to, the Town Clerk, Town Hall, Ilford, Essex, not later than the 6th September, 1951. 4211

CITY OF CARDIFF.
APPOINTMENT OF ARCHITECTURAL ASSISTANTS.

Applications are invited for the following appointments in the City Surveyor's Department, viz.:—

(*a*) ASSISTANT ARCHITECT (Housing). A.P.T., Grade X (£370-£1,000 per annum).
(*b*) ARCHITECTURAL ASSISTANT (Education). A.P.T., Grade VI (£645-£710 per annum).
(*c*) ARCHITECTURAL ASSISTANT (Education). A.P.T., Grade V (£570-£620 per annum).

Candidates should possess the minimum qualifications and experience prescribed by the National Joint Council for Local Authorities' Administrative, Professional, Technical and Clerical Services for posts in the above-mentioned grades.

General Conditions of Appointments may be obtained from the undersigned.

The Council will assist in finding housing accommodation for the successful candidates to these appointments.

Applications, accompanied by the names and addresses of three referees and endorsed "Architectural Assistant, Grade ——," as the case may be, should be delivered to the undersigned not later than the 6th September, 1951.

S. TAPPER-JONES,
Town Clerk.

City Hall, Cardiff.
August, 1951. 4212

LONDON ELECTRICITY BOARD.
ARCHITECTURAL ASSISTANT.

Applications are invited for the above position in the Architect's Section of the Chief Engineer's Department in Central London.

Applicants should be studying for or have passed the Intermediate Examination of the R.I.B.A., be capable draughtsmen, and have had several years' experience in an Architect's office.

Pending grading of the post under the national agreement of the appropriate negotiating body, the commencing salary will be from £525 per annum inclusive, according to qualifications and experience.

Application forms obtainable from Establishments Officer, 46, New Broad Street, E.C.2, to be returned duly completed by 8th September, 1951. Please enclose addressed envelope and quote Ref. V/1266/A. 4213

HIS MAJESTY'S COLONIAL SERVICE.

Applications are invited for the following posts:—

ARCHITECTS (27301/14), NORTHERN RHODESIA. Four vacancies exist for Architects in the Public Works Department, Northern Rhodesia, in the salary scale £655-£1,320 per annum, with a cost-of-living allowance of, at present, 12½ per cent. of salary. Point of entry to the scale will be determined by War service and experience, and appointment is on contract for three years with a gratuity. Free passages to and from the Colony will be granted to the officer, his wife, and children up to the cost of one adult passage. Quarters, if available, will be provided at a low rent. Candidates should be between the ages of 32 and 45, A.R.I.B.A., and should have at least five years' experience of large building schemes, with specialised knowledge of one of the following:—Hospitals, Municipal or Government Building Projects, Housing, Schools.

Intending candidates should apply in writing to the Director of Recruitment (Colonial Service), Colonial Office, Sanctuary Buildings, Great Smith Street, S.W.1, giving brief details of their age, qualifications and experience. They should mention this paper and quote the reference number (27301/14). 4215

CITY OF BELFAST.
APPOINTMENT OF SENIOR ASSISTANT ARCHITECT.

Applications are invited for this post in the Housing Architect's Department.

Salary £550×£25—£650+bonus+7½ per cent. (bonus £90 for men; £72 women). (The scale is under revision.)

Candidates should be fully qualified, experienced in the design and planning of Housing Estates, particularly flats and other ancillary buildings.

The commencing salary will be determined in the light of the qualifications, ability and experience of the person appointed. Superannuation contributions at the rate of 6 per cent. of remuneration will be payable.

Candidates must not be more than 45 years of age on 1st October, 1951.

Preference will be given to ex-Service candidates possessing the required qualifications, providing that the Council is satisfied that such candidates can or within a reasonable time will be able to fill the post efficiently.

Canvassing in any form, oral or written, direct or indirect, will, if proved to the satisfaction of the appointing authority, disqualify a candidate for appointment.

Forms of application can be obtained from the Housing Architect, 94, Chichester Street, Belfast.

Applications on official forms, accompanied by copies of two recent testimonials, should be enclosed in envelopes endorsed "Senior Assistant Architect," and must reach the undersigned not later than 12 noon on Saturday, 8th September, 1951.

JOHN DUNLOP.
Town Clerk.

City Hall, Belfast.
16th August, 1951. 4209

Tenders for Contracts

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

BOROUGH OF CHESTERFIELD.
NEWBOLD ESTATE.
ERECTION OF PERMANENT HOUSES.

Tenders are invited for 100 Traditional Type brick built houses on the Newbold Estate, Chesterfield, comprising:—

No. 50—2-Bedroom type Houses.
No. 44—3-Bedroom type Houses.
No. 6—4-Bedroom type Houses.

The Corporation do not bind themselves to accept the lowest or any tender, and the acceptance of the tender is subject to the prior approval of the Ministry of Local Government and Planning.

The plans and general conditions of contract (which are a modified form of R.I.B.A., Form 6) may be inspected at, and the Bills of Quantities obtained from, the office of the Borough Engineer and Surveyor, Town Hall, Chesterfield, upon payment of a deposit of two guineas, refundable upon receipt of a *bona fide* tender and the return of all documents.

Tenders must be forwarded in a plain sealed envelope, endorsed "Tender for 100 Houses, Newbold Estate," and must reach the undersigned not later than 10 a.m. on Wednesday, 5th September, 1951.

RICHARD CLEGG,
Town Clerk.

Town Hall, Chesterfield.
August, 1951. 4175

COUNTY BOROUGH OF READING.
TO BUILDERS AND CONTRACTORS.

The Corporation of Reading invite tenders for the erection of an extension to house filtration plant (with ancillary works) at the King's Meadow Swimming Bath, King's Meadow Road, Reading.

The General Conditions of Contract and Drawings may be inspected at the office of the Borough Architect, Town Hall, Reading, and the Bills of Quantities, Form of Tender, and endorsed envelope may be obtained on application to him, accompanied by a cheque for two guineas (made payable to the Reading Corporation), which will be refunded upon the receipt of a *bona fide* tender. The documents for tendering purposes will be ready for despatch on and after the 3rd September, 1951.

Tenders must be delivered to me at my office not later than Thursday, the 20th September, 1951.

No tender will be considered unless enclosed in the endorsed envelope provided, and sealed, but not bearing any name or mark indicating the sender.

The Corporation do not bind themselves to accept the lowest or any tender.

G. F. DARLOW,
Town Clerk.

Town Hall, Reading.
August, 1951. 4203

COUNTY BOROUGH OF READING.
TO BUILDERS AND CONTRACTORS.

The Corporation of Reading invite tenders for the conversion of part of No. 31A, London Street, Reading, for use as a small Theatre.

The plans have been prepared by Anthony I. Cripps, Dip.Arch., A.R.I.B.A., of 18, Caversham Road, Reading, and may be inspected at his office, together with the General Conditions of Contract.

A copy of the Bills of Quantities, Form of Tender, and endorsed envelope, may be obtained on application to the Borough Architect, Town Hall, Reading, accompanied by a cheque for two guineas (made payable to the Reading Corporation), which will be refunded upon receipt of a *bona fide* tender.

The documents for tendering purposes will be ready for despatch on the 7th September, 1951.

Tenders must be delivered to me at my office not later than Friday, the 21st September, 1951.

No tender will be considered unless enclosed in the endorsed envelope provided, and sealed, but not bearing any name or mark indicating the sender.

The Corporation do not bind themselves to accept the lowest or any tender.

G. F. DARLOW,
Town Clerk.

Town Hall, Reading.
August, 1951. 4202

Sale by Auction

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

JERSEY, CHANNEL ISLANDS.
SCOPE FOR ENGLISH DEVELOPERS. No T. & C.P. or irksome controls. Hautmont Hotel with 7 acres, 3 passed for building houses or flats. Auction 26th September. Town residence now as 5 well-let luxury flats, also 1½ acres building land with plans passed for 37 flats. Full details of these and others from Rumsey & Rumsey, Estate Agents, Bournemouth. 4195

Architectural Appointments Vacant

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

ARCHITECTURAL ASSISTANT required immediately. Car driver. Starting salary £350-£500, according to experience. Apply with full details to Deacon & Laing, 9, St. Paul's Square, Bedford. 4071

JUNIOR ARCHITECTURAL DRAUGHTSMAN required for Albert E. Reed & Co., Ltd., Aylesford Paper Mills, Larkfield, Maidstone. 4117

SENIOR ASSISTANT required to train as Manager. Particulars of qualifications, etc., to Box 4139.

SENIOR ASSISTANT (single) required for progressive office. Position will lead to Chief Assistant. Replies, with details of experience and qualifications, to Box 4138.

ASSISTANT about to take Final (R.I.C.S. or R.I.B.A.) required in City office. At least two years' office experience necessary. Salary by arrangement. Opportunity to handle School and Hospital contracts. Box 4136.

ASSISTANT required in small office. Approximately of Intermediate standard. Commencing salary £400, rising to £600, according to progress. Replies to Box 4140.

QUALIFIED or experienced ASSISTANT required in Architect's Department of Multiple Company in the Midlands, conversant with design, alterations and maintenance of retail shop premises, working drawings, specifications and surveys. Salary according to ability. Five-day week and pension scheme in operation. Applicants are requested to furnish details of training, age, experience, to Box 4137.

REQUIRED. — ARCHITECTURAL ASSISTANT, aged 25 to 40. Experienced in Industrial Building, Reinforced Concrete and Structural Steel Construction. Apply in writing to Men's Personnel Dept., Kodak, Ltd., Harrow, Middx. 4165

EXPERIENCED SENIOR ARCHITECTURAL ASSISTANT for varied practice. Write, giving particulars of experience and salary required, to J. C. Prestwich & Sons, M.A., F./A.R.I.B.A., Bradshawgate Chambers, Leigh, Lancs. 4163

ARCHITECTURAL REPRESENTATIVE required for London area. Apply by letter, giving all personal particulars, Leyland Paint & Varnish Co., 75, Newman Street, W.1. 4166

LONDON Firm of Chartered Architects and Surveyors have vacancies for SENIOR (Intermediate) and JUNIOR ARCHITECTURAL ASSISTANTS. Good salaries and prospects for the right men. Apply to Box 4167.

EAST MIDLAND Architects require ASSISTANT, to be in charge of Local Authority Housing. Two-bedroomed flat available. State age, qualifications, present employment, and salary required. Box 4169.

WANTED immediately Architect's Intermediate ASSISTANT, with office experience. Able to prepare working drawings from sketches and with knowledge of surveys. Office situated on South Coast, with varied and interesting practice. Reply, giving full details, if married, when available, and salary required. Box 4164.

RAGLAN SQUIRE, F.R.I.B.A., 39, Eaton Square, S.W.1, has vacancies for ASSISTANTS with good office experience. Salary according to qualifications. Apply in writing to the above address. 4179

SENIOR ARCHITECTURAL ASSISTANT required in Architect's office in Blackburn, N.E. Lancs. Must be good draughtsman, capable of handling Contracts from survey to completion. Write, stating experience and salary required, to Box 4180.

ARCHITECT'S ASSISTANT, of Intermediate standard, R.I.B.A., required for office in Westminster area. Must be a competent draughtsman and prepared to use his own initiative. Reply, stating age, experience, and salary required, to Box 4181.

ARCHITECT'S SENIOR ASSISTANT required in Architects' office, South London area. Experience in housing schemes and contracts. Good draughtsman and having knowledge of specification. Salary £700 per annum. Reply, with full details of experience, to Box 4182.

RONALD WARD & PARTNERS require a JUNIOR ARCHITECTURAL ASSISTANT (Intermediate standard), to work in their Victoria Office. Tel.: VIC. 5531. 4194

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The Incorporated Association of Architects and Surveyors will hold examinations at Intermediate and Final grades in the following Sections during the week beginning 19th November, 1951.

ARCHITECTURAL;
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BUILDING SURVEYORS (Private Practice).

The examination centres will be: London, Belfast, Birmingham, Blackpool, Bristol, Edinburgh, Hull, Manchester, Newcastle-on-Tyne, Newport (Mon.), Nottingham, Plymouth, Southampton. Applications from candidates for permission to sit, made on the prescribed form, must be received not later than Monday, 24th September, 1951.

Full information on application to the Examinations Secretary, I.A.S.S., 75, Eaton Place, London, S.W.1.

N.B.—The Incorporated Association of Architects and Surveyors hereby give notice that the General Regulations governing examinations have been revised, and that the revised regulations will apply to the examinations to be held in May, 1952, and thereafter until further notice. Syllabuses containing the revised regulations are obtainable (price 1s.) on application to the Examinations Secretary, I.A.A.S.

Notice is also given that the Association will hold a Preliminary Examination in March of each year beginning 1952, and that examinations in the Land Survey Section will be held in May, 1952, and thereafter at half-yearly intervals. 3045

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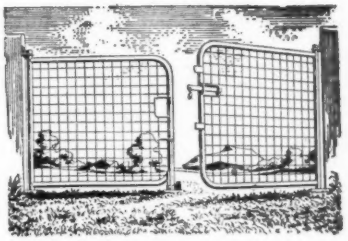

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