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

IGE	Institution of Gas Engineers. 17, Grosvenor Crescent, S.W.1.	Sloane 8266
IHVE	Institution of Heating and Ventilating Engineers. 75, Eaton Place, S.W.1.	Sloane 3158/1601
IIBD	Incorporated Institute of British Decorators. Drayton House, Gordon Street, W.C.1.	Euston 2450
ILA	Institute of Landscape Architects. 12, Gower Street, W.C.1.	Museum 1783
I of Arb.	Institute of Arbitrators, 35/37, Hastings House, 10, Norfolk Street, Strand, W.C.2.	Temple Bar 4071
IOB	Institute of Builders. 48, Bedford Square, W.C.1.	Museum 7197/5176
IR	Institute of Refrigeration. Dalmeny House, Monument Street, E.C.3.	Avenue 6851
IRA	Institute of Registered Architects. 47, Victoria Street, S.W.1.	Abbey 6172
ISE	Institution of Structural Engineers. 11, Upper Belgrave Street, S.W.1.	Sloane 7128
IWA	Inland Waterways Association. 11, Gower Street, W.C.1.	Museum 9200
LIDC	Lead Industries Development Council. Eagle House, Jermyn Street, S.W.1.	Whitehall 7264/4175
LMBA	London Master Builders' Association. 47, Bedford Square, W.C.1.	Museum 3891
MARS	MARS Group (English Branch of CIAM). Secretary: Gontran Goulden, Building Centre, 9, Conduit Street, W.1.	Mayfair 8641
MOA	Ministry of Agriculture and Fisheries. 55, Whitehall, S.W.1.	Whitehall 3400
MOE	Ministry of Education. Curzon Street House, Curzon Street, W.1.	Mayfair 9400
MOH	Ministry of Health. Whitehall, S.W.1.	Whitehall 4300
MOLNS	Ministry of Labour and National Service, 8, St. James's Square, S.W.1.	Whitehall 6200
MOS	Ministry of Supply. Shell Mex House, Victoria Embankment, W.C.	Gerrard 6933
MOT	Ministry of Transport. Berkeley Square House, Berkeley Square, W.1.	Mayfair 9494
MOTCP	Ministry of Town and Country Planning. 32-33, St. James's Square, S.W.1.	Whitehall 8411
MOW	Ministry of Works. Lambeth Bridge House, S.E.1.	Reliance 7611
NAMMC	Natural Asphalte Mine-Owners and Manufacturers Council. 94-98, Petty France, S.W.1.	Abbey 1010
NAS	National Association of Shopfitters. 9, Victoria Street, S.W.1.	Abbey 4813
NBR	National Buildings Record. 37, Onslow Gardens, S.W.7.	Kensington 8161
NCBMP	National Council of Building Material Producers. 10, Princes Street, S.W.1.	Abbey 5111
NFBTE	National Federation of Building Trades Employers. 82, New Cavendish Street, W.1.	Langham 4041/4054
NFBTO	National Federation of Building Trades Operatives, Federal House, Cedars Road, Clapham, S.W.4.	Macaulay 4451
NFHS	National Federation of Housing Societies. 13, Suffolk St., S.W.1.	Whitehall 1693
NHBRC	National House Builders Registration Council. 82, New Cavendish Street, W.1.	Langham 4341
NPL	National Physical Laboratory. Head Office, Teddington.	Molesey 1380
NSA	National Sawmilling Association. 14, New Bridge Street, E.C.4.	City 1476
NSAS	National Smoke Abatement Society. Chandos House, Buckingham Gate, S.W.1.	Abbey 1359
NT	National Trust for Places of Historic Interest or Natural Beauty. 42, Queen Anne's Gate, S.W.1.	Whitehall 0211
PEP	Political and Economic Planning. 16, Queen Anne's Gate, S.W.1.	Whitehall 7245
RCA	Reinforced Concrete Association. 94, Petty France, S.W.1.	Whitehall 9936
RIAS	Royal Incorporation of Architects in Scotland. 15, Rutland Square, Edinburgh.	Edinburgh 20396
RIBA	Royal Institute of British Architects. 66, Portland Place, W.1.	Langham 5721
RICS	Royal Institution of Chartered Surveyors. 12, Great George St., S.W.1.	Whitehall 5322/9242
RFAC	Royal Fine Art Commission. 22A, Queen Anne's Gate, S.W.1.	Whitehall 3935
RS	Royal Society. Burlington House, Piccadilly, W.1.	Regent 3335
RSA	Royal Society of Arts. 6, John Adam Street, W.C.2.	Trafalgar 2366
RSI	Royal Sanitary Institute. 90, Buckingham Palace Road, S.W.1.	Sloane 5134
RIB	Rural Industries Bureau. 35, Camp Road, Wimbledon, S.W.19.	Wimbledon 5101
SBPM	Society of British Paint Manufacturers. Grosvenor Gardens House, Grosvenor Gardens, S.W.1.	Victoria 2186
SCR	Society for Cultural Relations with the USSR. 14, Kensington Square, London, W.8.	Western 1571
SE	Society of Engineers. 17, Victoria Street, Westminster, S.W.1.	Abbey 7244
SFMA	School Furniture Manufacturers' Association. 30, Cornhill, London, E.C.3.	Mansion House 3921
SIA	Structural Insulation Association. 14, Moorgate, London, E.C.2.	Central 4444
SIA	Society of Industrial Artists. 7, Woburn Square, W.C.1.	Langham 1984
SNHTPC	Scottish National Housing Town Planning Council. Hon. Sec., Robert Pollock, Town Clerk, Ruthlergen.	
SPAB	Society for the Protection of Ancient Buildings. 55, Great Ormond Street, W.C.1.	Holborn 2646
TCPA	Town and Country Planning Association. 28, King Street, Covent Garden, W.C.2.	Temple Bar 5006
TDA	Timber Development Association. 75, Cannon Street, E.C.4.	City 4771
TGC	The Gas Council. 1, Grosvenor Place, S.W.1.	Sloane 4554
TPI	Town Planning Institute. 18, Ashley Place, S.W.1.	Victoria 8815
TTF	Timber Trades Federation. 69, Cannon Street, E.C.4.	City 4444
WDC	War Damage Commission. Devonshire House, Mayfair Place, Piccadilly, W.1.	Mayfair 8866
WEDA	Welfare Equipment Development Association. 74, Victoria Street, S.W.1.	Victoria 5783
ZDA	Zinc Development Association. Lincoln House, Turl Street, Oxford.	Oxford 47988

TH

A DISTINCTIVE FLOOR-COVERING THAT CAN BE LAID DIRECT TO CONCRETE

DECORATIVE SCOPE AND LONG WEAR AT LOW COST

CURRENT restrictions mean that careful consideration must be given to the installation cost of flooring for new buildings. Armstrong's Accotile Flooring can be perfectly satisfactorily laid on screeded concrete—yet it is inexpensive, distinctive in appearance and unusually durable.

Armstrong's Accotile is laid throughout the ground floors of the Chippingfield site, an estate of about 100 houses in Harlow New Town, Essex. The architect is Mr. Frederick Gibberd, F.R.I.B.A., Architect Planner, 35 Gordon Square, London W.1, and the contractors Gee, Walker & Slater Ltd., 100 Park Lane, London W.1.

LAID ON CONCRETE— NO DAMP-COURSE

Accotile can be quickly laid on any sub-floor —concrete, wood, or metal. It is especially suitable for use on screeded concrete direct to earth since it is unaffected by alkaline moisture. Damp-proofing is not essential unless actual water pressure is suspected.

INEXPENSIVE

Accotile installed is competitive with any other flooring laid on concrete.

OUTSTANDINGLY DURABLE

Accotile withstands hard wear. It stands up to the hard usage frequently met with in Council property and will, in most cases, long outlast more expensive floors. Many local authorities have found repair costs, too, much reduced by Accotile installations. Accidental damage is easily and cheaply made good.

Accotile durability is proved. Accotile floors laid in England twelve years ago can be inspected. They are still in excellent condition.

DECORATIVE— UNLIMITED CHOICE OF DESIGN

With Accotile there is unlimited scope for decorative effect. The tiles are made in a wide range of plain and marbled colours and can be laid in any design. The colours are fast since they are an integral part of the tile.

EASILY MAINTAINED— NON-STAINING

Accotile is kept fresh and new-looking indefinitely by normal sweeping and washing, but may be polished if desired. It offers good resistance to stains, and to most acids.

COVED SKIRTING

Accotile Top Set Coved Skirting gives an hygienic finish to the floor and saves timber and painting maintenance.

WHAT IS ACCOTILE?

Armstrong's Accotile is a composition of inert asbestos fibres and ground rock fillers, fadeless mineral pigment, and asphalt or resin binders, supplied in accurately cut tiles, border strips, etc.

With 20 years' successful experience in America behind it, it is now manufactured in England at the Tyneside factory of the Armstrong Cork Company Ltd.

ALSO FOR SCHOOLS, HOSPITALS, PUBLIC BUILDINGS, AND COMMERCIAL PREMISES

ACCOTILE is quiet and comfortable to walk on, warm and non-slip. For schools, hospitals, and public buildings, Accotile flooring is economical both in first cost and in maintenance—cleaning is facilitated by Accotile Top Set Coved Skirting.

Business offices, shops, restaurants, and licensed premises are among places that exploit to the full the advantages of Accotile. In existing buildings, it is laid quickly and can be used immediately, so that occupation of the room is disturbed for the minimum time.

INSTALLATION

To ensure satisfaction, Accotile is laid only by skilled personnel trained in Armstrong's Laying School, where particular attention is paid to workmanship and the correct method of setting out.

ARMSTRONG'S ACCOTILE* FLOORING

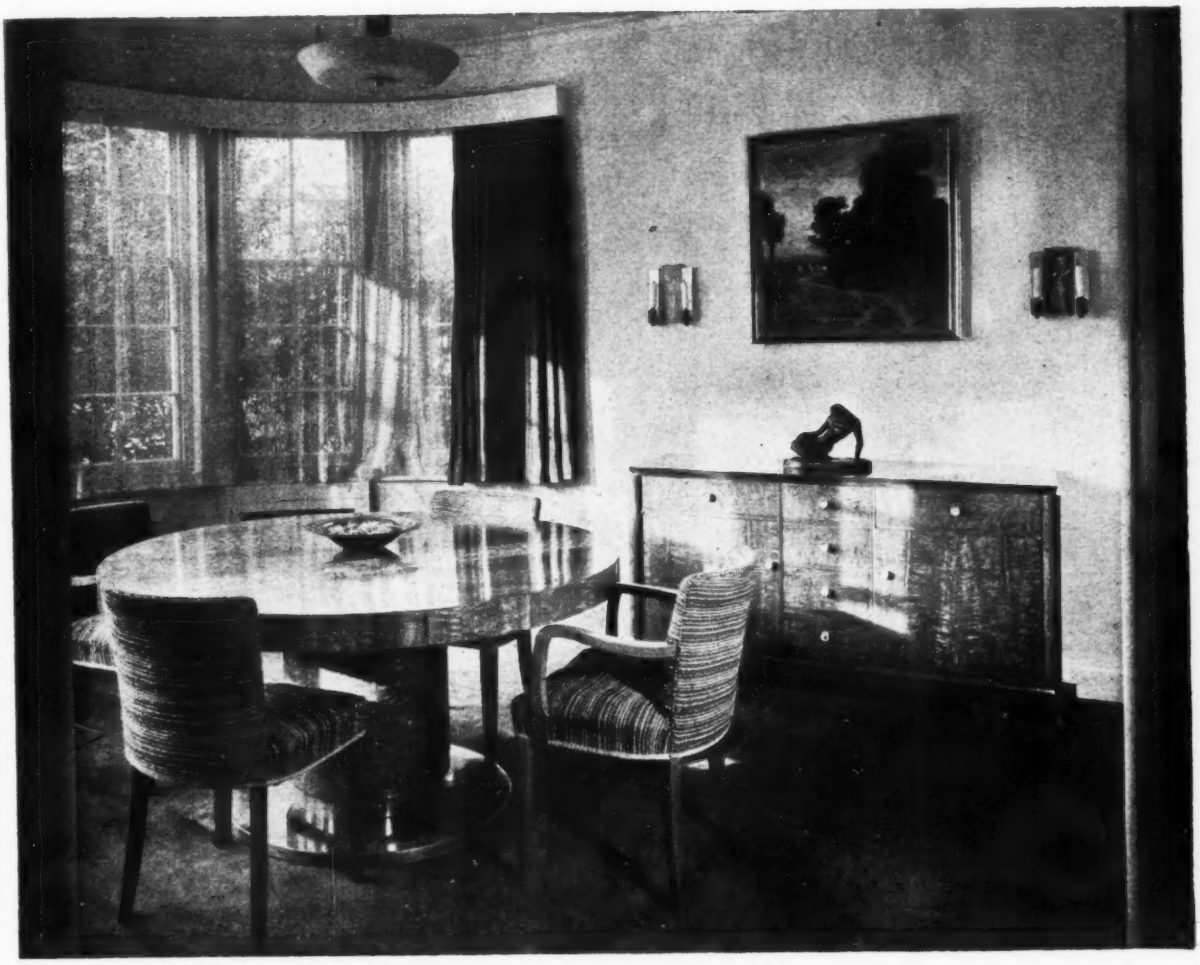
"The low-cost floor with the luxury look"

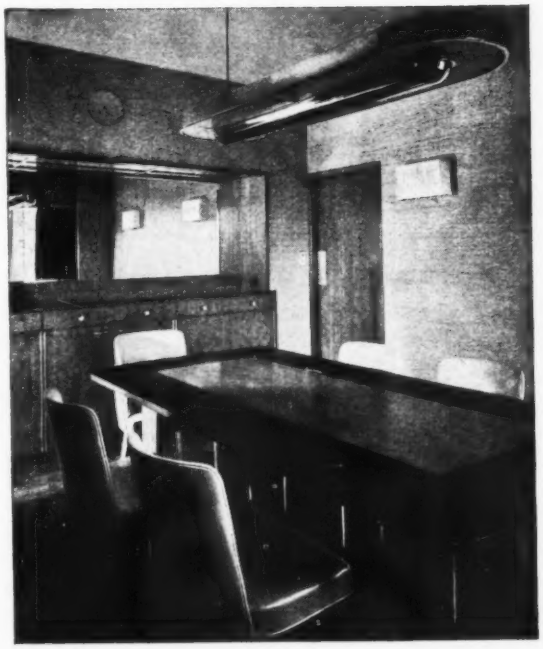
ARMSTRONG CORK COMPANY LIMITED, FLOORING DEPARTMENT

BUSH HOUSE, ALDWYCH, LONDON W.C.2. TELEPHONE: CHANCERY 6281

SCOTTISH BRANCH: 5 OSWALD STREET, GLASGOW C.1. TELEPHONE: CENTRAL 5703

* British Registered Trade Mark 663698. Armstrong Cork Co. Ltd., Registered Users.





Above : Dining Room Furniture in Figured Teak.

Left : Dining Room Table in Mahogany with Centre Panel in Sycamore.

Bath
CABINET MAKERS AND ARTCRAFT LTD.

CONTRACTORS FOR MODERN INTERIORS

FURNISHINGS FOR HOTELS, PUBLIC BUILDINGS, HOMES AND SHIPS

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SAFE — for years to come

ON STAIRS FOR PUBLIC USE, safety is essential: a surface that can't wear slippery, and a good clear edge to the steps.

Ferodo Stairtreads meet both requirements—handsomely. The gleaming aluminium nosing outlines each tread, and the inlaid strips of Ferodo fabric are non-slip through and through. They give a safe, comfortable grip to hurrying feet, even where shoes may be wet. They seem to absorb endless wear without themselves wearing appreciably, and last for many years under heavy traffic.

There are both single and double channel types, in various widths and profiles. As an alternative to Ferodo fabric, the strips may be of Ferodo composition, giving a non-slip surface in red, white, or grey.

Ferodo Stairtreads are being increasingly installed in hotels, stores, offices, and other buildings. They are easily fitted to existing stairs of any type, are easily cleaned, and need no other maintenance. The various models, including a plain steel-backed industrial type, are described and illustrated in our catalogue No. 732KK, gladly sent on request.

FERODO
STAIRTREADS

FERODO LIMITED
CHAPEL-EN-LE-FRITH
A Member of the Turner & Newall Organization

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How and Where to Specify
Pressure Preserved Timber
for protection from

DRY ROT

Insect Attack and Fire

MOISTURE CONTENT OF TIMBER	SITUATION	WHAT TO SPECIFY
Above 20 per cent. moisture content	All Dry Rot replacements Ground floor joists and flooring Fillets in concrete and flooring Wallplates and other timber embedded in brickwork Exterior doorframes and window frames Framing (garages, outhouses, etc.) External fascia boards and bargeboards, etc.	"Tanalised" Timber 0.25 lb./cu. ft. net retention
	Fence posts Gate posts Gutters	0.33 lb./cu. ft. net retention
Below 20 per cent. moisture content	Doors First floor joists and flooring Internal staircases *Note.*—If the following conditions are conformed with :—Good design, good workmanship, properly seasoned timber, adequate ventilation, good maintenance, *i.e.*, dry timber, kept dry ; preservation *against decay* is not necessary.	Untreated timber
Irrespective of moisture content	Any situation where timber may be endangered by the ravages of wood-destroying insects.	"Tanalised" Timber 0.25 lb./cu. ft. net retention
Irrespective of moisture content	Any interior situation where there is a fire hazard in :—	Timber treated with "Pyrolith"
	Exhibition Stands (Approved by L.C.C.)	2.5 lb./cu. ft. net retention
	Situations where Admiralty specifications have to be complied with	6 lb./cu. ft. net retention
	Public buildings	To local government specification

'Tanalised' Timber

"Tanalised" Timber is solid timber, plywood or hardboard impregnated under vacuum and pressure, with "Wolman" "Tanalith" wood preservative. Treatment plants and stockists throughout the country.

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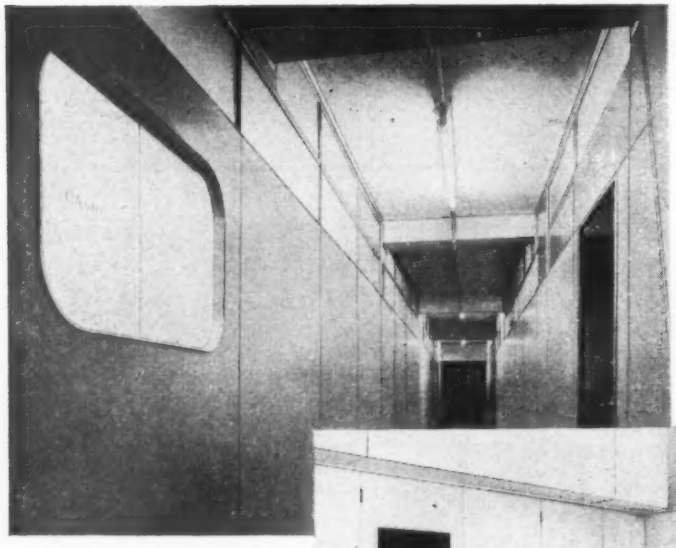
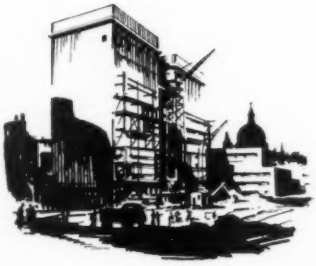
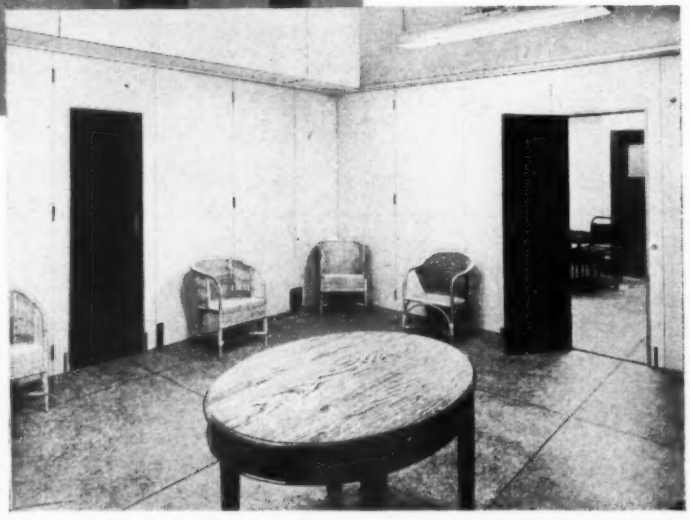
Members of The British Wood Preserving Association

Reconstruction of the City of London...







New Building for

CITY OF LONDON REAL PROPERTY CO. LTD.

now completed at

16 ST. HELENS PLACE LONDON, E.C.3

Occupied by

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★

6 IMPORTANT REASONS why your organisation can benefit by the use of "HOLOPLAST"

- **SPACE SAVING**
  "Holoplast" Movable Walls are one third the thickness of ordinary walls—this saves space and provides greater accommodation.
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  "Holoplast" Walls have a hard and beautiful finish—last longer—are not easily damaged—maintenance costs are at least halved.
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- **TAILOR-MADE FOR THE JOB**
  No bills for extras – the price quoted for the whole perfect job is guaranteed.

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NO MATERIAL LICENCES REQUIRED

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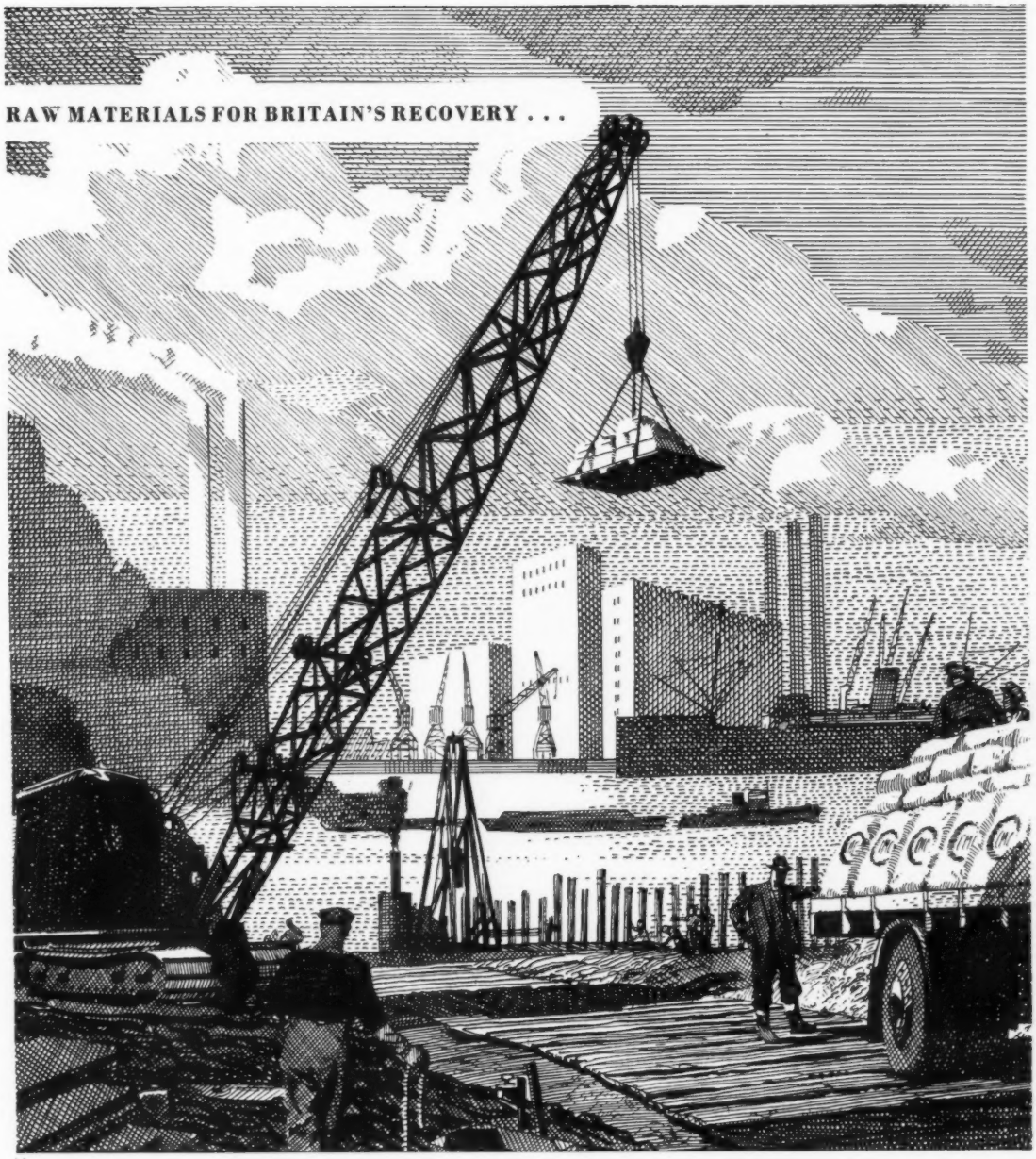
Telephone: VICtoria 9981 & 9354/7

HEAD OFFICE AND FACTORY: NEW HYTHE, NEAR MAIDSTONE, KENT

Telephone: Aylesford 7361



CEMENT BUILDS UP OUR SEA TRADE

Britain's docks are right in the front line of her fight for recovery. Men and machines work at top pressure—ships come and go, carrying the hopes of a nation.

But more ships doing more work need more dock space—and docks need cement. So once again, the Blue Circle Cement Organisation answers the nation's call and makes an all-out effort to meet yet another vital demand.

A BLUE CIRCLE CMC PRODUCT

This symbol identifies the products of the largest cement organisation in the world.

THE CEMENT MARKETING COMPANY LIMITED

PORTLAND HOUSE · TOTHILL STREET · LONDON · SW1

Design for a Pub. From the original Collage by R. MYERSCOUGH-WALKER.

LOOKING DOWN ON A PUB goes against the grain with us especially so when it's such a warm friendly place as this. We prefer to keep our feet on the ground, or more precisely, on the Marley Floor Tiles which in this case (as in so many others) emphasise the bright cheerful atmosphere, are so comfortable to stand on, so easy to keep clean, and which keep all signs of rising damp at bay.

Cock o' the walk

The Marley Tile Company Limited, London Rd., Sevenoaks, Kent. Sevenoaks 2251-8 MARLEY

DOW-MAC FOR PRESTRESSED CONCRETE

WHY PRESTRESSED?

➡ MODERN MATERIAL

Prestressed concrete is a modern material for the architect, builder and engineer and has a wide and growing application in building, structural and civil engineering.

➡ SAVING MATERIAL

Prestressed concrete replaces constructional steel and in so doing can save up to ninety per cent of the weight of steel and eliminates maintenance costs. It replaces timber and unlike timber is not subject to deterioration. It also replaces conventional reinforced concrete because no shrinkage cracks occur, nor do stress cracks occur below a certain predetermined loading. Also the steel requirement for a given purpose may be only twenty per cent of the weight of ordinary reinforcing steel.

➡ REDUCTION IN WEIGHT AND DEPTH

Compared with conventional reinforced concrete, prestressing permits reduced sections with shallower overall constructional depth.

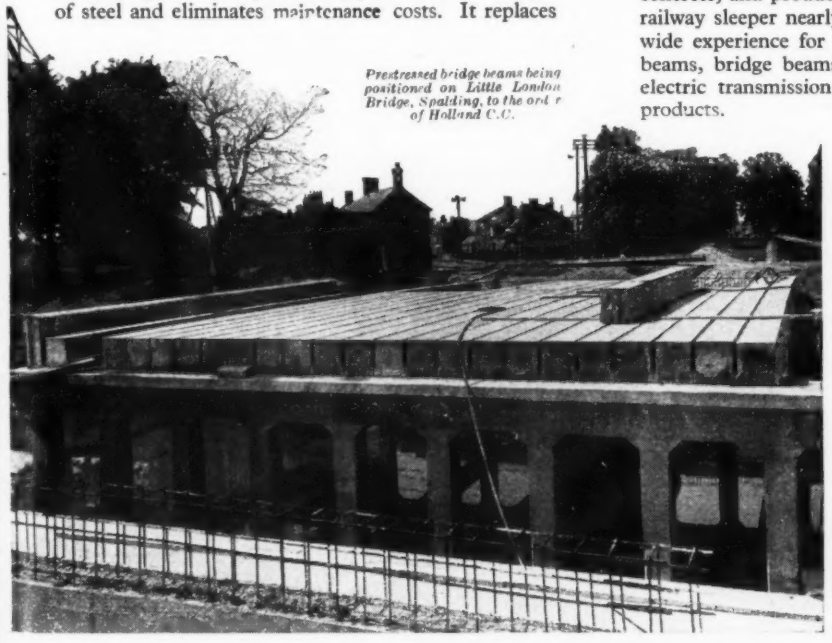
➡ FLEXIBILITY

Under designed conditions, prestressed concrete acts as a homogeneous material and therefore shows a high degree of flexibility and resilience.

➡ APPLICATION

Pre-cast units are ideal for the application of prestressing and offer unlimited scope. They are convenient to handle, and frequently eliminate shuttering with resultant further reduction in overall costs. Factory production allows the closest control of materials and manufacture.

Dow-Mac, who are pioneers in Britain of prestressed concrete, and produced their first prestressed concrete railway sleeper nearly 10 years ago, are utilising their wide experience for the production of roof and floor beams, bridge beams and girders, piles and walings, electric transmission poles and many other concrete products.

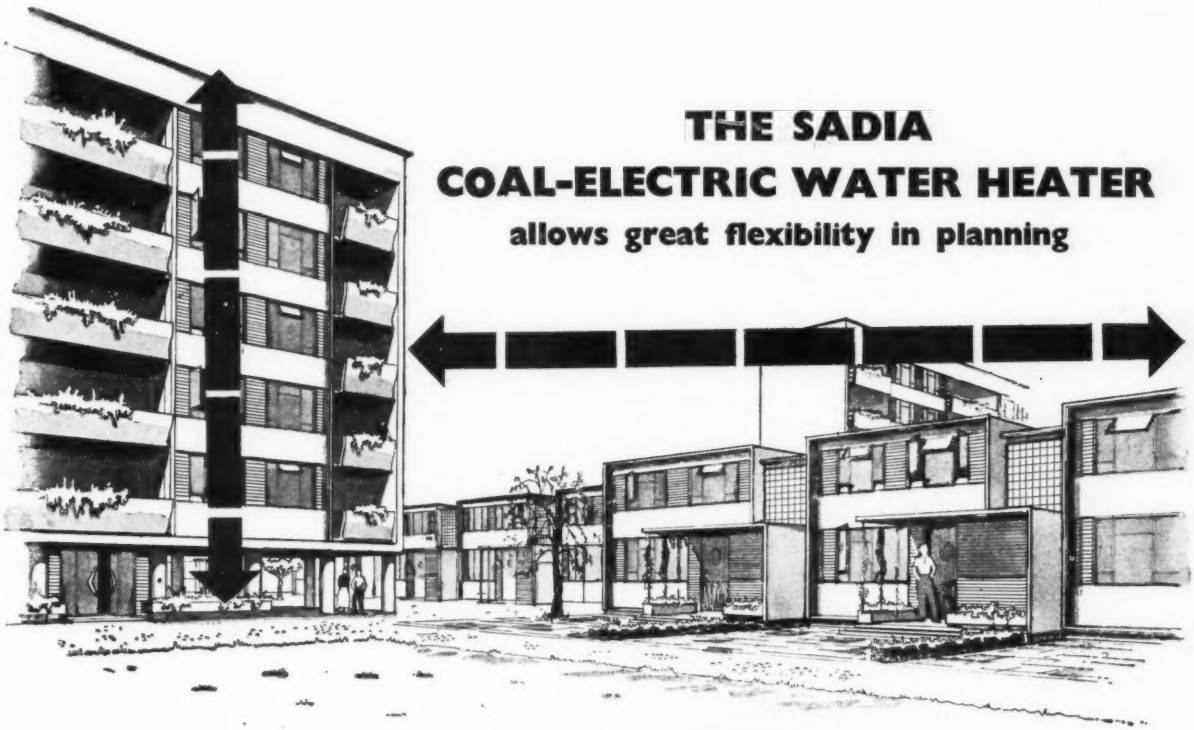


Prestressed bridge beams being positioned on Little London Bridge, Spalding, to the ord r of Holland C.C.

DOWSETT GROUP
DOW MAC

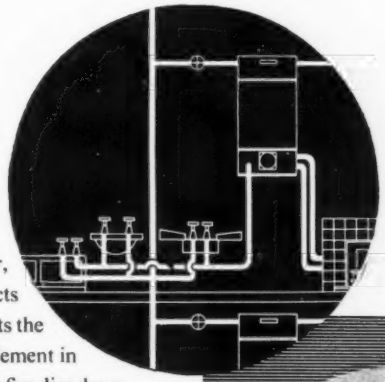
DOW-MAC (PRODUCTS) LTD., TALLINGTON, STAMFORD LINCOLNSHIRE. TELEPHONE: PETERBOROUGH 4501 (8 lines)

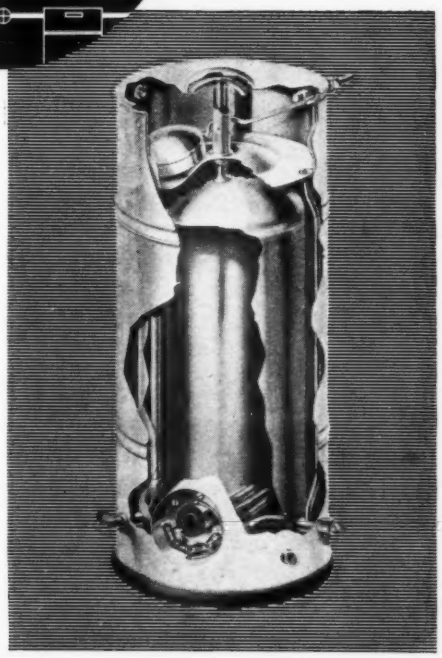
D.M.1



THE SADIA COAL-ELECTRIC WATER HEATER

allows great flexibility in planning





The Sadia coal-electric water heater is suitable for both houses and flats, and can be used either with a back-boiler or an independent boiler. It is a water heater planned to make the best use of available fuels. During winter, when fires are lighted, the Sadia coal-electric water heater acts as a storage tank, the back-boiler or the solid-fuel boiler heats the water, and the thermostatically controlled electric heating element in the Sadia coal-electric water heater takes over only when the fire dies down. In summer, no fires need be lighted, electricity takes over completely, and the house keeps cool.

The Sadia coal-electric water heater is the only factory-built unit of its type; made by water heating specialists it is the result of the accumulated experience of many years in this particular field. Efficiently insulated, it increases the effectiveness of the solid fuel boiler to which it is connected.

When installed in blocks of flats, the patented self-venting and self-filling calorifier makes for simplified plumbing. One common down-service pipe can supply all the Sadia water heaters.

Aidas Electric Ltd., the makers of the Sadia coal-electric water heater, are always very glad to give specialist advice on all aspects of water heating to architects when they are preparing plans.

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

SADIA
HOT WATER BY ELECTRICITY

6

BRINGING COLOUR TO LIFE

IN HOUSES AND FLATS

The colourful tapestries that bedecked the homes of the more privileged of our ancestors, the paintings that made their ceilings gay, the Blue, Pink and Yellow Drawing Rooms of the stately homes of old England may well justify those who accuse this age of a drab and unimaginative uniformity in its interior decoration. If the accusation has foundation, it is surely not for lack of colour.

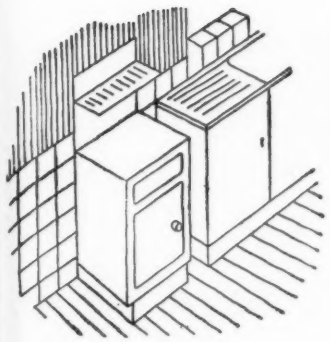
At Docker Brothers, for instance, paints, lacquers and varnishes are to-day available in an increasing variety of colours and shades and in finishes—matt, glossy, satin, . . . that our ancestors never knew. What's more, a vast fund of technical information and experience is available to the architect or builder wishing to bring colour to life in the modern home.

HERMASHEEN, for example, is a Semi-Gloss paint with a singularly beautiful "satin" appearance. Supplied in a wide range of pleasing shades suitable for interior decoration, it is highly durable and easy to apply.

DOCKER BROTHERS

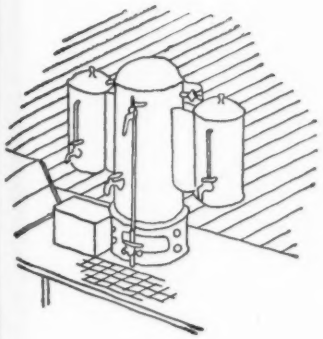
Makers of Paints, Lacquers and Varnishes for every purpose

LADYWOOD BIRMINGHAM, 16



Information and advice on GAS equipment

In order that architects, builders and others interested may keep abreast of the latest developments in gas services, a permanent exhibit is maintained at the London Building Centre. Here may be seen examples of the following types of appliances :—



DOMESTIC GAS COOKER

Various well-known cookers are exhibited, all of a high standard of design and performance.

CATERING EQUIPMENT

Included in this part of the exhibit is equipment for snack bar counters, refuse disposal, vegetable boiling, grilling, roasting and steaming.

CENTRAL AND WATER HEATING

Coke and gas-fired boilers are included, as well as hot water circulators, bath heaters, sink heaters, and multipoint heaters.

SPACE HEATERS

Appliances include coke fires with back boilers, gas radiators, panel fires, hearth fires, portable gas heaters, and overhead radiant heaters.

HOME LAUNDRY EQUIPMENT

Under this heading are exhibited appliances for drying and airing towels, clothes drying (both built-in and free-standing), and various types of clothes washing machines.

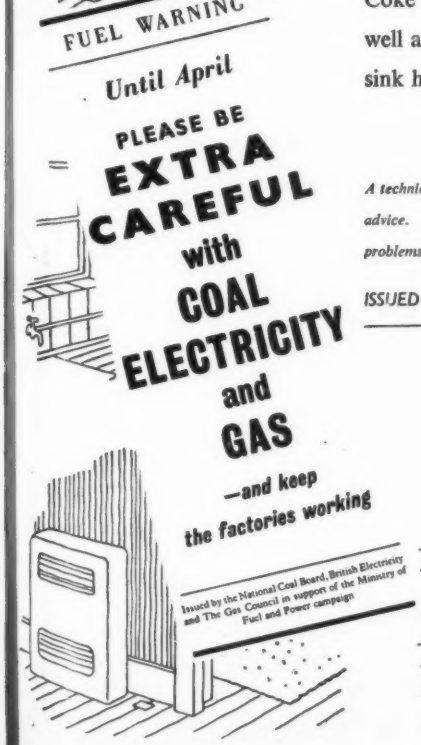
REFRIGERATORS

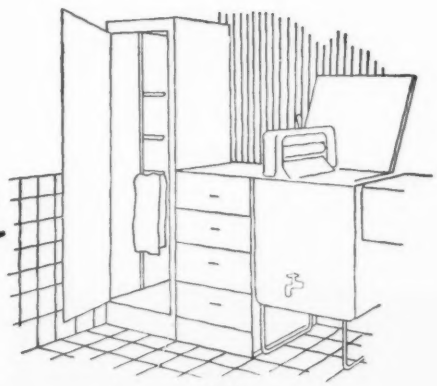
Both built-in and free-standing types are included.

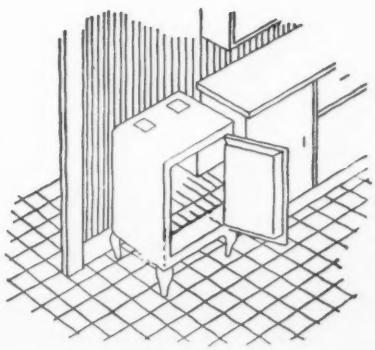
A technical assistant is in attendance at the Building Centre to give information and advice. Literature dealing with the application of gas appliances to a great variety of problems may also be obtained from the Area Gas Boards or the Gas Council.

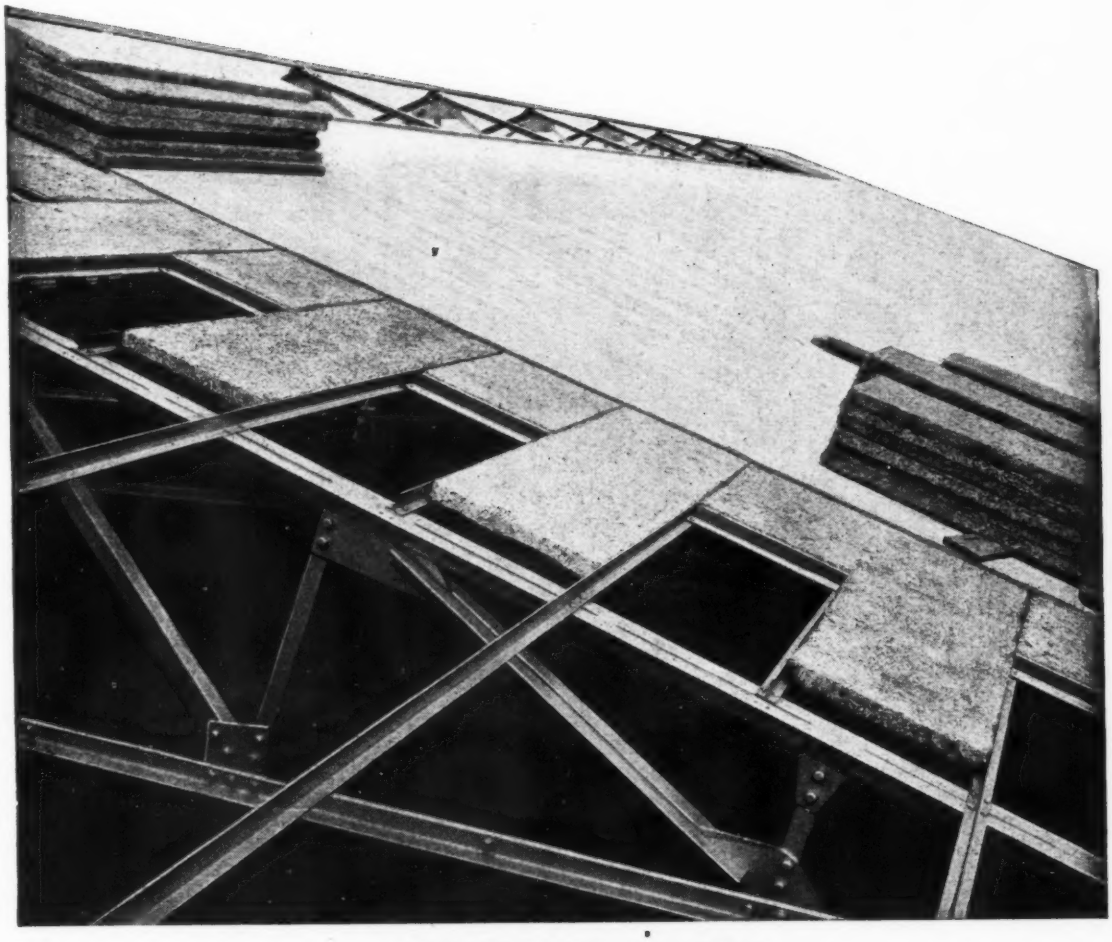
GAS

ISSUED BY THE GAS COUNCIL, 1 GROSVENOR PLACE, LONDON, S.W.1. Telephone: SLOANE 4554









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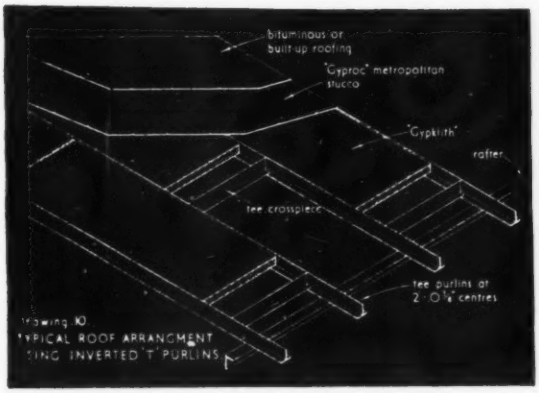

Typical roof arrangement using inverted "T" purlins

In the building illustrated, GYPKLITH is supported between purlins of inverted "T" section, spaced at centres equal to 2 ft. plus the web thickness and bolted direct through the flange to the trusses.

The top surface of the GYPKLITH is screeded with GYPROC Metropolitan Stucco ready for finishing with bituminous roofing.

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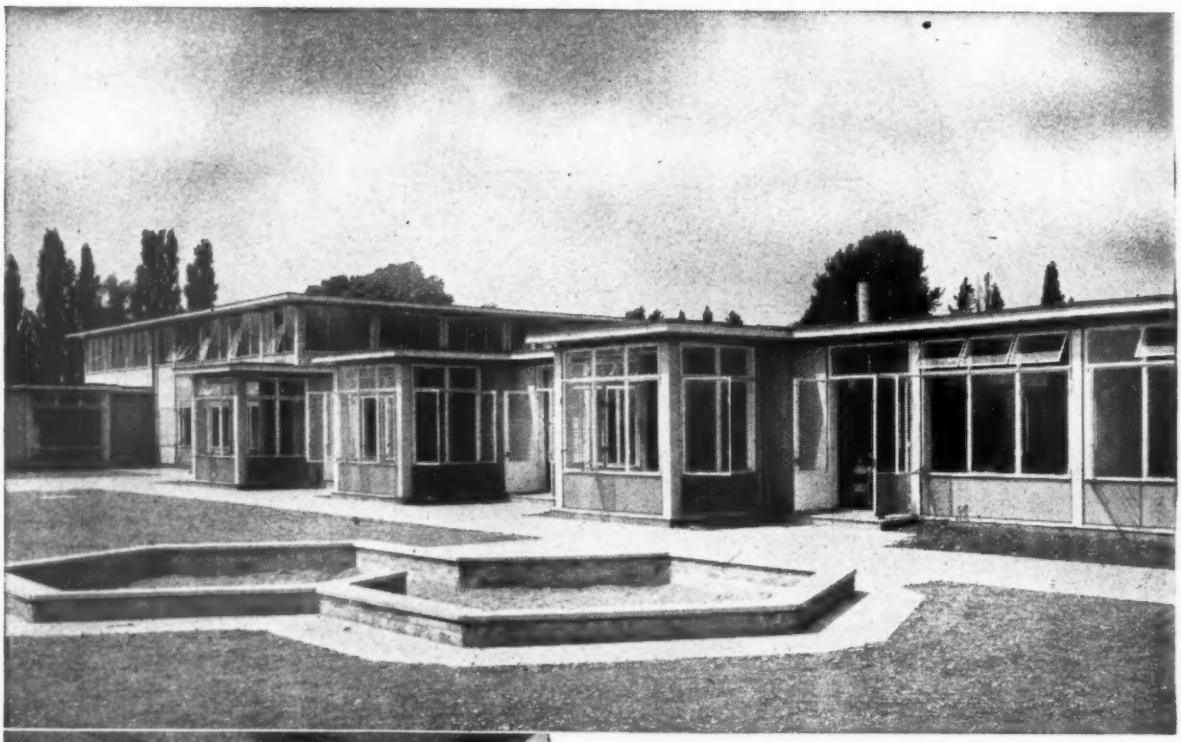
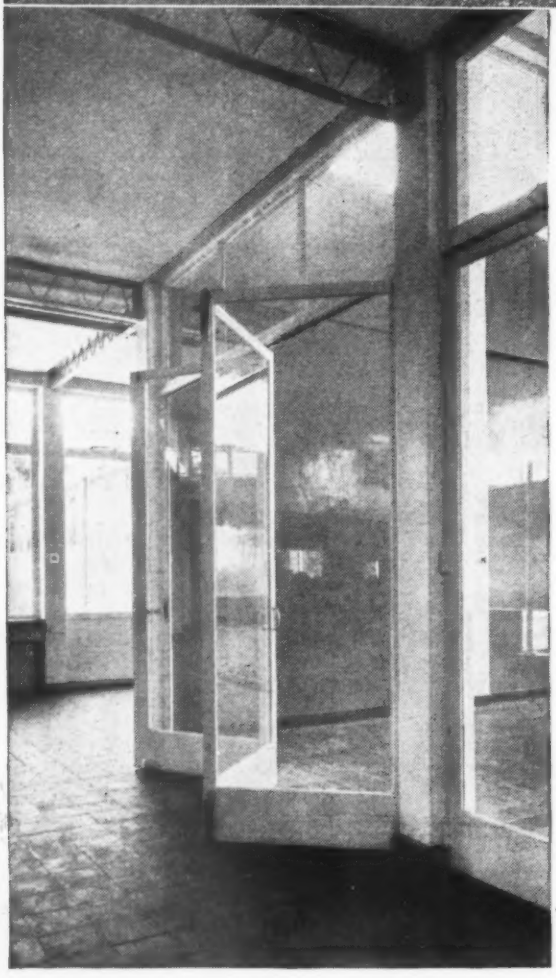




Hertfordshire's production line schools

The schools produced for the ambitious Education Programme of the Hertford County Council are partially prefabricated for easy, swift erection; identical component units being used in each school. The parts are congregated in a store adjacent to the proposed site of the school and then erected in one continuous operation by a building contractor. This means that all the sub-contractors have to ensure that their drawing offices design their particular component parts so that they can assemble them with a minimum of trouble. Although the same type of parts are used in each school, no two schools are alike. On the drawing board the architects worked out a series of component parts that could be assembled in different forms. This made for simplicity and economy of construction and also eliminated the possible monotony of a series of schools of the same design. As a Williams & Williams man on the site said, "Each school is a very ingenious jig-saw puzzle."

The windows designed for the Junior Mixed School at Morgan Road, Hertford, were no exception. Working closely in co-operation with the county architect, Williams & Williams helped to produce a school which is pleasing in appearance, and a joy to teach, and be taught in.

County Architect—C. H. ASLIN, F.R.I.B.A., *County Hall, Hertford.*
Contractor—MESSRS. EKIN & COMPANY, *Great Northern Works, Hertford.*

The windows The windows were of aluminium, alocromed and painted. They were standardised to suit an 8′ 3″ module, which was used throughout this school, and other schools in the scheme. From the sill to the ground Williams & Williams prefabricated panels insulated with fibre-glass and sheathed in aluminium. When used in the classrooms these windows have three horizontal centre-hung casements over three side-hung casements (see top right).

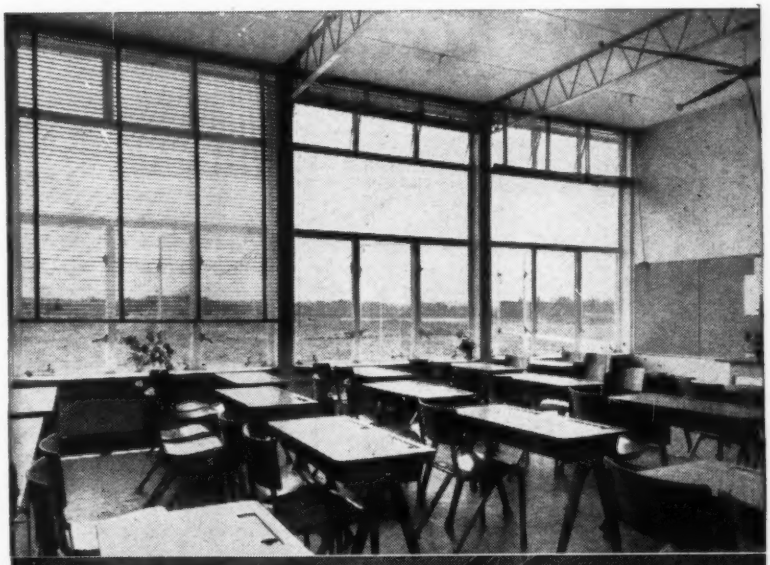
. . .

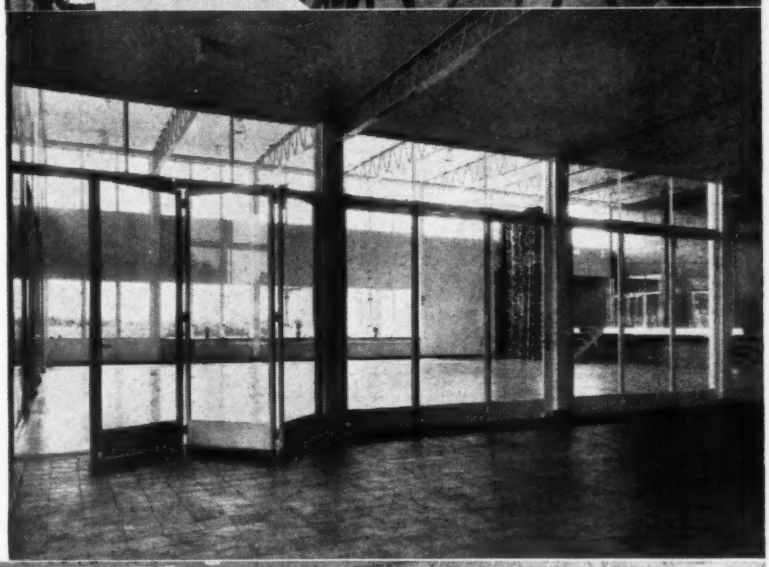
Internal Bays The internal glazed partitions of the school hall (see middle right) are of steel and aluminium and were designed so that they could be drawn back to provide greater floor space when required. For this Williams & Williams provided a series of three leaf sliding doors, the third leaf being loose but controlled by a castor in the toe (see bottom left).

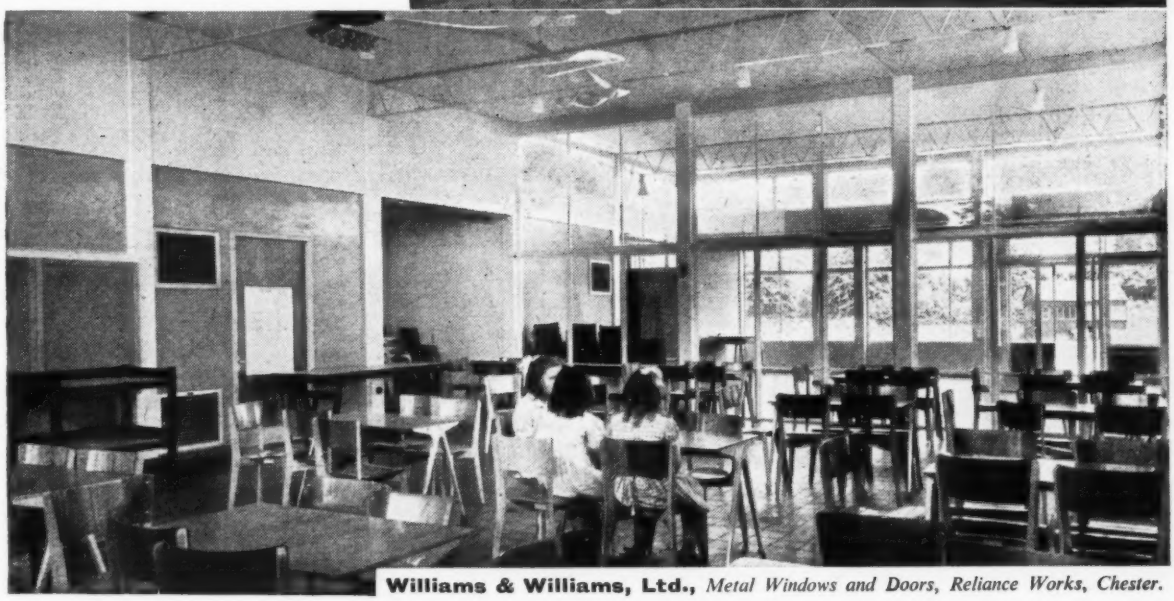
Glass partitions of this type were used to localise the dining space from the entrance hall. The use of glass gave the maximum of light to the dining room when in use by the children (see bottom right).

. . .

External Doors The external doors were of double side hung casement type fitted with friction stays to control the opening to an agreed limit. Tubular pull handles were fitted, also push discs in red doverite.







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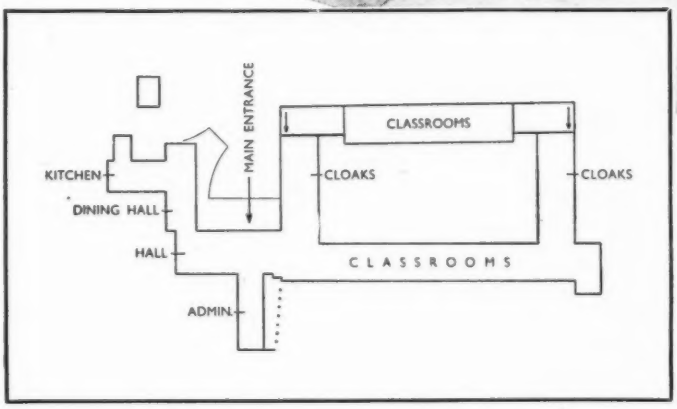

WEXHAM ROAD SCHOOL, SLOUGH
(For Bucks. County Council)
County Architect: *F. A. C. Maunder, R.S., Dip. Arch., F. R. I. B. A., A. M. T. P. I.*
Contractor: *A. Roberts & Co., Ltd., Victoria*

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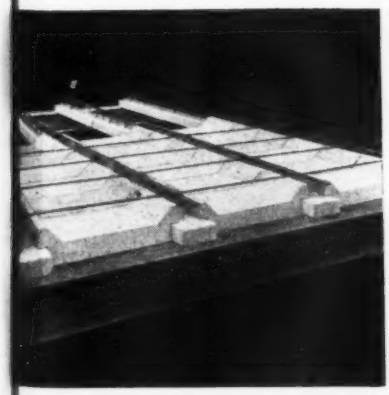
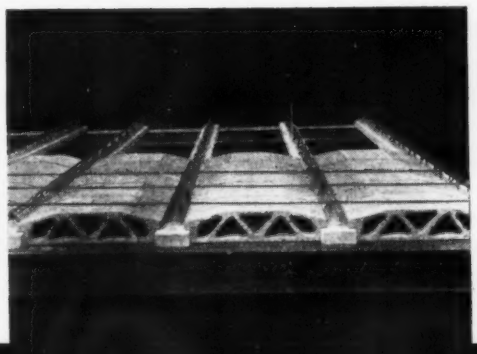
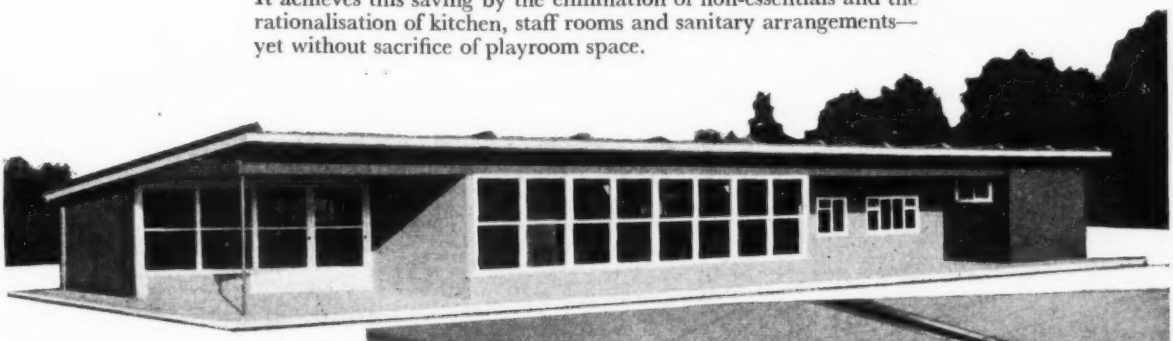


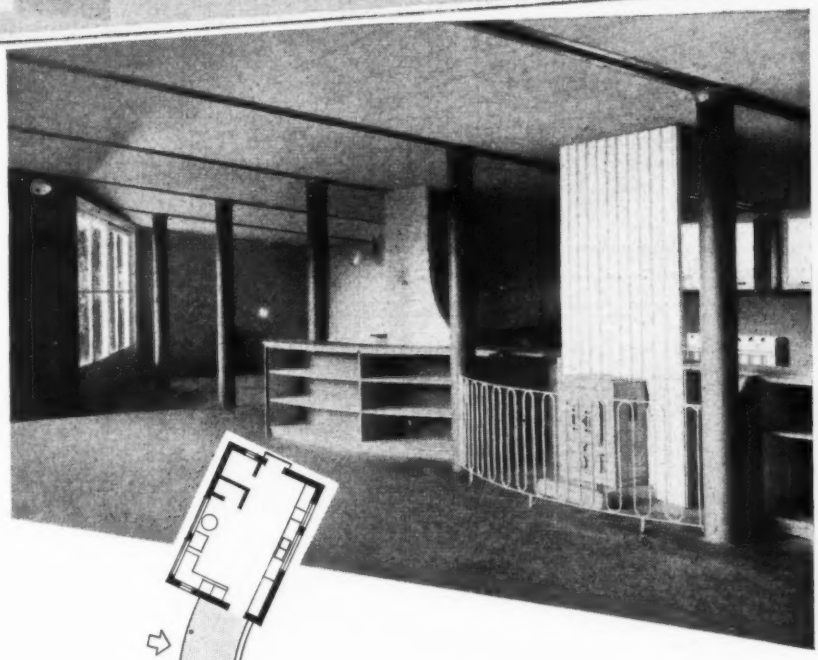


the ASCOS solution for the under fives

and the release of mothers for industry

As labour is increasingly switched to rearmament, more and more women will be needed in the factories. The care of their young children thus becomes an important problem in our defence effort—a problem which can be overcome with the ASCOS nursery school at a cost of about £200 per place as against the normal £400. It achieves this saving by the elimination of non-essentials and the rationalisation of kitchen, staff rooms and sanitary arrangements—yet without sacrifice of playroom space.





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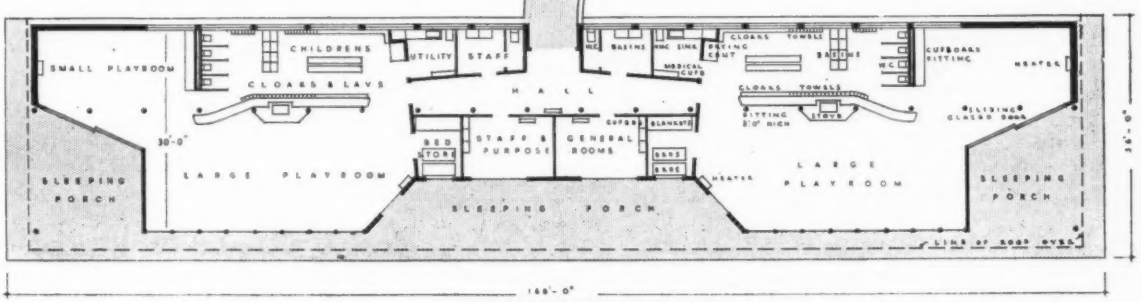

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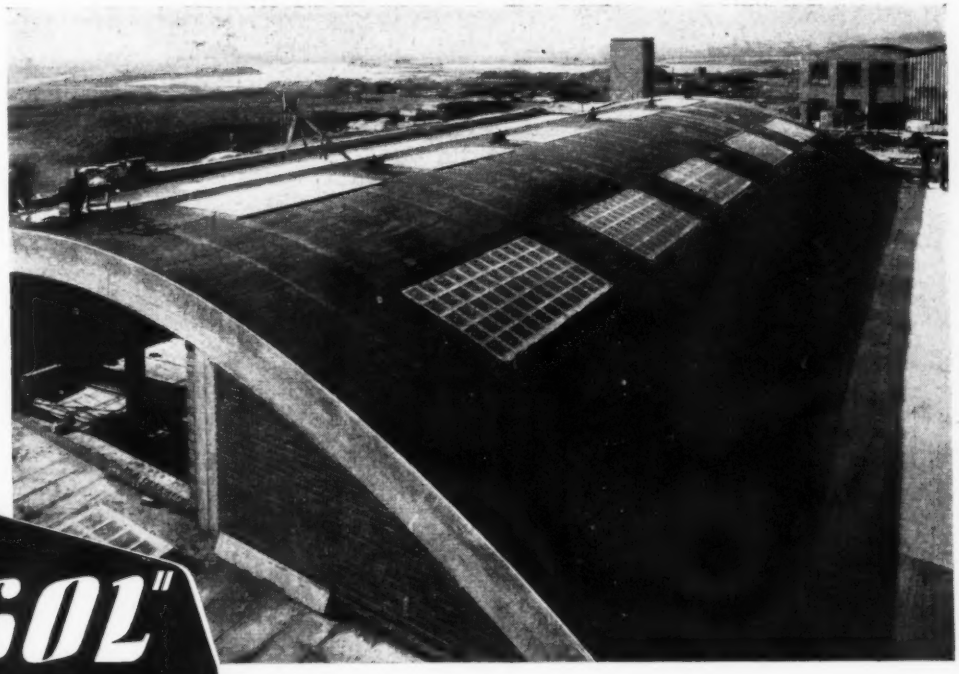

Research Laboratory, Yorkshire Copper Works, Stourton, near Leeds. (Radiant Heating in Soffit).
Architect:
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THE ARCHITECTS' JOURNAL

No 2921 22 FEBRUARY 1951 VOL 113

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FURNISHED HOUSES

How much does it cost to furnish a small house today? The *Evening Standard*, after studying the furniture at the Furniture and Allied Trades' Exhibition at Earls Court, decided that the bare minimum was £249, exclusive of kitchen equipment, carpets, curtains, light fittings and so on. The furniture chosen was the conventional suites of dining, living and main-bedroom furniture. On the usual never-never system of payment a couple setting up home might just be able to manage financially if they lived in a house with the low rent of the prize winning designs for *The Builder* cheap house competition, illustrated elsewhere in this week's JOURNAL. They would also be aided by the fact that with the small floor areas of these designs they would probably be unable to get all the furniture into the house anyway.

The present-day solution for the young couple lies in picking up cheap second-hand furniture. However, there is, I would suggest, an alternative partial solution to their problem. That is for the larger local authorities to place bulk orders for considerable quantities of standardized unit furniture, particularly of the wardrobe-cum-chest-of-drawers type, which can be built into bedrooms of standardized dimensions and paid for in an inclusive rent. The size of bedrooms can only reasonably be reduced if built-in cupboards are provided. The greatest waste of space occurs, as can be readily seen on any plan, when a bed, a chair, a wardrobe and a chest of drawers or dressing table, all of unrelated sizes, are placed against the four walls of a room.

*

But, the local housing committees will indignantly exclaim, that will put the cost of housing up. So it will, but a smaller house without a second W.C. and laundry rooms, might allow the newly-wed to have better furniture at no higher rent. Some day an intelligent man, perhaps even a Minister, will realise that a higher standard of living is ensured by the amount of money left *after* paying the rent. It is not much fun eating food cooked in a well-fitted kitchen while seated on the cold bare boards of the dining room. Which is the reason, you'll remember, why coal found its way into the bath (when there was coal).

*

Of the Furniture Exhibition there is little to say. The good designers you already know about, the remainder are as before. Spare a moment, however, to look at my illustration on page 235. A variation of the chair design which we have seen developing in America and Italy over the last few years is now, at last, with us. Indeed, I hear that seventy are to be in one of the foyers of the Royal Festival Hall. Does this mean the first overshadowing of the eighteenth century English-*via*-Scandinavia-*via*-Scotland furniture design?

EDINBURGH STUDENTS AND GEORGE SQUARE

ASTRAGAL sends his congratulations to the Edinburgh Student Architects' Group for the initiative, enterprise and imagination they have shown in producing a supplement to the University magazine, *The Student*, containing a development plan for the University area. In view of the recent Medical School competition, and the controversy over George Square, it could not be better timed. The overall plan is of the rather bold, extravagant type typical of students, but it is nevertheless a courageous and imaginative effort which, judging by past examples of re-planning, it is extremely unlikely will be bettered.

*

The students propose retaining three sides of George Square, and siting new buildings on cleared areas behind the houses. (As you may have read, the University intended demolishing the square.) The students agree to rebuilding the fourth side of the square, the north, as a Medical School, but are not flattering about the design chosen for this site in the recent competition (see the last two JOURNALS), which they describe as follows: " The façade, quite pleasantly proportioned and composed, was not of a new medical block but of a rather unimaginative domestic street. Its windows, apeing the proportions of George Square to hide the building in respectable nonentity, were too small for the rooms behind them. The planning showed no clarity of thought and had the look of being coaxed and squeezed together leaving only an occasional

damp, dark courtyard. It would be an uninteresting building to work in, dead from the moment it was built, expressing neither its purpose nor anything of the spirit of its time." Quite strong meat, isn't it? But that is not all. The students go on to make their own choice: "Did any of the designs approach a sane and honest solution? We would suggest that of Messrs. Maxwell Stephen, Colquhoun, Dent and Nesbitt" (again, see last week's JOURNAL). "The simplicity of the planning had an immediate appeal. Here was a building which would be pleasant to work in."

*

I understand that the editors intend illustrating this latter design in the near future, so you will be able to judge the wisdom of the students' choice for yourselves.

"Stick it in a drawing you fool, I'm the other assessor!"

THE CAP FITS

ASTRAGAL sadly records the fact that Croydon Borough Council have rejected the proposal that they should buy Wrencote, the fine early Georgian building mentioned two week ago, in order to ensure its preservation. Considerable local feeling has been aroused on the subject and many architects and local organizations together with several thousand residents supported the proposal. When I first mentioned this building I pointed out that in spite of the legislation which now exists whereby the MOTCP (or what is now presumably called the MLGP) lists buildings that are thereafter temporarily safeguarded, if the local authority does not choose to take action to see that a building is properly looked after, there is nothing the Ministry can do to stop it falling to pieces. So presumably Croydon Council's lack of interest means the nation's loss.

*

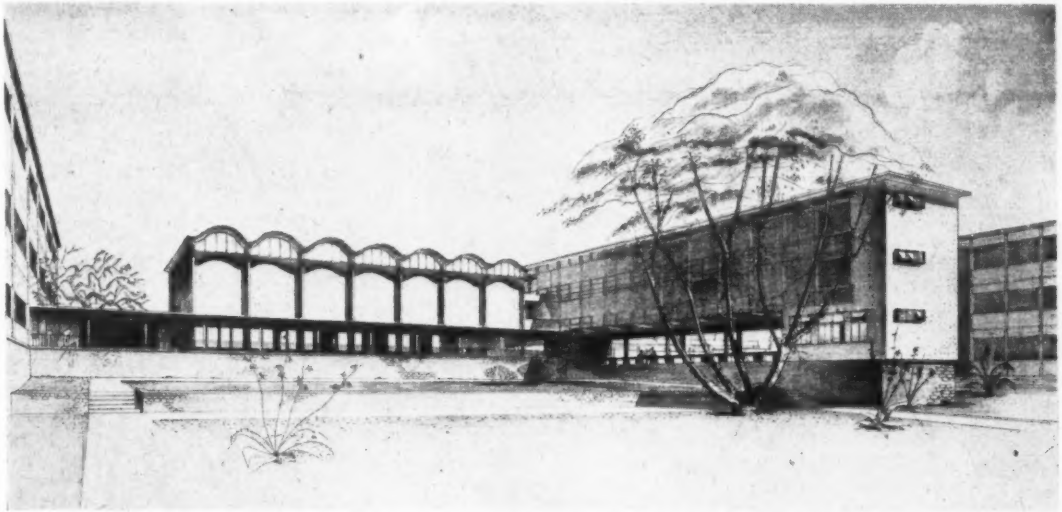
I also suggested that as the house is a national possession, lack of positive action will cause Croydon to be labelled a city of Philistines. I see no reason for changing my mind.

PASTEL SHADES, AND SOME OTHERS

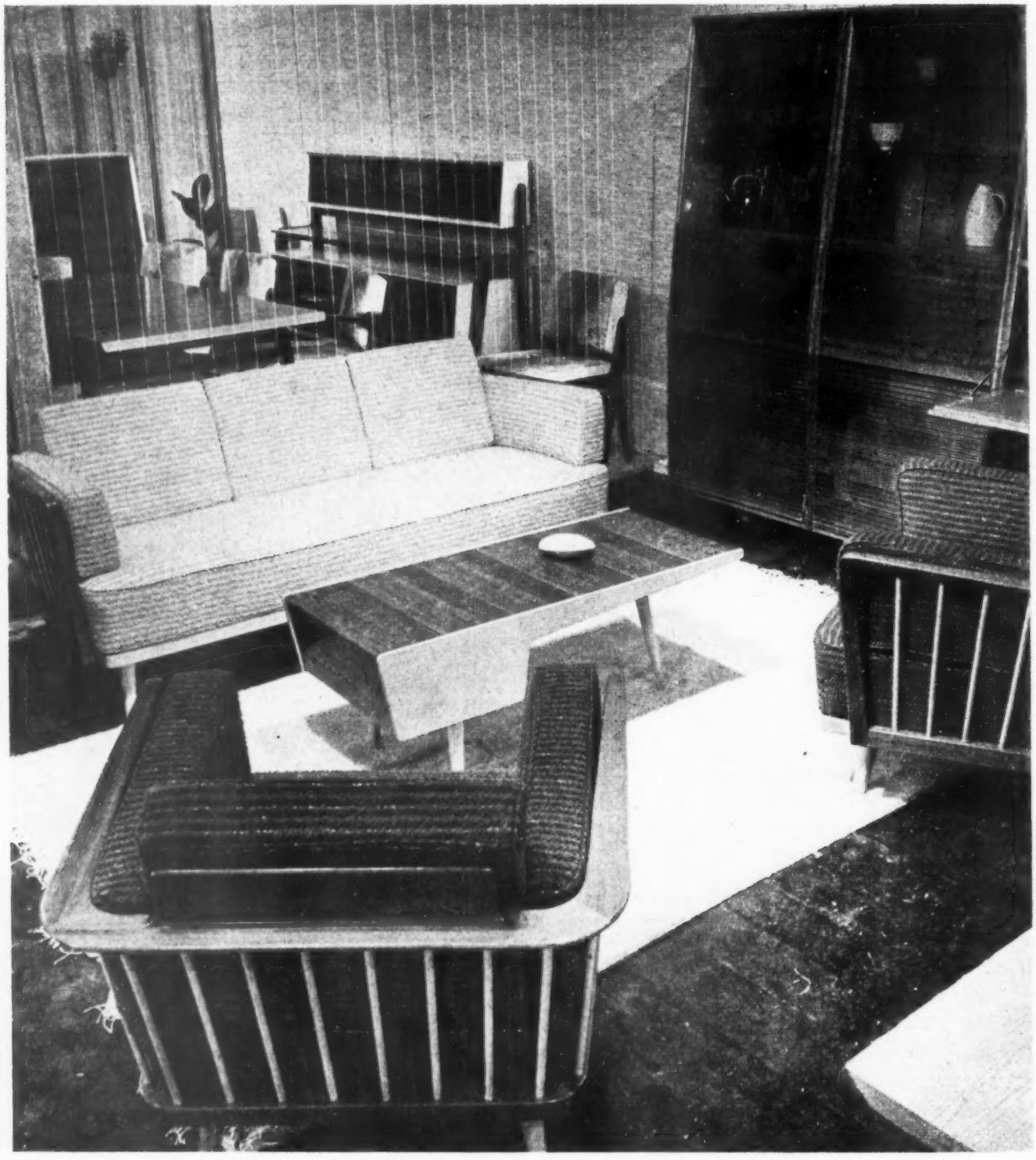
It was a good idea of the Georgian Group's to put out a leaflet of hints on the painting of Georgian buildings at a time when, as they say, "many householders are, or shortly will be, repainting their houses in anticipation of the Festival of Britain." But it is a pity that their recommendations should be so timid—peculiarly un-festive, in fact.

*

All ironwork, says the Group, should be black or blue-back, while cornices, windows, window frames, door frames, fanlights and wooden porches may only



With the signing of the contract, work is now commencing on the building of the first University in West Africa, at Ibadan, Nigeria, to the design of the architects, Fry, Drew & Partners of London. The University is one of a series to be built with funds provided by the British Government through the Colonial Development and Welfare Fund. The present scheme consists of four large residential Colleges for about 160 students each on a collegiate plan modified by tropical conditions, a library of four storeys and building for the Faculty of Arts and administration. The various departments of science are being temporarily accommodated in utility buildings in another part of the site. The contractors are Messrs. Cappa & D'Alberto of Lagos, Nigeria.



Furniture Exhibition

Last year, ASTRAGAL described the Furniture Trades Exhibition at Earls Court as a "Sargasso Sea of boarding house brown and Golders Green Gothic." This year's exhibition, which closes tomorrow, merits much the same description. The one island of refuge is the display by Hille, of London, of the furniture design of Robin Day, shown above. On the right are display and storage units in sycamore veneer. In the foreground is a set of armchairs and settee, made with a frame of mansonia and stick uprights in sycamore, grouped round an unusually designed occasional table. Beyond the screen can be seen a suite of dining furniture. The extending table is of African cherry, inlaid with holly, and it stands on legs of mansonia. The chairs are upholstered with foam rubber covered with unborn Yemen calf. With the exception of a stand by ICI, a design for an architect's studio by Finewood Products Ltd., and dining room furniture by Gordon Russell Ltd. and Beresford and Hicks there are very few examples of good contemporary design on view at Earls Court. See also ASTRAGAL'S column.

be off-white or light cream, whatever the type of house. There is rather more choice when it comes to front doors—"dark red, any shade of blue, aquamarine or black"—and the plastered or rendered walls of cottages in the country may be painted in "pastel shades." (Town houses are limited to off-white or pale cream.)

*

Green, one notes, is nowhere mentioned as a possible colour for anything, while grass green specifically is discouraged in a footnote. Now of course we have had enough grass green for this century, but the fact remains that people like green and are going to go on using it, Georgian Group or not. Wouldn't it have been better to have told them when and how they may use green, instead of ignoring the problem? I am told that the Georgians themselves used green quite a bit—as I am sure they used graining, which the Group also frowns on.

This chair, designed by Robin Day for Hille of London, is on view at the furniture exhibition at Earls Court. The arms, sides and back are moulded in one piece and supplied in various veneer finishes. The legs are copper-plated or stove-enamelled steel rods. Price, £23

CITY ARCHITECT FOR GLASGOW

A few weeks ago I called attention to the fact that Glasgow Corporation had had the good sense to advertise for a city architect and planner. This double task, as I have said before, is too much for one man, nevertheless, my congratulations on their admirable choice of A. G. Jury, the director of housing for the city since 1949.

ASTRAGAL

No. 4: Technical Editor

DRY ROT—THE ARCHITECTS' RESPONSIBILITY

MOST of this week's JOURNAL is devoted to the subject of dry rot. The subject is dealt with in three sections. The first lists the means by which different species of fungi which cause dry rot may be recognized ; the second contains suggestions for the design of buildings in which conditions which aid the growth of these fungi are eliminated, and the third describes how dry rot may be located and eradicated

It is difficult to understand why some architects and some local authorities still use the suspended timber ground floor. There are, in the British Isles, towns in which the vast majority of the buildings are affected by dry rot and streets where every building is infected. Many buildings were unoccupied for long periods during the war, others suffered damage or prolonged neglect, and these factors have been responsible for an increase in the number and severity of outbreaks of dry rot.

It is possible for the fungus, *Merulius lacrymans*, to destroy *all* the timber in a building and there may be no remedy for a neglected outbreak, short of the complete destruction of an infected building. Recently, it has been necessary to demolish over one third of Woburn Abbey largely owing to the hold which dry rot had gained on this fine example of the 18th century country mansion.

It is true that building practice today is far less favourable to the development of dry rot fungi than it was, say, 40 years ago—the greatest single factor being the widespread use of cavity walling. As a result, partly of the shortage of timber, but, mainly, of the changes which have taken place in architectural taste, heavy, built-up wooden skirtings, architraves and cornices are things of the past ; the use of panelling with elaborate linings and mouldings is rare ; the use of bonding timbers in walls is extinct and the parapet, source of so much trouble, is no longer popular. As a result of the shortage of timber, light steel or alloy trusses are being used in roofs, concrete in floors and thermoplastic tiles for floorings.

Nevertheless, dry rot has already been discovered in many post-war buildings. It is customary to blame the quality of timber, which the present shortage forces builders to use, or ineffective seasoning, but there is no doubt that unsound constructional design is more often a cause of dry rot than the poor quality of timber used. Dry rot can only develop, in good or bad timber, under certain conditions ; these conditions arise as a result of thoughtless detailing or careless construction, such as the omission of throatings to cills or weather mouldings to external doors.

Now that timber is in short supply and must be paid for with valuable exports, it is the responsibility of the architectural profession to ensure that it is not used in such a way as to be susceptible to attack. The requirements of the building bye-

laws, particularly those concerned with damp proof courses and oversite concrete, ensure some protection of timber, but, if dry rot is to be eliminated completely, more must be done than is insisted upon by law.

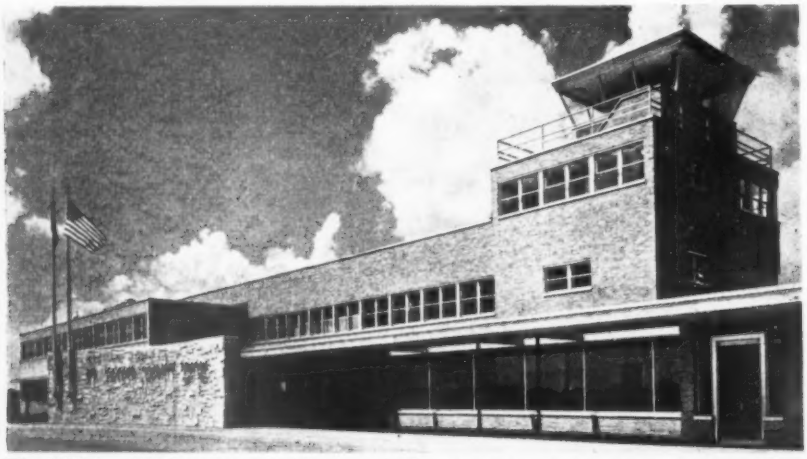
The Editors

LOW-COST HOUSING COMPETITION

In view of the rising cost of building and the possibility of a reduced annual housing programme due to the Government's re-armament policy, *The Builder* merits the congratulations of all for its enterprise in organizing a competition for low-cost housing at such an appropriate time. The prize-winning designs are illustrated and described on pages 237 to 239.

This competition illustrates two important and very different points. Firstly, it must be realized that the designs are largely theoretical architectural exercises on paper, and that the prices given for the cost of building them cannot be considered as more than approximate. The real test for accurate costing lies only in the hands of the building contractor. The true price could only be discovered if these houses were to be built.

The second point stems from the subject discussed on this page last week: the competition system. The success of this hinges to a large extent on the effectiveness of the assessor's report. The recommendation by the MARS group that the author of every design submitted should be given a written criticism is, perhaps, perfectionist, but it is an ideal to be aimed at. It is, therefore, somewhat surprising to find that the assessors, in their report on this competition for low-cost housing, do not give their reasons for selecting the winning designs. A general description of the many economies suggested by all the competitors is given, and one reference is made to the second prize-winning design, but of the combination of economies and good design which caused the assessors finally to select the winners there is no word written. This, to say the least of it, is an extraordinary omission.



The RIBA exhibition on the Architecture of Transport opens today at 66, Portland Place, W.1. Amongst the examples of transport buildings abroad is the St. Joseph County Airport (above) at South Bend, Indiana. The architect is Roy A. Worden.

HARLOW

Architect Wanted for New Town

Harlow Development Corporation is inviting applications for the post of senior architect (grade 2) at a salary of £1,000 by £50 to £1,200 per annum in the department of the architect-planner, Frederick Gibberd. The last date for applications is March 5.

MLGP

Advertisement Appeals: Reduction Hoped For

The Minister of Local Government and Planning has sent a circular (MLGP No. 1: Advertisement Applications, HMSO, price 2d) to all local authorities in England and Wales calling for more informal contact between the authorities themselves and advertisers.

He hopes that this will lead to a reduction in the number of advertisement appeals. Since the Regulations came into force on August 1, 1948, more than 2,000 appeals against decisions of local authorities refusing permission for outdoor advertisements have been made.

The importance of discussion between authorities and advertisers before making a formal application for permission to put up advertisements is particularly stressed in the circular. At this stage the authority will often be able to indicate to the applicant the type of proposal which would not be objected to.

Appeals arising from cases in which consent is made subject to conditions could often be avoided, it is said, if the conditions were discussed with the advertiser before the issue of a formal decision.

GLASGOW

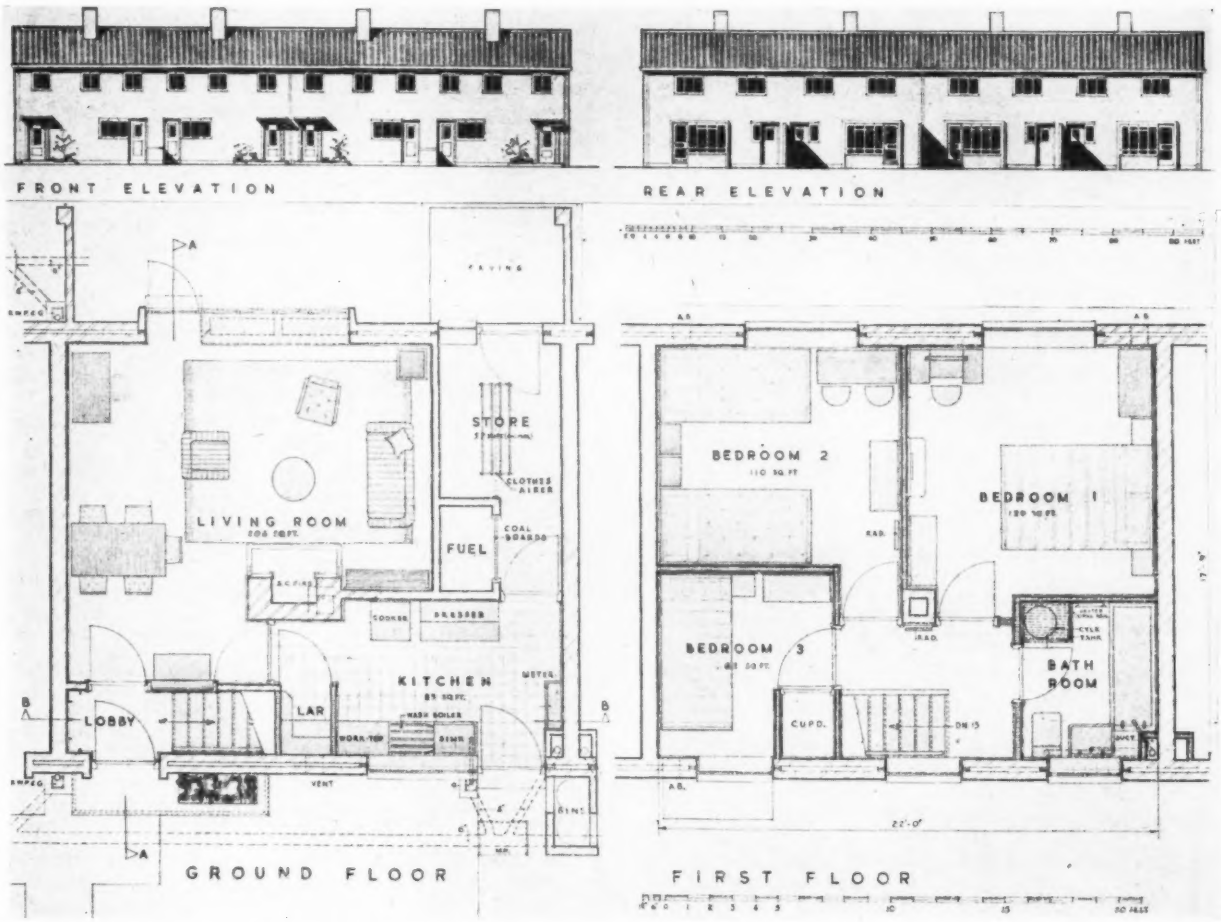
City Architect Appointed

A. G. Jury, the director of housing for the city of Glasgow, has been appointed to the £2,500 post of city architect and planning officer.

He was first proposed for this post by the General Finance Committee last September, but the corporation decided, by a majority of one vote, that applications should be invited by public advertisement. Mr. Jury was finally selected from a short list of seven.

He became director of housing in Glasgow in January, 1949. He was previously principal architect at Liverpool under Sir Lancelot Keay's administration and has also held architectural appointments in Middlesbrough, Gravesend and Taunton.

WINNING DESIGNS IN "THE BUILDER'S" LOW-COST HOUSING COMPETITION



First winning design ; by J. L. Womersley and G. Hopkinson.

On this and the following page we show plans and elevations prepared by the prize winners in the competition for low-cost terrace housing organized by "The Builder" newspaper. In their fifteen hundred word report, the assessors, Lancelot H. Keay, Arthur W. Kenyon and Stephen Tallents, make no reference to the first winning design by J. L. Womersley and G. Hopkinson (illustrated above) and the third winning design (illustrated overleaf with the second winning design) and make only the briefest reference to the second winning design. They point out that: "the full fruits of the competition will be reaped only by those who study many designs besides those selected for award".

LOW-COST HOUSING

Reports by Competition Prize Winners

FIRST WINNING DESIGN

Following are extracts from the report of J. L. Womersley and G. Hopkinson, of Northampton, winners of the first prize (£250) in the competition:—

Floor area, 781 sq. ft.; price per ft. super, 24s. 4d.; capital cost, £950; rental (inclusive of subsidies but exclusive of rates and supervision), 11s. 3d.

Entrances: both main and trades doors open on to the road frontage, access to the rear being *via* the store and kitchen.

Frontage Width: the frontage (22 ft. between party walls) has been kept as narrow as possible compatible with other plan requirements, as, of course, it is unrealistic to save house costs at the expense of land, roads and services.

Partitions are of hollow clay blocks 3 in. in thickness.

The *ground floor* is of 4 in. solid concrete (waterproofed where covered with plastic tiles) on 4 in. hardcore.

The *first floor* is of 6 in. by 2 in. and 6 in. by 2½ in. timber joists, one 6 in. by 3 in. by 10 lb. RSJ being introduced across the narrow portion of the living-room in the floor thickness.

The *roof* is of timber covered with sand-faced clay pantiles on reinforced roofing felt, at 30 deg. pitch.

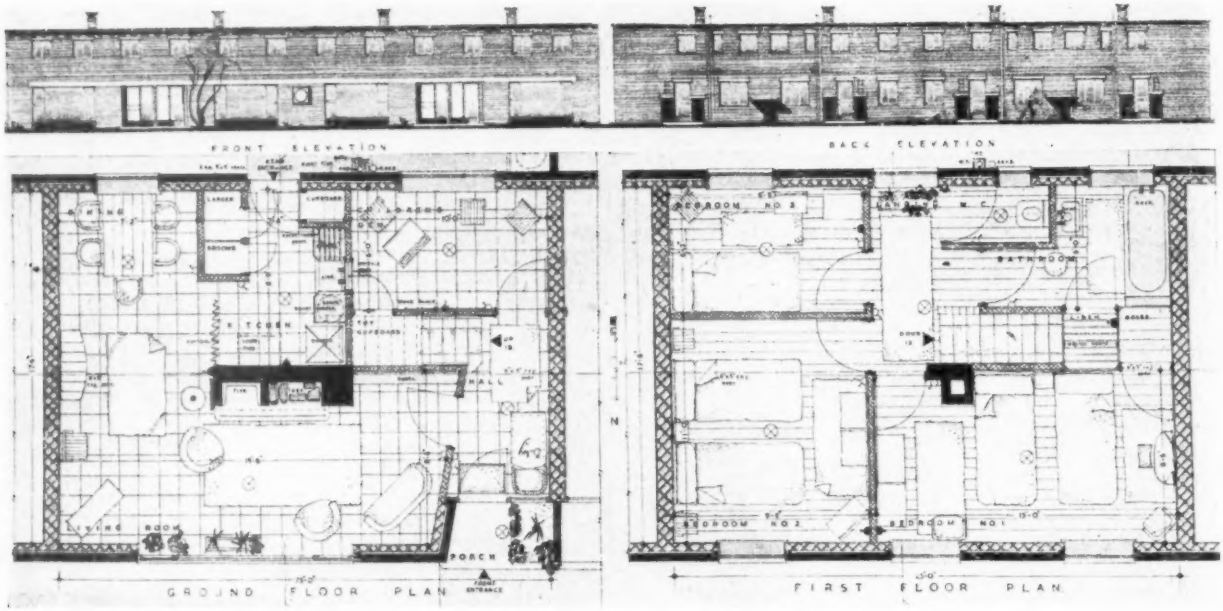
The authors are interested in the recommendations of the Girdwood Report in respect of using single lap interlocking tiles as they have themselves used this method extensively with a view to both timber economy and financial saving.

The *windows* are standard metal with wide frames built directly into the brickwork.

The *door and window heads and surrounds* are of precast concrete, the exposed portions only being "faced" with reconstructed stone. This treatment has proved economical in practice and gives the necessary emphasis to these features in contrast to large areas of brickwork.

Eaves: the use of the Finlock precast eaves block saves timber, labour and cost and provides an æsthetically satisfying treatment as the proprietors are prepared to amend the profile of the fascia to suit the architect's taste. A further improvement would be to face the visible portion of the blocks in reconstructed stone to match the window surrounds, etc., thus eliminating the need to paint and repaint the blocks. This feature has been fixed as low as practicable, walling

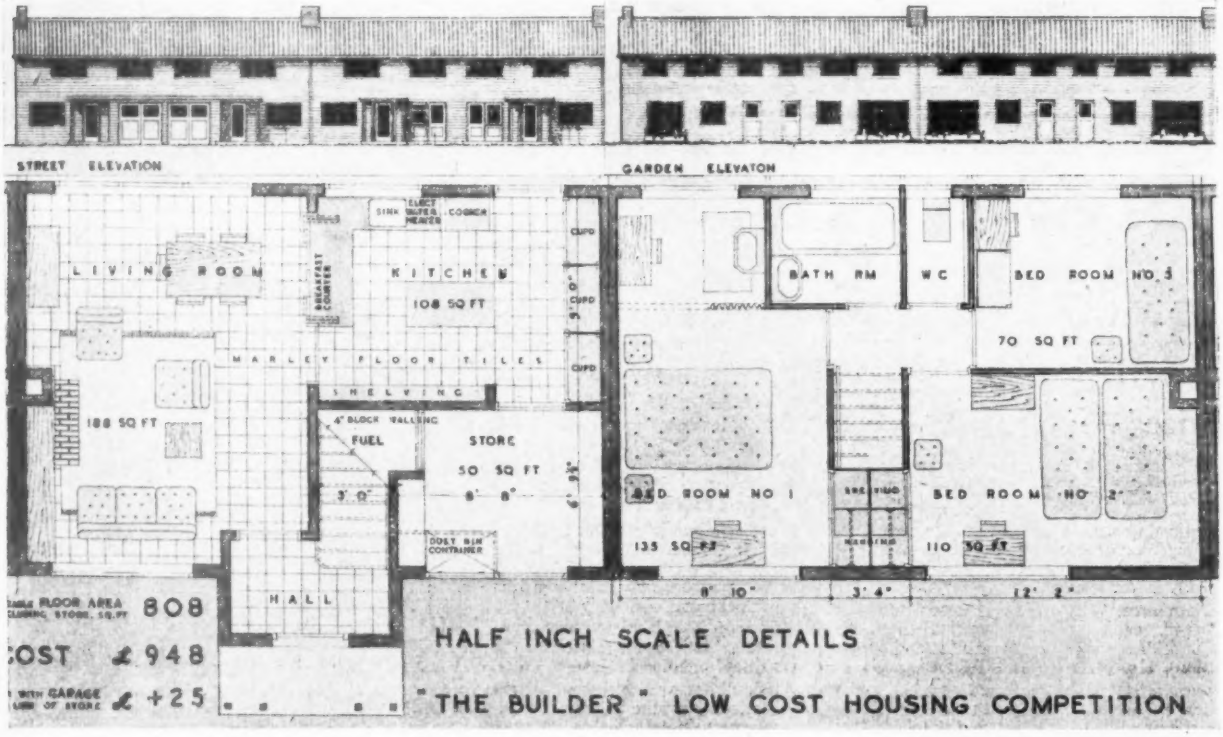
WINNING DESIGNS IN "THE BUILDER'S" LOW-COST HOUSING COMPETITION



Second winning design ; by Edward Narracott and Associates.

The assessors were non-committal about the winning designs but record their conviction, "based on an intensive examination of this large body of designs and on the information supplied by the Quantity Surveyor (Edwin H. Palmer, of Gardiner & Theobald, appointed by "The Builder" to assist the assessors) that given the cost of labour and materials prevailing at January 1, 1951, it is feasible to build within a terrace in an urban district a good looking house containing three bedrooms and otherwise providing efficient and comfortable accommodation for a family of five persons, at a cost not exceeding £1,000." Conditions laid down for the competition allowed departures from the standards of the Housing Manual and the Building Bye-laws. All designs (322) are on view until Saturday at the Conference Hall, County Hall, S.E.1.

Third winning design ; by H. Underhill Diplock.



being saved by keeping the ceiling joists above the wall plate and thus allowing a small splay or cove in the ceiling.

Finishes: the temptation to reduce costs by using poor quality internal finishing materials has been resisted, particularly with regard to floor finishes. A schedule of internal finishes is as follows:—Living room: floor, plastic tiles; walls, plaster and washable distemper. Lobby: floor, lobby and walls as for living room. Kitchen: floor, quarry tiles; walls, plaster and oil paint with tiles to height of 12 in. above sink and drainer. Store: floor, granolithic; walls, fair-face common brickwork and washable distemper. Fuel store: floor, concrete, spade finish; walls, fair-face common brickwork, lime-whitened. Bedrooms 1, 2 and 3, and landing: floor, $\frac{7}{8}$ in. T & G boarding; walls, plaster and washable distemper. Bathroom: floor, $\frac{7}{8}$ in. T & G boarding; walls, plaster and oil paint. All ceilings: skimmed plasterboard, distempered.

Cupboards: over-provision of cupboards has been avoided. The kitchen contains a cabinet 3 ft. 6 in. wide, contiguous with a worktop and an adequate larder.

Copper waste pipes from lavatory basin and bath have deep-seal traps and, together with the soil pipe from the w.c., are taken directly into a single vertical soil, waste and vent pipe which has ground bosses to receive the waste pipe branches.

Cooking, Lighting and Power: electricity is generally considered to be the most suitable means of supplying lighting and power; it is proposed to use it for cooking and so avoid the need to bring gas mains to the site.

Power points: living room, one near window, one near fireplace; store, one at kitchen end (so that tenant could use a portable convector heater to dry clothes); bedroom 2, one near door; bedroom 3, one near door. Light points are included for each bedroom, bathroom, landing, kitchen, store and lobby with two points in the living-room.

Heat Insulation and Ventilation: reinforced roofing felt covers the roof under the pantiles and slagwool pugging 1 in. thick is laid between the ceiling joists over the first floor to reduce heat losses *via* the roof.

Sound Insulation: in planning the scheme, kitchens, bathrooms and stores of adjoining houses have been grouped together so that the noises made in these rooms in one house are insulated so far as possible from the living-room and bedrooms of the next house. Care has been taken to avoid building any floor joists, roof timbers, etc., into party walls to obviate sound transmission.

Drainage: a 6-in. combined soil and surface water drain has been included for along the front of the terrace and a 4-in. surface water drain along the rear.

SECOND WINNING DESIGN

Following are extracts from the report of Edward Narracott and associates, of Torquay, winners of the second prize (£100):—

Floor area, 875 sq. ft.; capital cost, £981.

Timber: special attention has been paid to the use of the minimum amount of timber. Only 0·50 of a standard has been used compared with 1·25 standards the Government would allow for a floor area of equivalent size.

Construction: the house is intended to be built off a 4-in. cement raft foundation with the outer raft thickness and chimney platform reinforced. The floor of the raft is covered with Accotile.

External walls are of 4½-in. common brick, 1½-in. cavity and 4-in. concrete block. External brick facing and concrete lintols will be covered with two coats of broken white "Paintcrete." 9-in. party walls are of concrete block. All internal walls are rendered in cement and sand, and set with cement, sand and lime, using a wood float finish, left natural. External window cills are of weathered common brick. Roof consists of 5½-in. av. by 2½-in. precast concrete beams, in two lengths, reinforced with two No. $\frac{5}{8}$-in. m.s. bars, having a fall of 1½-in. from front to back. The beams bearing on the external walls and the central 6-in. by 5-in. RSJ are spaced at 2-ft. centres, covered on top with 2-in. thick slabs of Thermacoust and three layers of "Standard" roofing, grit finish, with the bottom layer of asbestos-based bituminous felt.

The roof falls from front to back to a single 3-in. asbestos RW pipe and 3-in. downpipe fixed at rear.

To the underside of the beams in the first floor is fixed ¼-in. Ten-Test sheets with the edges of same splayed to produce V joints. The first floor consists of 6-in. by 1½-in. deal joists covered on top with 7-in. by ¾-in. SE flooring and and on underside with ¼-in. thick Ten-Test sheets with the edges of same splayed to produce V joints.

The large window to living-room is of 3-in. by 2-in. rebated deal, with the central section consisting of a fixed sheet of ¼-in. plate glass with an external plinth of asbestos sheeting on timber framing. A like construction applies to the side window of the front entrance. All other external doors and windows are to standard metal sizes without sub-frames, but having ¾-in. wood window boards. Doors are to standard size, off-licence type, consisting of framing faced with ⅛-in. hardboard.

The fireplace to living-room consists of a standard 24-in. fire-back set into a buff-coloured Devon engineering brick surround and wall, built up with the main structural walls. Hot water is served from a multi-point gas water heater, type NEA 32, fixed in the kitchen, connected to the cold water service direct without a storage tank. A ¾-in. copper cold-water main serves the house direct off the public main. Branches in ½-in. copper feed all points.

Linen and store cupboard on first floor consists of prefabricated units of ¼-in. unfaced "Weyroc" framed up on site. The single flight deal staircase consists of 1-in. strings, ½-in. risers and 1-in. treads. The handrail is of a 1½-in. dia. oak mopstick on one wall face supported on No. 3 metal wall brackets. Electric points are on the ringed main system. A tubular heater serves the linen cupboard.

Decorations: as all internal wall surfaces are left natural white stucco, they will remain undecorated. Fibre-board ceilings are twice distempered. All internal and external woodwork, but excluding floors, staircases and shelving, is twice gloss painted after using an aluminium primer. All internal and external metalwork is twice gloss painted after using a red lead primer.

A central 2-in. thick concrete path on 2-in. bed of ashes, 4 ft. wide, serves each pair of houses on the block in front. At the rear, a radiating 3-ft. gravel path serves each pair, together with a separate gravel path to each dustbin enclosure. No party fences or boundary fences are included for the authors wish to encourage a free open type of layout.

THIRD WINNING DESIGN

Following are extracts from the report of H. Underhill Diplock, of Richmond, Surrey, winner of the third prize (£75):—

Floor area, 808 sq. ft.; capital cost, £948.

Walling: the principal economy of structure offered is the use of 6-in. hollow clay blocks for external walling. Such blocks are advertised as being satisfactorily reported on by the Building Research Station, and an allowance has been made in the cost report for the improvement of thermal insulation in these walls by the use of vermiculite loaded plaster.

Care has been taken not to overload these hollow blocks which only carry the roof weight, the floor loading being carried by spanning the floor joists from party walls to a 4-in. block partition half-way between them. No floor trimming difficulties occur in the plan used and the total floor area is used as a diaphragm, anchored to the front and back walls to ensure their stability under extremes of wind loading.

Roof: freedom from any tendency to roof spread in spite of the low eaves is obtained by the use of 6-in. by 1½-in. rafters quite capable of transferring the load with negligible deflection.

Furniture: furniture has been shown on the plan to indicate the usability of the rooms, and one feature not immediately obvious is the serving hatch, which can be opened to double width to form a counter at which two children could partake of meals under the eye of mother at work in the kitchen.

Water Heating: Actual experience of a very well-insulated electric heater is the reason for proposing its installation under the draining-board adjacent to the sink and immediately under the bathroom. Much argument is offered against electric water heating by those who expect something for nothing from a back boiler in a coal fire. In the author's experience the properly designed and well-insulated electric two-stage water-heater is completely practical for low incomes.

Extra Lavatory Basin: the over-long use of an only lavatory basin more frequently causes annoyance than the similar use of a w.c., therefore a second lavatory basin has been installed in the principal bedroom. In the position shown the cost will be minimized as drainage and services are within inches of the fitting.

Drainage: an internal one-pipe system is proposed with one manhole per house, all fittings being together on plan.

Garages: the house has been designed with a store of garage width; the purchaser or tenant could have a garage instead of a store for a very small extra and seems to be a worthwhile feature.

DIARY

The Reconstruction of a War Damaged City. Two-day course at Coventry. (Sponsor, British Council and Coventry's Architectural and Planning Department.) FEB. 23-24

The Architecture of Transport. Exhibition at the RIBA, 66, Portland Place, W.1, showing projects in this country and a selection of material from abroad. Weekdays 10 a.m. to 7 p.m. Saturdays 10 a.m. to 5 p.m. UNTIL MAR. 22

Furniture and Allied Trades' Exhibition. At Earls Court, London. (Sponsor, British Furniture Manufacturers' Federated Association.) Open to public: Feb. 17, 10 a.m. to 7 p.m.; Feb. 19-22, 2 p.m. to 7 p.m.; Feb. 23, 10 a.m. to 5 p.m. Open to trade until Feb. 23. UNTIL FEB. 23

Rotor Stations. R. H. Whitby. *Town Planning Aspect* and *Architectural Problems of Roof Top Rotor Stations*, by representatives of MOTCP. *Public User Viewpoint*, by a representative of Rotor Stations Ltd. At the Royal Aeronautical Society, 4, Hamilton Place, W.1. (Sponsor, Helicopter Association of Great Britain, 19, Park Lane, W.1.) RIBA members welcome: tickets obtainable in advance. 2.30 p.m. FEB. 24

Floor Finishes. (Architectural Science Board Lecture.) F. C. Harper. At 66, Portland Place, W.1. (Sponsor, RIBA.) 6 p.m. FEB. 27

The Work of the Northern Ireland Trust. Sir Lucius O'Brien. At 13, Suffolk Street, S.W.1. (Sponsor, HC.) 6 p.m. FEB. 27

Debate Arranged by AA Students' Committee. Subject: "That in the opinion of this house the AA is a defunct and apathetic body and has yet to justify its existence." At 34, Bedford Square, W.C.1. 8 p.m. FEB. 28

Structural Use of Timber in Building. A course of six lectures by D. H. Moss. At S.E. London Technical College, S.E.4. March 2 and five following Fridays. 7 p.m. to 9 p.m. MARCH 2

A comprehensive study of dry rot,

the fungi which cause it, methods of preventing it, and means of eradicating it.

DRY ROT

Part I: W. P. K. Findlay

The means of recognizing the various types of fungi which cause dry rot and a description of the conditions under which they develop in buildings.

"I HAVE never seen the rot upon so large a scale in timber until lately." Thus wrote Benjamin Johnson of Ipswich in 1803. In the same year Richard Bramley with some prescience, foresaw that "in all rapidly improving countries this evil is likely to be an increasing one, as the current demand for timber exceeds the supply laid by in store so as to be applied to use in regular succession after being properly seasoned." The trouble has certainly been with us, in varying degree, ever since. Undoubtedly, dry rot increased after the 1914-18 war when large quantities of unseasoned wood were used, and new methods of constructing floors were tried, sometimes unwisely. There was no sign of any decrease in the prevalence of the trouble between 1918 and 1939, and the annual cost of repairing buildings infected with dry rot was estimated, in 1938, to be not less than £1,000,000. But it was during the last war that the most spectacular increase took place. In many towns an appreciable proportion of all the houses have been affected and in some streets *every* house has had some degree of dry rot.

REASONS FOR RECENT INCREASE

The reasons for this increase are fairly obvious:

Firstly—general maintenance of property was neglected during the war, owing to shortages of labour and materials; such things as guttering and drain pipes were not kept in good repair.

Secondly—war damage to buildings admitted dampness; fires caused by incendiary bombs were often followed by severe outbreaks, as no steps were taken to dry out the buildings after they had been saturated by the water used for fire fighting.

Thirdly—air raid precautions were the direct cause of many outbreaks; rooms were rendered gasproof by blocking up the ventilators under the floors, and damp basements were strutted up with timbering. Sandbags placed against external walls often covered the DPC and thereby led to dampness in the walls.

Fourthly—owners were often absent from their houses and unable to supervise their maintenance. This was most serious in the larger country mansions, many of which were requisitioned by the Army, or by local authorities. (For example, a claim for £45,000 was recently brought before the courts in Scotland by the owners of a castle on the West Coast, on account of delapidations resulting mainly from dry rot.)

Left, the effect of two years dry rot attack on packing cases in a damp cellar.

DEFINITION OF DRY ROT

As Benjamin Johnson rightly remarked in 1803, *dry* rot is a "misnomer" for the trouble which is invariably due to damp—but the term has persisted and is now so well established that it would be almost impossible to change it. It would, however, be convenient if the term could be restricted to that form of rot brought about by the fungus *Merulius lacrymans*, and if decay caused by other less virulent species were known collectively as "wet rot." The need for such definition may arise when decay is found in a rented house where liability for dry rot has been specifically excluded in the terms of the lease; or when decayed timber is discovered in a house after repairs for dry rot have already been carried out.

DURABILITY OF TIMBER

Because timber is one of the most naturally durable materials it has often been mis-used and employed without adequate protection. No one would think of leaving ironwork unprotected against the elements, yet untreated timber is often used in damp situations, and disappointment is expressed when it ultimately decays. Wood does not deteriorate through age alone—wooden objects thousands of years old have been recovered, in a perfect state of preservation, from Egyptian tombs—but, like all other organic materials derived from plants and animals, it can be decomposed by the action of micro-organisms, particularly by fungi.

Woods vary greatly in their resistance to fungal decay. In general, the sapwood (the outer ring of wood which contains living cells in the growing trees) is much less resistant to decay than the heartwood, where this is appreciably darker in colour than the sapwood. Density is not a reliable guide to the durability of timber. Western red cedar, which is one of the lightest of softwoods, is, for instance, much more resistant to decay than beech, a moderately heavy hardwood. A dark colour is often associated with high decay resistance, but this also is not infallible. In fact, the only certain guide to the durability of a timber is the record of its performance in service, though laboratory tests can give a very good indication of its inherent decay resistance. Among the newer woods that have been tested, the following can probably be classed along with Teak as very resistant to fungal decay: Kokro-

dua (Afrormosia), Iroko, Rhodesian "Teak," Afzelia, Peroba do Campo opepe and, slightly less resistant but probably to be classed with oak, Idigbo, Makoré, Kapur, and Kempas.

Except for special purposes it is usually more economical to use one of the ordinary, less durable woods, which has been impregnated with an effective wood preservative (of which there are several on the market), than to specify a naturally durable timber.

NATURE OF FUNGAL DECAY

Fungal decay is, in effect, a form of digesting of the wood by the fungus, and only those fungi which produce enzymes (ferments) capable of decomposing lignified cellulose are able to attack it. These fungi turn cellulose into a sugar solution which they absorb for their nutrition. There are many different kinds of fungi which can grow on wood—some of these are just harmless moulds that cannot cause decay—but of all the types which are capable of bringing about decay of timber in the forest there are, fortunately, only a few that flourish in buildings.

RECOGNITION OF DRY ROT FUNGI

Merulius lacrymans—the dry rot fungus—is by far the most dangerous of all the fungi which may be found in buildings, and it is very important for the architect and the builder to be able to recognise it in its various stages of growth.

When *Merulius lacrymans* is in active growth in a damp still atmosphere it forms soft cotton-wool-like masses of mycelium, which usually show, here and there, patches of bright lemon yellow colour. In slightly less damp situations it forms a thick silvery grey skin (see Fig. 1), which has a rather silky appearance, and usually exhibits the same yellow colour and also, occasionally, tinges of pale violet. Running off from the wood may be found root-like strands (see Fig. 2), which sometimes attain the thickness of a lead pencil. These become brittle when dry. It is the ability to form such strands which makes this fungus such a serious pest, for these strands are able to penetrate through any thickness of masonry or brickwork, transporting through their tissues the moisture necessary for the further growth and spread of the plant. It is not uncommon to find them permeating plaster and working their way through mortar joints for considerable distances in search of other timber. Occasionally the bricks themselves may be penetrated if they are old and fissured, and materials such as breeze concrete may also become permeated with them. Soil under a floor which is affected with dry rot is often found to contain these strands.

The effect of true dry rot on wood is characteristic. Wood decayed by *Merulius* tends to warp, particularly where it dries out, and warping and collapse of the surface of matchboarding or skirting is a frequent indication of hidden decay. Large shrinkage cracks both across and along the grain break up the decayed wood into fairly large square edged blocks (see Fig. 3). It should be noted that other fungi can cause somewhat similar cracking but, with these, the cross cracks are not so deep and seldom appear on the surface. Wood decayed by *Merulius* is a pale snuff colour, and does not have the pleasant resinous smell of sound timber.

After the fungus has been growing in woodwork for some time, usually after a year or so, it produces the fructifications on which the spores are borne. These fruiting bodies, which usually develop towards the end of the summer, begin as tough leathery outgrowths, shaped like pancakes or thick brackets, and have a lilac tinge. Their surface becomes wrinkled into a number of irregular shallow pores on which the bright rusty brown spores soon begin to develop in large numbers (see Fig. 4). These spores, or seeds, are individually invisible to the naked eye as they measure only about 1/2,500 in. but, in mass, they appear as a fine rusty-brown powder. They are produced in enormous numbers, a large fruit body being able to produce many millions of spores every minute over a period of many days. In a room where there are large fruit bodies it is not uncommon to find everything covered with quite a thick deposit of spores. They drift about in gentle air currents, and often appear in a room where no fructifications are present, having come up through cracks in the floor boards. Under the microscope they appear as egg-shaped bodies, slightly flattened on one side, and having a bright orange-yellow colour. Being so small, these spores are readily disseminated by vermin and insects and can be carried on clothing or tools.

Poria vaillantii—pore fungus—causes a rather similar type of decay to *Merulius* but the growths are always more or less white, and the strands, which never become thicker than stout twine, remain flexible even when dry. They rarely penetrate to any depth into brickwork and therefore the fungus does not spread in a building to anything like

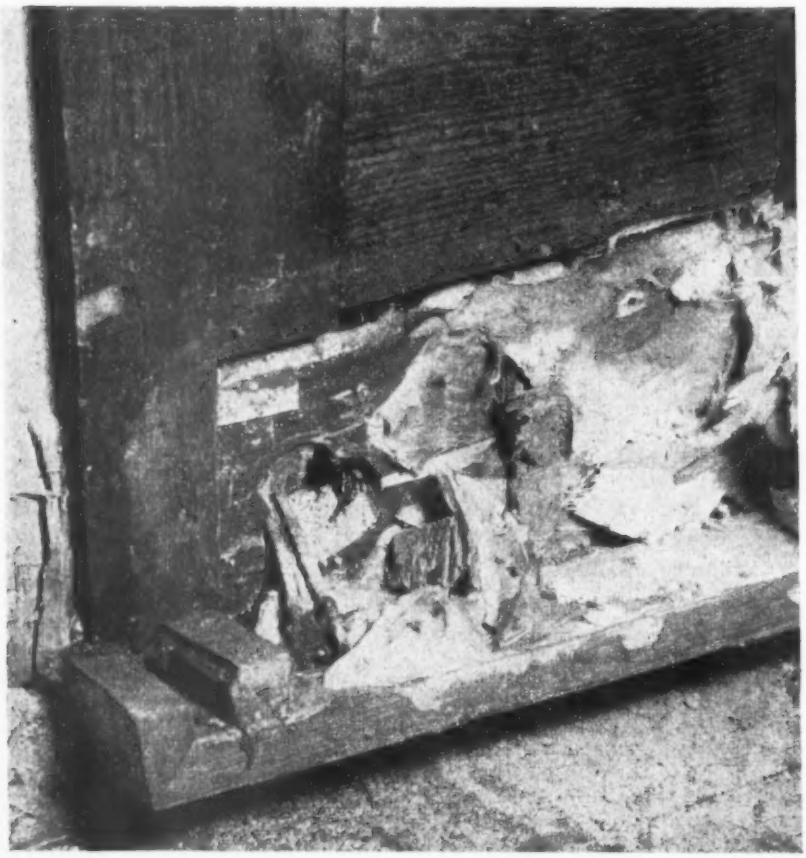


Fig. 1. A thick silvery grey skin of Merulius lacrymans, *the dry rot fungus, formed on the bottom of a door.*

the same extent as *Merulius*. The fruit body consists of an irregular whitish plate covered with irregular torn pores (see Fig. 5).

Coniophora cerebella—cellar fungus—is perhaps the commonest of all fungi in buildings, and is liable to make its appearance in any place where there has been persistent leakage of water. It causes the wood to become darker in colour and to break up into rather smaller pieces than when affected by the dry rot fungus. Very often the decay which it causes is entirely internal and it leaves a thin skin of sound wood on the surface which conceals the decayed condition within (see Fig. 6). Its strands, which are never thicker than fine string, eventually become dark brown or almost black (see Fig. 7) but, frequently, no growths whatever are visible on the surface of the decayed wood.

Cellar fungus occurs commonly in roofing timbers wetted by leakage, and is the most frequent cause of decay in solid floors laid without a proper damp proof course. Much of the internal decay which is found in flooring and joists on which there are no traces of fungus growth can be attributed to this fungus. Since it is fairly common in forests and in timber yards, it is likely that much timber carries *Coniophora* spores, although the wood itself may be perfectly sound. These spores germinate only if there is sufficient moisture present but, if unseasoned timber is used in a place where it cannot dry out rapidly (as in a solid floor), the fungus can soon become established and cause considerable damage before the wood dries out. This probably explains why internal decay of this type is sometimes found in floors which appear to be perfectly dry and well ventilated when the rot is detected—possibly years after it has ceased to spread.

Cellar fungus does not spread appreciably beyond the area which is actually wet, for its strands do not have the water transporting capacity of those of *Merulius*. They do not penetrate through brickwork, though they may spread over the surface of a wall for some distance (see Fig. 8). The growth of this fungus is readily checked by drying out, and its eradication is always much easier than that of dry rot.

There are a number of other species which appear sporadically on timber in buildings, but the decay which they cause can, for practical purposes, be treated as if it had been caused by *Coniophora*. However, their identity may give a clue as to when the timber became infected. For instance, if Douglas Fir is found to be infected by a fungus which is common in America but rare or non-existent in this country (*e.g. Poria monticola*), there will be good grounds for concluding that the timber was infected before it was imported. In the same way, if the decay is found to be due to a fungus which only attacks living trees, it can obviously be assumed that the timber was infected when it was in the forest.

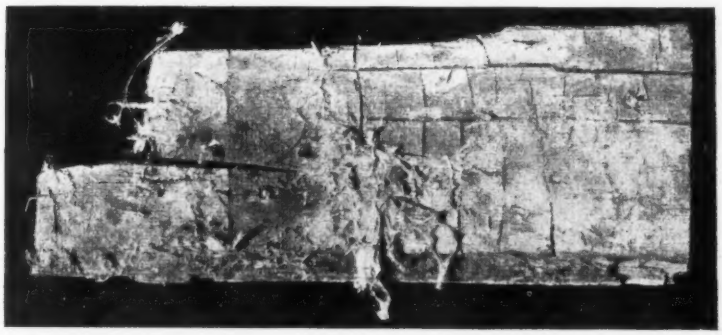


Fig. 2.

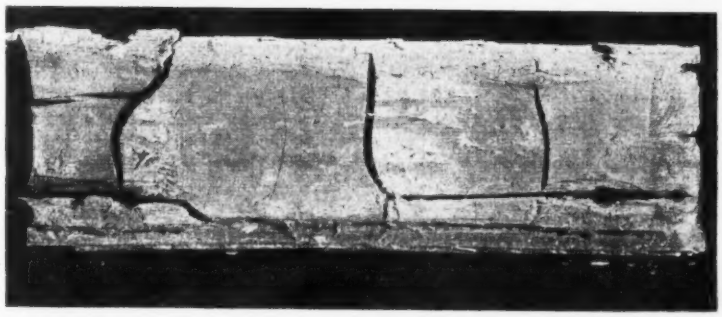


Fig. 3.

Fig. 4.

Various stages of decay caused by Merulius lacrymans. (*Note the root-like strands in Fig. 2.*)

CONDITIONS UNDER WHICH FUNGI CAN FLOURISH

Before fungal growth can develop in a building, the following conditions must exist:

1. A suitable food material must be present from which the fungus can derive its nourishment. In the case of wood-rotting fungi this is, of course, usually wood in some form; but these fungi can also attack other materials which contain cellulose, such as wall board or paper. *Merulius lacrymans* can, in fact, grow vigorously on damp books, and sometimes causes severe damage in libraries where it reaches books in wooden cases if they are left against a damp wall. It has also been found more than once attacking documents in a strong-room.

2. Sufficient moisture must be present to permit germination of the spores and continued growth of the fungus. More moisture is necessary for the initiation of an outbreak than for its continued spread, for once the fungus is established and growing vigorously, it can, by its action in the wood, synthesise water from the wood substance itself. Glucose, formed by enzymatic hydrolysis of the cellulose, is oxidised in the cells of the fungus to produce carbon dioxide and water according to the chemical equation $C_6 H_{12} O_5 + 13O = 6 CO_2 + 6H_2O$. This means that, for every pound of wood which is rotted

away many ounces of water are produced. Once an outbreak is established a vicious circle is thus set up. The more rapidly the wood is decayed the more moisture is produced, and the moister the wood becomes the faster the fungus grows, and so on. It is very noticeable, both in practice and in experimental work with the dry rot fungus, that it may take some little time for it to gain a foothold in wood but once it is firmly established it romps away.

Wood containing less than 20 per cent. of moisture (based on the oven dry weight of the wood) is immune to attack, and there is comparatively little risk of rot developing in wood containing less than 25 per cent. of moisture. But if the moisture content remains for any length of time over 25-27 per cent. some form of decay will inevitably appear. Germination of the spore is stimulated by the presence of liquid water, so outbreaks usually become established either where there has been an actual leakage of water or where water has condensed.

3. Wood-rotting fungi demand a certain amount of air for their development and wood which is completely submerged under water can remain for years in a completely unchanged sound condition. Such conditions, of course, rarely, if ever, arise in buildings and, if the moisture content of the wood is too high for *Merulius* to flourish, other species, such as *Coniophora* or *Paxillus panuoides*, which can tolerate a very high moisture content, will be found.

4. The temperature must be within a certain range. Little or no growth takes place at temperatures just over freezing point, and growth is slow at temperatures below 50°F. Dry rot is not uncommon in the wooden linings of cold stores, where condensation in the timber has raised the moisture content dangerously high. But it will be found that the temperature of the woodwork in which the fungus is actually growing is appreciably above freezing point. Dry rot is most prevalent in buildings and boats used for the cool storage or transport of fruit such as apples and bananas, it rarely occurs in the linings of meat stores, in which the temperature is usually kept much lower. The optimum temperature for *Merulius* is about 70° F. when the rate of growth is probably twice as fast as it is at 50°. It does not grow at temperatures much above 75°, and is easily killed by exposure for a few hours in a humid atmosphere, to a temperature of 140°. It is therefore possible to sterilize valuable woodwork that is infected with dry rot by heating it in a timber drying kiln for a few hours. It is important that the relative humidity in the kiln should be kept as high as possible during the treatment. Not only does this make the heat treatment more effective in killing the fungus, but it also helps to prevent shrinkage and distortion of the woodwork during the heat treatment.

5. The fungus itself must be introduced either in the form of spores, or in already decayed wood. There is no evidence to show that dried fragments of mycelium, or particles of infected sawdust, act as foci of infection, though this must always remain a theoretical possibility. It has already been explained how easily spores, on account of their minute size, can be carried long distances by air, or on clothing, etc.; probably most outbreaks of dry rot arise from airborne spore infection, though it is hard to prove this. While it can rarely happen that wood containing active infection with *Merulius* is introduced into buildings during construction or repair work, the original source of infection has been traced in a number of cases to infected firewood, stored in a damp outhouse or cellar, from which the fungus has spread on to the structural timbers of the house.

Since *Merulius* does not, fortunately, grow in the forest, many isolated buildings escape infection even when favourable conditions for its development exist. But in a built-up area, where dry rot is already prevalent, the chances are that sooner or later infection will find its way to any woodwork which is in a damp condition. *Coniophora* is so common and is so widely distributed that it is almost certain to make its appearance in a building if the woodwork remains damp for any length of time.

Fig. 5. Poria vaillantii—*the pore fungus—irregular patches of fruit body.*

Fig. 6. Coniophora cerebella — *cellar fungus—decay entirely internal.*

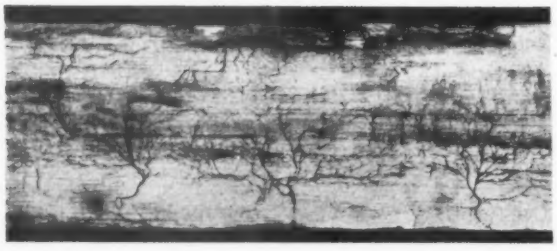


Fig. 7. *Cellar fungus, later stage, strands have become almost black.*

HOW CONDITIONS SUITABLE FOR FUNGAL GROWTH ARISE IN BUILDINGS

The moisture content of timber in a well built house which is occupied and normally heated should never become sufficiently high for dry rot to become established, even if living spores of the fungus should be accidentally introduced. Even in an unoccupied building the risk of dry rot is negligible provided the building is properly maintained, because the periods of the year during which the atmospheric humidity is sufficiently high to raise the equilibrium moisture of thin fully-exposed timber to the danger point do not last long enough to raise the moisture content of the joists and boards as a whole. Provided that no moisture penetration or leakage is taking place through porous walls, the only serious source of dampness can come from condensation. While this may be sufficient to cause the

wall paper to go mouldy it is rarely enough, by itself, to set up fungal decay in the woodwork. However, where any tendency to dampness exists in a house, due to porous walls or to rising damp coming up walls which have no DPC, the absence of the heating and ventilation which accompany normal occupancy may be sufficient to turn the scale. If the rate of evaporation from the exposed surfaces of the woodwork is reduced and becomes lower than the rate of entry from the damp masonry with which it is in contact, then the moisture content will steadily rise until it reaches the point at which there is a risk of fungal decay being established.

This is most likely to occur in large, old buildings having no DPC, and it is common knowledge that many country mansions have been attacked by dry rot after they have been left unoccupied for a few years. Unoccupied property is seldom as well maintained as that which is inhabited and, frequently, there is a failure to keep down-pipes and guttering clear and in good condition, so that sooner or later actual leakage of water occurs, thus producing ideal conditions for fungal growth. When true dry rot is discovered in a house, nine times out of ten its origin can be traced either to leakage of water from guttering, down-pipes or plumbing, or to insufficient ventilation below the floors, which has allowed the moisture content of the joists and boards to rise above the danger point by the absorption and condensation of moisture rising off the site.

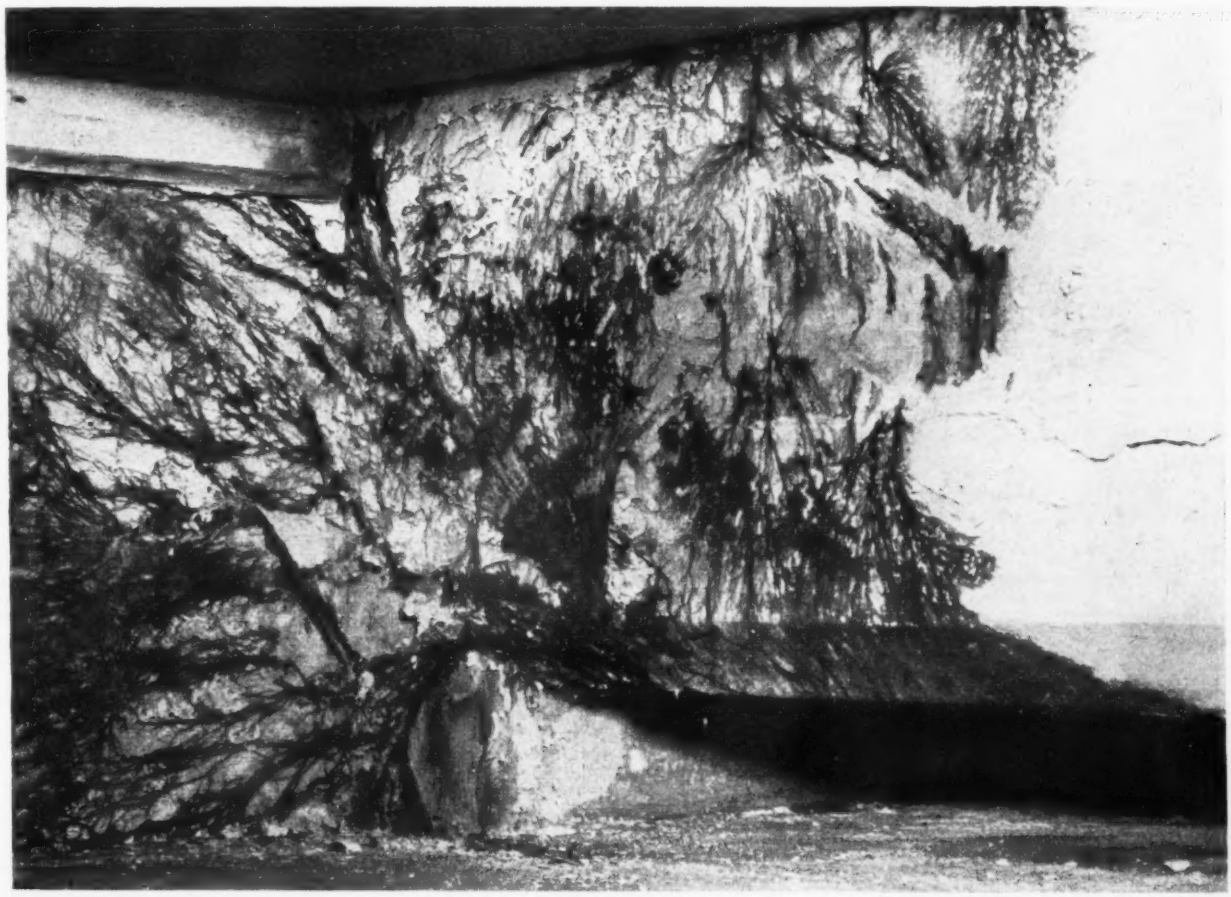
DRY ROT IN DRY TIMBER

Some of the most puzzling cases of rot are those in which the decayed timber is found to be perfectly dry. In such cases it may be that the source of dampness was cured years before the rot was discovered, and all traces of it on decorations, etc., have been covered up. Again, it is possible that the moisture responsible for the start of the trouble was present in the timber when it was built into the house; *i.e.* either the timber was initially unseasoned, or it was allowed to get wet on the site.

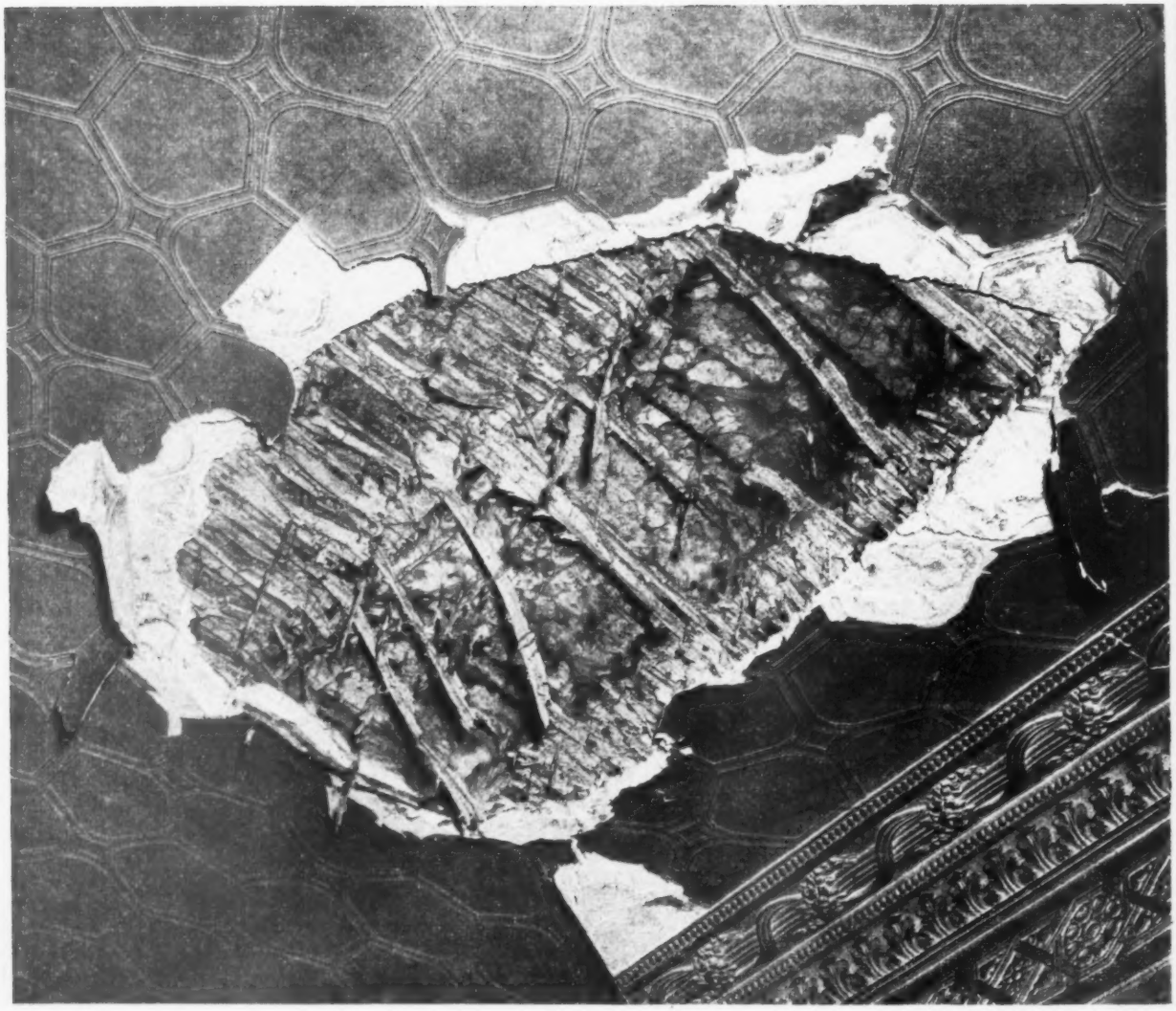
Many cases of internal decay caused by *Coniophora cerebella* in flooring on which no superficial growths are present, and below which there is good ventilation and no signs of dampness, can be explained only by the supposition that the moisture was present in the joists and boards when laid, and that drying out in-situ was delayed so that rot had time to become established, and continued until the wood did eventually dry out sufficiently to prevent further spread. *Coniophora* does not seem able to maintain itself indefinitely if the source of moisture is cut off. Decay is, of course, most likely to arise as a result of using unseasoned timber if the surface of the woodwork is covered immediately with anything impervious to the passage of moisture vapour, such as linoleum, oak parquet or high gloss paint. Boarding laid in an unseasoned conditions is much more likely to decay in solid floors than it is in suspended floors below which there is reasonably good ventilation. For this reason it is most important to ensure that boards laid on solid floors are in fact seasoned down to the proper moisture content. If for any reason flooring has to be laid at a moisture content that is higher than is desirable it is essential to leave it exposed to the air for at least six months so that it can dry out from its upper surface.

In the second article on dry rot (see page 247) the precautions necessary to prevent moisture reaching woodwork in buildings are discussed, and it is shown how careful design and detailing, combined with good workmanship, can reduce the risk of dry rot in new buildings to negligible proportions.

Fig. 8. Coniophora cerebella—*cellar fungus—spreading itself over the surface of a wall.*



This sort of thing, left, may have an "old-world" charm, but it leads to the type of disaster shown below—a fine plaster ceiling severely affected by dry rot; it collapsed completely shortly after this photograph was taken.



SPECIALISED FITTINGS | KITCHEN UNITS

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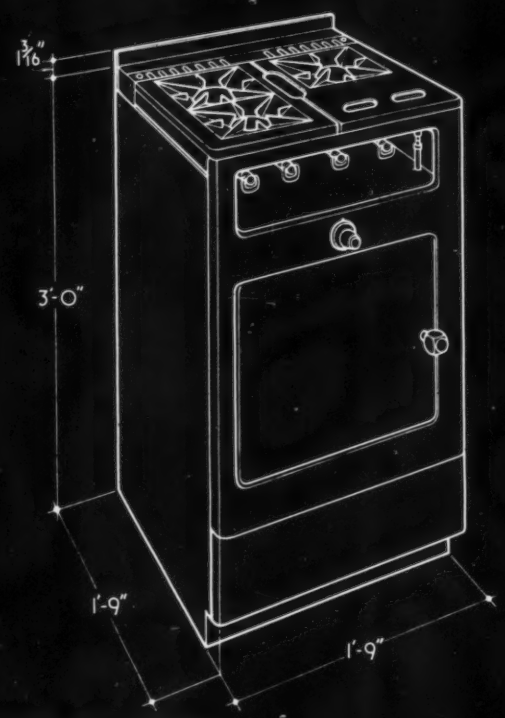
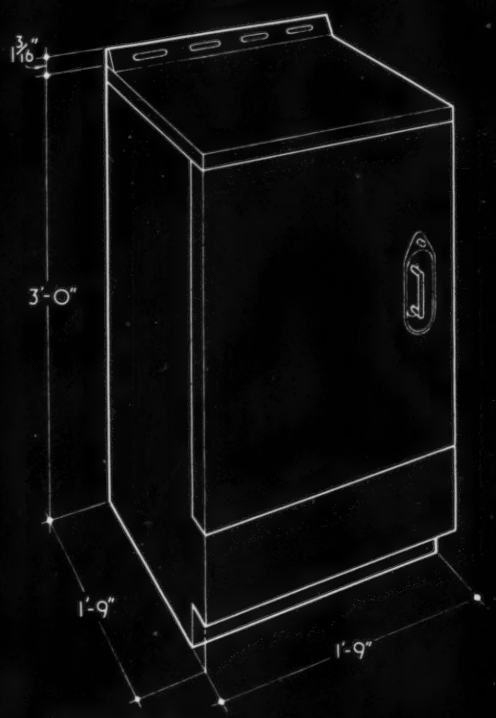
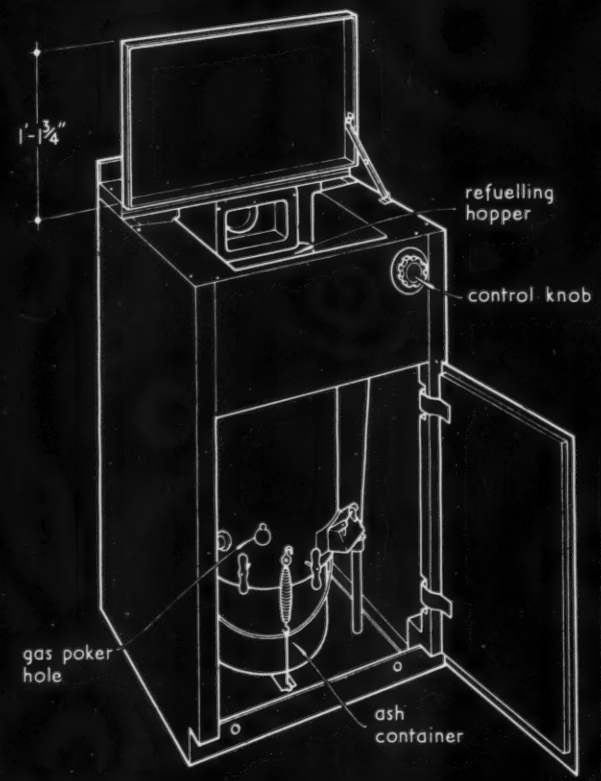


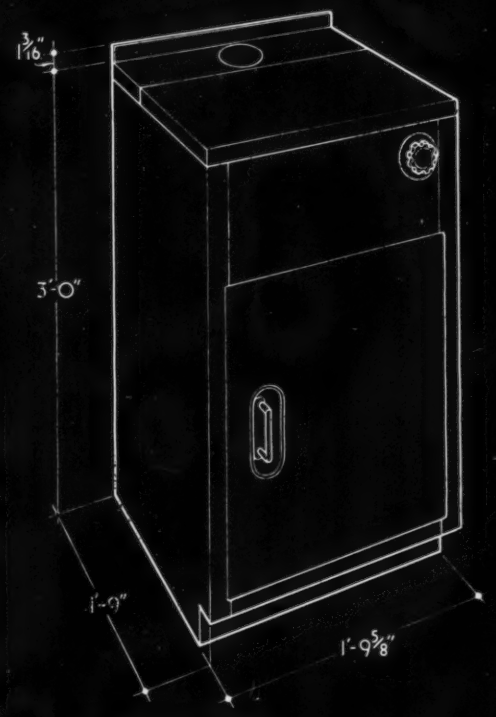
·FLAVEL· GAS COOKER.



REFRIGERATOR.



view of boiler open



view of boiler closed

·HAZEL· DOMESTIC BOILER.

·WARWICK· GAS COOKER, REFRIGERATOR AND DOMESTIC BOILER.
Manufacturer: C.S.A. Industries Ltd.

43.E14 'WARWICK' GAS COOKER, REFRIGERATOR AND DOMESTIC BOILER

This Sheet, the second of two describing the Warwick range of kitchen equipment, deals with the Flavel gas cooker, refrigerator and Hazel domestic boiler. Other Warwick kitchen equipment—floor cabinets, sink units and wall cupboards, which are designed to match the above—is described on Sheet 43.E13.

'Flavel' Gas Cooker

Hot-plate: This is made in two halves and is of cast iron vitreous-enamelled black and is removable for cleaning the underside.

Hot-plate burners: There are three aerated burner rings—large, medium and small—and a grill burner.

Oven: The side linings are of acid-resisting vitreous enamel on cast iron with embossed shelf positions. The inside dimensions of the oven are 1 ft. 3½ in. wide by 1 ft. 2 in. high by 1 ft. deep. The flue outlet discharges at hot-plate level.

Fittings: The cooker is fitted with a Thermotap (combined oven tap and heat control) and detachable front toe-piece to facilitate cleaning. Accessories include two grid shelves, cake tray and meat tin.

Cooker side plates: One or both of these may be omitted if other Warwick units are installed at the side or sides of the cooker.

Levelling: Four levelling screws are fitted to the cooker bottom supports.

Refrigerator

Accommodation: The capacity of the refrigerator is 3 cu. ft.

Condensing unit: This is the British Thomson-Houston FA. 21.C hermetically sealed unit, 50 cycles, A.C. 220/250 volts.

Operation: The refrigerator is thermostatically controlled.

Insulation: The insulation material used is Fibreglass of 2½ to 3 lb./cu. ft. density.

'Hazel' Domestic Boiler

The boiler is designed to supply hot water to sink, wash basin, bath, hot towel rail and three radiators. It is constructed of steel and is housed in an aluminium cabinet with a stainless steel top and incorporates the following features: continuous burning; single control of rate of combustion operating both air inlet and flue damper simultaneously; special ash container which need only be emptied once a week; shaking grate with special dumping section for periodic removal of any accumulation of stone or clinker; provision for use of gas poker.

Construction: Conforms to B.S. 758 : 1945 *Small domestic hot water supply boilers for solid fuel.*

Rating: Hot water supply rating 45,000 B.th.u.'s per hour. 45 gallons per hour at 150° F. Central heating rating 18,500 B.th.u's per hour or 124 sq. ft. radiator surface. Combined hot water supply and heating—hot water supply 20,000 B.th.u's per hour, heating 10,000 B.th.u's per hour or 67 sq. ft. radiator surface.

Fuels recommended: Coalite is the most suitable. Alternatively 1 in. to 2 in. broken coke, 1¼ in. by 2½ in. (approx.) anthracite and dry steam coal or Phurnacite, may be used.

Fuel consumption per 24 hours: Hot water only 15-30 lb. Central heating 30-45 lb.

Access for sweeping flue nozzle: The flue nozzle can be swept from the front of the flue damper box when the damper is in the closed position. The main flue must be provided with a soot door for cleaning in the usual manner.

Operation: The appliance is fitted with a single control operating an air inlet and flue damper giving complete control of the rate of combustion.

Installation: A 4 in. internal diameter flue pipe is required and may be fitted to the back or top of the boiler as required. The flow and return pipes to the hot water cylinder should preferably not exceed 15 ft. each in length.

Maintenance: Empty ash container every 7 days. Use shaker grate regularly to keep fire clean. Use dumping grate or tongs to remove clinker occasionally and clean flue periodically.

Hot water cylinders: The standard boiler is designed for the indirect system only and a 35-gallon indirect cylinder is recommended. If the boiler is to be used on a direct system with soft water, this should be specified when ordering. For this system a 45-gallon direct cylinder is recommended.

Finish

All units are supplied finished stove-enamelled cream. The plinths are finished stove-enamelled black.

Compiled from information supplied by:

C.S.A. Industries Ltd.
Address: Warwick, England.
Telephone: Warwick 500.
Telegrams: Conscrew, Warwick.

SANDLIME BRICKS : GENERAL DATA

This Sheet sets out general data on sandlime bricks and includes laying instructions.

Materials

Sandlime bricks are made from siliceous sand and slaked lime, with sufficient water to enable the mix to be moulded under pressure and hardened by exposure to steam. Hydrated calcium silicate is formed from the sand and lime by the action of the steam and this becomes a strong and permanent cementing agent, binding the sand grains together.

British Standard

Sandlime bricks are covered by B.S. 187 : 1942 *Sandlime (calcium silicate) bricks*, which covers three grades of brick:—

1. Bricks for special purposes—described as "bricks suitable for use when high strength is required, or in positions where they are liable to be exposed to temperatures below freezing when saturated with water."
2. Building bricks, Class A (i) and (ii), for facing and general building work.
3. Building bricks, Class B, for internal use only.

The major practical requirements under B.S. 187 : 1942 are the dimensions, minimum compressive or transverse strength (by agreement between purchaser and manufacturer), and maximum drying shrinkage. The limits are as follows:—

Dimensions:
Length, $8\frac{3}{4}$ in. $\pm \frac{1}{8}$ in.
Width, $4\frac{3}{16}$ in. $\pm \frac{1}{16}$ in.

Crushing strength: The test figures called for by the specification for crushing strength are:—

Grade of sandlime brick	Crushing strength (wet)	
	Lb. per sq. in.	Tons per sq. ft.
For special purposes ..	3,000	192·9
Building, Class A ..	2,000	128·6
Building, Class B ..	1,000	64·3

Transverse strength: The test figures required for transverse strength are:—

Grade of sandlime brick	Modulus of rupture (wet)	
	Lb. per sq. in.	Tons per sq. ft.
For special purposes ..	500	32·1
Building, Class A ..	350	22·5
Building, Class B ..	200	12·9

Drying shrinkage: The average drying shrinkage is laid down at:—

For special purposes .. 0·025% of wet length.
Building class A (i) .. 0·025% ,, ,,
,, ,, A (ii) .. 0·035% ,, ,,

Characteristics

Durability: Satisfactory resistance to weather by sandlime bricks of good quality is adequately demonstrated by bricks that have been exposed in actual buildings, in some instances for forty years and more.

The principal factors affecting durability of bricks are:—

(*a*) Frost—In a number of tests it has been shown that sandlime bricks of the quality appropriate for external work have high resistance to the action of frost.

(*b*) Wetting and drying—Wetting and drying conditions are not likely to have any important weathering effect upon sandlime bricks.

(*c*) Crystallisation of salts—A common cause of disintegration and disfigurement of some building materials is efflorescence, due to crystallisation of soluble salts in the pores or on the surface. These salts may be contained in the material, formed by the action of atmospheric gases on it or derived from neighbouring materials. Sandlime bricks are free from soluble salts in appreciable quantities and tests indicate that the second source mentioned above is not dangerous and, therefore, efflorescence does not normally occur on sandlime brickwork.

(*d*) Atmospheric gases—No evidence of any harmful effect from atmospheric gases has been observed, and there is some increase in strength through the action of atmospheric carbon dioxide.

Shrinkage: Sandlime bricks have no irreversible shrinkage, such as is found with concrete products. The reversible shrinkage or expansion varies from 0·001 to 0·035 per cent. for bricks complying with the British Standard Specification.

Light reflection: Sandlime bricks, owing to their colour and texture, give a maximum of light reflection without glare. They are consequently suitable for the external walling of courts and areas and for internal walls where maximum light reflection and minimum maintenance costs are essential requirements.

They are easily washed down and are, consequently, more economical than distempered plaster, since they eliminate the expense of recurring decoration.

Hardness: The hardness—resistance to abrasion—varies according to the quality of the brick and is within the same range as clay building bricks.

Fire-resistance: In so far as actual experience of the fire-resisting qualities of sandlime bricks has been obtained, their reputation is good.

They have been successfully used for chimney stack flues and in other positions where a refractory material of moderate quality is required.

Colour: The usual natural colours of sandlime bricks are white, light cream or pink, varying in accordance with the type of sand used in the manufacture. Bricks in other colours are also produced by the use of either a mineral pigment or other coloured sands.

Applications

Sandlime bricks can be used in all types of brickwork—as high-quality facing bricks, in foundations

13.H1 SANDLIME BRICKS: GENERAL DATA

and as common bricks. It is, however, important that bricks of the correct grade for the type of work should be used.

For use in places where they are liable to be continually wet or exposed to frost, as in work below damp-proof courses, bricks of the special purposes class of the British Standard Specification should be used. This class should also be used where unusually high loads are to be sustained.

Bricks of Class A should be used for external facing work and where the conditions may be conducive to cracking, as in long runs of brickwork, they should be of Class A1.

Laying Instructions

Recommended mortar mixes: Stronger mixes than necessary should be avoided with all types of brickwork. The Building Research Station suggests the following mortar mixes:—

(*a*) For general use (with Classes A or B)

From—1 part cement, 2 parts hydrated lime, 8 parts sand.

To—1 part cement, 3 parts hydrated lime, 12 parts sand.

Or—1 part hydrated lime, 2½ parts sand.

(*b*) For use with special-purpose bricks, 1 part cement, 1 part hydrated lime, 6 parts sand—or weaker when the construction so permits.

Plastering and Rendering

Sandlime bricks can be plastered with any type of gypsum and anhydrite plaster, lime or cement plaster. Joints can be left rough or raked to give the maximum mechanical key when plastering.

Some wetting before plastering is often preferable, but excessive wetting should be avoided.

External rendering finishes can be applied without difficulty.

Pointing

A lime-cement-sand mortar, gauged a little more heavily with cement than the mortar used for laying, is recommended. Dense cement mortar should be avoided.

Cleaning

Sandlime bricks do not readily absorb sooty matter and keep clean where washed by rain.

For removal of grease, oil or general dirt, when soap and water are found to be ineffective, any other good detergent may be used with warm water and a scrubbing brush.

Compiled from information supplied by:
The Sand Lime Brick Manufacturers Association, Ltd.
Address: 55, Romney Street, Westminster, London, S.W.1.
Telephone: Abbey 3891-2.

DRY ROT

Part II: Assistant Editor, No. 23

Constructional design to prevent conditions arising under which dry rot can develop, including a description of types of preservatives and methods of using them.

THE main characteristic of all the fungi which cause dry rot is that their growth can only take place when the moisture content of the wood which they attack rises to a point close to saturation point. The danger line is around 20 per cent. Below this figure there is no danger of dry rot and, in situations where it can dry out readily, a moisture content between 20 and 25 per cent. presents little risk but, if timber *persistently* has a content over 20 per cent., there is a strong probability that dry rot will develop. It is persistent damp which is the great danger—water alone does not produce dry rot; in fact, timber fully submerged in water is relatively immune.

It is important to note that this degree of moisture content can be reached before the timber *appears* wet—this may be the reason why the "disease," caused by damp, is known as "dry" rot. Further, since wood absorbs moisture from the air, under conditions of poor ventilation it can reach the danger point even if the air is somewhat below saturation point.

The fungus *Merulius lacrymans*, presents an additional problem. Whilst the focal point of an infection by this fungus may be some damp timber, it can grow rapidly and extend to, and destroy, dry timber, for it synthesises its own moisture by chemical action and its strands can travel considerable distances—30 or 40 ft.—over inorganic materials in search of fresh timber to destroy.

Whilst the eradication of serious outbreaks of dry rot is usually a task for specialists, every architect should understand the principles to be observed for avoiding the possibility of dry rot attack in new buildings.

Obviously, the essential task is to ensure that no timber in the building should have a moisture content above 20 per cent., but where this is unavoidable (*e.g.* in industrial buildings with wet processes or in intermittently occupied premises) there is no alternative but to render the timber immune by impregnating it, under pressure, with a reliable preservative.

PRESERVATIVE TREATMENT

It is fortunate that, owing to its structure and mode of growth, wood is a most difficult material through which to ensure thorough penetration. However, sapwood, although most liable to decay is more easily penetrated by liquids than heartwood.

Surface application of preservatives is virtually useless for most purposes. Penetration is seldom more than $\frac{1}{16}$ in. and even this evaporates before long. Soaking, too, has limited usefulness, but is adequate for joist ends and rafter feet. These members may be stood on end in a tank or drum of preservative for 24-48 hours.

Far better is the "hot and cold" treatment. The timber is immersed in a tank of preservative, raised to a temperature of about 180° F., kept at this temperature for several hours and then allowed to cool slowly. Some preservatives decompose at this temperature so, instead, the timber can be heated in water and then immersed in a cold bath of the preservative, for it is during the cooling that the liquid is drawn into the pores.

For complete immunity, pressure impregnation is essential. The timber to be treated is placed in an air-tight vessel, which is then evacuated. The preservative is admitted and, when atmospheric pressure has been regained, the liquid will have been drawn into the pores. Additional pressure can be used to increase the degree of penetration. Careful control of temperature, viscosities, concentrations and timing is vital and, when using proprietary preservatives, the guidance of the manufacturers should be followed exactly.

TYPES OF PRESERVATIVE

There are two principal types of preservative—oily and water-soluble. Of the first, creosote is the most widely used—it is cheap and efficient, but it creeps and is, therefore, not usually considered very suitable for use internally. Proprietary forms of oil-soluble preservatives are less objectionable but, as with creosote, timber treated with them cannot be decorated satisfactorily.

The water-soluble preservatives consist mainly of solutions of inorganic salts, such as zinc chloride, although, nowadays, fluorides, arsenates and chrome salts are most popular, as is the highly fungicidal di-nitro-phenol. Mixtures prove most effective, since different chemicals appear to destroy different species of fungi. Many of these preservatives have the added advantage that they make the timber more fire-resistant.

Before treatment, all timber should be clean and dry and thoroughly seasoned and, of course, after impregnation with a water-soluble preservative, it must be dried out again, usually for 3 to 5 weeks, unless a kiln is used.

There is a good case for advocating the treatment of all timber used in building, so as to render it permanently immune from dry rot attack. The cost is, of course, the snag—pressure impregnation makes the price of softwood which has been treated roughly equal to that of hardwood. But, if proper care is taken in detailing and construction, dry rot can be avoided without this expense.

CHOICE OF AND PREPARATION OF SITE

The most elaborate precautions will be of little avail if the site is excessively wet. The lower part of a sloping site is always a risk, and the presence of rushy tufts amongst the grass is a sure sign that the ground is wet at certain seasons.

Quite often, one of the first things which happens when a building site is opened up is that the existing field drainage is destroyed. Land which was arable and well-drained becomes water-logged and remains so. In many cases this state of affairs could be remedied by ditching between the plots in order to pick up the ends of existing land drains. Certainly, special attention must be paid to land drainage on wet sites.

In preparing the site, it should be noted that it is often inadequate to remove the "top 6-in." It is absolutely essential to dig up and destroy all roots which may have (or can readily

develop) dry rot and pass it on to the fabric of the building.

SELECTION OF TIMBER

In these days of severe timber shortage, it is impossible to insist on all the requirements of a 19th-century specification. But timber must be well-seasoned, sound and dry (moisture content under 20 per cent. if possible). The best guarantee of this is to obtain the timber from a reliable merchant, who stacks it properly in his yard so that it is unlikely to develop dry rot before it reaches the site.

CONSTRUCTIONAL DESIGN

To avoid dry rot, constructional design must aim, firstly, at preventing moisture entering the building and, secondly, at eliminating, by means of thorough ventilation, any moisture that does succeed in finding its way in.

Moisture can enter in four ways, barring accidents (or neglect). Firstly, it can pass directly through the external walls. Driving rain has been known to find its way through 4 ft. of brick or stone and commonly gets through 14 to 18 in. of brickwork. Secondly, moisture can rise, by capillary attraction, from the soil and up through the brickwork or masonry. Similarly, it can rise through surface concrete (for no concrete is completely impervious and the slab rests on an inexhaustible supply of moisture) and evaporate above. Lastly, condensation of the water vapour in the atmosphere may take place for, if air is to come into a building, it is bound to bring water vapour in with it.

DIRECT PASSAGE OF MOISTURE THROUGH WALLS

There is only one answer to this—the use of the cavity wall. This has become almost a universal practice but it is not effective unless very careful attention is paid to details. Mortar must be given to the detailing around the wall ties; the cavity must be carried down below the damp course; mortar droppings must be raked out from the bottom of the cavity and great care must be given to the detailing around door and window openings and to parapets, when they are used. Bearers for box gutters behind parapets are especially prone to rot and parapets should have two DPCs, one immediately below the coping and another at roof level. If the roof is flat the DPC at roof level can be continuous with the roof covering. (See Fig. 2.)

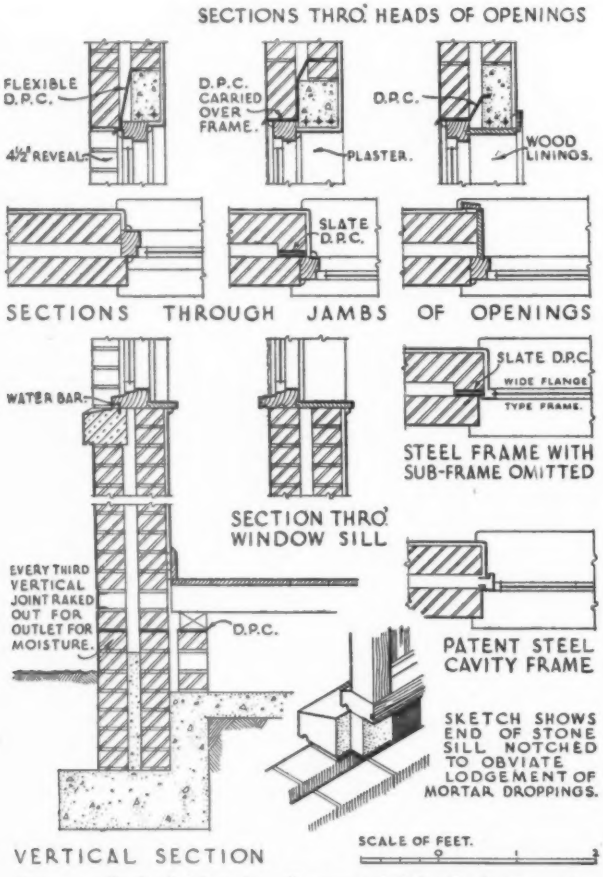


Fig. 1. Cavity brickwork. Recommended details for preventing moisture reaching the inner skin at window openings and at the foot of the cavity.

External renderings may reduce moisture penetration but it should be realised that the least porous renderings are not necessarily the best. Cement/lime, although more porous than cement, is better, since it is less liable to crack and it is through the cracks that the danger of moisture penetration is accentuated. A recommended mix for cement-lime renderings is 1 : 1-1½ : 8-9. Rough cast and pebble dash finishes also reduce the tendency for cracks to develop.

For the same reasons, cement/lime mortar is better than ordinary cement and sand for most purposes—gaps between the bricks and the mortar joints are less likely to occur.

MOISTURE RISING BY CAPILLARY ATTRACTION

Moisture will not rise up through walls if an impervious damp course is used, but it should be remembered that most buildings are designed to last a long time and the DPC should be of a material which will last as long as the remainder of the building. It must be continuous, and care should be taken to ensure that it is not bridged by mortar droppings on the face of the wall. Do not forget DPC's in sleeper walls.

SUSPENDED TIMBER GROUND FLOORS

When all the precautions necessary to prevent dry rot in suspended ground floors are considered, (not forgetting that the high degree of ventilation, which must be maintained under them, results in excessive heat loss from the floor), it is surprising that they are not extinct. In fact, in Switzerland and Austria, in spite of the fact that neither of these countries suffer from an acute timber shortage, as we do, suspended timber ground floors are rarely used today.

However, there are cases where solid fill to floor level is impracticable—*e.g.* on sloping sites. Then, the first precaution is the use of a bed of hardcore under the site concrete. This should be of large ballast or broken dense brick, and all fine material *must* be eliminated. It should be noted, however, that on very wet sites, hardcore will act as a sponge unless used in conjunction with thorough sub-soil drainage.

With regard to the site concrete itself a relatively thin layer of dense, well-tamped concrete is more effective than, say, 6 in. of poor, loose concrete. It is interesting to note that, in Scotland, a tar or bituminous concrete is used instead of the usual grade.

In spite of these precautions, moisture will inevitably force its way through into the space under the timber floor, and this space must, therefore, be ventilated thoroughly. The clear space between the surface concrete and the timber floor joists should never be less

than 9 in., and it is important to make sure that the contractor does not leave any shavings, soil or *débris* there. Cross ventilation is essential and precautions must be taken to avoid pockets of stagnant air. Hence, sleeper walls must be of honeycomb construction and, if there are solid floors adjacent to the suspended floor, it is necessary to lay pipes under (or through) these, to complete the air path. Similarly, a pipe laid under the hearth will prevent pockets of air remaining at either side.

Air vents are usually too few and too small. It is the proportion of clear openings that matters—the only limit to the size of openings should be that they exclude vermin. It is desirable to insert the vents further above ground level than is normal practice but the tops of them should be below the bottom of the lowest timber in order to allow free movement of air.

It is difficult to give definite rules for the number of vents; the area below a floor increases as the square of the length of the boundary walls. Hence the old rules relating ventilating openings to wall length are not valid. However, as a rough guide, the absolute minimum of clear opening should be 1 sq. in. to every 4 sq. ft. of floor area, and this could be doubled for a wet site.

The use of splayed openings increases the rate of air flow.

In order to reduce heat loss and draughts through suspended floors, tongued and grooved boarding should always be used.

SOLID GROUND FLOORS

In the period between the wars, a rather curious hybrid became quite popular and was responsible for a great deal of dry rot. This is the boarded floor on timber battens supported on concrete. This type of floor is certainly not to be recommended but, if it must be used, the recommendations of the Forest Products Research Laboratory (based on a series of experiments on trial floors) should be observed. The most practical solution is the use of dove-tailed battens, which *must* be pressure creosoted, embedded in the concrete and finishing just clear of the upper surface. A damp proof membrane, at least $\frac{1}{8}$ in. thick, at the thinnest point, should be applied *hot* over the concrete and the fillets. The underside of the floor boards should also be treated generously with creosote.

The alternative of using breeze or clinker concrete as a nailing medium is not altogether satisfactory. The hold of these materials on the nails is not infallible and there is a danger of these types of concrete being corrosive to embedded steel.

An important precaution with all solid ground floors is that linoleum or other impervious floorings should never be laid on boarding until about 12 months after the building is completed, and, even then it is desirable to leave a margin around each room uncovered to allow the evaporation of moisture which would otherwise be entrapped.

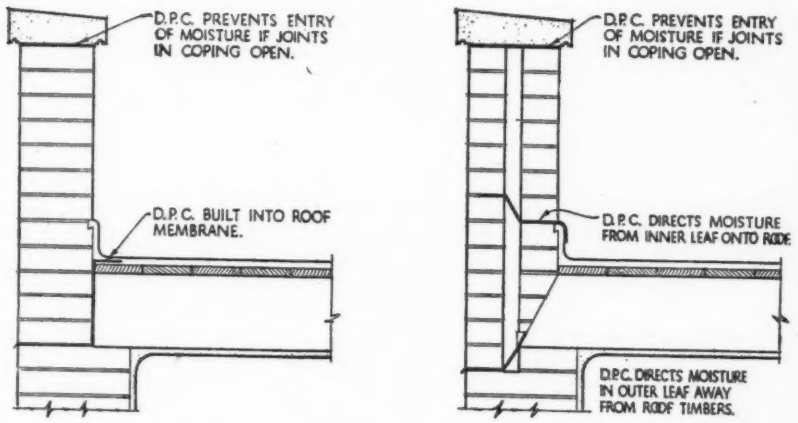
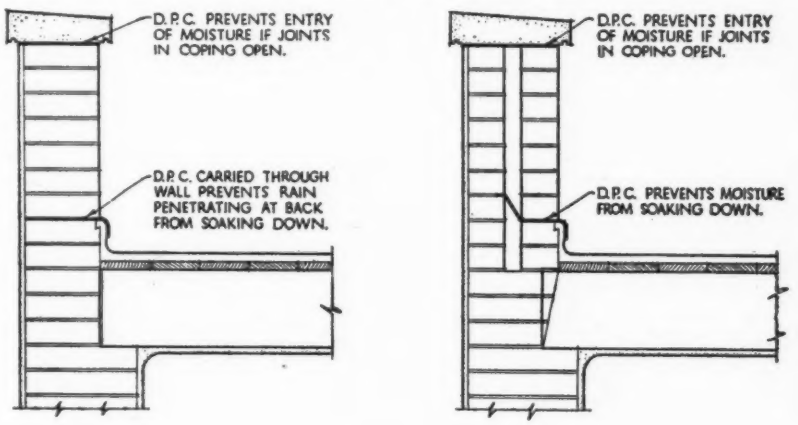


Fig. 2. Good constructional details for parapet walls to timber flat roofs. Above, unrendered parapet walls. Left, parapet may become saturated by rain on one or both faces, but moisture is directed by DPC to outer face below roof timbers. Right, cavity reduces amount of brickwork liable to saturation if parapet gets wet from one side only. Parapet is, therefore, more likely to present the same appearance as the main wall. Below, rendered walls. Left, brickwork gets wet from back but moisture can escape. Right, cavity prevents moisture which enters at back of parapet from reaching rendering.



ROOFS

In normal pitched roof construction there is plenty of air circulation and even the occasional leak, which every pitched roof will spring from time to time, will constitute no great danger as the wood can dry out rapidly. But in Mansards (and similar forms of roof construction, where accommodation is provided in the roof space and the underside of the rafters sealed with plaster or wallboard) conditions are ideal for the development of dry rot, unless clear air spaces are provided so that all the voids are swept by a vigorous stream of air. The only alternative is the use of fully impregnated timber.

The timber flat roof is particularly prone to dry rot attack and, unless the underside is left open, it is absolutely essential to fully impregnate all the roof timbers.

BUILT-IN TIMBER

The use of the cavity wall vastly reduces the danger of damp reaching built-in timber and there is little evidence to support the view that high winds can drive rain through the outer skin and across the cavity. Nevertheless the architect must guard against every possibility—during the lifetime of a building, pipes and fittings and, particularly, the coverings of flat roofs, are bound to leak. The trouble often starts with pinholes, which may weep, unobserved, for weeks and there is, therefore, little excuse for building timber into brickwork or masonry. Ground floor joists are better supported on independent sleeper walls; upper floor joists, on corbels or by using metal hangers. Wall plates can be replaced by steel flats and rough grounds and plugs, by using breeze bricks and nailable concrete.

When the ends of joists *must* be built into a wall, a pocket of air should be left around them and the only alterna-

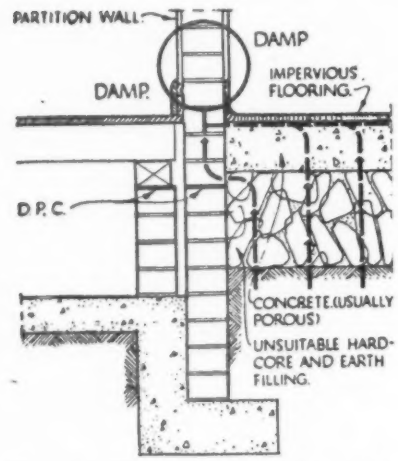
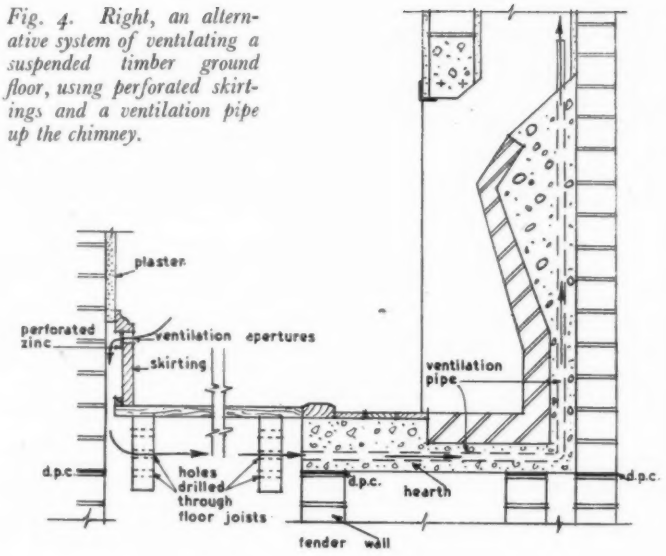


Fig. 3. The traditional danger spot, where a suspended timber floor abuts a solid concrete floor. Damp will enter unless a vertical DPC is included.

Fig. 4. Right, an alternative system of ventilating a suspended timber ground floor, using perforated skirtings and a ventilation pipe up the chimney.



tive to a thorough soaking in preservative is to wrap them in a covering of bituminous felt.

CONDENSATION

The only answer to this problem is to maintain a steady warmth throughout the building, such as is provided by a system of central heating—full air conditioning is the ideal. A danger of condensation will arise in buildings unevenly heated and small, localised outbreaks of dry rot are often the result of this. As always, good ventilation reduces the danger, so too does the use of absorptive finishes, and good insulation of the building is a considerable safeguard.

CARE AFTER COMPLETION

Many (possibly most) outbreaks of dry rot are due to lack of proper care and maintenance after a building is completed. This is seldom under the architect's control, but it is certainly his duty to explain the dangers to the occupier.

Firstly, the building should be allowed as long as possible to dry out, and no impervious finishes should be applied (or laid) until this process is complete. Secondly, hedges and bushes should be kept away from vents, otherwise they will interrupt the flow of air to (or from) them; garden soil should not be built up so as to cover vents or damp courses, and creepers should be shunned. Thirdly, linoleum on boarded floors should be waxed and polished, not washed. Lastly, regular maintenance should be kept up—gutters should be kept clear, and roofings and plumbing regularly inspected for leaks.

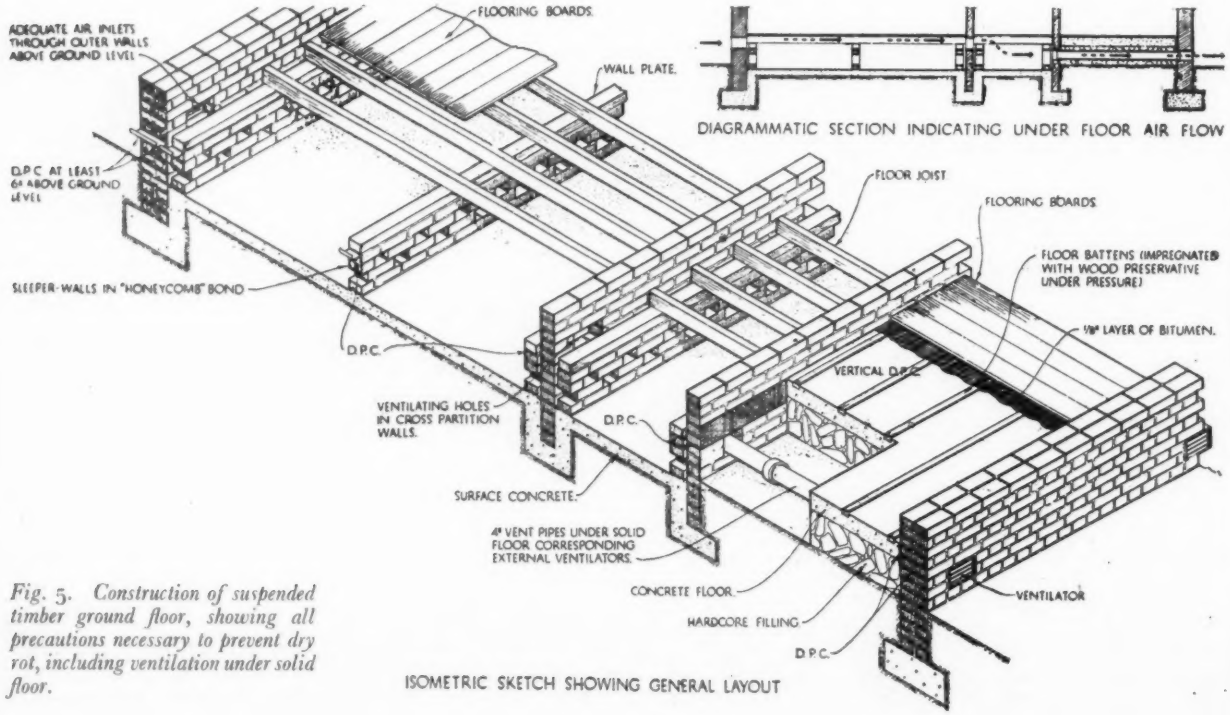
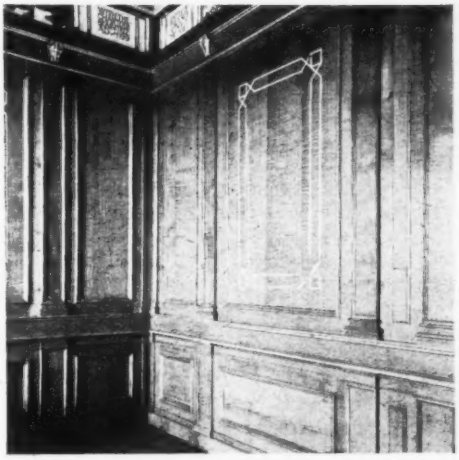
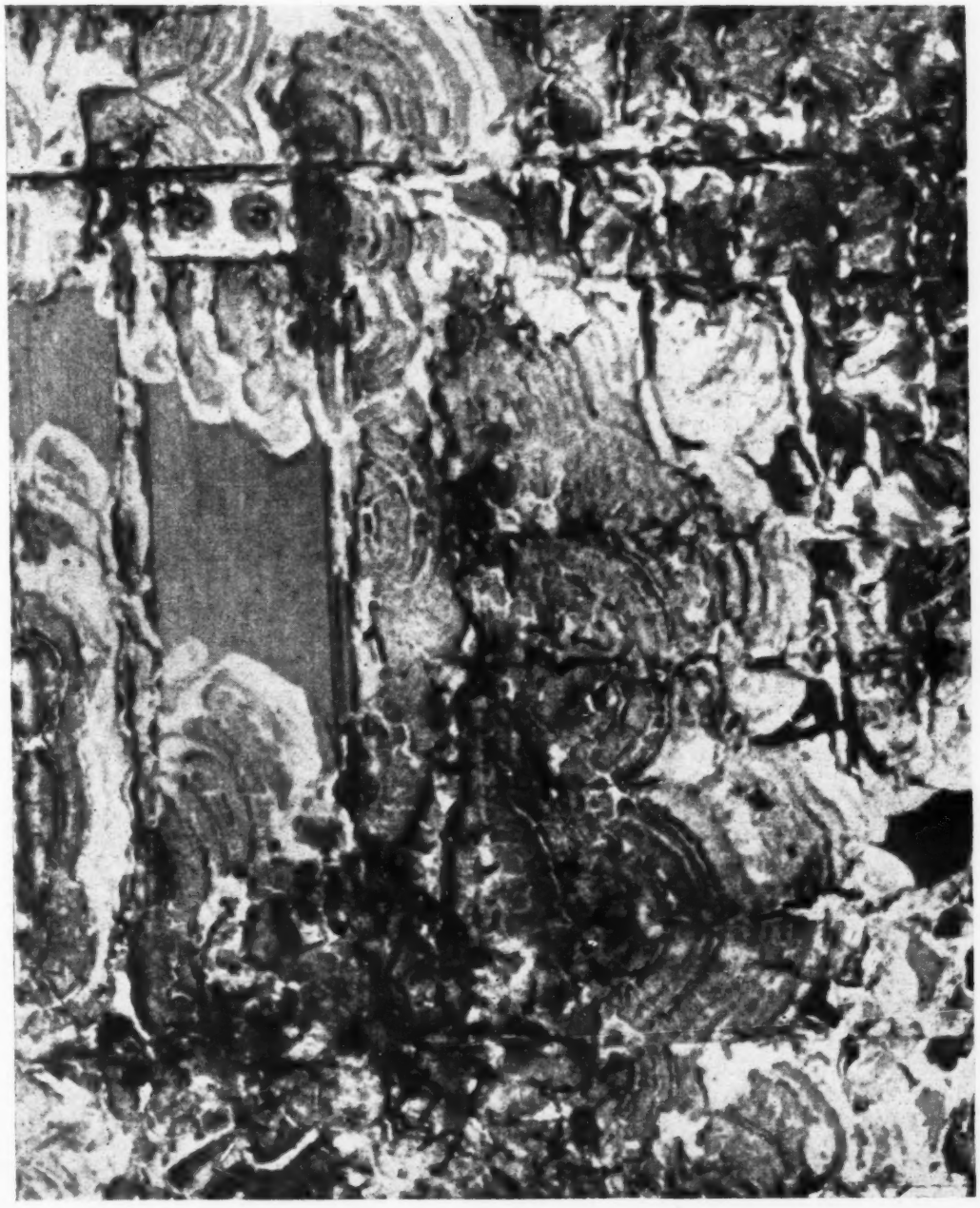


Fig. 5. Construction of suspended timber ground floor, showing all precautions necessary to prevent dry rot, including ventilation under solid floor.



Two examples of wood panelling; but what may be going on behind?



This too is dry rot, found behind some panelling similar to that shown above.

DRY ROT

Part III : J. Bayley Butler

The technique of examining buildings in order to locate dry rot fungi, and a description of methods of eradication and reinstatement.

DRY rot must be dealt with in the same manner as a human disease, such as cancer. There is the diagnosis, firstly, of the nature of the infective organism and, secondly, of the extent to which the infection has extended. Then comes the removal of the diseased tissue and the destruction of any residual infection in the surrounding areas. Finally, the structure has to be treated chemically and architecturally to reduce the likelihood of a recurrence and to restore normal conditions by reconstruction. Architects are frequently asked to examine houses for a prospective purchaser and, unless the examination is very thorough, an early, or indeed an advanced but concealed, state of infection by dry rot may be overlooked. Like the surgeon, the timber technologist or the architect must always make full use of the senses of vision, hearing, smell and touch and, just as the surgeon employs special methods and apparatus for the diagnosis of disease, the timber technologist or the architect must evolve a special technique and use special apparatus for the diagnosis of timber diseases.

VISUAL EXAMINATION

By visual examination, the presence of fungoid growths or fruiting bodies on the surface of timber or walling can be detected, and particular attention must be paid to unventilated cavities, such as roof spaces, cupboards, or spaces behind timber window framing, where external growths of the fungus are likely to be found owing to lack of ventilation and of light. The trapdoor which is provided for renewing sash-cords can be removed easily and the cavity exposed and examined. Ventilation indeed may be called the foremost enemy of all species of dry rot.

Where oil paint, especially glossy oil paint, protects the surface layer of woodwork, the earliest sign of rot is a wavy appearance as if the boards had been badly planed. Warping and buckling of boards represent a more advanced stage of rot, and at a still later stage longitudinal and cross shakes or splits are seen.

Attention should be paid to the junction of the floor with the skirting boards; if the joists have been attacked and compressive failure has developed, a distinct gap is noticeable between the floor and skirting where the floor has sagged. A slight gap, however, may be caused by the natural shrinkage of unseasoned timber.

In unpainted timber the development on softwood of dark or reddish brown discoloration (sometimes almost purplish in hue), and on hardwood of whitish spots or dark brown spots or streaks may be signs of infection by dry rot fungi. Caution is necessary here since abnormal colours in timber can arise from other causes, such as oxidation, chemical change of cell contents, contact with chemicals, especially iron, or the growth of sap-staining fungi or moulds. Sap-staining fungi may cause blue, grey, green or blackish stains and occasionally tones of pink, yellow or orange are seen. Sap-staining fungi feed on such easily digestible material as sugar, starch or oil, and as a rule are confined to sap wood. They do not attack the cellulose of wood and hence they do not produce any appreciable weakening of fibres. Sap stain has only an insignificant effect on compressive and bending strength, and timber so affected can be used with safety for building construction, though æsthetically the appearance lowers the value of the timber.

Since the hyphae of fungi contain dissolved substances, such as sugar, enormous internal or osmotic pressures can develop, in some cases up to 200 atmospheres. Disruptive external pressures are thus produced which can cause the mechanical lifting or cracking of plaster and indeed the partial disintegration of soft bricks or weak concrete. Thus, cracks in plaster, though very commonly due to mechanical or chemical causes, may indicate the growth of dry rot fungi behind the plaster and should be examined as possible areas of infection.

A fine rust coloured powder, composed of the microscopically small spores of *Merulius lacrymans*, sometimes seen on horizontal surfaces or on cobwebs near open joints in woodwork indicates the presence of fruiting bodies concealed behind the timber.

EXAMINATION BY SOUND

The sense of hearing comes to our aid in further examination. Light percussion with a wooden handle or even the knuckles can give useful information. Sound timber emits a resonant, high-pitched note, but if rot is present, the note is flat and dull. Percussion also helps in locating timber buried in walling (e.g., bond or noggin timber) and distinguishes studded or lath and plaster partitions from solid walls.

EXAMINATION BY SMELL

Again, like a witch-doctor, we can often smell out a criminal. Early stages of *Merulius lacrymans* produce a pleasant mushroomy smell but in the late stages, when fruiting bodies are decomposing, the smell is distinctly foul. *Lentinus lepideus* has a pleasant aromatic smell like that of Balsam of Peru while other dry rot fungi produce odours resembling benzaldehyde, spices (*Lenzites*), aniseed, unbleached calico (*Paxillus*) details of which are given by Badcock.* A mouldy musty smell may not necessarily be evidence of dry rot but only of damp conditions and mould growths.

TACTILE EXAMINATION

Information gained by tactile examination is of great importance. The rot can be detected by the use of a long thin conical spike or even a penknife. If the timber is sound the spike needs considerable force to push it in, and when in, force is needed to withdraw it, while, if the timber is infected the spike enters easily and, an even more significant sign, can be withdrawn without effort, as rotted timber loses its natural elasticity and so does not hold the tool.

SPECIAL INSTRUMENTS

I have found an electric periscope, primarily intended for surgical purposes, extremely useful. It is often necessary to examine the joists under a floor or behind panelling, or the studding applied to a masonry wall. Lifting floor boards, or the opening up of panelling or studding, cannot be carried out without leaving obvious disfiguration. This periscope is illustrated in

* Badcock, E. C. (1939), Trans. Bri. Mycol. Soc., Vol. XXIII, Pt. II.

Fig. 1. It will enter through a ½-in. hole which can be plugged afterwards. The periscope gives a magnified image, not only of the joists but also of the underside of the floor boards or the back of panelling and studding.

The electric periscope is rather an expensive instrument, but a much simpler one can be made using a dental mirror and two pieces of narrow, flexible brass tubing. This is quite efficient but necessitates a larger hole to admit the mirror. Fig. 2 shows the construction of the periscope which can be made for a few shillings. No direct light reaches the eye, as the light from the bulb is reflected from the mirror on to the object to be examined and this illuminated surface is seen in the mirror.

Another useful tool is the Pressler borer, primarily designed for use by foresters in determining the number of annual rings in a tree. Dry rot infection can extend considerably farther into the timber than can be determined by mere visual examination or by testing with a spike. It is only when rot is well advanced that timber loses its elasticity, cracks or changes colour—hence it is essential to leave a safety margin when cutting away diseased timber work. A core is taken with the Pressler borer, from which microscopic sections are cut. These are then stained according to the technique, devised by Cartwright,* in which the wood structure is stained red and the fungal hyphae blue, so that under the microscope the presence of fungal hyphae can easily be detected. By making sections from core borings taken at various distances from the focus of infection it is possible to determine the exact extent of the fungal infection.

EXAMINATION OF ST. PATRICK'S CATHEDRAL, DUBLIN

This cathedral, of which Dean Swift was the most illustrious Dean, presented quite a series of problems from dry rot to *Anobium punctatum*, and was unique in being the only instance of the invasion into Ireland of the Death Watch Beetle. The bases of the principal members of some roof trusses had become infected with *Merulius lacrymans* which had extended from the adjacent wall-plate. To save expense it was most important not to cut away more timber than was absolutely necessary. By means of the Pressler borer the extent of the mycelium of the fungus in each timber member was plotted and from this information a design for reconstruction was prepared, which is shown in Fig. 3.

COMBINATION EXTENSION TOOL

A combination extension tool has proved most useful not only for diagnostic work but also for cutting away defective timber in parts of a building not easy of access during the course of repair. This tool was made up in the engineers' workshop of University College, Dublin, by courtesy of Prof. Hogan. Two lengths of very light steel tubing ¾ in. in diameter, similar to that used for making tubular steel furniture, were employed. The tubing was too light to be threaded, so sockets for ½-in. gun barrel were turned in a lathe to make a slip-on fit and then were oxyacetylene welded to the tubes. The various accessories for the tube are shown in Fig. 4. A testing spike, a wood chisel or a cold chisel can be screwed to the working end of the tool and a steel striker head to the other end. When fitted with an inch chisel the tool is 7 ft. 5 in. long and weighs only 4½ lb. and it can be handled easily. To obtain specimens for microscopic examination the carpenter's brace has been cut in two, the chuck being fitted to the working end and the brace to the proximal end: a small tin 2½ in. in diameter around the chuck fitting enables borings to be collected for microscopical examination. The tool can also be used for boring otherwise inaccessible structural members so that they can be treated with fungicidal solution when it is not possible to remove them. An additional fitment is a slotted saw blade 1 ft. 6 in. long which is attached to a screwed socket, enabling defective timber to be cut away.

INTERNAL EXAMINATION

From the nature of their construction certain areas in a building are more vulnerable to dry rot and should be examined with particular attention. On a solid floor, whether of concrete, tiles, asphalt or even parquet, the bases of the door frames, architraves, skirting boards and framed panelling are very liable to attack by fungi. Where the end grain of the timber rests on the floor, e.g., an architrave or the vertical scantling in a dado panel, susceptibility to attack is greatest, as water used for washing the floor may run behind the timberwork and be soaked up by the end grain.

Timber floors covered with linoleum or sheet rubber, especially in lavatories and bathrooms, are particularly liable to rot. When linoleum is washed, the water soaks down along the joints of the sheets to the timber floor and, being imprisoned by a gas-tight sheet, the floor remains damp. The initial focus of a dry rot infection is often found on either side of a joint in linoleum covering. The linoleum should be turned back and the floor and the underface of the linoleum examined, as the vegetable fibres which form the basis of linoleum are commonly attacked by mould fungi and sometimes even by dry rot fungi. Dry rot fungi do not always confine their attack to timber but will attack almost any substance containing natural cellulose, such as canvas, hemp, paper, books, cardboard and wood pulp (as in wallboards—although some brands of wallboard are impregnated with fungicide in the course of manufacture and so are immune from attack). An unfortunate practice, sometimes adopted by plasterers when replastering an old wall, is to stuff newspaper behind the skirting board where it happens not to fit the wall. Such paper is very liable to develop dry rot, as it starts by being saturated with water and remains in an unventilated space. From this "poultice" of damp paper the dry rot spreads to the woodwork. In one case *Merulius lacrymans* had extended from the plaster of the wall in a library through a book from cover to cover. (The name of the book was "Anthony Adverse," but there is no evidence to show that dry rot fungi are selective in their literary tastes !)

In many old houses with massive masonry walls, to avoid condensation and to increase thermal insulation, timber studding was applied to the inner surface of the wall, which was then covered with lath and plaster. No signs of infection may be visible on the surface though dry rot may be widespread behind the plasterwork. By removing a skirting board it is often possible to examine the condition of the studding behind the plaster without doing any injury to the surface of the wall.

Bond and noggin timbers, so often used in former times to give tensile strength to brickwork, can act as ducts leading dry rot hyphae from place to place. By carefully tapping a wall the presence of a bond timber can be determined by a change in the resonance. As already mentioned, cracks in the plaster of walls are sometimes indicative of the spread of dry rot, due to growth and swelling of the hyphae of dry rot fungi.

Some types of rot-causing fungi, notably *Merulius lacrymans*, *Coniophora cerebella* and *Poria vaporaria*, develop extensive mycelial growths outside the actual timber, which may extend through or over inert materials. To trace the extent of such growth, it is often necessary to hack away plasterwork and examine the mortar joints in the wall for the presence of hyphae. Care should be taken to avoid mistaking cow hair in plaster for hyphal strands.

The hyphae of *Merulius lacrymans* can extend from infected timber through inert materials for a very considerable distance, indeed fungus strands have been traced to a distance of fifteen feet from the nearest timber through brickwork and masonry and even along steel joists. In one classic case a conduit channel containing lead, copper and

* Cartwright, K. St. G. (1929), Ann. Bot., Vol. XLIII, No. CLXX.

galvanised iron piping and several types of electric cable were all matted together by mycelium. The external mycelial growth over inert materials, from which the fungi can obtain no nourishment, while primarily serving as colonising strands seeking new timber to infect, also serves other purposes; they enable surplus water produced in the course of respiration to be eliminated and, by moistening the ambient air, enable the fungus to spread to areas otherwise not sufficiently moist for fungal growth.

EXTERNAL EXAMINATION

External examination of a building is very important. Depressed areas over lead gutters or flats are often indications of rot in the supporting timbers, either in the rafters or in other roof members. Eaves gutters laid with an inadequate fall or with defective joints, and cracked or defective downpipes are constant causes of trouble. Defective pointing of brickwork and masonry in chimney stacks, parapets or copings, can also cause conditions predisposing to dry rot. Leaks frequently occur where there is an offset in a wall, and the downpipe has an "S" bend. In old houses, cast iron downpipes are very often secured to the wall by hook nails; when the surface of the wall is cement rendered, the cast iron pipes are found to be partially embedded in the cement facing. Longitudinal cracks in the iron pipes are likely to develop due to sudden changes of temperature—the heat of the sun or the extreme cold of frost causing a greater expansion or contraction of the exposed sides of the pipe than of the part embedded in the cement. This differential expansion may lead to cracks on the side next to the wall. The use of holder-bats is recommended. The pipes are thus held free from the wall; they can be painted all round and more uniform expansion and contraction with changes of temperature is permitted.

Projecting brick or masonry string courses on an external wall are another danger point. Water is liable to enter the wall above such courses. Sometimes a triangular fillet of cement plaster is applied to the upper surfaces of brick string courses but this procedure only makes matters worse, as the water from the vertical face penetrates behind the cement fillet and extensive rot may then develop.

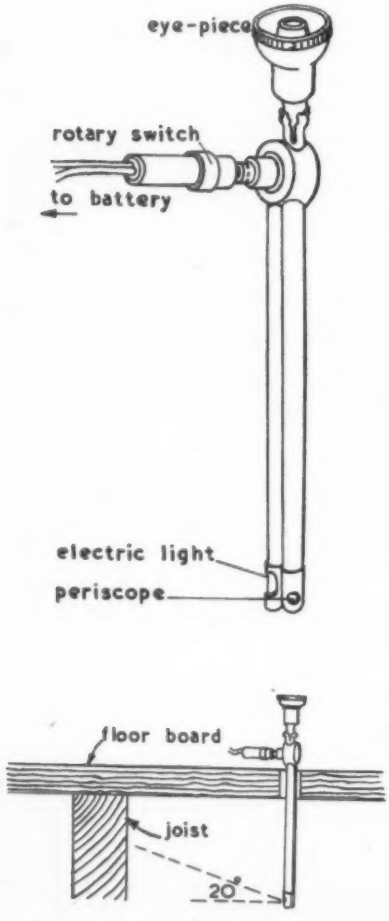


Fig. 1. The electric periscope and method of examining underside of floor boards.

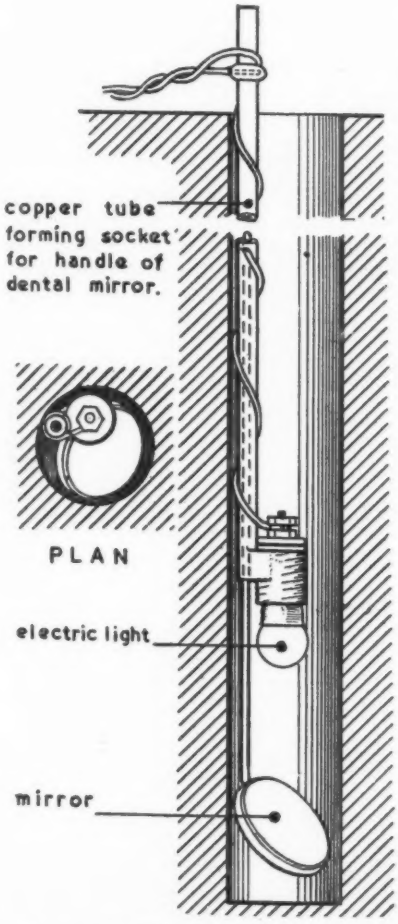


Fig. 2. Improvised electric periscope using a dental mirror and ordinary flash lamp bulb.

Mock half timbering applied to asbestos cement sheeting is often a serious source of trouble. In a large primary school a very extensive outbreak of dry rot originated in the mock timberwork and then spread inwards to the structural timbers of the building. Several thousand pounds will have to be spent on renewals and repairs. (In order to avoid a recurrence of the trouble and yet retain the "character" of the building, it has been decided to replace the mock timberwork with coloured cement rendering!)

NEWMAN HOUSE

Special difficulties necessitate unusual methods both of treatment and of subsequent reconstruction. Newman House, Dublin, was built in 1740 by Richard Castle, who was brought to Ireland from Saxony by Sir Gustavus Hume. Castle was the most distinguished of the School of Palladian builders in Ireland.

The fine stucco work on the ceilings and walls was the work of the brothers Paul and Philip Francini, the most famous craftsmen of the period. The building was, therefore, of great historical and architectural interest, and special methods were justified in endeavouring to preserve the beautiful workmanship. Unfortunately, *Merulius lacrymans* had made serious inroads on portions of the roof timbers, and the fungus had extended behind the decorative stucco work of the walls and, in places, downwards for four storeys. In addition, there was a widespread attack of the furniture beetle, *Anobium punctatum*.

The space between the circumferential ribs of the ceiling and the roof rafters was too narrow to enable an operative to cut away the infected wallplate and the infected portions of the rafters. To avoid the expense of stripping the slates and lead valleys for exploratory examination and also for the purpose of removing the rotted timbers, the combination extension tool, already described (and illustrated in Fig. 4), was used. By means of this tool, the rotted portions of the wallplate and the ends of the rafters were cut away bit by bit and the crumbling brickwork was loosened. The larger debris was picked out by means of a long-reach shop window fitting and the smaller fragments extracted by a vacuum cleaner. As the end of each infected rafter and the adjacent wallplate was cut away, a steel support was fitted to the rafter. The end of this was cut and splayed so as to form a seating on the wall and was bolted to the sound portion of the rafter. Fungicidal treatment was applied by means of extension syringes. A wooden trough surrounding the rafter and its reinforcement was put in position and concrete was packed down on to the wall so that each rafter was supported

directly on the brick walling independently of the original wallplate. This elaborate process was justified by the historical value of the ceiling which retained all its original beauty after redecoration. The treatment was carried out in 1938 and the building has shown no sign of deterioration since.

FORMALIN FUMIGATION

In the same building a vent shaft, a foot in diameter, extended up four storeys from a basement kitchen to the roof. It was impossible to spray or irrigate the shaft, which was almost filled with a fluffy mycelial growth of *Merulius lacrymans*, so it was decided to fumigate with formalin vapour at full strength. A gallon tin heated on a stove was used as an improvised distillation flask and the vapour led by a pipe to the opening of the vent shaft which was sealed off. The distilled vapour proved quite effective. This method can also be used when treating infected cavity walls. The process can only be used if the building is unoccupied. All operatives must use gas masks as the vapour is highly irritant.

DECORATIVE CORNICE

A country mansion built in the early part of the eighteenth century, presented a similar problem—once again the historical value and the beauty of the building justified the development of special methods of preservation. There was some very beautiful Italian stucco work in the cornice and ceiling of the main rooms, but the massive brickwork walls had been studded and then covered with lath and plaster. The studding ran behind the cornice, which was suspended by means of timber sprocket pieces nailed to the studding, which in turn was secured to the walls. There was an extensive attack of *Merulius lacrymans* behind nearly the whole of one external wall, due to a leak in a lead valley. The main difficulty was to decide how to support the cornice. At intervals of 2 ft. the studding and plaster was cut away and a concrete brick were inserted into the existing brickwork, projecting as a cantilever to carry the bottom edge of the cornice. The face of the bricks was set back sufficiently to allow for the plaster finishing coat. The cornice was then opened from above and bit by bit the timbers were cut away. A bronze bar (1 in. × ⅛ in.) split at each end, and formed into a rag bolt anchorage, was passed from between the joints of the brick to the back of the cornice, where the distal end was secured by an application of plaster and a bronze pin. These bronze tie bars were placed at 3-ft. intervals and served to hold the top of the cornice to the wall. Copper wire netting with ½-in. mesh was then secured to the joints in the brickwork by cement and sand grouting, and to the cornice by plaster. When fixed in position the copper wire gauze was coated with plaster to form a rigid anchorage to the top of the cornice. In this way the cornice was carried independently of the vertical timber studs, which were then cut away.

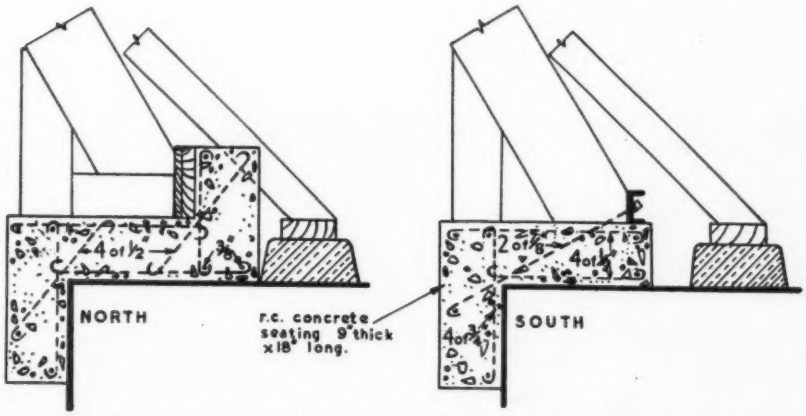


Fig. 3. Roof truss details. Reinstatement after dry rot eradication at St. Patrick's Cathedral, Dublin.

Half bricks were cut out at intervals over the surface of the wall and breeze concrete bricks projecting 2 in. from the wall were inserted in the holes. The concrete bricks were spaced as required to carry reinforced expanded metal lathing and over this the plaster work was applied and surface finished. This left a space between the wall and the plaster as in the original design. Provision was made for a series of apertures behind the cornice, leading to the air space behind the metal lathing and from there down to the space beneath the joists ; this space in turn was ventilated through openings cut in a brick crowned arch into the cellars below. The expense involved was justified in this case, as the ceiling represented some of the most beautiful Italian stucco work ever carried out in Ireland. Details of the reconstruction are shown in Fig. 5.

USE OF SILICA GEL

An unfortunate accident occurred during the re-slating of the roof over the cornice and ceiling. A heavy gale occurred and the tarpaulin cover over the area from which the slates had been removed was blown loose, with the result that a considerable quantity of water entered the back of the plasterwork. It was important to dry out the lath and plaster as gently as possible and without delay. For this purpose ¼ lb. bags of silica gel (which were available as war surplus at a low cost) were used.

Silica gel is a colloidal oxide of silica resembling broken glass and it is highly hygroscopic, absorbing up to approximately half its weight of water from a saturated atmosphere, but for

Extension bar and coupling.

Lengthening bar.

Cold chisel, probe.

Chisel.

Chuck and brace.

Saw.

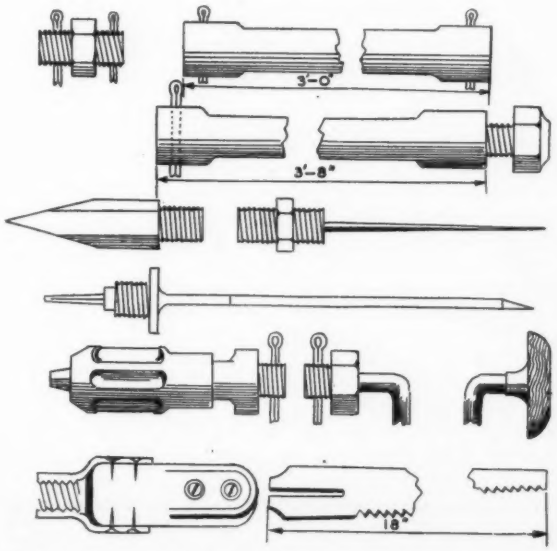
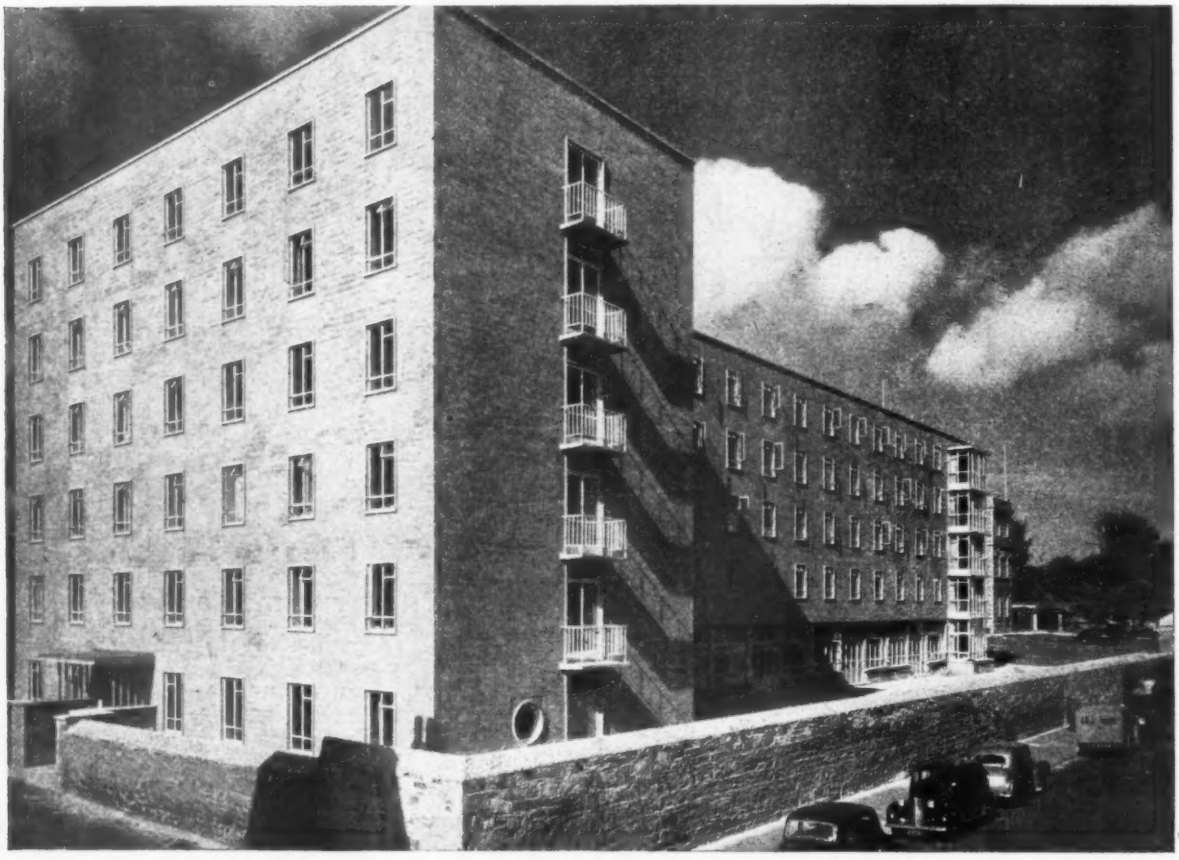


Fig. 4. Extension tool and equipment.

Nurses' Residence, Jersey General Hospital. St. Helier, Jersey, C.I. ARCHITECTS: GRAYSON AND LE SUEUR F./A.R.I.B.A., A.A. DIPLOMA



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rapid absorption 15 per cent. is a safer figure to work on. This represents an equilibrium with air at about 35 per cent. relative humidity. It was extensively used during the war for keeping electrical and other equipment dry in tropical climates. A special form can be obtained in which the gel is treated with cobalt chloride. When absolutely dry this is of a deep blue colour, but it changes through a series of bluish purple and reddish purple tints to a deep pink colour as water vapour is absorbed. When the silica gel has absorbed water it can be regenerated by baking in an oven at 200° C. By using indicator quality it is easy to see when the gel requires to be "baked." In this case the bags of silica gel absorbed the moisture from the plaster satisfactorily and were "cooked" in an electric oven as required.

DRY ROT IN WALLING

One of the greatest difficulties met with in eradicating dry rot from a building is the destruction of the strands of *Merulius lacrymans* in walling. To pull down a solid wall because it is infected by dry rot is a policy of despair. On the other hand, to renew timber work, even if carried out with the greatest thoroughness, is not sufficient because the fungal strands living in the substance of the wall are likely to grow back into the replacement timber work. Practical experience has made it clear that no surface treatment of massive walls is effective once the wall has become infected with *Merulius lacrymans*. This fungus is killed by a comparatively low degree of heat under moist conditions but disappointing results of heat treatment have led to the use of systems of irrigation of walls with a water soluble fungicide. The object of this treatment is not only to kill the fungus actually present but also to leave a permanently poisoned area as a barrier against re-growth or re-infection from other areas. The system is illustrated in Figs. 6 to 10.

On the vertical face of a brick wall holes ½ in. in diameter and 6 in. to 9 in. deep are drilled in a direction sloping downwards using either a hand jumper or an electric-jump hammer. The holes should be drilled through vertical mortar joints. By means of pierced rubber bungs and tubing the irrigation fluid is fed into the holes from douche cans, which are suspended from a portable timber framework. As a rule the plaster is stripped from the wall so as to expose the brickwork, to which a blow-lamp can be applied directly. This treatment sterilises the surface layer and helps to dry out the wall so that the irrigating fluid can penetrate more easily. The removal of the plaster also facilitates the subsequent drying out of the irrigating fluid. If the walls have valuable decorative stucco work it is possible to treat the walls without removal of plaster by selecting undecorated portions of the surface through which to drill the holes. In this case, of course, a longer drying-out period is necessary.

In the case of masonry walls similar holes can be drilled through the wider mortar joints or small pieces of the stonework can be removed and pockets made by means of temporary "dams" of cement and sand, the solution being poured into these pockets. If the horizontal top of a brick or masonry wall is exposed, a longitudinal trough can be formed by triangular fillets of cement and sand. Similarly, spaces left by the removal of infected bond timbers or timber bats may be utilised for irrigation by constructing similar "dams."

When a floor has been laid directly on concrete and then nailed to dovetailed fillets, an infection from the skirting board may have started to spread to the fillets. In an early stage the infection can be arrested without the expense of lifting the floor and fillets by the method shown in Fig. 10. Care must be taken to avoid the use of too much of the water soluble fungicide or the floor boards will swell and lift. This method can only be employed when there is no tar, pitch or bitumen layer between the floor boards and the fillets.

The siting and distribution of the irrigation holes and the quantity of fungicidal solution required depends upon a variety of circumstances—the thickness of the wall, whether it is made of brick or masonry, whether the mortar joints are closed or open. It is desirable to have this work carried out by trained operatives who have learned by experience how to deal with any particular case. As a rough guide, taking a 14-in. brick wall, the holes should be spaced 3 ft. apart horizontally and 1 ft. 6 in. vertically, in staggered rows.

Brick walls are much easier to deal with than masonry walls as the jointing is uniform and the holes can be spaced evenly. Masonry walls, owing to the irregular mortar joints, present a difficult problem; the fungicidal solution may pour out below a "pocket" and another "pocket" must be tried.

EXAMPLE OF USE OF IRRIGATION METHODS

In a large residential college, one of the buildings, 140 yards long and three storeys high, in which there were about 100 rooms, had been completely gutted by fire in March, 1940. Reconstruction was started at once, using existing walls, as accommodation was urgently needed. The building was in occupation again in September, 1941. About a month later dry rot was observed in various different parts of the building; window frames and casements, doors, lintels, skirtings and floorings were all attacked. The infection was traced to some old timbers and lintels which had been left in the walls and had become infected with *Merulius lacrymans* through exposure to the weather. Floors had to be shored up, infected timber removed and a considerable number of casements and door frames, cupboards and other timberwork had to be pulled out. All the walls were thoroughly irrigated and all new timberwork was treated with fungicide and replaced in accordance with the general directions to contractors given later in this article. The building has been kept under observation ever since and there has not been a trace of a recurrence.

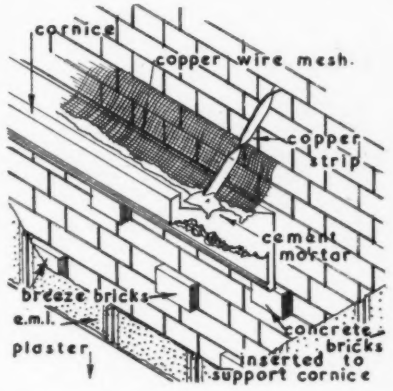
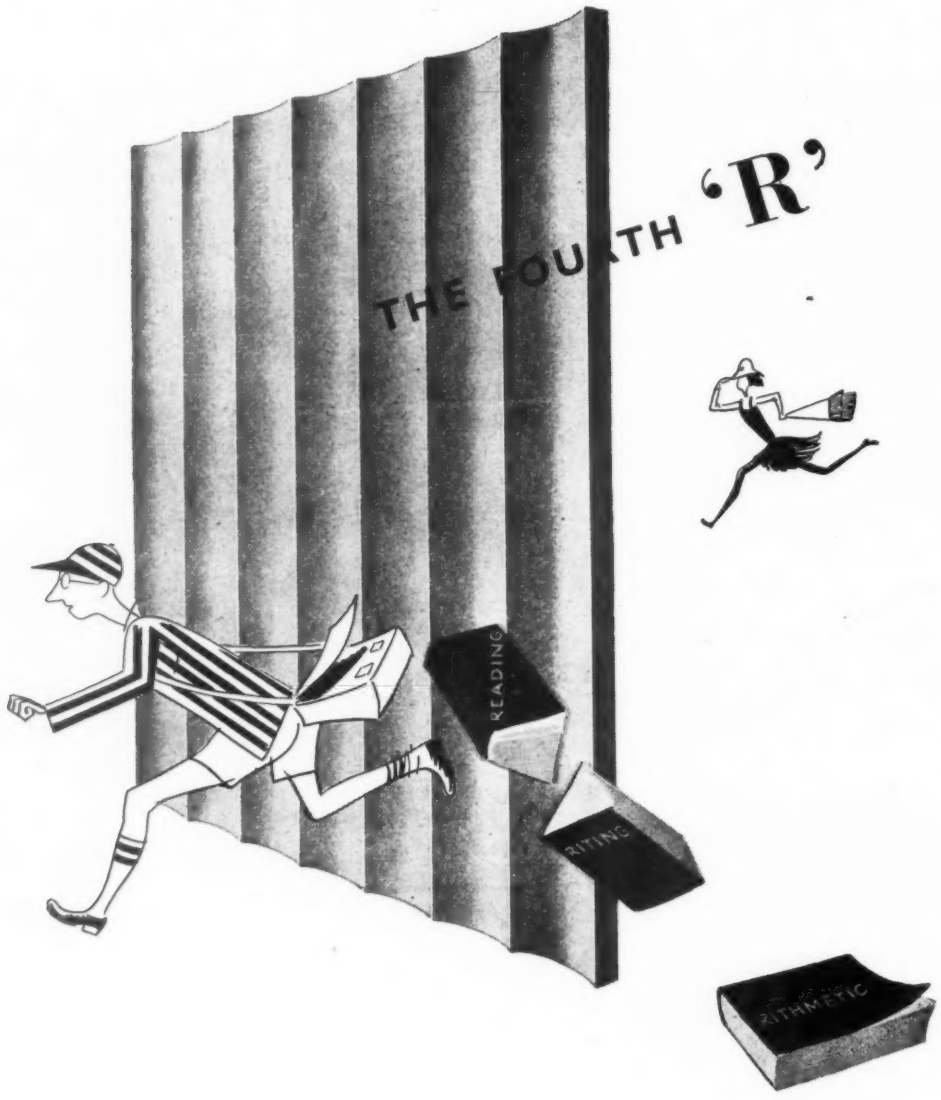


Fig. 5. Reinstatement of plaster cornice after eradication of dry rot, using concrete bricks for support.

A considerable number of buildings, ranging from small private houses to cathedrals and large institutions, have been treated successfully by the irrigation method.

HEAT TREATMENT

Although heat treatment applied by a blow-lamp or oxyacetylene flame cannot be relied on to kill the fungus throughout the thickness of a massive wall, it is a very useful measure in conjunction with the irrigation method. It is also useful for local sterilisation of pockets from which rotted timber have been removed. Care should be taken to apply the blow lamp or oxyacetylene flame over a limited area at a time—say one square yard—and to move the flame from place to place so that the surface is not heated up to such a degree as to cause calcining of lime mortar or spalling of the stone. But at the same time the wall surface must be maintained hot enough to prevent local cooling. The use of electric blankets for continuous local applica-



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tion of a moderate degree of heat has been reported as giving successful results. Walls in general are not good conductors of heat—Molesworth's Pocket Book of Engineering Formulae, quoting Peclet, gives the conductivity of copper as 512, iron—233, stone—15, brick-work—4·8, plaster—3·9 and timber from 1·7 to 0·78. The low figure for brickwork indicates the advantage of a long continuous supply of heat, as provided by electric heating, over the more temporary local heating of a blow lamp or the oxyacetylene flame. The susceptibility of dry rot fungi to the lethal effects of temperature varies greatly with the species of fungus and the moisture content of the substrate. *Merulius lacrymans* is particularly susceptible to heat, for instance Liese (1931) found that exposure of a culture tube to 40° C. for 15 minutes was lethal, but this was under very moist conditions. In moderately dry timber a much higher temperature and longer exposure would be required. *Merulius lacrymans* is confined to the cool temperate zone and seems to be rare in southern Europe, probably because the summer heat is unfavourable to its continued existence.

SPECIAL CASE OF HEAT TREATMENT

A particularly difficult problem was presented by a house built on the side of a hill, where the joists of the ground floor rooms were bedded in dry filling consisting of old bricks and local stone—a schistose shale. An old sewer passing the back of the house had broken and, as the site was on the side of a hill and the ground floor stepped, the sewage seeped through the dry filling and gave rise to a virulent attack of *Merulius lacrymans*. The presence of organic nitrogen compounds in the sewage water greatly accelerated the growth of the fungus. In one long room which had a valuable maple floor and was expensively decorated, it was found that portions of the floor joists adjacent to the inner wall of the room had been attacked. To save the expense of renewal of the floor and of damage to the decoration, the architect and the client agreed to try out an experimental heat treatment. From a basement passage a tunnel 35 ft. long was cut under the hearth and through the loose filling below the floor. The mouth of the tunnel was closed with a temporary small door provided with spy holes, and ten high-temperature heater units, of one kW capacity each, were wired to a system of control switches. The Electricity Supply Board's engineers gave consent for this 50-amp. load to be taken during the "off-peak" period from 9 a.m. on Saturday to 9 a.m. on Monday. Assistants worked in relays to keep the temperature records over the 48-hour period. Internal temperatures were taken by a thermometer attached to a bamboo pole. After 12 hours the temperature reached 180° F. but it continued to rise and was maintained for the rest of the period between 180° and 220° F. by controlling the switches. The door was kept closed for most of the period so that the steam generated from the damp filling was enabled to heat up the more distant parts of the sub-floor filling, the joists and the floorboards. As the conditions provided both high temperature and a saturated atmosphere, the experiment proved successful in killing the fungus *in situ*. On the close of the experiment one heater element was left in position and a ventilated door provided so that subsequently the sub-floor area could be maintained in a dry condition and so prevent any recurrence, since it was not

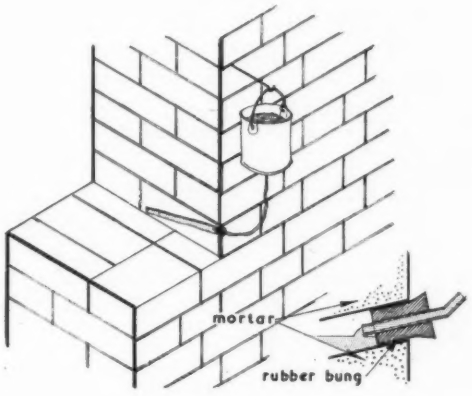

Fig. 6. Left, method of irrigating a wall with fungicide by inclined boring through a vertical joint in the brickwork.

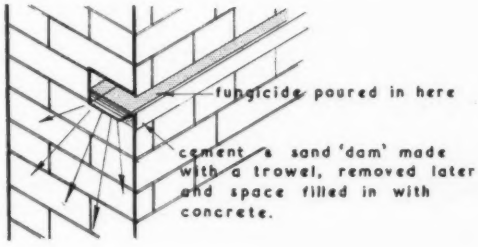

Fig. 7. Right, method of irrigating a wall with fungicide by using the space left after the removal of a horizontal bond timber.

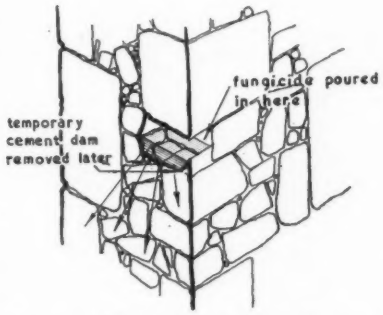

Fig. 8. Above, method of irrigating a masonry wall with fungicide by using the space left after removing a small stone.

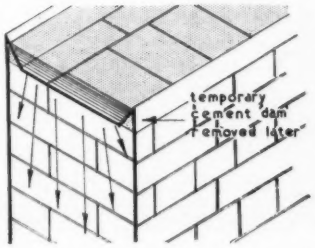

Fig. 9. Above, method of treating a wall with fungicide when the top of the wall is accessible.

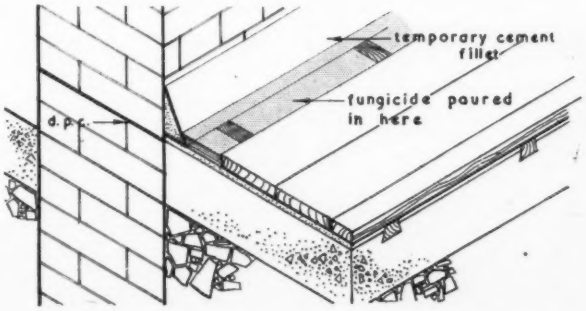

Fig. 10. Right, method of treating a floor laid directly on concrete.

possible to irrigate the area with fungicide.

RECONSTRUCTION

It may be of use to summarise the general directions to be given to a contractor when dealing with reconstruction where cases of dry rot are involved.

All infected woodwork in which signs of dry rot are present should be cut away and burnt immediately. It is dangerous to use infected timber as kindling wood or firewood, owing to the risk of introducing infection into a coal-hole or cellar. Where practicable, the infected materials, timber and plaster, should be evacuated through doors and windows opening directly into the open ; if this is not possible, all infected material should be sprayed with a water soluble fungicide. Fruiting bodies should be sprayed before they are touched or moved as they liberate large numbers of minute spores which may be carried by air currents or light draughts to other parts of the building. A mat moistened with fungicide should be placed in the doorway and the workmen instructed to wipe their feet on it to avoid carrying infection to other parts of the building.

Tools, such as saws, chisels, planes, etc., used in premises infected by dry rot should be disinfected before being used elsewhere. A solution of thymol in lubricating oil is a good disinfectant as it does not corrode steel.

Debris, brickwork or masonry from an infected building should not be used as dry filling or even for paths around the houses, but should be dumped some distance from any building. Special care should be taken to remove all timber plugs, bond timbers, lintels, dovetailed fillets—in fact, all pieces of timber, however small, from an infected wall, and the holes in which these had been inserted should be scraped clean and sprayed with fungicide. All timber shavings, sawdust and chippings, cardboard and paper, should be removed from sub-floor spaces, especially if on the ground floor. The sub-floor should be sprayed with water soluble fungicide before closing in. When timberwork in contact with a wall has to be replaced, for example, skirting boards and picture rails, they should be treated with a fungicidal solution, allowed to dry, and then primed on *all* surfaces with an oil paint. Timber grounds should not be used for refixing skirtings; breeze blocks or blocks of nailable concrete can be inserted in the wall or, if preferred, the skirting can be drilled and secured to the wall by screws into metal or plastic rawl plugs. (The ordinary glue-bonded fibre rawl plug is susceptible to fungus attack.) If it is necessary to re-house joists in the pockets it is desirable to encase the ends of the joists in a sheet of bituminous roofing felt which should be bent over and nailed. To prevent cracking of the felt when it is bent sharply over the angles it can be softened and rendered flexible by heat, for example, by the careful use of a blow-lamp. It is not desirable to fill in the pockets with beam filling; the joists can be kept in position by diagonal herring-bone struts but, unless the floor has to be lifted, this precaution is unnecessary.

In the case of masonry walls, where it is difficult to sterilise the walls satisfactorily or to get full penetration by irrigation methods, the joists can be carried on light steel channels or RSJs either supported on the lateral walls, or secured to the main wall by angle plates or rag bolts built in. No timber should be buried (i.e., embedded in concrete or walling) unless pressure-treated with fungicide and every possible step should be taken to ventilate all air spaces to which timber is exposed. Air circulation is the greatest enemy of dry rot.

There is a full account of the various types of fungicides in Cartwright and Findlay's "Decay of Timber and its Prevention." It should be emphasised that it is false economy to stint the amount used. There is a great difference between "covering capacity" and "effective capacity" per gallon. The best method is to use one of the effective proprietary products now available.

When renewing woodwork after an attack of dry rot, the use of timber pressure-treated with water soluble fungicide is advised. This is now readily available from timber merchants.

To conclude—despite the greatest care in diagnostic work and the most detailed instructions to contractors, results may be surprisingly disappointing unless operatives are highly trained and well supervised. The reason is not difficult to find; skilled workers in the building trade have to spend long years of apprenticeship and, therefore, know their work thoroughly. Similarly, the treatment of dry rot is a highly skilled trade and necessitates a long apprenticeship before a man is capable of carrying out treatment on his own. Should we expect men trained in other trades to have adequate knowledge of fungus diseases and of the chemical treatment of them? It is surprising how many carpenters and other skilled building workers have a good working knowledge from experience and observation of dry rot, but we cannot afford to leave it to chance that a man will have sufficient knowledge and humility to carry out the instructions of someone outside the building trade. Further, the trained operative will take a greater pride in his work if he knows he is exercising skill and technical training of a specialist character and that his work is based on scientific principles. The ordinary building worker, on the other hand, may not realise the danger of, say, closing up suspected areas before such areas have been inspected and proper treatment applied. He probably does not understand why, if he is short of a piece of timber, he cannot use a piece from an infected area which, on visual examination, appears quite sound. There is also the tendency, if work has proceeded a certain distance and signs indicative of the presence of rotted wood are noted, to carry on and hope for the best. Therefore, if serious attempts are to be made to treat dry rot and to eradicate it completely, men must be trained in the recognition of fungi and the treatment of it.

The author wishes to express his thanks to the Dean and Chapter of St. Patrick's Cathedral, for permission to use Fig. 3; to P. C. Murphy and B. E. Tobias, who prepared the drawings; and to K. St. G. Cartwright and Philip Findlay of FPRS, for their assistance over a number of years. The photographs illustrating these Articles on Dry Rot are all (except the two at the top of page 247)

INFORMATION CENTRE

INDEX, 1950

An alphabetical index covering items published during the twelve months ended December 31, 1950, *is being prepared. Readers who wish to have a copy—it is free of charge—should complete the form below and post it to the Technical Editor,* THE ARCHITECTS' JOURNAL, *not later than March* 9, 1951.

Please send me the Information Centre Index for 1950:—

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.....A. J. 22.2.51

Announcements

The DSIR announce that as the technical papers published in the National Building Studies series are being purchased under the misapprehension that they deal with matters of immediate and direct interest to the builder, they are now being renamed "research papers." They are not intended for the building industry in general, for most of the material they contain is of interest only to those engaged on research and development work.

On Mr. Peter Caspari's departure to Canada, Mr. H. S. Jaretzki has agreed to take over the goodwill of his practice and his work in hand. The firm will be known as H. S. Jaretzki & Peter Caspari. The address is 20, Dorset Square, N.W.1.

Mr. F. E. Tasker, L.R.I.B.A., and Mr. Norman Royce, A.R.I.B.A., announce that from February 1, 1951, the title of their firm, hitherto designated and known as G. R. Tasker, Sons & Partners, will be altered to Sir Robert Tasker & Partners. They will contine to practice from No. 1, Staple Inn, London, W.C.1, Sir Robert Inigo Tasker acting as consultant to the firm.

With the closing of the MOW South Eastern Regional Office at Tunbridge Wells on March 31, the work of building control and builders' registration will be transferred to the London licensing office of the Ministry. This transfer took effect as from Monday February 12. From that date all applications for building licences, statistical returns from builders and inquiries regarding builders' registration should be made to the Ministry of Works, 17, Cornwall Terrace, Regent's Park, N.W.1 (tel.: Museum 5030). From the same date the work of the Building Materials Officer has been carried out by the Directorate of Building Materials, Lambeth Bridge House, S.E.1 (tel.: Reliance 7611).

Mr. Robert Townsend, A.R.I.B.A., A.A.DIP., has opened an office for the practice of architecture at 7, Bridge Street, Bath. He is retaining his office at 24, Chancery Lane, London, W.C.2, and will be pleased to receive manufacturers catalogues and samples at both addresses.

The Industrial Department of Philips Electrical Limited, which was previously operated from 122 Snow Hill, Birmingham, is now accomodated in the main Branch premises at 28a and c, Ludgate Hill, Birmingham.

The practices of Edwards & Branson and A. Drew Edwards have now been amalgamated. The title is now Edwards, Branson and Edwards. The address is 53, Regent Road, Leicester.

Messrs. Sydney Webster & Partners, A./A.R.I.B.A., A.M.T.P.I., will be pleased to receive trade catalogues, etc., at 83, Latymer Court, W.6.

Mr. S. W. Hinxman of Young Street, Petrie, Pine Shire, Queensland, would like to receive manufacturers catalogues.

Correction

John Thompson Beacon Windows Ltd., wish to point out that in a recent advertisement featuring Beacon Windows supplied to the Chloride Electrical Co. Ltd., Manchester, the name of the architect was incorrectly stated. His name is T. Trepess.

THOUGH the recognised indexes of industrial production for January will not appear for a good many weeks yet, it is already clear that over a wide range of industry output since the turn of the year has changed significantly for the worse.

On the basis of the ... to the "bottlenecks" in sheet steel, copper, zinc, etc. The current troubles of the motor manufacturing industry have in particular been well publicised.

Sheet steel deliveries to the industry were cut by 15 per cent. early in January and further cuts are on the way. Austins ...

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Moulded in one piece without any joins or crevices to harbour germs or dirt, Belvedere toilet seats can confidently be recommended. The material used is unaffected by moisture or chemical influences, is virtually unbreakable and always looks as good as new. Their cleanliness, good appearance and perfect hygiene justify their inclusion in every modern-day specification. Full details obtainable from any of the addresses below.

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Black, Mottled Red, Mottled Green, Walnut ...	£2 13 3
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White	£3 10 0

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Export Enquiries: E. K. Cole Ltd., 5 Vigo St., London, W.1. *'Phone:* Regent 7030

Distributors: United Merchants Ltd., 73 High Holborn, W.C.1. *'Phone:* Chancery 7535

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CLASSIFIED ADVERTISEMENTS

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

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

Public and Official Announcements

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

NORTH THAMES GAS BOARD.

Applications are invited for the following appointment in the Architects' Section of the Chief Engineer's Department of Westminster: SENIOR ARCHITECTURAL ASSISTANT, minimum starting salary £650 per annum.

Applicants, who must be Registered Architects and should be studying for or have passed the Final Examination of the R.I.B.A., should be capable of preparing working and detailed drawings and specifications, and supervising and controlling the work on contracts. Experience in design and planning of industrial buildings would be an advantage.

The appointment is of a permanent nature, and pension arrangements will be discussed with short list candidates.

Applications, stating age, qualifications, and particulars of previous appointments held, must be submitted to the Staff Controller, North Thames Gas Board, 30, Kensington Church Street, London, W.8, quoting reference 9757 4341

LONDON COUNTY COUNCIL.

Applications are invited for positions of ARCHITECTURAL ASSISTANT (salaries up to £680 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.

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) 4558

CHESHIRE COUNTY COUNCIL.
COUNTY PLANNING DEPARTMENT.
WIRRAL AND WEST CHESHIRE AREA PLANNING COMMITTEES.
APPOINTMENT OF PLANNING ASSISTANT.

Applications are invited for the appointment of a Planning Assistant on the permanent establishment of the County Planning Department. The successful candidate will be stationed in the Wirral and West Cheshire Area Planning Office, which is situated at 11, Bridge Place, Chester.

The post is subject to the Local Government Superannuation Act, 1937, and the successful applicant will be required to act under the direction of the Area Planning Officer in the preparation of a Development Plan for the County and the Control of Development under the Town and Country Planning Act, 1947.

The salary will be in accordance with A.P.T., III-IV, of the National Joint Council Scales (£450 to £525 p.a.), and the commencing salary will be at the minimum of A.P.T., III.

Applicants for this position should have obtained the Intermediate Examination (or equivalent) of one of the recognised professional institutes, and preference will be given to candidates who have had experience in town and country planning.

Forms of application, together with details of the duties and conditions attaching to the appointment, may be obtained from me on receipt of a stamped and addressed foolscap envelope. The last date for the receipt of completed applications is Saturday, the 10th March, 1951.

KENNETH O. MALE,
County Planning Officer.

Bridgegate House,
Lower Bridge Street, Chester. 1858

GOVERNMENT OF NORTHERN IRELAND.
MINISTRY OF FINANCE.
CHIEF ARCHITECT'S BRANCH.

Applications are invited for ASSISTANT ARCHITECT posts in the Ministry of Finance. Subject to a probationary period of two years, the posts are permanent and pensionable.

Remuneration: The scale is £500×£25—£750. The entry point to this scale depends on age, *viz.*, £500 at age 26, plus £25 for each year above that age. The upper entry point is, however, subject to a limit of £650 per annum.

Qualifications: Candidates must be Registered Architects by examination. In addition, they must have had at least two years' experience in an Architect's office or department in the preparation of working drawings for new buildings.

Preference will be given to candidates who have served in H.M. Forces in wartime, provided that such candidates can, or within a reasonable time will be able to, fill the posts efficiently.

Closing date for receipt of applications: Application forms may be obtained from the Secretary, Civil Service Commission, Stormont, Belfast, to whom they must be returned with copies of two recent testimonials, so as to reach him not later than the 13th March, 1951. 1925

CARDIGANSHIRE COUNTY COUNCIL.
COUNTY ARCHITECT'S DEPARTMENT, ABERAYRON.

Applications are invited for the following appointments:—

(*a*) ONE QUANTITY SURVEYOR. Salary A.P.T., Grade VIII, £685-£760.

Applicants should be thoroughly experienced in the preparation of estimates, Bills of Quantities, Interim Valuations and Final Accounts for all types of buildings, and should be Associates of the R.I.C.S. The commencing salary will be fixed in accordance with the successful candidate's experience.

(*b*) ONE ASSISTANT ARCHITECT. Salary A.P.T., Grade VI, £595-£660.

Applicants should be Members of the Royal Institute of British Architects, with experience in the design and construction of modern buildings (particularly schools), the supervision of large contracts and other works carried out by Local Authorities.

(*c*) ONE ARCHITECTURAL ASSISTANT. Salary Grade III-IV, A.P.T., £450-£525.

Applicants should preferably have passed the Intermediate Examination of the R.I.B.A., and should have a good general experience in Architectural work. The commencing salary will be fixed in accordance with the successful candidate's training and experience.

All the above appointments will be subject to one month's notice on either side and to the provisions of the Local Government Superannuation Act, 1937.

Successful applicants will be required to pass a medical examination.

Applications, suitably endorsed, stating age, qualifications, details of experience, previous and present appointments, present salary and the earliest possible date when available, together with two recent testimonials and names of two referees, are to be delivered to the undersigned on or before the 1st March, 1951.

The Council regret that they are not in a position to assist in finding living accommodation.

J. E. R. CARSON,
Clerk of the County Council.

County Council Offices,
Cambrian Chambers, Aberystwyth.
3rd February, 1951. 1848

COUNTY BOROUGH OF SOUTH SHIELDS.
ARCHITECTURAL ASSISTANTS AND GENERAL ENGINEERING ASSISTANT.

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

ARCHITECTURAL ASSISTANTS.

Applicants must have passed the Final Examination of the R.I.B.A.

The salary will be within Grades VI and VII of the N.J.C. Scales (£595-£710), according to qualifications and experience.

Housing accommodation can be made available to successful applicants if necessary.

GENERAL ENGINEERING ASSISTANT.

The appointment will be subject to qualifications and experience as set out in the N.J.C. Conditions of Service, and the salary will be A.P.T., Grade V (£520-£570).

Selected applicants will be required to pass a medical examination, and the appointments will be subject to the provisions of the Local Government (Superannuation) Act, 1937.

Canvassing will be a disqualification, and candidates must disclose any relationship to members or senior officers of the Council.

Applications on forms to be obtained from the Borough Engineer, Town Hall, South Shields, should be returned not later than the 1st March, 1951.

HAROLD AYREY,
Town Clerk.

Town Hall, South Shields.
2nd February, 1951. 1836

KENT COUNTY COUNCIL.

Applications are invited for appointment in the Buildings Department of a SENIOR ASSISTANT ARCHITECT, at a salary in A.P.T., Grade VIII (£685-£760).

Applicants must be Fellows or Associates of the Royal Institute of British Architects. The person appointed will be required to act as a liaison officer in connection with the employment of private architects for the erection of school buildings. Applicants must, therefore, have had considerable practical experience in administration and in the planning, designing and construction of school buildings. Previous employment with a local authority will be an advantage.

The post is superannuable, and the successful candidate will be required to undergo a medical examination.

Applications, on forms obtainable from the County Architect, Springfield, Maidstone, must be delivered to him within 14 days of the appearance of this advertisement.

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

County Hall, Maidstone.
5th February, 1951. 1861

LONDON COUNTY COUNCIL.
ARCHITECT'S DEPARTMENT.

Applications are invited for positions of ARCHITECT, Grade III (£550-£700), and TECHNICAL ASSISTANT (up to £580) for work on new housing, schools, and other public buildings. The positions are superannuable. Candidates for Grade III positions should possess professional qualifications. Application forms from the Architect (AR/P/S), The County Hall, Westminster Bridge, S.E.1, enclosing stamped addressed foolscap envelope. Canvassing disqualifies. (384) 3914

BLACKWELL RURAL DISTRICT COUNCIL.
ARCHITECT AND HOUSING SUPERINTENDENT'S DEPARTMENT.
ARCHITECTURAL ASSISTANT.

Applications are invited for the appointment of Architectural Assistant, in the Architect and Housing Superintendent's Department, at a salary of £480 per annum, rising by annual increments of £15 to £525 (Grade A.P.T., IV).

Applicants should have attended a full time course of Architecture and have passed the R.I.B.A. Intermediate Examination, or its equivalent, at one of the recognised schools of Architecture, but have had less than one year's subsequent experience in an architectural office.

Applications, stating age, experience and training, accompanied by two recent testimonials, should be sent so as to reach the undersigned not later than 28th February, 1951.

R. EVANS,
Clerk to the Council.

Dale Close, 100, Chesterfield Road South,
Mansfield. 1846

LONDON COUNTY COUNCIL.
ARCHITECT'S DEPARTMENT.
ARCHITECTS FOR HOUSING DIVISION.

Applications are invited for the following grades in the new Housing Division of the Architect's Department:—Architect, Grade II (£700-£840); Architect, Grade III (£550-£700); Technical Assistant, salaries up to £580. This division will ultimately be responsible for the design and erection of all the Council's housing, and staff are required immediately for the preparation of new schemes.

The positions are superannuable. Application forms, to be returned by 10th March, 1951, obtainable from the Architect, County Hall, S.E.1, enclosing stamped addressed foolscap envelope and quoting AR/EK/H. (128) 1873

COUNTY BOROUGH OF SWANSEA.
BOROUGH ARCHITECT'S DEPARTMENT.

Applications are invited for the established staff appointment of:

BUILDING WORKS MANAGER,

to take charge, under the Borough Architect, of all Direct Labour building, at a salary of £685 per annum, rising to £760 per annum.

Candidates must be under 45 years of age, unless in Local Government service. The appointment will be subject to the Local Government Superannuation Act, 1937, and to medical examination.

A statement of the duties and a Form of Application may be obtained from the Borough Architect, Guildhall, Swansea, and must be returned to the undersigned by the 6th March, 1951.

T. B. BOWEN,
Town Clerk.

Guildhall, Swansea.
12th February, 1951. 1879

BOROUGH OF WIDNES.
BOROUGH ARCHITECT'S DEPARTMENT.

Applications are invited for two appointments as ARCHITECTURAL ASSISTANTS, Grade A.P.T., IV (£480-£525).

Applicants should be Student R.I.B.A., and have worked in an Architectural office for at least two years.

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

Applications, stating full particulars of experience, qualifications, etc., together with the names of two referees, should be sent to the Borough Architect, Brendan House, Widnes Road, Widnes, not later than Saturday, 3rd March, 1951.

Canvassing, directly or indirectly, will disqualify.

FRANK HOWARTH,
Town Clerk.

Town Hall, Widnes.
7th February, 1951. 1857

BOROUGH OF FINCHLEY.
APPOINTMENT OF BUILDING AND SURVEYING ASSISTANT.

Applications are invited for the abovementioned appointment in the Borough Engineer and Surveyor's Department, at a salary within the range of Grades A.P.T., V/VI, according to qualifications and experience. Candidates must have a thorough knowledge of building construction and be experienced in the preparation of estimates for all kinds of building work and in the supervision of work in progress, with particular regard to the efficient organisation of maintenance works in schools and public buildings.

The appointment will be terminable by one calendar month's notice on either side, and will be subject to the provisions of the Local Government Superannuation Act, 1937. The person appointed will be required to pass a medical examination.

Applications, stating age, qualifications, present and past appointments, with details of experience, and giving names of three persons to whom reference as to character and ability can be made, should be forwarded to the Borough Engineer and Surveyor, Mr. P. M. Spencer, A.M.I.C.E., M.I.Mun.E., 294-6, Regents Park Road, Finchley, N.3, by not later than first post on Friday, 2nd March, 1951.

R. M. FRANKLIN,
Town Clerk.

Municipal Offices, Finchley, N.3.
February, 1951. 1895

SOUTH-WEST METROPOLITAN REGIONAL HOSPITAL BOARD.

Applications are invited for the following appointment on the Board's Architectural Staff :—

ASSISTANT ARCHITECT. A.P.T., Grade VI (£595×£20—£635×£25—£660 p.a.), plus London weighting of £30 p.a.

Applicants should preferably be Associates of the Royal Institute of British Architects, and be capable of preparing working and detail drawings and specifications, and supervising the work of individual projects.

Experience in hospital planning and construction will be an advantage.

The appointment is subject to the National Health Service (Superannuation) Regulations, and the successful candidate will be required to pass a medical examination.

Applications, stating age, qualifications and experience, together with the names of three referees, should be forwarded to the Secretary (S.2), South West Metropolitan Regional Hospital Board, 11a, Portland Place, London, W.1, to be received not later than 3rd March, 1951. 1894

CITY OF OXFORD.
CITY ARCHITECT AND PLANNING OFFICER'S DEPARTMENT.
ASSISTANT ARCHITECTS.

Applications are invited from fully qualified Architects for posts on the permanent staff of the City Architect and Planning Officer's Department.

The salary scale will be £520×£15(2)×£20(1)—£570 per annum.

Applicants must be Registered Architects, capable of preparing sketch designs, full working drawings, specifications, etc., and competent to undertake educational, housing, and general architectural work.

Housing accommodation, if required, will be provided by the Council.

The appointments will be subject to the National Conditions of Service, the Local Government Superannuation Act, 1937, and the successful candidates will be required to pass a medical examination.

Further details of the duties of the posts and Application Forms, which must be used in applying for the posts, may be obtained from E. G. Chandler, A.R.I.B.A., A.M.T.P.I., City Architect and Planning Officer, Town Hall, Oxford, and these forms must be returned not later than Saturday, 10th March, 1951.

HARRY PLOWMAN,
Town Clerk.
Town Hall, Oxford. 1893

LONDON ELECTRICITY BOARD.
STRUCTURAL DRAUGHTSMEN.

Applications are invited for the above positions in the Chief Engineer's Department, at present located at Lesco House, Stamford Street, S.E.1.

Applicants should be designer-detailers having a knowledge of building construction and experience in the design and detailing of either reinforced concrete or structural steelwork or both.

Pending grading of the posts under the National agreement of the appropriate negotiating body, commencing salaries will be from £500 per annum, dependent upon qualifications and experience.

Application forms obtainable on receipt of an addressed foolscap envelope, from Establishments Officer, 46, New Broad Street, E.C.2, to be returned within 7 days of the appearance of this advertisement, quoting Ref. EST/V/995/A. on envelope and all correspondence. 1890

BOROUGH OF HEMEL HEMPSTEAD.
SENIOR ARCHITECTURAL ASSISTANT.

Applications are invited for the appointment of Senior Architectural Assistant, in the Borough and Water Engineer's Department, at a salary in accordance with A.P.T., Grade V (£520-£570), of the National Joint Council's Scale. Candidates should be Registered Architects. The appointment will be subject to the Local Government Superannuation Acts, to the National Conditions of Service from time to time in force, and to the passing of a medical examination, and will be terminable by one month's notice in writing on either side. Application forms may be obtained from Mr. A. H. Turner, A.M.I.C.E., Borough and Water Engineer, Market Square, Hemel Hempstead, Herts., and should be returned not later than the 7th March. Canvassing will disqualify, and applicants must state whether to their knowledge they are related to any member of the Council or to any senior officer of the Corporation.

C. W. G. T. KIRK,
Town Clerk.
Town Hall, Hemel Hempstead, Herts.
7th February, 1951. 1889

COUNTY BOROUGH OF BURNLEY.

Applications are invited for the undermentioned appointments in the office of the Borough Engineer and Surveyor :—

(*a*) BUILDING INSPECTOR. Grade II (£420-£465 per annum).

(*b*) ARCHITECTURAL ASSISTANT. Grade II (£420-£465 per annum).

Applicants should have had experience in a similar capacity, and preference will be given to candidates holding a recognised qualification.

Forms of application may be obtained from the Borough Engineer and Surveyor, 22-24, Nicholas Street, Burnley, to whom applications should be returned not later than Saturday, 10th March, 1951.

C. T. THORNLEY,
Town Clerk.
1903

BOROUGH OF MALDEN AND COOMBE.
BOROUGH ENGINEER AND SURVEYOR'S DEPARTMENT.
APPOINTMENT OF ARCHITECTURAL ASSISTANT, GRADE A.P.T., III.

Applications are invited for the above-mentioned permanent appointment at a salary in accordance with Grade A.P.T., III, of the Administrative, Professional and Technical Division of the National Scales for Local Government Officers—namely, £450×£15—£495 per annum, plus "London weighting."

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

Preference will be given to applicants who have passed the Intermediate Examination of the Royal Institute of British Architects. Applications, giving age, qualifications and details of training, experience, present and previous appointments, accompanied by copies of two recent testimonials, should be addressed to reach the undersigned not later than Thursday, 1st March, 1951.

Canvassing, directly or indirectly, will be deemed a disqualification, and candidates must disclose in their applications whether to their knowledge they are related to any member or senior official of the Council.

The Council will endeavour to provide the successful candidate with housing accommodation if deemed necessary.

HAROLD E. BARRETT,
Town Clerk.
Municipal Offices, New Malden, Surrey. 1913

CITY OF NOTTINGHAM.
HOUSING ARCHITECT'S DEPARTMENT.
ASSISTANT ARCHITECT.

Applications are invited from Registered Architects, preferably with experience of large-scale housing work, for the appointment of Assistant Architect, in A.P.T. Division, Grade VI (£595 to £660).

The appointment is in accordance with the National Joint Council's Scheme of Conditions of Service, and subject to the Local Government Superannuation Act, 1937.

The successful candidate will be required to pass a medical examination.

Applications, giving details of age, training, qualifications, experience and present appointment, together with the names and addresses of two persons to whom reference can be made, should be forwarded to C. A. Pilkington, L.R.I.B.A., City Housing Architect, The Guildhall, Nottingham, not later than Friday, 16th March, 1951.

T. J. OWEN,
Town Clerk.
The Guildhall, Nottingham. 1912

COUNTY BOROUGH OF BLACKBURN.
APPOINTMENT OF ASSISTANT QUANTITY SURVEYOR AND ARCHITECTURAL ASSISTANTS.

Applications are invited for the following permanent appointments :—

ONE ARCHITECTURAL ASSISTANT. Grade VI (£595-£660).

ONE ARCHITECTURAL ASSISTANT. Grade III (£450-£495).

Applicants for the Grade VI post must be Registered Architects, and have good experience in the design and construction of schools and Municipal buildings. Preference will be given to Associates of the R.I.B.A.

Applicants for the Grade III post must have good experience in an Architect's office, and preference will be given to those who have passed the R.I.B.A. Intermediate examination.

ONE ASSISTANT QUANTITY SURVEYOR. Grade VI (£595-£660).

Applicants must be experienced in the preparation of Bills of Quantities, Specifications, Estimates, and the settlement of final accounts. Preference will be given to Professional Associates of the Chartered Surveyors' Institute.

Applications with full particulars should be submitted, with three recent testimonials, to the Borough Engineer, by 8th March.

CHAS. S. ROBINSON,
Town Clerk.
1911

LONDON COUNTY COUNCIL.

Technical College for the Furnishing Trades, Hamond Square, Ivy Street, N.1. Applications are invited for the post of PRINCIPAL. The College provides full-time, part-time day and evening courses in craftsmanship, draughtsmanship, management, cabinet making, french polishing, upholstery, and the history and design of furniture for students preparing to enter or already engaged in the furnishing trades. Candidates should have good trade experience and a sound knowledge of design. Teaching and organising experience will be added qualifications.

The existing salary is £900×£25—£1,050 (men), or £720×£20—£840 (women), plus £36 or £48 London allowance and additions for graduate or equivalent qualifications and training. This scale will be reviewed in the light of the new Burnham award for comparable scales for heads of departments, and may result in a basic increase of £200 (men) or £160 (women) p.a., with the discontinuance of graduate and training additions. Further details and application forms (stamped addressed foolscap envelope necessary) from the Education Officer (T.1), County Hall, London, S.E.1, to be returned by 27th March, 1951. (180) 1916

HEMEL HEMPSTEAD DEVELOPMENT CORPORATION.

Applications are invited for appointments in the office of the Chief Architect, H. Kellett Ablett, as follows :—

(1) SENIOR ARCHITECTURAL ASSISTANT (scale £550×£30 to £750).

(2) ARCHITECTURAL ASSISTANT (scale £400×£25 to £525).

Applicants for (1) should be Associates of the R.I.B.A. This appointment offers scope to those having considerable experience in design and practical knowledge in that connection. A reasonable amount of experience in the preparation and carrying out of contracts for individual buildings of a public character is also desirable.

Applicants for (2) should have had previous experience in an Architect's office, and have passed 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 the Local Government "Charter."

Contributory superannuation with an opportunity of entering or continuing in Local Government Superannuation Fund will be provided.

Housing accommodation can be provided, where appropriate, within a reasonable period.

Forms of application (to be applied for in an envelope marked "Architect"), which should be returned by 5th March, 1951, may be obtained from the General Manager, Hemel Hempstead Development Corporation, Westbrook Hay, Hemel Hempstead.

W. O. HART,
General Manager.
Westbrook Hay, Hemel Hempstead, Herts. 1896

GOVERNMENT OF NORTHERN IRELAND.
MINISTRY OF HEALTH AND LOCAL GOVERNMENT.
TECHNICAL STAFF—HOUSING AND PLANNING.

Applications are invited for unestablished posts of :—

(*a*) ASSISTANT ARCHITECT. Grade A (Planning). £700-£900 per annum.

(*b*) ASSISTANT ARCHITECT. Grade B (Housing). £500-£750 per annum.

(*c*) PLANNING ASSISTANT. £500-£750 per annum.

Commencing salary within the above ranges will be fixed according to qualifications and experience; a salary lower than £500 may be paid to a candidate under 26 years of age.

Qualifications : Candidates for (*a*) and (*b*) posts must be Registered Architects by examination. In addition, candidates for the Housing vacancy should have experience in up-to-date house design and layout.

Candidates for the Planning Assistant post must be either Registered Architects by examination, Corporate Members of the Institution of Civil Engineers or Associates of the Royal Institution of Chartered Surveyors.

In addition, applicants for Planning appointments must possess a recognised qualification in town planning or have good experience in town planning work.

Preference will be given to candidates who served with H.M. Forces during wartime, providing the Ministry is satisfied that such candidates can, or within a reasonable time will be able to, discharge the duties efficiently.

Applications, giving date of birth, full particulars of qualifications and experience, stating the post applied for, with copies of two recent testimonials, should be sent without delay, to the Director of Establishments, Ministry of Finance, Stormont, Belfast. 1926

BRITISH ELECTRICITY AUTHORITY.
SOUTH WALES DIVISION.

Applications are invited for the appointment of ASSISTANT QUANTITY SURVEYOR (Temporary) at the Uskmouth Generating Station Site, near Newport, at a salary of £500-£600 per annum, according to age and experience.

The salary is provisional and subject to negotiation through the appropriate national machinery.

Consideration will be given to the payment of travelling or subsistence allowance to the successful applicant.

Applicants should be capable of checking interim and final measurements in accordance with the priced Bill of Quantities for inclusion in the Contractor's Statement, and preference will be given to those who have passed the Intermediate Examination of an appropriate Professional Institute.

Forms of application may be obtained from the Divisional Secretary's Office at the address below, to whom completed applications should be returned not later than 5th March, 1951.

H. V. PUGH,
Divisional Controller.
Cardiff (Pengam Moors) Airport, Cardiff. 1928

GLENROTHES DEVELOPMENT CORPORATION.

Applications are invited for the post of ASSISTANT QUANTITY SURVEYOR, the salary grade for which is £570, by annual increments of £25 and £30 to £780 per annum, with placing according to experience and qualifications. Applicants should be under 45 years of age. Corporate Members of the R.I.C.S., or hold an equivalent qualification, and have experience, preferably in Scotland, in estimating, preparing Bills of Quantities, and settling final accounts.

Further particulars are available from the Secretary, Glenrothes Development Corporation, Woodside, Glenrothes, by Markinch, to whom applications should be made before 2nd March, 1951. 1917

HAMPSHIRE COUNTY COUNCIL.

Applications are invited for the following appointments :—

(*a*) SENIOR ASSISTANT ARCHITECTS. Grade VI (£595×£20 and £25—£660).

(*b*) ARCHITECTURAL ASSISTANTS. Grades II, III or IV (£420×£15—£465, £450×£15—£495, or £480×£15—£525), according to experience.

(*c*) ASSISTANT HEATING ENGINEER. Grade IV (£480×£15—£525).

(*d*) SENIOR ASSISTANT QUANTITY SURVEYOR. Grade VI (£595×£20 and £25—£660).

(*e*) SENIOR ASSISTANT QUANTITY SURVEYOR. Grade V (£520×£15 and £20—£570).

(*f*) ASSISTANT QUANTITY SURVEYOR. Grade III (£450×£15—£495).

Candidates for appointment :—

(*a*) Must be Registered Architects, preferably A.R.I.B.A., with experience in the design and construction of Public Buildings.

(*b*) Should have passed the Intermediate Examination of the R.I.B.A. or its equivalent at one of the recognised Schools of Architecture and have had suitable experience.

(*c*) Should be Associates of the Institute of Heating and Ventilating Engineers, or possess other suitable examination qualifications, and be accustomed to the design of heating, hot water services and ventilating systems, under supervision, to various types of County Buildings. A knowledge of electrical installations and mechanical equipment of buildings will be considered an advantage.

(*d*) and (*e*) Should be Members of the R.I.C.S. (Quantities Section), with good experience in the preparation of estimates and quantities for all types of buildings and the settlement of final accounts for building contracts.

(*f*) Should have completed professional training and have passed the Intermediate Examination of the R.I.C.S. (Quantities Section).

The appointments are pensionable and will be subject to satisfactory medical reports.

Appointments (*a*), (*d*) and (*e*) will be terminable by three months' notice on either side, and appointments (*b*), (*c*) and (*f*) will be terminable by one month's notice on either side.

In approved cases, the County Council are prepared to assist newly appointed members of the staff to meet removal and other expenses.

Applications should be made on forms to be obtained from The County Architect, The Castle, Winchester, to whom they should be returned not later than Saturday, the 10th March, 1951.

G. A. WHEATLEY,
Clerk of the County Council.

The Castle, Winchester.
12th February, 1951. 1914

NORTH-EAST METROPOLITAN REGIONAL HOSPITAL BOARD. ARCHITECTS DEPARTMENT.

Applications are invited for the following permanent posts :—

(*a*) ASSISTANT ARCHITECT. A.P.T., Grade VII (£635×£25—£710 p.a.).

Applicants should be Registered Architects and Associates of the R.I.B.A., experienced in design, and with sound knowledge of construction. Hospital experience not essential, but would be an advantage.

(*b*) ASSISTANT ARCHITECT. A.P.T., Grade VI (£595×£20/£25—£660 p.a.).

Applicants should be R.I.B.A. Final Examination standard, with experience in design and construction.

(*c*) JUNIOR ASSISTANT ARCHITECT. A.P.T., Grade III (£450×£15—£495 p.a.).

(*d*) JUNIOR ASSISTANT ARCHITECT. A.P.T., Grade I (£390×£15—£435 p.a.).

For position (*c*) applicants should have passed Intermediate Examination of R.I.B.A., and those for (*d*) should be of R.I.B.A. Intermediate Examination standard. For both (*c*) and (*d*) experience in the preparation of working drawings, the making of surveys and good draughtsmanship is required.

(*e*) BUILDING SURVEYOR. A.P.T., Grade Va (£550×£20—£610 p.a.).

Candidates must have a thorough experience of preparing site surveys and reports, surveys of existing buildings, and the preparation of approximate estimates and specifications. A good practical all-round knowledge of buildings construction is required, and the ability to plot surveys will be an advantage.

(*f*) JUNIOR QUANTITY SURVEYOR. A.P.T., Grade III (£450×£15—£495 p.a.).

Candidates should have had experience of the working of a Quantity Surveyor's office, and will be expected to assist generally and in checking accounts, working up Bills of Quantities, Specifications and Estimates. Preference will be given to those undergoing a course of instruction with a view of professional examinations.

All the above positions carry a London weighting allowance and are subject to the National Health Service (Superannuation) Regulations, 1950, and to medical examination on appointment.

Applications, stating age, qualifications and experience, together with the names of two referees, should reach C. E. Nicol, Secretary, North-East Metropolitan Regional Hospital Board, 11a, Portland Place, W.1, not later than 10 days from the appearance of this advertisement. 1905

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

Applications are invited for the following appointments at salaries in accordance with the National Scales as indicated :—

(*a*) PRINCIPAL ARCHITECTURAL ASSISTANT. Grade A.P.T., VII-VIII (£635-£760).

(*b*) TWO ARCHITECTURAL ASSISTANTS. Grade A.P.T., III (£450-£495).

Applicants should be suitably qualified and experienced in design of houses, flats, schools and other Municipal buildings. In the case of (*a*) preference will be given to Members of the Royal Institute of British Architects.

The appointments are subject to the National Scheme of Conditions of Service, the provisions of the Local Government Superannuation Act, 1937, the passing by the successful candidates of medical examinations, and to termination by one month's notice on either side.

Form of Application can be obtained from the Borough Engineer and Surveyor, the Council House, Smethwick, 40, and should be returned suitably endorsed, together with copies of two recent testimonials, to reach him not later than 3rd March, 1951.

E. L. TWYCROSS,
Town Clerk.
1906

LINDSEY COUNTY COUNCIL.
COUNTY ARCHITECT'S DEPARTMENT.

Vacancy at £12 12s. per week for CLERK OF WORKS, to supervise erection of First Instalment of Technical College at Scunthorpe, and to live in or near Scunthorpe. Appointment expected to last at least two years. Considerable experience in reinforced concrete work required, and preference for persons with experience in a barrel vault construction. Work on the site expected to commence March, 1951.

Applications, stating age and experience, with copies of two testimonials, to reach Mr. A. Ronald Clark, A.R.I.B.A., A.M.T.P.I., County Architect, County Offices, Lincoln, not later than Thursday, 1st March. Any applicant related to member or senior officer of Council to disclose that fact. Failure to disclose such relationship or canvassing of members will disqualify.

H. COPLAND,
Clerk of the County Council.
County Offices, Lincoln. 1924

ISLE OF WIGHT COUNTY COUNCIL.
APPOINTMENT OF CHIEF QUANTITY SURVEYOR.

Applications are invited for the appointment of Chief Quantity Surveyor, on the permanent staff of the County Architect's Department, at a salary in accordance with Grade VIII, A.P.T. Division (£685×£25—£760).

Candidates should possess approved qualifications and experience, and preference will be given to those who are Members of the Royal Institute of Chartered Surveyors (Quantities sub-Division). They should be capable of undertaking all stages of the work for the preparation of Bills of Quantities, preparation and settlement of Final Accounts, Site Measurements, Interim Certificates, and general administrative duties, including preliminary estimates and Ministry forms.

Applications on forms to be obtained from the County Architect, Mr. Frederick H. Booth, A.R.I.B.A., A.M.T.P.I., should be returned completed to the undersigned at the address stated below, together with a copy of one recent testimonial and the names of two persons to whom reference may be made, not later than 7th March, 1951.

L. H. BAINES,
Clerk of the County Council.
County Hall, Newport, Isle of Wight.
13th February, 1951. 1902

WAR DEPARTMENT.

Applications are invited for vacancies in the Fortifications and Works Directorate at Chessington, Surrey :—

ARCHITECTS.

Must be A.R.I.B.A. or Registered Architect by examination.

Applicants should be under 50 years of age.

Salaries for the posts are on the range £720-£960 per annum.

Starting salary will be fixed according to age, qualifications and experience. Annual increases are payable, subject to satisfactory service.

The posts are temporary but have long-term possibilities.

The work is varied and interesting, and good canteen facilities exist.

Apply in writing only, stating age, nationality, and full details of qualifications and experience, to The War Office (C.5(A)), Room 504, Hotel Victoria, Northumberland Avenue, London, W.C.2. 1915

THE UNIVERSITY OF SHEFFIELD.

Applications are invited for a post of LECTURER or ASSISTANT LECTURER in the Department of Architecture, to begin duties as soon as possible.

Salary scales : Lecturer, £550-£1,100; Assistant Lecturer, £450-£500, with Superannuation provision under the Federated Superannuation Scheme for Universities, and a family allowance. The commencing salary on either scale will depend upon the qualifications and experience of the successful candidate.

Applications from Art Teachers with qualifications and practical experience in Interior Design and Decoration will be considered.

Further particulars may be obtained from the undersigned, with whom applications (three copies), including the names and addresses of two referees, should be lodged by 10th March, 1951.

A. W. CHAPMAN,
Registrar.
1904

COUNTY OF LEICESTER.
COUNTY ARCHITECT'S DEPARTMENT.

Applications are invited for the following established posts :—

SENIOR ASSISTANT ARCHITECTS. A.P.T., Grades VII/VIII. Salary £635-£760.

Candidates must be Registered Architects, should have good experience in the design and construction of modern buildings; be capable of carrying through projects from inception to completion; and if necessary able to take charge of a group. There are several vacancies in these grades, and applications will be considered which indicate a specialised training, *e.g.*, ability to handle large projects or an aptitude for taking charge of programmes of smaller works.

The appointments will be subject to the National Scheme of Conditions of Service and to the provisions of the Local Government Superannuation Act, 1937, and to a satisfactory medical examination. Consideration will be given to applications from Registered Disabled Persons.

Applications must be made on the forms to be obtained from the County Architect, T. A. Collins, A.R.I.B.A., 123, London Road, Leicester, to whom they should be returned, accompanied by copies of three recent testimonials, not later than 17th March, 1951.

JOHN A. CHATTERTON,
Clerk of the County Council.
Grey Friars, Leicester. 1927

NORFOLK COUNTY COUNCIL.
COUNTY ARCHITECT'S DEPARTMENT.

Applications are invited from Registered Architects for the appointment of a Senior ASSISTANT ARCHITECT, Grade VI (£595-£660 per annum).

Applications, stating age, qualifications, full details of experience, and giving the name of three persons to whom reference may be made, should be sent to the County Architect, 27, Thorpe Road, Norwich, within 10 days of the appearance of this advertisement.

The appointment is on the permanent staff and is subject to National Conditions of Service.

H. OSWALD BROWN,
Clerk of the Council.
1844

Partnership

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

CHARTERED ARCHITECT, with medium sized office in Midlands, industrial and school work, etc., in hand, requires ASSOCIATE, preferably A.M.T.P.I., for position leading to Partnership. Having contemporary ideas, able to introduce work. Box 1852.

PARTNERSHIP or Senior appointment leading thereto required in North Lancashire area by A.R.I.B.A. aged 36, with varied experience. Box 1920.

UNUSUAL OPPORTUNITY.—S/c. 3-room Flat, moderate rent, S.E. London, available to Architect willing invest suitable capital to form business arrangement, not necessarily full time nor architectural. Facilities studio office same premises. Suggestions to Box 1923.

Competition

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

ARCHITECTURAL COMPETITION
for the
HERZL MEMORIAL ON MOUNT HERZL, JERUSALEM, ISRAEL.

The Executive of the World Zionist Organisation, in conjunction with the Board of Trustees for Herzl's Tomb, invite Jewish ARCHITECTS, SCULPTORS and PLANNERS throughout the world to submit designs in competition for the proposed Memorial to Herzl's Tomb, the park, and the traffic layout of the immediate vicinity.

Assessors:

1. B. Locker, Chairman, Jewish Agency, Jerusalem.
2. A. Berachyahu, Engineer, Jewish National Fund, Jerusalem.
3. Dr. L. Lauterbach, Secretary of the Zionist Executive, Jerusalem.
4. J. Metrikin, Architect, Jewish Agency, Jerusalem.
5. J. Pinkerfeld, Architect, Tel-Aviv.
6. Professor Y. Ratner, Architect, Haifa.
7. H. Rau, Architect, Jerusalem.
8. J. Weitz, Jerusalem.
9. N. J. Aslan, A.R.I.B.A., A.M.T.P.I., London.

Premiums:

11 premiums totalling I£5,000.

Last day for submitting designs, 21st June, 1951. Schedule of conditions and particulars may be obtained on application to the Secretary, The London Committee, Herzl Memorial, 77, Great Russell Street, London, W.C.1, enclosing a deposit of £2 2s.

(In view of the religious character of the project this Competition has been restricted to members of the Jewish faith.) 1815

Architectural Appointments Vacant

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

FULLY qualified ARCHITECTURAL ASSISTANT required for West End office. Capable of handling contracts. State qualifications, experience, and salary required. Box 1586.

DRAUGHTSMAN, with experience in the design of structural steelwork on industrial buildings, required. A knowledge of reinforced concrete and general building construction also desirable. Write, stating age, experience, and salary desired, to E.M.A., Cadbury Brothers, Ltd., Bournville. 1796

LLEWELLYN SMITH & WATERS, F./F.R.I.B.A., 103, Old Brompton Road, S.W.7, and Willis, Llewellyn Smith & Waters, Albany House, Worcester, require competent ASSISTANTS. Applicants should have passed the Intermediate Examination and have had at least three years' office experience. Interesting programme of varied work in hand. Please apply in writing to London office. 1834

SENIOR ASSISTANT required. Salary according to experience. Apply Carpenter & Beresford Smith, Chartered Architects, 27, Queen Square, Bath. 1865

SENIOR ARCHITECTURAL ASSISTANT required in London office. Must be fully experienced, able to take charge of jobs, and to control staff of seven assistants. Excellent prospects for right man. Please reply, with full details of age, experience, and salary required, to Box 1863.

BRILLIANT CONTEMPORARY ARCHITECT, preferably A.R.I.B.A. and Competition winner, required by practising Architect, A.R.I.B.A., in Warwickshire, to help in competition work, evenings or daytime, by arrangement. Mutual financial agreement to full details. Box 1853.

ARCHITECTURAL ASSISTANT wanted for small office. Sound knowledge of working drawings and specifications essential. Write, stating salary required. Box 1839.

REQUIRED in Architects' office (S.W. coastal area), with varied practice, good ARCHITECTURAL ASSISTANT, with designing ability and some knowledge of specification writing. Reply, giving full details whether married or single, when available, and salary required, to Box 1856.

ASSISTANTS required in Architects' Department of large commercial organisation. Sound all-round training in the profession essential, including supervision of work. Excellent opportunities for men of initiative. Apply in writing, giving details of experience, age, and salary required, to Box 1885.

ARCHITECTURAL ASSISTANT required immediately, Kensington area, experienced in measured surveys, preparation of sketch plans and working drawings. Apply, giving full particulars and salary required, to Box 1886.

ARCHITECTURAL ASSISTANT urgently required in Portsmouth office of London Architect. Applicants should be of at least Intermediate standard. Interesting work and good salary for right man. Send applications in duplicate, giving age, qualifications, and experience, to Box 1930.

ARCHITECTURAL AND BUILDING DRAUGHTSMEN required urgently for Head Office appointments. Commencing salary up to £500 p.a., with good prospects of advancement. Applications, giving brief outline of experience, should be addressed to the Staff Architect, George Wimpey & Co., Ltd., 27, Hammersmith Grove, W.6. 1931

ARCHITECT'S ASSISTANT required, Intermediate to Final standard. Write, giving full particulars of previous experience and salary required, to Graham Crump & Denis Crump, F./A.R.I.B.A., 43, George Street, Croydon. 1933

SENIOR ARCHITECTURAL STAFF required by London Firm of Architects. Please reply by letter, stating training, experience, age, and salary required. Box 1932.

JUNIOR or Intermediate standard ASSISTANT required in North London office. 'Phone NOR. 4114 for appointment. 1910

ASSISTANT, Intermediate standard, with some office experience, required small general practice, London. Varied and interesting work. Alternate Saturdays. Salary by arrangement. Please ring Temple Bar 9970 for appointment. 1909

TWO ASSISTANTS, between Inter. and Final standard required in Birmingham office, with varied long term programme. Salary £460 to £650, according to qualifications and experience. Box 1908.

VACANCY occurs in Provincial Architect's office for ARCHITECTURAL ASSISTANT. Applicant must be conversant with Rural Housing Schemes, Camp Conversions, etc., and General Supervision, and should have Intermediate R.I.B.A. qualification. Apply in writing, stating age and salary required, to Charles E. T. Booth, A.I.A.A., F.R.S.A., Architect and Surveyor, Barclays Bank Chambers, Broad Street, Hereford. 1907

ARCHITECTURAL ASSISTANT, Intermediate standard, required in Property Dept. at London office of National concern. Excellent prospects, with security and superannuation. Write, giving age, experience, and salary, to Property Manager, Box No. 2993, 43, Hertford Street, London, W.1. 1897

THE RAILWAY EXECUTIVE invite applications for posts of ASSISTANT ARCHITECT in London. Applicants should be A.R.I.B.A. or hold equivalent qualification, and have had several years' experience in an Architect's office. Commencing salary £500-£550 per annum. Applicants selected may be required to join a Superannuation Fund, in accordance with the rules of any such scheme. Applications should give full particulars of qualifications, experience and age, and should be sent to Civil Engineer, the Railway Executive, London Midland Region, Euston Grove, London, N.W.1. 1891

Architectural Appointments Wanted

OFFICE trained ASSOCIATE, with varied experience, including 6 years as Senior and Managing Assistant in private practice, and accustomed to responsibility for office administration and staff supervision, desires new appointment. Box 85.

A POSITION is required as ARCHITECTURAL ASSISTANT by Chartered Architect (Dist. in Thesis), 2 years' experience in contemporary work. Planning qualifications. Box 86.

CHARTERED ARCHITECT (L.R.I.B.A.), with long and varied general practice experience and good administrative ability, accustomed to dealing with clients, contractors, supervision of works, etc., seeks engagement, London or country, as ARCHITECT'S MANAGING ASSISTANT or other responsible senior position. Box 91.

QUALIFIED ARCHITECT, capable of drawing office and site supervision, requires responsible position in busy practice. Salary £750. Box 89.

FULLY experienced ASSISTANT, Chartered, varied experience, seeks position offering considerable responsibility. Preferably with prospects of future Junior or salaried Partnership. Not London. Box 92.

A. R.I.B.A., Dipl.Arch., young, experienced, requires progressive position in private practice, anywhere in Southern England where small furnished flat is available. Box 93.

ASSOCIATE, age 34 years, office trained, seeks progressive appointment with private Architect or company. 14 years' varied experience housing, schools, factories, conversions, etc. London or Home Counties preferred. Box 90.

SENIOR ASSISTANT, A.R.I.B.A., 35 years' experience housing, hospitals, local government work, etc., seeks responsible position where hard work and initiative would be appreciated. London or South-West district preferred. Box 88.

Services Offered

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

SURVEYOR offers services to Architects and others in the preparation of detailed Land and Building Surveys, Levelling, etc. Birmingham district. Own car and equipment. Box 1798.

SERVICES offered by Architect, Perspective Artist and Model-maker. Box 1830.

A. R.I.B.A., A.M.T.P.I., requires part-time in own office in Central Scottish area. Wide experience. Will undertake sketch plans, perspectives, models and working drawings. Box 1896.

SECRETARIAL SERVICE.—Shorthand, typewriting, promptly and accurately executed; work of every description undertaken. Telephone Perivale 2101; write Miss Barclay, 43, Longford Avenue, Southall, Middlesex. 1859

DUPLICATING OR TYPEWRITING.—Specifications, Bills of Quantities, etc., efficiently and speedily undertaken by Typist of many years' experience in the profession. Samples. Molly Wilson, 50, Hawthorn Avenue, Luton. Telephone: Luton 1915, preferably before 10 a.m. 1840

R. I.B.A. Calculations of Simple Structural Members and Theory of Structures. Postal Tuition. Apply D. A. Fowler, Dip.Arch.(Abdn.), F.R.I.B.A., 22, Oakwell Mount, Leeds, 8. 1208

EXPERIENCED ARCHITECTURAL ASSISTANT seeks spare-time work. Sketch Plans, Working Drawings, Details, Tracings. Surveys. Box 1929.

CONTINENTAL ARCHITECTS offer spare time to Contemporary Architects. Models and Perspectives. Specialists in exhibition work. No satisfaction—no money. Box 1901.

DIP.ARCH., A.R.I.B.A., offers other Architects part-time service in the preparation of Drawings and Specifications. Surveys carried out in London area, Kent or Surrey. Box 1898.

RECENTLY qualified ASSOCIATE R.I.B.A. desires evening work at own home. Ten years' varied experience in Housing, Domestic and Alteration Works of all descriptions. Quick and accurate draughtsman. Newcastle-upon-Tyne and Northern area preferred. Own car. Terms by arrangement. Large or small jobs welcomed. Write Box 1899.

A. R.I.B.A. (44) offers services to other Architects, of Surveys and Dilapidations, with reports and estimates thereon, Sketch and Working Drawings and Estimated Costs, Supervision of Work and Final Accounts. Main experience in domestic, ecclesiastical and agricultural building. Country work preferred, up to 200 miles from London. Own car. Owen, 25, Collingham Gardens, S.W.5. Flaxman 9676. 1922

QUALIFIED and experienced QUANTITY SURVEYOR will give assistance to Architects in the preparation of Bills of Quantities, Specifications, etc. South Wales area. Box 1921.

ARCHITECT, experienced in Domestic Commercial and Industrial work offers services to Architects requiring part-time assistance for urgent work. Box 1919.

Other Appointments Vacant

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

AN additional vacancy occurs in the Research and Design Department of the Timber Development Association, Ltd., for a STRUCTURAL ENGINEERING ASSISTANT. Applicants should have a sound knowledge of structural theory and experience in the design of framed structures. The successful candidate will be engaged upon the design and development of timber structures. Professional qualifications are desirable but not essential. The appointment will be subject to the successful applicant joining the Staff Superannuation Scheme if invited to do so. Applications, stating age, qualifications, experience, and salary required, should be addressed to: The Director, Timber Development Association, Ltd., 75, Cannon Street, London, E.C.4, and received not later than Monday, 5th March, 1951. 1918

Miscellaneous

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

A. J. BINNS, LTD., Specialists in the supply and fixing of all types of Fencing, Gates and Cloakroom Equipment. Harvest Works, 99-107, St. Paul's Road, N.1. Canonbury 2061.

The Race Upholstery Unit will be pleased to report on and tender for your specialised upholstery requirements and repairs. 22, Union Road, Clapham, S.W.4. 4048

WINKFIELD MANOR NURSERIES, ASCOT, lay out Rock and Formal Gardens and Labourless "Allweather" Tennis Courts. Six Chelsea Gold Medals since 1947. Winkfield Row 393. 1716

ACCOMMODATION address available for professional use; 1 minute Victoria Station and in very well-known road. Letters forwarded and telephone messages taken; £26 for one year. Box 1787.

FENCING FOR ALL PURPOSES. Supplied and erected; established 100 years. PARKER, WINDER & ACHURCH, LTD., 80, Broad Street, Birmingham, 1.

£50 FOR ONE JOB. Architectural Modelling pays! We supply Plans, Instructions, and sell your work. Details free. D6, Biltex, Chiswick, London. 1892

Educational Announcements

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

R. I.B.A. EXAMS.—Mr. L. Stuart Stanley, M.A., F.R.I.B.A., M.T.P.I., Distn. in T.P. (Tutor in the Sch. of Arch. Lon. Univ.), and Mr. G. A. Crockett, B.A., A.R.I.B.A. (Medallist), A.M.T.P.I., F.R.S.A., prepare Students by correspondence tuition. Stuart Stanley & Crockett, 10, Adelaide Street, Strand, W.C.2. TEM. 1603/4.

FROM NOW ON Winston Walker, A.A.Dipl.F.R.I.B.A., Dipl.T.P., is enrolling Students for his personal course of DESIGN for FINAL R.I.B.A. Course commences 26th February, and is the last before the July Final. Write 107, Sloane Street, S.W.1. 1849

THEORY OF STRUCTURES SUBJECT, R.I.B.A. EXAMS.—Simple and Condensed Course. 10s. per copy. Details or copies from 23, Abbey Gardens, Whiteabbey, Belfast. 1900

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