THE ARCHITECTS' JOURNAL

standard contents

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

No. 3252] [Vol. 125

THE ARCHITECTURAL PRESS

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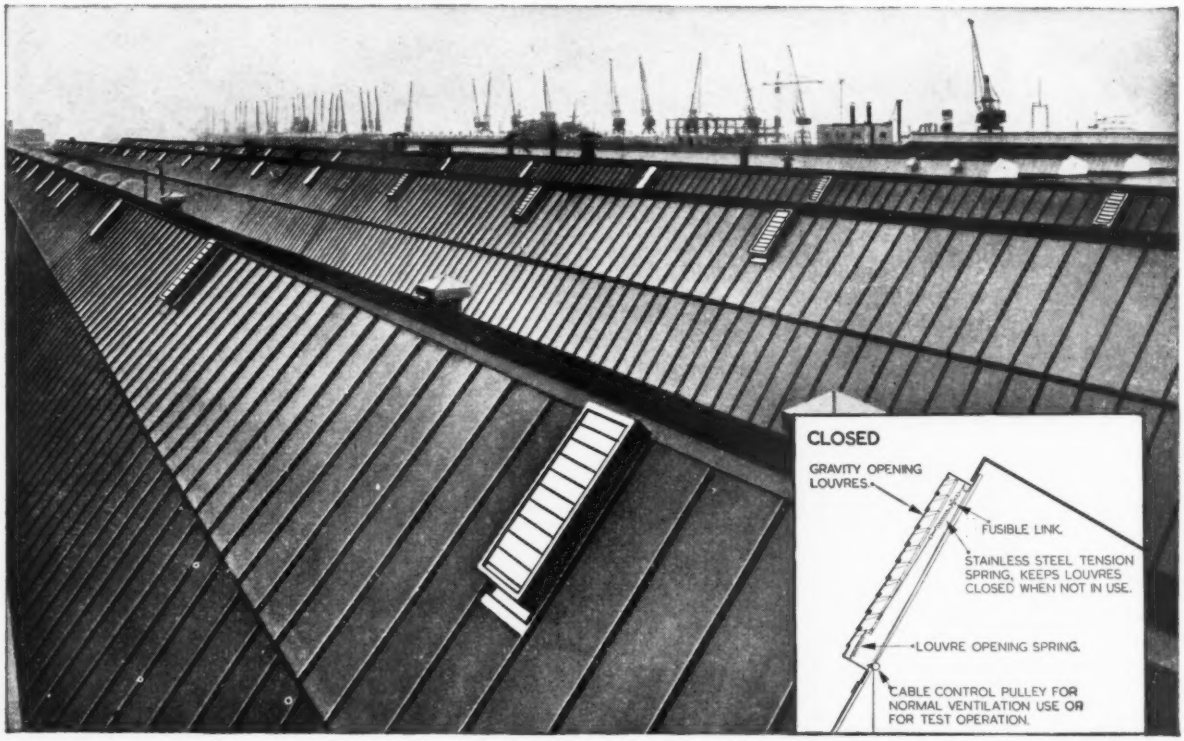
Registered as a Newspaper.

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

IHVE	Institution of Heating and Ventilating Engineers. 49, Cadogan Square.	Sloane 1601/3158
IIBDID	Incorporated Institute of British Decorators and Interior Designers. 100, Park Street, Grosvenor Square, W.1.	Mayfair 7086
ILA	Institute of Landscape Architects. 2, Guilford Place, W.C.1.	Holborn 0281
I of Arb	Institute of Arbitrators. Hastings House, 10, Norfolk Street, Strand, W.C.2.	Temple Bar 4071
IOB	Institute of Builders. 48, Bedford Square, W.C.1.	Museum 7179
IQS	Institute of Quantity Surveyors. 98, Gloucester Place, W.1.	Welbeck 1859
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	Institute of Structural Engineers. 11, Upper Belgrave Street, S.W.1.	Sloane 7128
LDA	Lead Development Association. Eagle House, Jermyn Street, S.W.1.	Whitehall 7264/4175
LMBA	London Master Builders' Association. 47, Bedford Square, W.C.1.	Museum 3891
LSPC	Lead Sheet and Pipe Council. Eagle House, Jermyn Street, S.W.1.	Whitehall 7264/4175
MAFF	Ministry of Agriculture, Fisheries and Food. Whitehall Place, S.W.1.	Trafalgar 7711
MOE	Ministry of Education. Curzon Street House, Curzon Street, W.1.	Mayfair 9400
MOH	Ministry of Health. 23, Savile Row, W.1.	Regent 8411
MOHLG	Ministry of Housing and Local Government. Whitehall, S.W.1.	Whitehall 4300
MOLNS	Ministry of Labour and National Service. 8, St. James' Square, S.W.1.	Whitehall 6200
MOS	Ministry of Supply. Shell Mex House, W.C.2.	Gerrard 6933
MOT	Ministry of Transport. Berkeley Square House, Berkeley Square, W.1.	Mayfair 9494
MOW	Ministry of Works. Lambeth Bridge House, S.E.1.	Reliance 7611
NAMMC	Natural Asphalte Mine Owners and Manufacturers Council. 94/98, Petty France, S.W.1.	Abbey 1010
NAS	National Association of Shopfitters. 9, Victoria Street, S.W.1.	Abbey 4813
NBR	National Buildings Record. 31, Chester Terrace, Regent's Park, N.W.1.	Welbeck 0619
NCBMP	National Council of Building Material Producers. 10, Storey's Gate, S.W.1.	Abbey5111
NEFMAI	National Employers Federation of the Mastic Asphalt Industry. 21, John Adam Street, Adelphi, W.C.2.	Trafalgar 3927
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. 12, Suffolk St., S.W.1.	Whitehall 1693
NHBRC	National House Builders Registration Council. 58, Portland Place, W.1.	Langham 0064/5
NPL	National Physical Laboratory. Head Office, Teddington.	Molesey 1380
NRDB	Natural Rubber Development Board. Market Buildings, Mark Lane, E.C.3.	Mansion House 9383
NSAS	National Smoke Abatement Society. Palace Chambers, Bridge Street, S.W.1.	Trafalgar 6838
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.	Abbey 4504
RIAS	Royal Incorporation of Architects in Scotland. 15, Rutland Square, Edinburgh.	Fountainbridge 7631
RIBA	Royal Institute of British Architects. 66, Portland Place, W.1.	Langham 5721
RICS	Royal Institution of Chartered Surveyors. 12, Great George Street, S.W.1.	Whitehall 5322/9242
RFAC	Royal Fine Art Commission. 5, Old Palace Yard, 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
RSH	Royal Society of Health. 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
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	Society of Industrial Artists. 7, Woburn Square, London W.C.1.	Langham 1984/5
SIA	Structural Insulation Association. 32, Queen Anne Street, W.1.	Langham 7616
SNHTPC	Scottish National Housing. Town Planning Council. Hon. Sec., Robert Pollock, Town Clerk, Rutherglen	
SPAB	Society for the Protection of Ancient Buildings. 55, Great Ormond Street, W.C.1.	Holborn 2646
TCPA	Town and Country Planning Association. 28, King Street, Covent Garden, W.C.2.	Temple Bar 5006
TDA	Timber Development Association. 21, College Hill, E.C.4.	City 4771
TPI	Town Planning Institute. 18, Ashley Place, S.W.1.	Victoria 8815
TTF	Timber Trades Federation. 75, Cannon Street, E.C.4.	City 5040
WDC	War Damage Commission. 6, Carlton House Terrace, S.W.1.	Whitehall 4341
ZDA	Zinc Development Association. 34, Berkeley Square, W.1.	Grosvenor 6636

VENTILATION *AND* FIRE PROTECTION!



with the COLT DUAL PURPOSE FIRE VENTILATOR

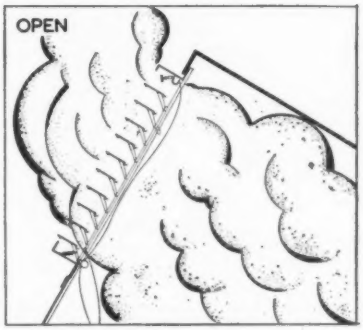
at AC-Delco, Division of General Motors Ltd., Southampton.

A study of industrial fires in Great Britain and in America has shown that the primary cause for the spread of fire is the super-heated air, smoke and explosive gases trapped under the roof. They build up in heat and intensity from the fire below and cause flash fires. Furthermore, the smoke rapidly extends downwards, entirely filling the premises and preventing the work of the fire fighters.

Colt have successfully solved this problem with the design of the Dual Purpose Fire Ventilator which **provides ventilation during normal conditions and—in the event of fire—functions as a heat and smoke exhaust.**

The installation of heat and smoke exhausts is standard practice in America and is rapidly being adopted by leading industrialists in the United Kingdom. Already, 1,290 Colt Dual Purpose Fire Ventilators have been installed in General Motors buildings in this country.

Write to Dept. L.9/6B for paper "Some Aspects of Fire Prevention in Industrial Buildings" by M. J. Reaney, which deals fully with this matter.



The insets illustrate the action of the ventilator as a Heat and Smoke Exhaust. In the event of fire, the fusible link fuses, providing Automatic Escape for Super-Heated Air and Smoke.

COLT VENTILATION

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Branches at: Birmingham, Bradford, Bridgend (Glam.), Bristol, Coventry, Dublin, Edinburgh, Glasgow, Liverpool, London, Manchester, Newcastle-upon-Tyne, Sheffield, and Warwick.

Agents in: Australia, Belgian Congo, Canada, Cyprus, India, Indonesia, Madagascar, Malaya, Mauritius, New Zealand, Pakistan, Portugal, North and South Rhodesia, and South Africa.

G579

Nature's Protection

A lucky fellow is the Armadillo. Mother Nature, with the aid of hundreds of overlapping scales, has given him complete protection against all his enemies.

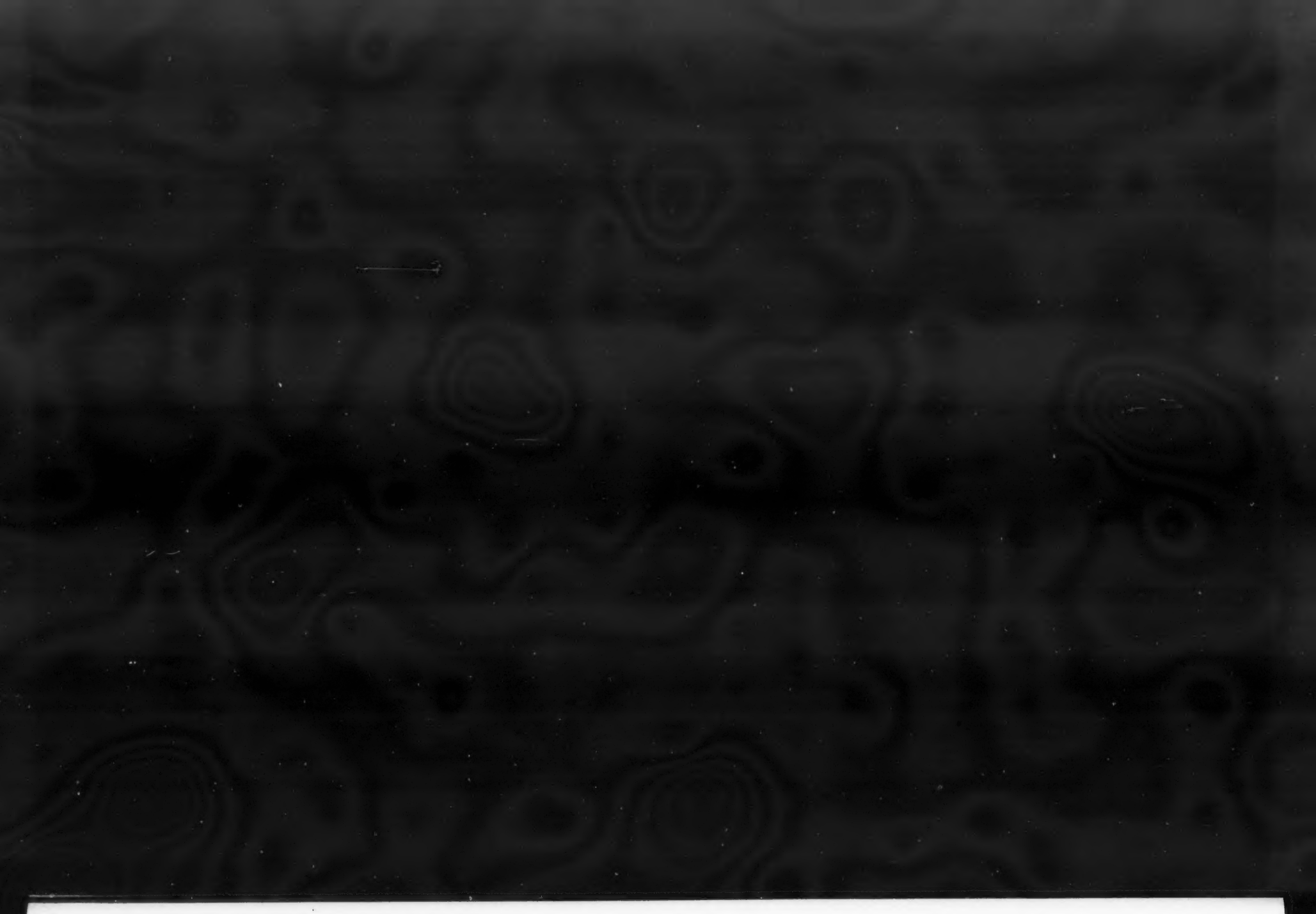
Man has discovered that overlapping scales of zinc can give steel complete protection against rust and corrosion. That is the underlying principle of the Zinc Metallisation Process used for rustproofing Beacon Windows. By means of a special oxy-propane flame gun, minute particles of pure zinc are deposited on the window surfaces after they have been subjected to intensive shot-blasting to remove scale, grease and dirt.

These zinc particles overlap—like the scales of the armadillo—and merge together to form an overcoat sufficiently thick to give every Beacon Window lifelong protection against Rust and Corrosion even under the worst possible climatic conditions.

BEACON
METAL WINDOWS

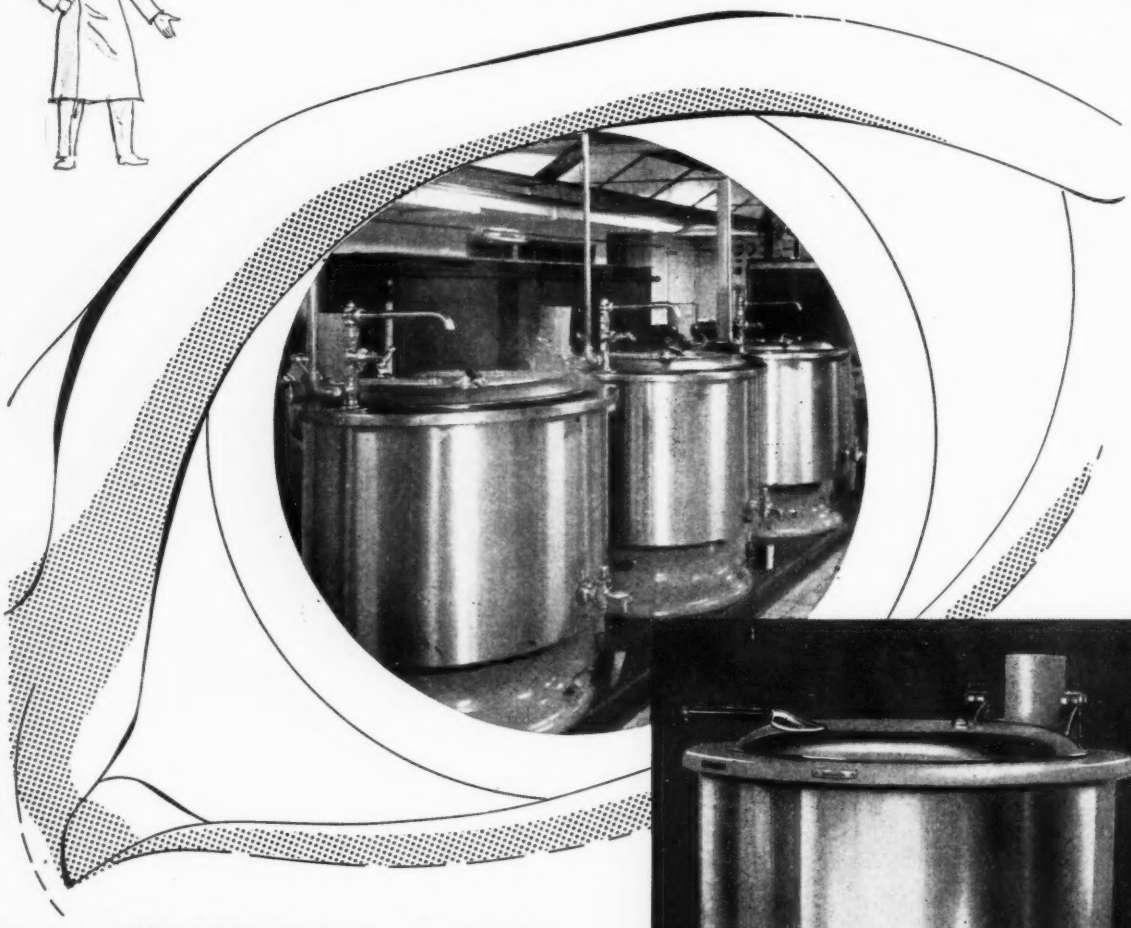
Member of the Metal Window Association

JOHN THOMPSON BEACON WINDOWS LTD · WOLVERHAMPTON



Chef's eye view . . .

of a NEW WORLD in the kitchen



The LANGHAM Vegetable Boiler

The pan is of stainless steel. Burners and gas box are enclosed, with flash tube ignition. Various extras and deviations are available.

The LUNE, a less expensive model, is made in three sizes: 10, 20, and 30 gallon working capacities—(or 12½, 25, and 39 full to the brim)—with a die-cast pan made of a copper-free aluminium alloy, specially developed for food purposes.

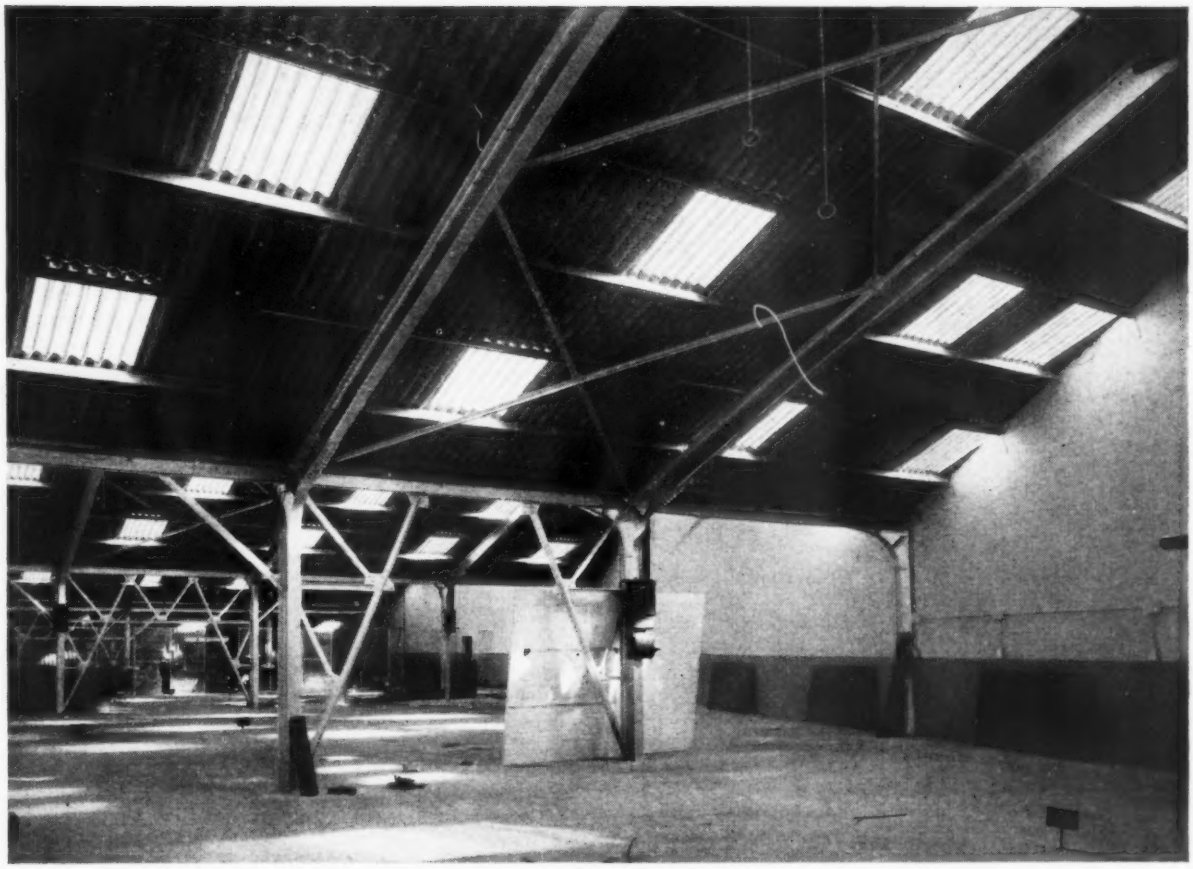
Also available with a loose inner pan for milk and porridge, with a steaming top, and with thermostat control for slow low-temperature cooking.

It has 1½″ thick insulation, and is fitted with pilot jet and interlocking safety gas tap. A sturdy, reliable, general-purpose boiling pan at a highly competitive price.

Please consult us on all large cooking problems.

insist on NEW WORLD PRODUCT OF Radiation Ltd **Large Cooking Equipment**

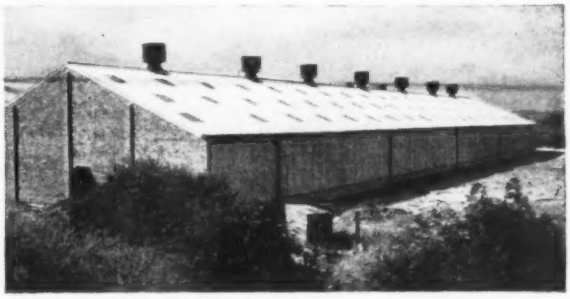
RADIATION GROUP SALES LTD., *Large Apparatus Division*, 7 STRATFORD PLACE, LONDON, W.1. MAYfair 6462



Corrugated 'Perspex' roof lighting installed in the works of M. & C. Switchgear Ltd., Kirkintilloch. Photographs by arrangement with Newton, Robertson & Co. Ltd., Glasgow.

Two words that mean the best roof lighting—

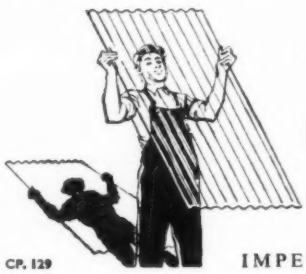
Corrugated 'Perspex'



CORRUGATED 'PERSPEX' is the answer in all buildings, large and small, where good light conditions are important. Corrugated 'Perspex' acrylic sheet is tough, durable, and gives a very high transmission of daylight. It means good health, good morale and increased efficiency in factories and workshops—as well as reduced lighting costs.

Corrugated 'Perspex' is light, easy to handle and inexpensive to install. It will stand up to weather conditions in any part of the world. It is available in a wide range of profiles. It is not harmed by the corrosive atmospheres in industrial areas.

If diffused daylight is desired, Opal Corrugated 'Perspex' is available. Originally developed for intense light conditions overseas, Opal Corrugated 'Perspex' diffuses daylight evenly and efficiently.



It's as clear as daylight—it must be

CORRUGATED 'PERSPEX'

'Perspex' is the registered trade mark for the acrylic sheet manufactured by I.C.I.

CP. 129

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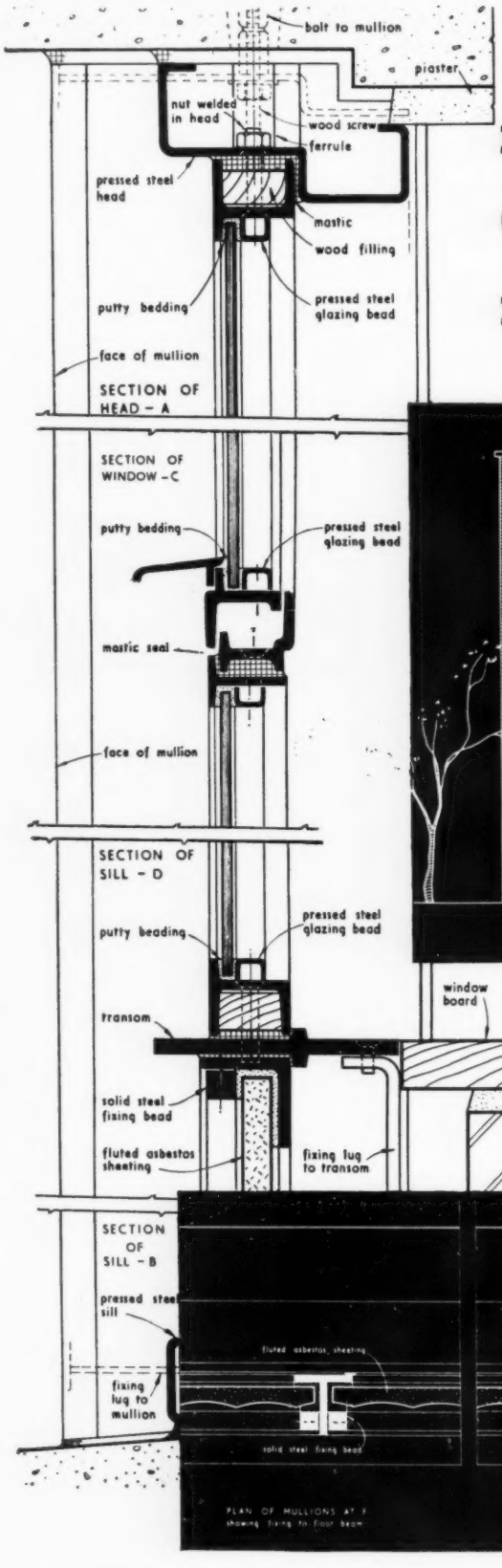
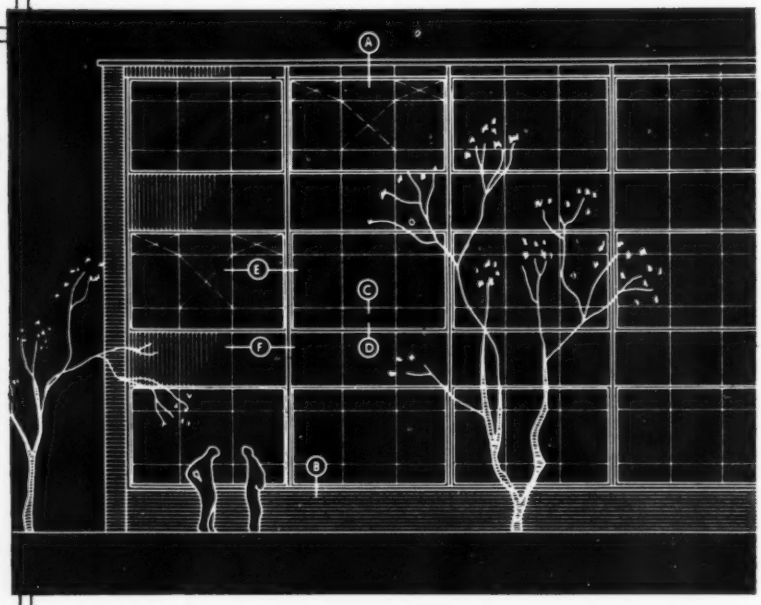
HOLOFORM PURPOSE MADE CURTAIN WALLING BY MORRIS SINGER





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Window units and corrugated asbestos cement sheet panels are set between the pressed steel mullions.

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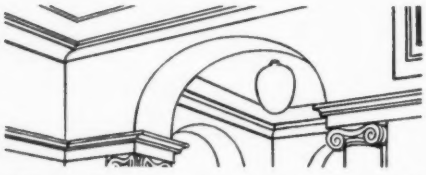
THE MORRIS SINGER COMPANY LTD., FERRY LANE WORKS, FOREST ROAD, LONDON, E.17. TEL: LARKSWOOD 1055

BPL/D66

The NEW Alkyd Wall Paint of Outstanding OPACITY



LUXOL Flat is the modern paint for modern purposes—the supreme specification for Schools, Banks, Offices, Cinemas, Stores, and Hotels. And a boon to the small decorator—his sharpest weapon for slashing costs and fighting any kind of competition. 20 contemporary shades—all intermixable for many additional shades—plus black and white.

A test will convince you that LUXOL Flat stands up to all the claims we have made for it. Samples available on request.

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These are the forceful reasons why LUXOL Flat reduces initial costs *and* maintenance costs:—

1. **Amazing opacity.** The obliteration achieved with LUXOL Flat supersedes anything previously available in this country and the opacity is such that one coat covers *any* colour on a previously painted surface.

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3. **Dirt Resistance.** The special, attractive 'low degree' sheen of LUXOL Flat is extremely resistant to dirt accumulation.

4. **Washability.** LUXOL Flat wears well and washes like brand new.

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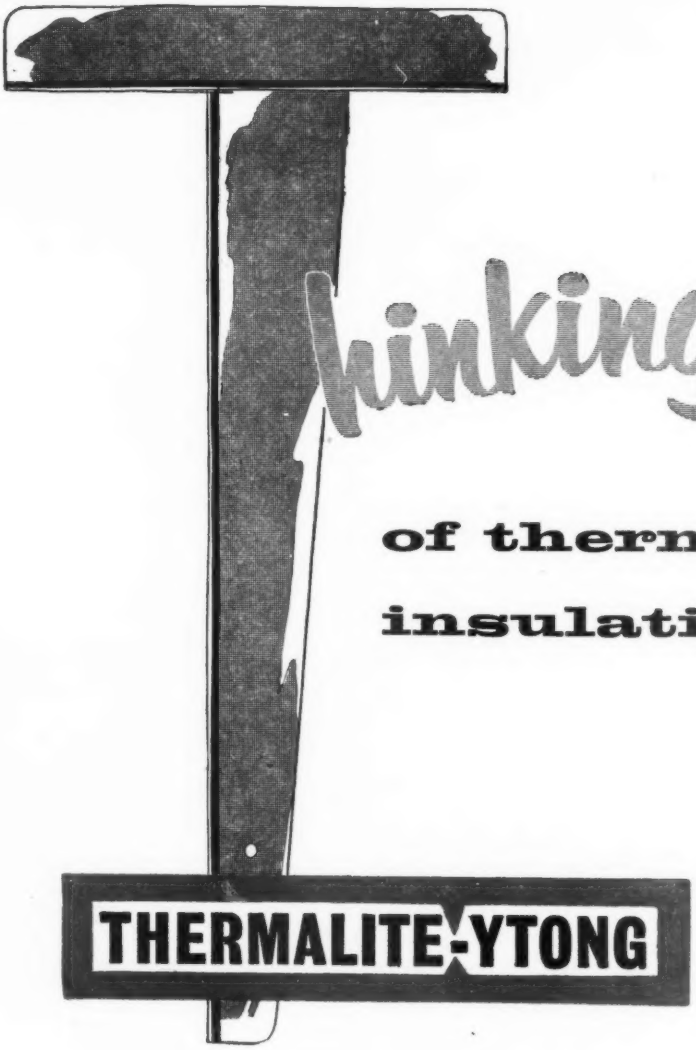

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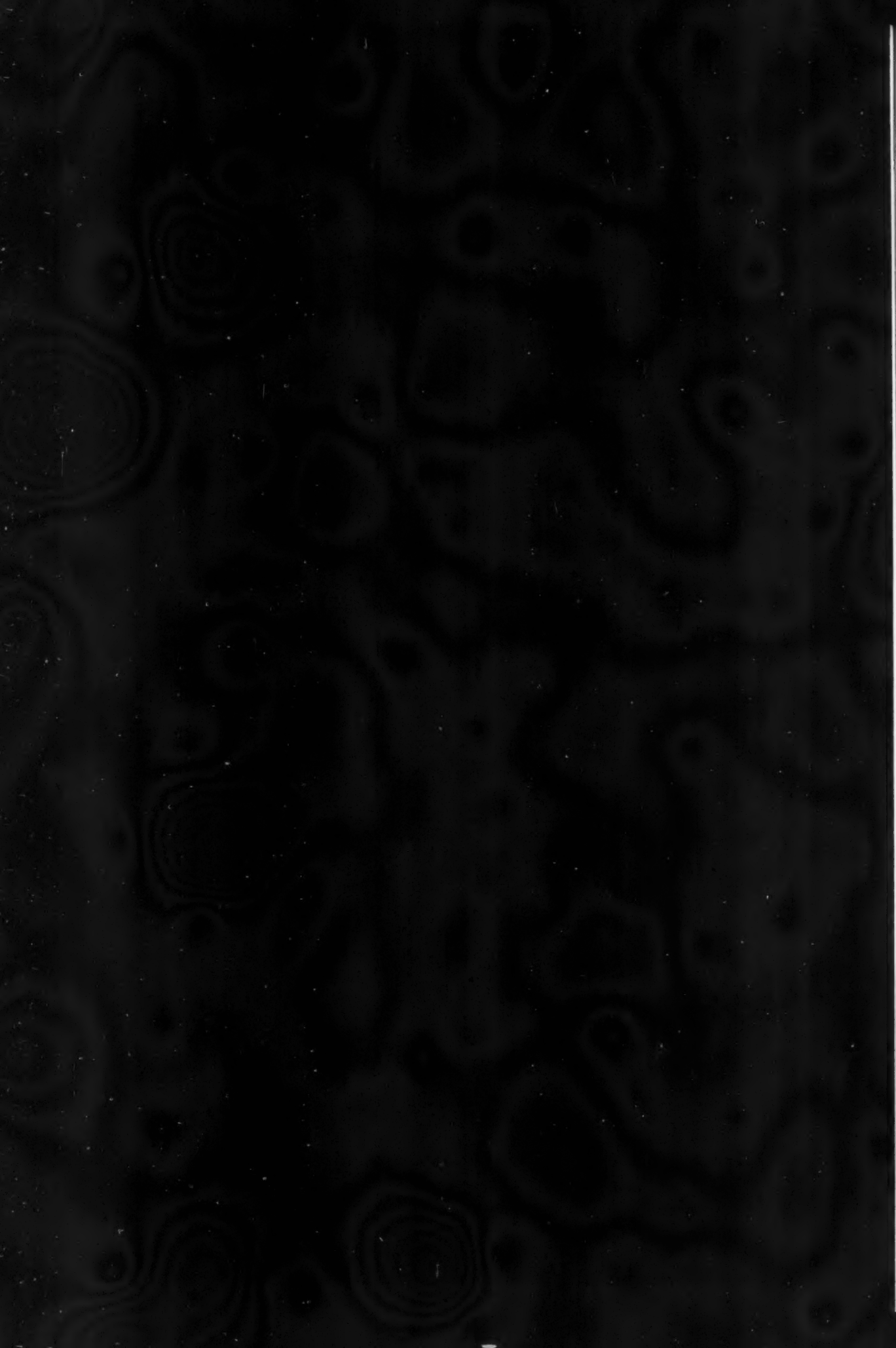
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Architects and Surveyors: Harry S. Fairhurst & Son, 55 Brown Street, Manchester, 2.

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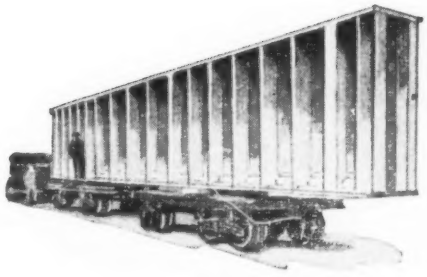

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dm WD51

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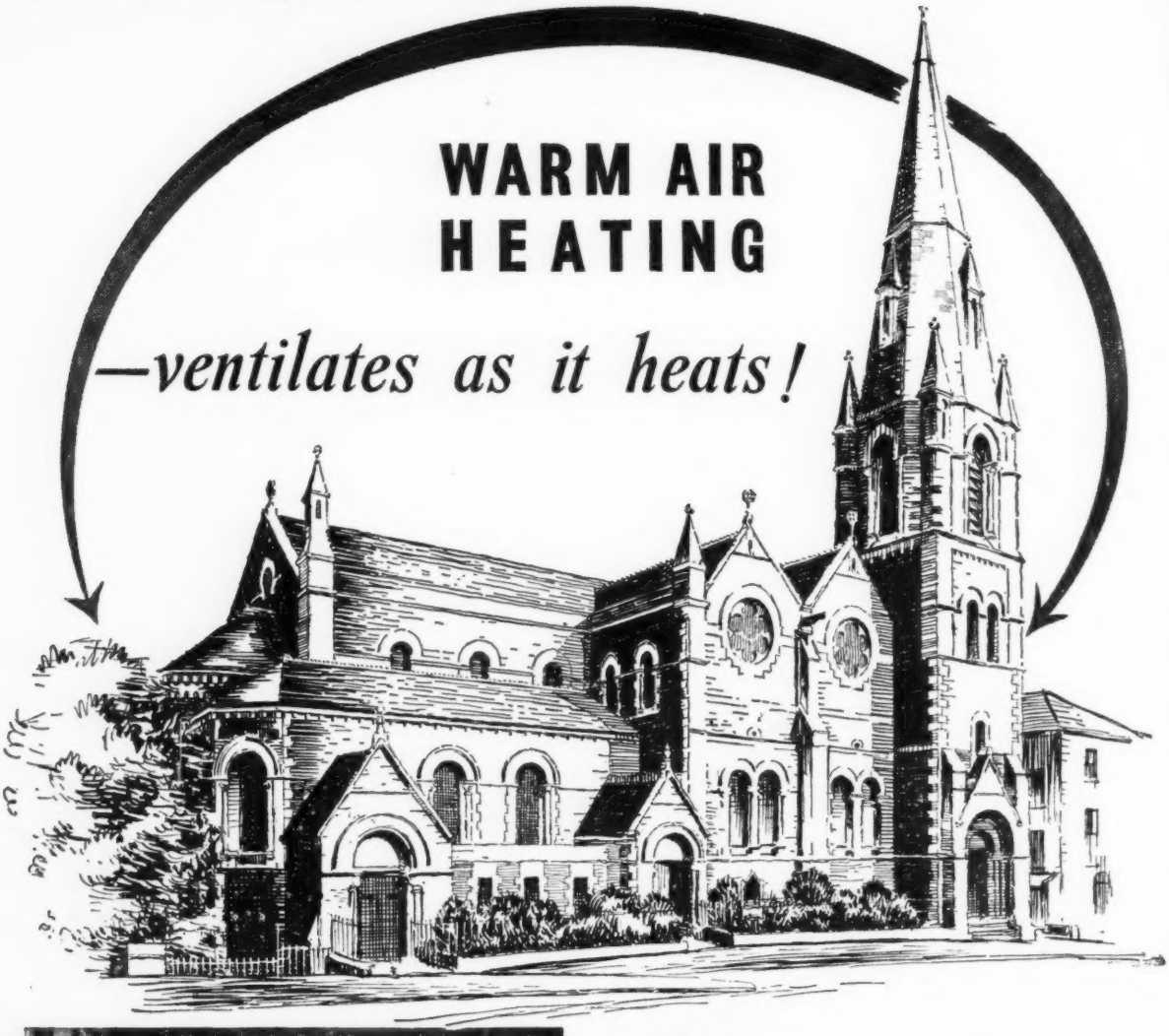
S.78

WARM AIR HEATING

—ventilates as it heats!



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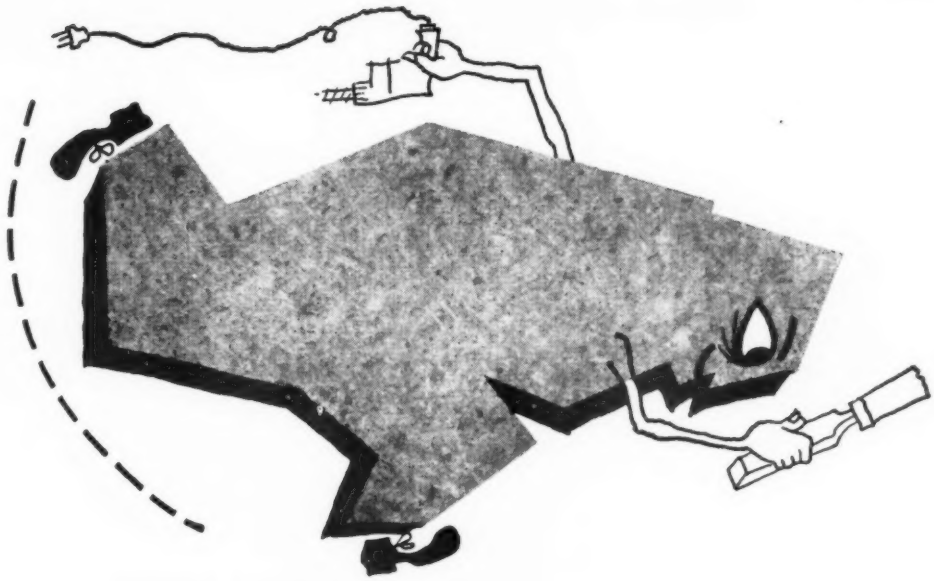

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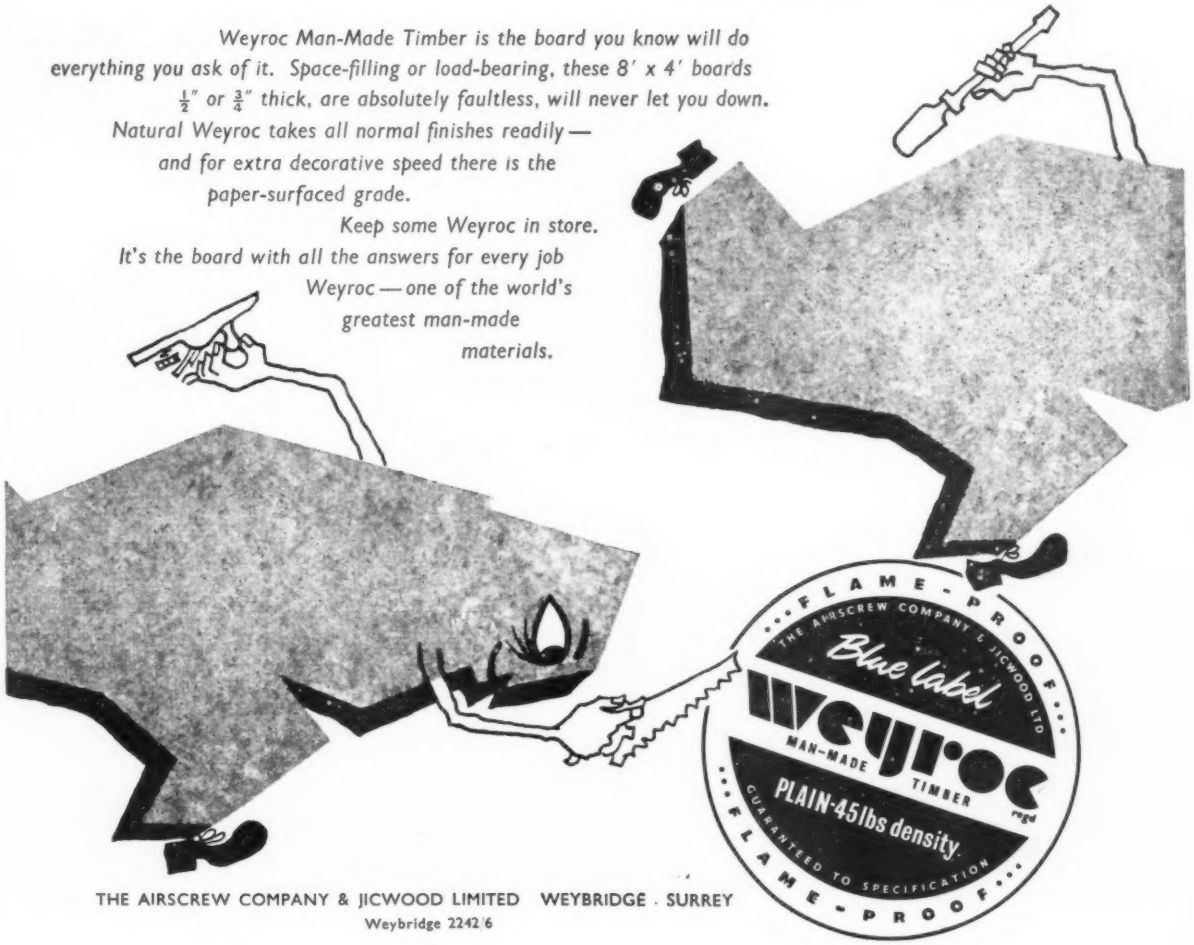

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As a secondary roof under tiles or slates, Zylex prevents damage due to roof defects and at the same time substantially reduces heat loss. Because of its exceptionally high quality, Zylex performs both functions supremely well. Available Reinforced for open rafters, Standard for boarded roofs.

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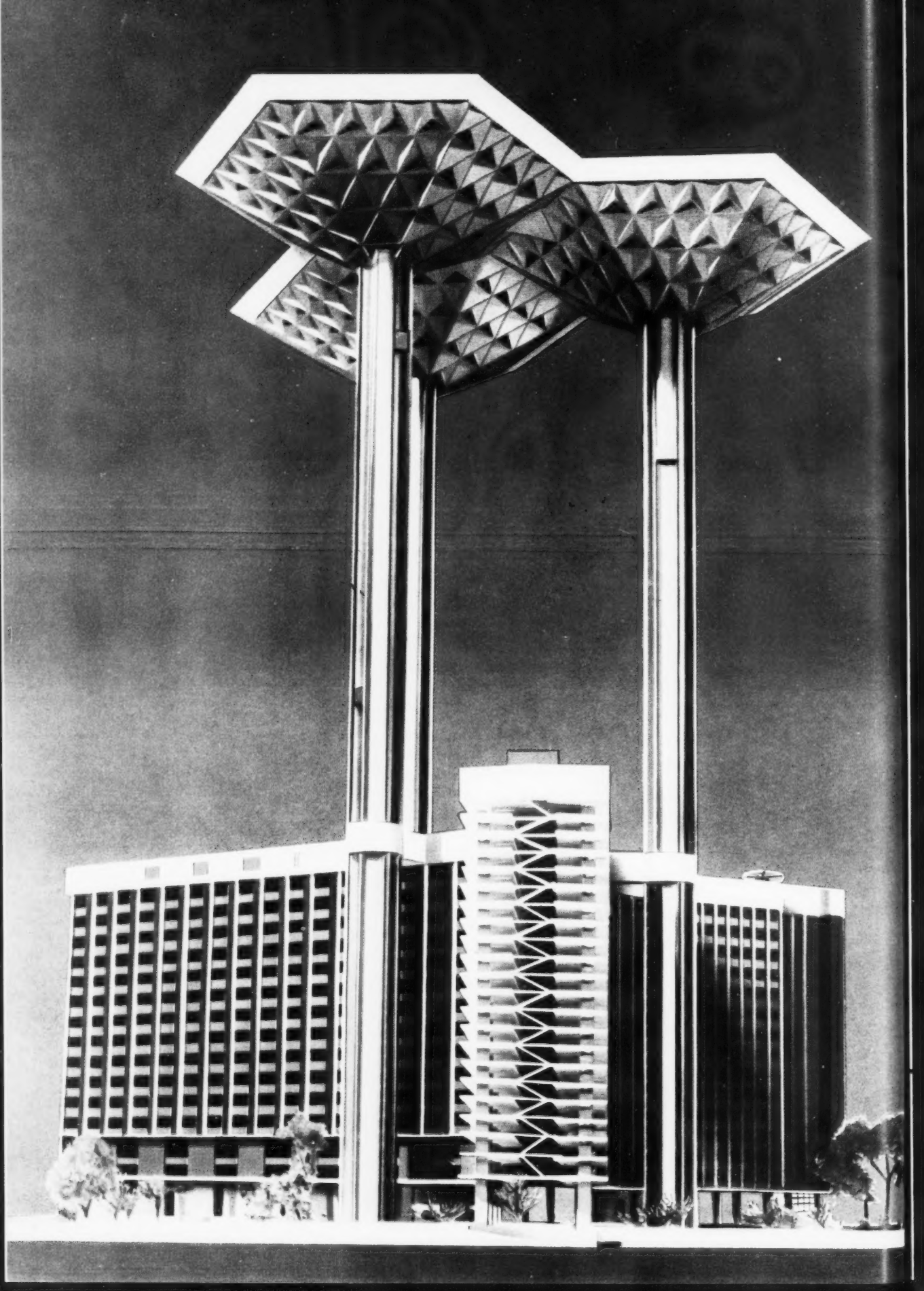
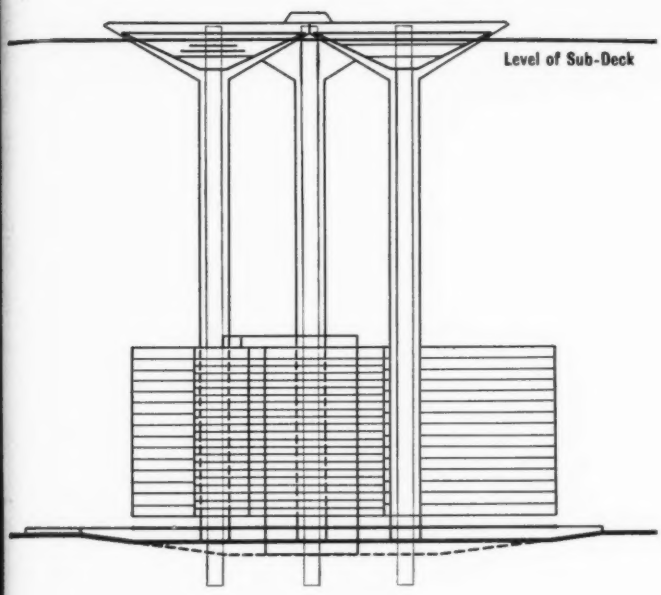


SKYPORT ONE

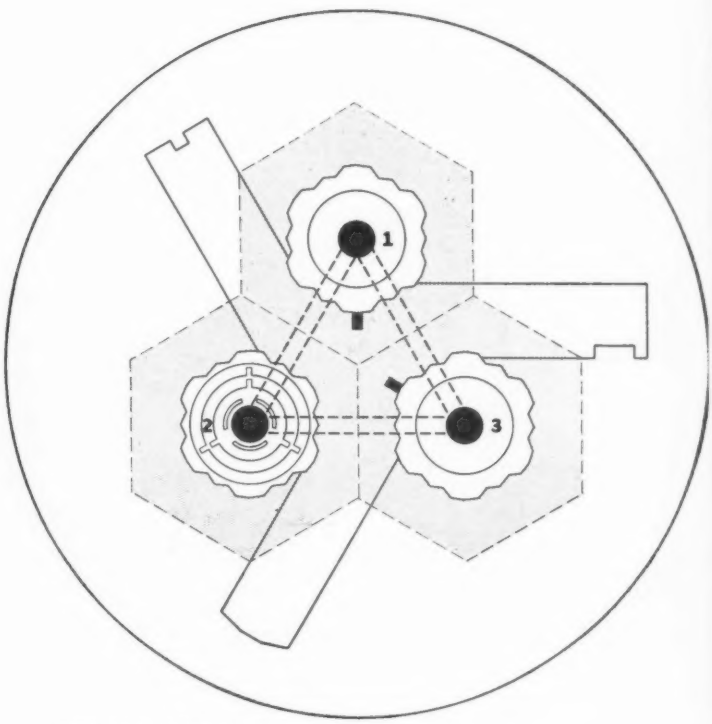


THE SUB-DECK AND PUBLIC RESTAURANT

SKYPORT ONE is a *Glass Age Development Committee project. It has been designed by James Dartford, A.R.I.B.A., as an example of the city-centre air station which will be needed in the year 2000. These drawings describe a purely imaginary building which would occupy a site at St. George's Circus, London, but they are also intended as basic plans for a standard type of Skyport, which, with local variations—especially in regard to height—would serve any large centre of population. In essence SKYPORT ONE consists of a 500 ft. high landing-deck supported by three shafts which in this example straddle a 200 ft. high triple-wing building.

The sub-deck accommodates all the services and amenities which are necessary for the safe operation of scheduled air flights and for the comfort of the passengers. These are concentrated under two of the pads. Under the third, and separated from the passenger and the administration areas, is the public restaurant. This is in the form of three tiered circular platforms, the lower two revolving slowly to give constantly changing panoramic views over London through large triangular windows. These windows make up one third of the facets of the pyramidal coffering which forms the under surface of the sub-deck. The remainder of the coffering is superimposed with a large vitreous mosaic pattern. Upward views are also afforded through the peripheral skylights set in the flight deck above.

**The Glass Age Development Committee is convened by Pilkington Brothers. Ltd., and consists of G. A. Jellicoe, F.R.I.B.A., Edward Mills, F.R.I.B.A., and Ove Arup and Partners.*



THE SUB-DECK

Lifts, Stairs and Escalators.

1 Air passenger reception and despatch, transit restaurant, bar and lounge.

2 Public restaurant and bar; kitchen; lavatories below.

3 Administration office, Staff canteen, casualty station etc.

COMPARATIVE HEIGHTS OF ST. PAUL'S CATHEDRAL AND SKYPORT

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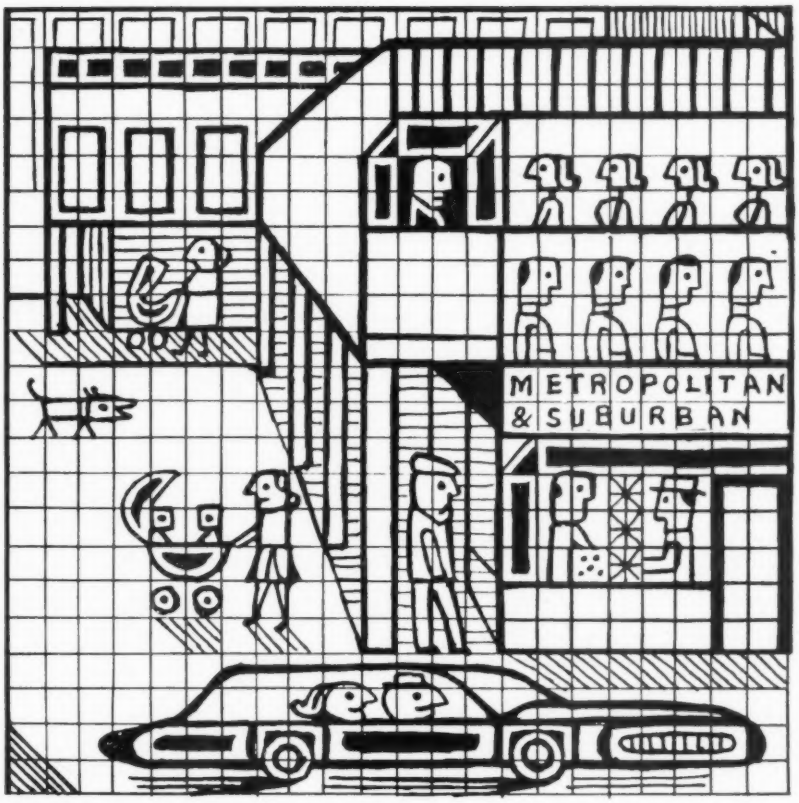

The Bankers' Dilemma

WHEN the Metropolitan & Suburban Bank decided to open a branch in Harvenage New Town, they were confronted with a grave architectural dilemma.

A normal Met. & Sub. branch office, with its Grecian pillars, rusticated stonework and brass-studded doors epitomizing security, was out of the question. And what sort of bank could be built with plain yellow bricks and armoured glass?

The result, something between an exhibition stand and a welfare centre, was surprisingly effective. The Man from Chubb, consulted at the blue-print stage about strongrooms, safes, and fire-resisting equipment, had the idea of making the strongroom door visible from the street.

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And so it was. The one professional burglar who had moved to Harvenage for easy pickings took a quick look and caught the next train for London.

"These Chubb people are getting in everywhere," he was heard to say. "It's downright dishonest."

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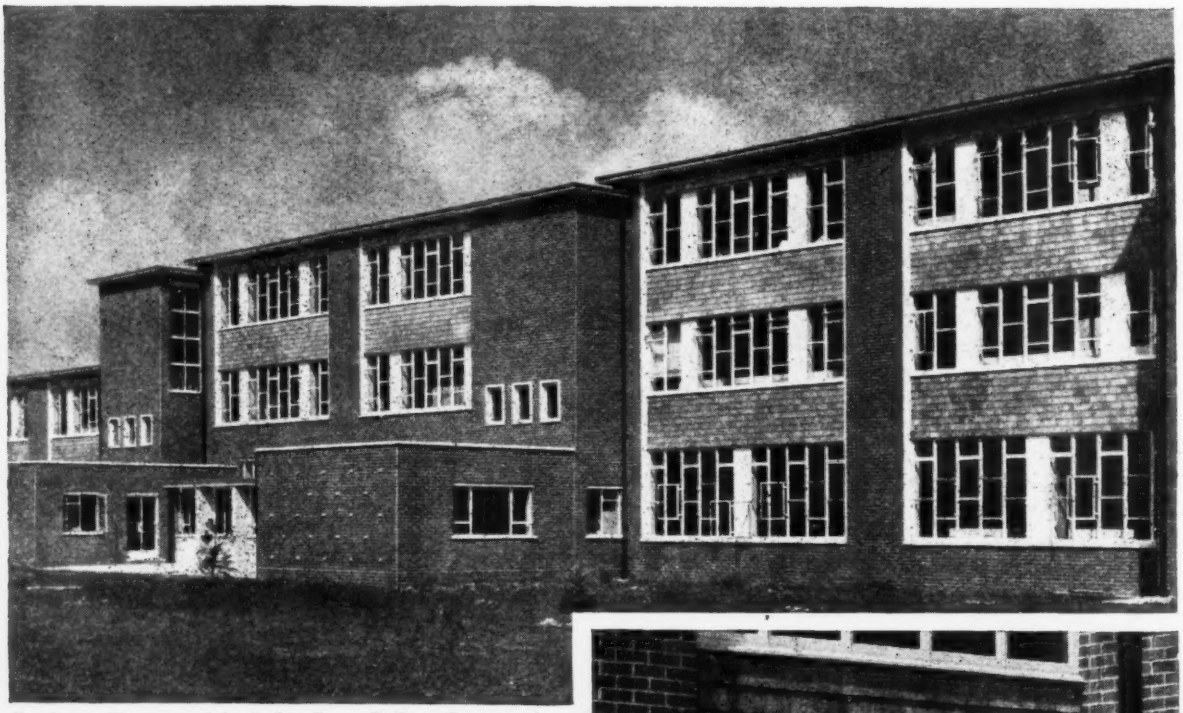

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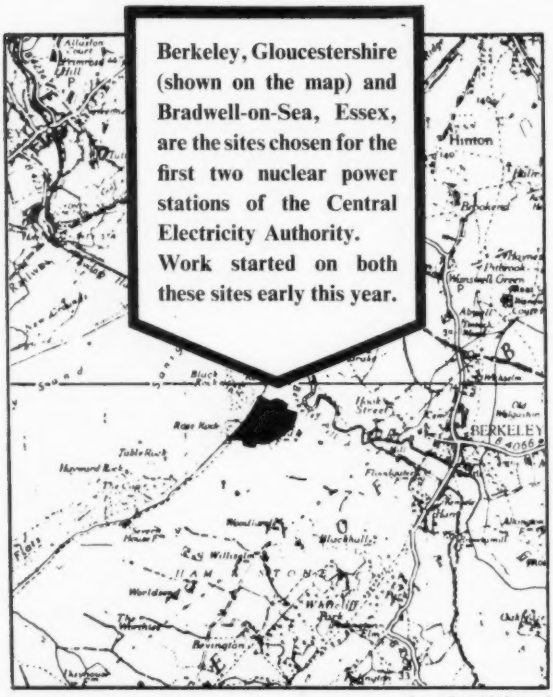


The growing need for power

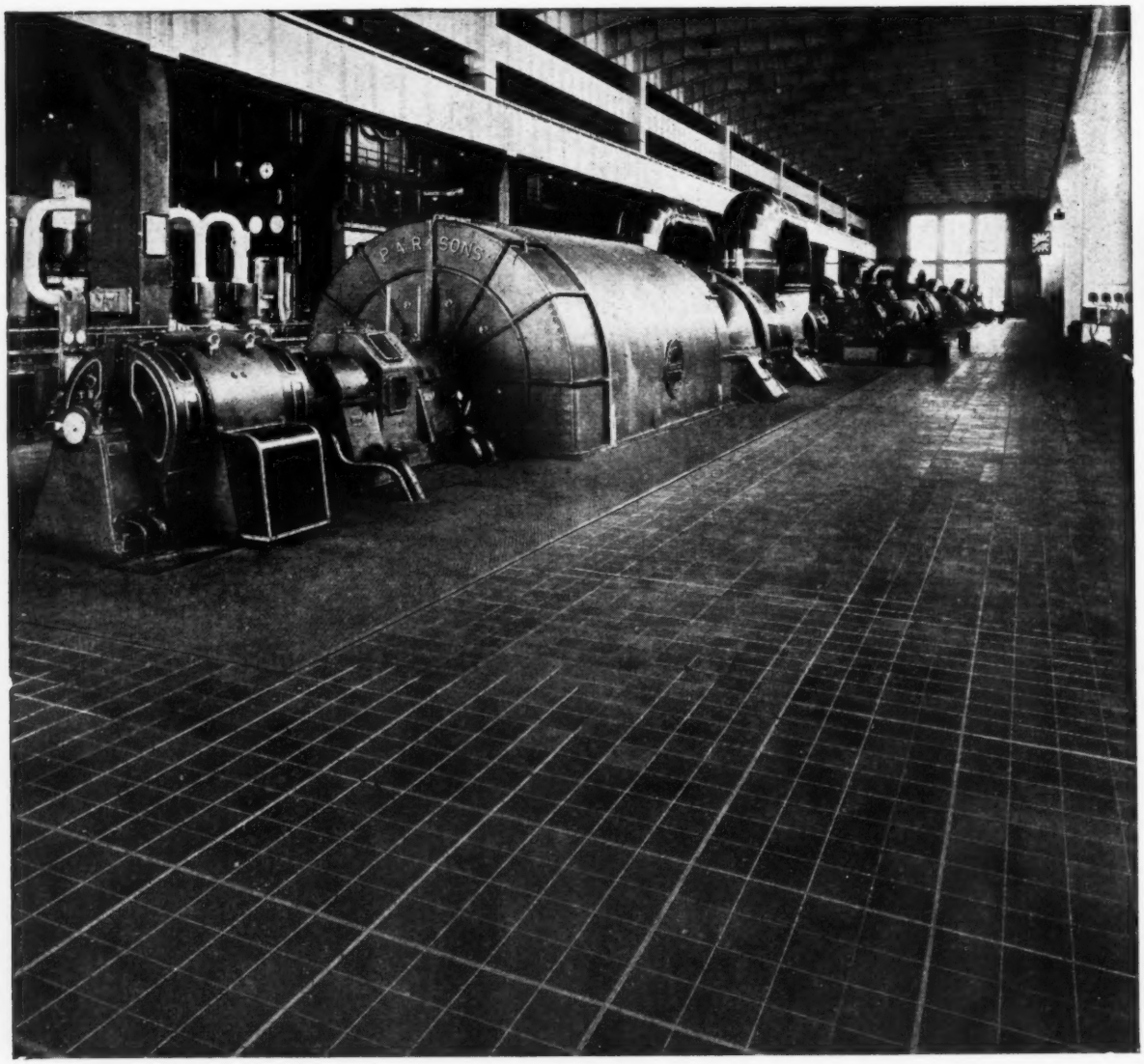
As Britain's industrial efficiency increases, so does the need for power. The demand for power doubles every ten years; supplies of home-produced coal do not keep pace with these developments. Nuclear energy will do much to make up the discrepancy between the demands for electric power and the available coal supplies.

Central Electricity Authority has placed contracts for two nuclear power stations, sited at Berkeley in Gloucestershire, and Bradwell in Essex. Negotiations are proceeding for a third station which, subject to consent, will be erected at Hinkley Point near Bridgwater in Somerset. These three stations will have an aggregate capacity of some 850,000 kilowatts.

The Government's revised nuclear power station programme provides for 19 nuclear power stations to be completed by 1965. They will develop from 5,000 to 6,000 megawatts of capacity and add to the national power resources the equivalent of some 18 million tons of coal a year.

As the demand for power grows, nuclear energy will become more and more important as a source of electric power, upon which the economic future of the country so largely depends.

CEA



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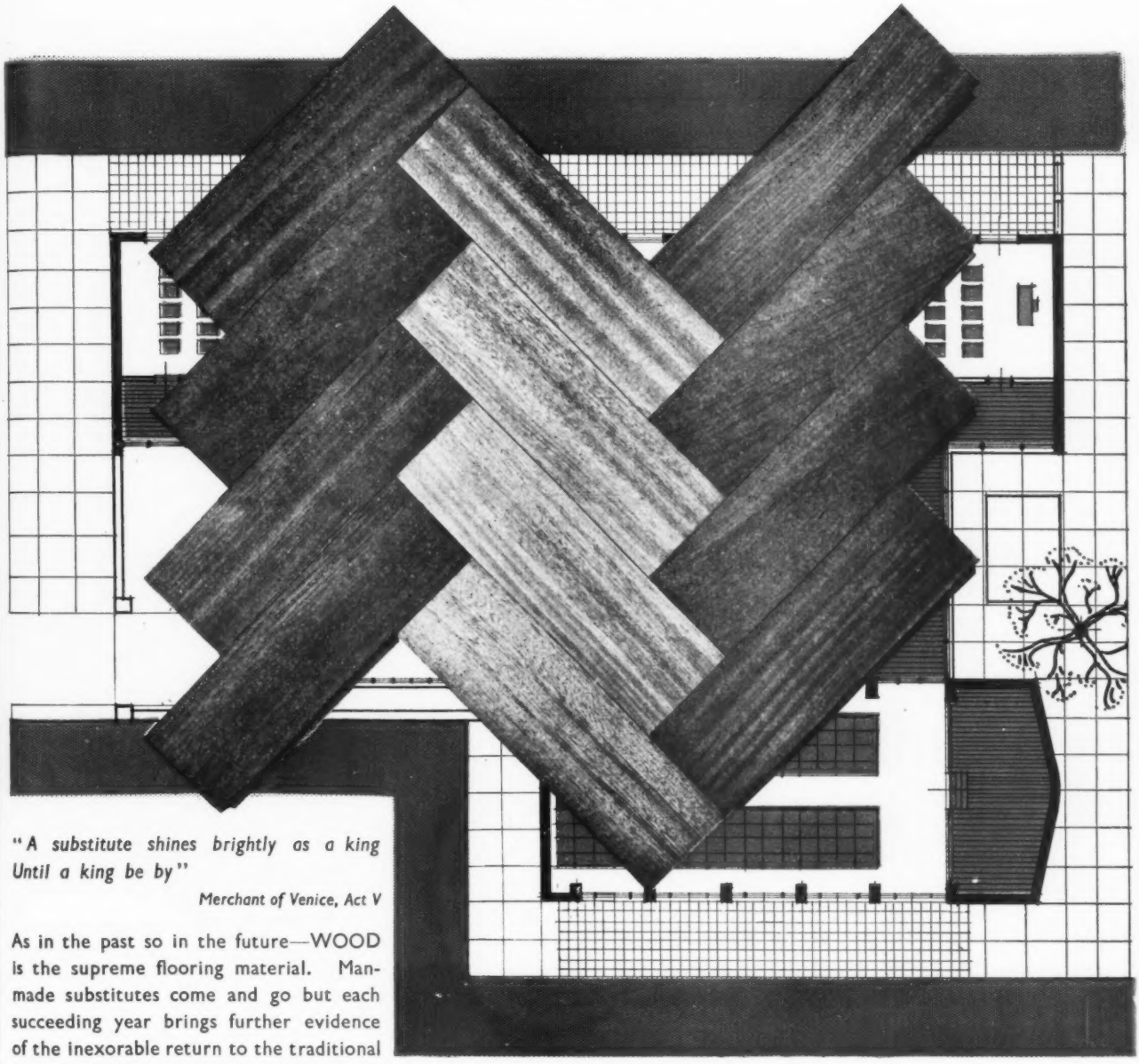

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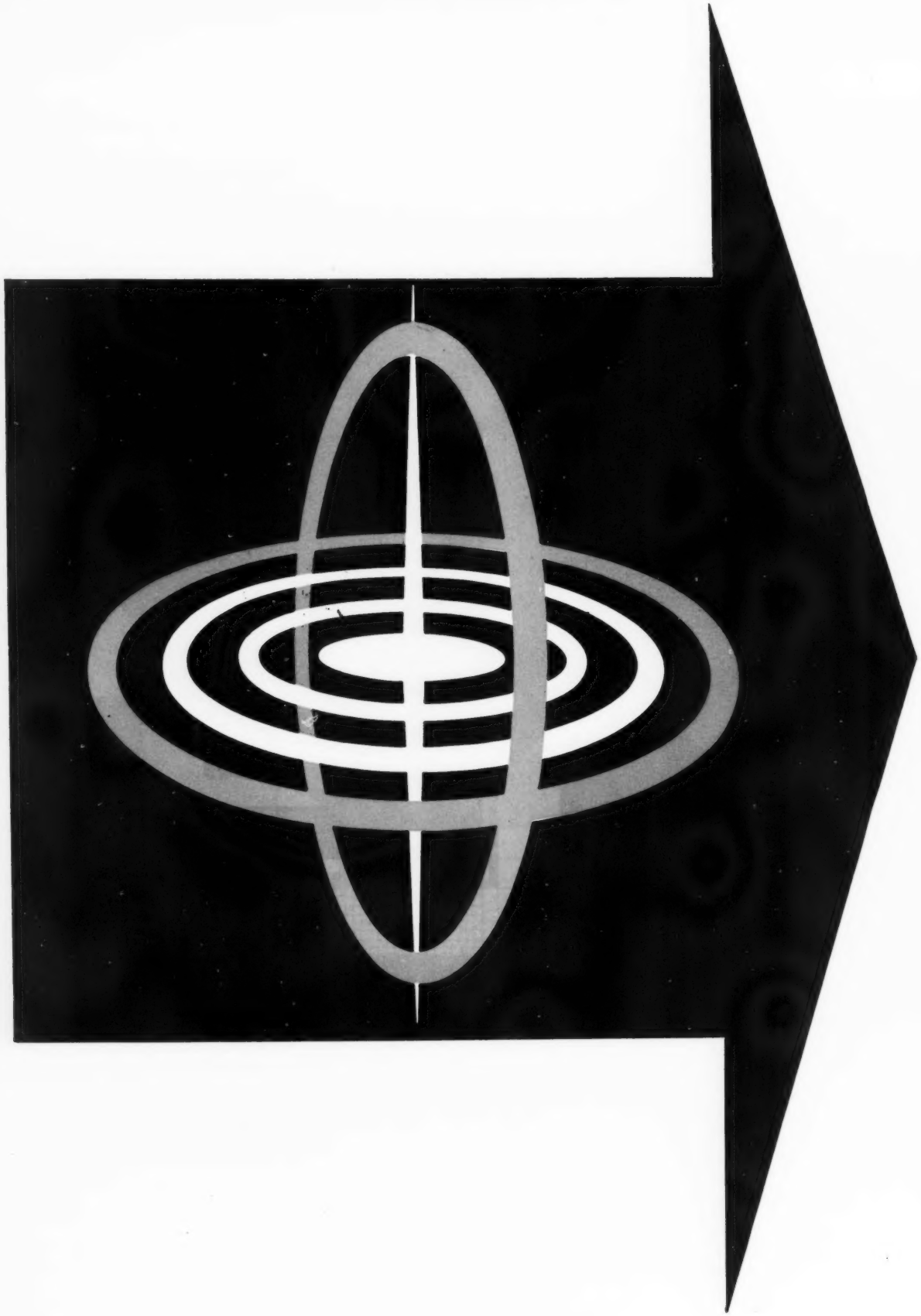

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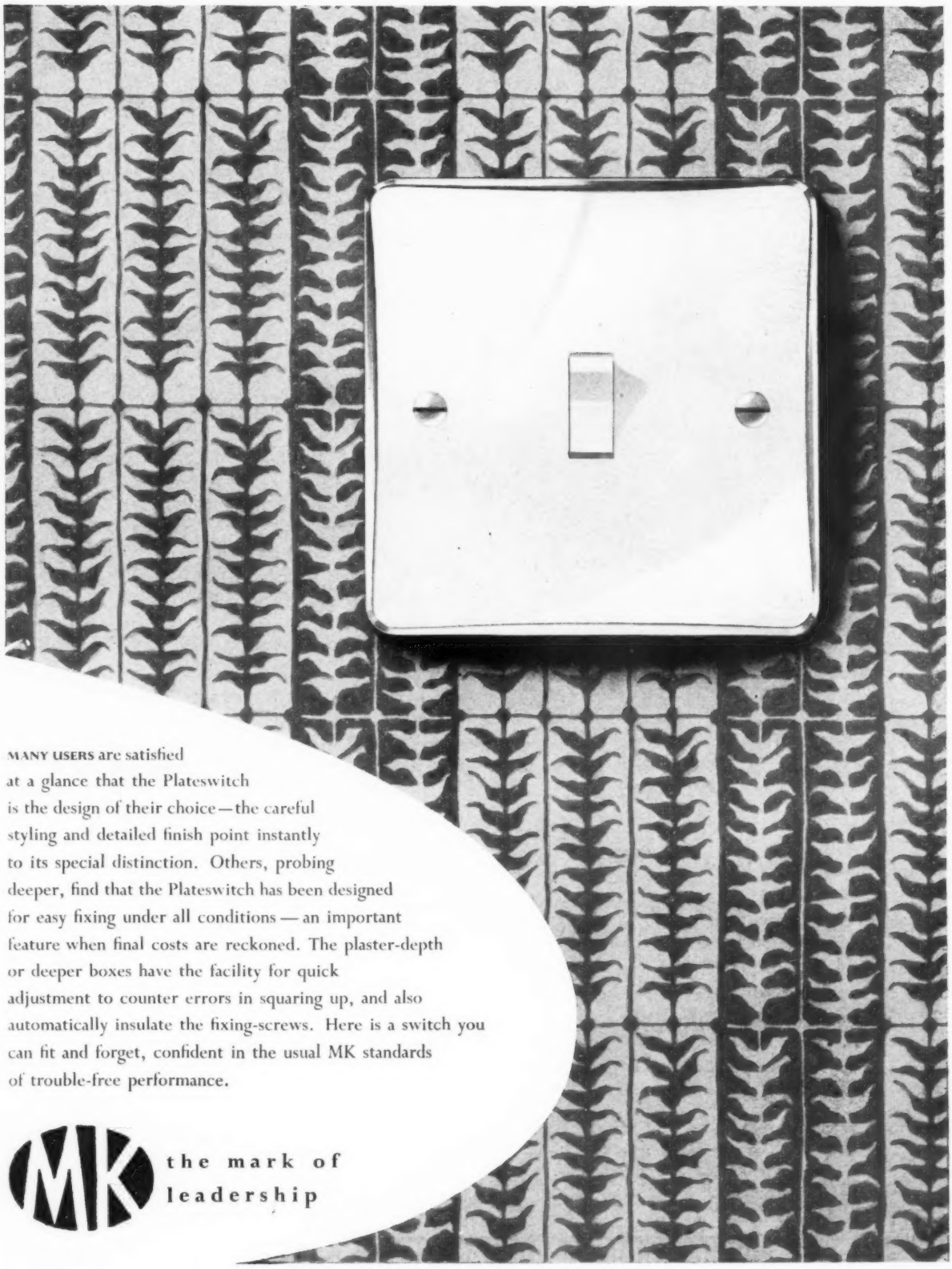

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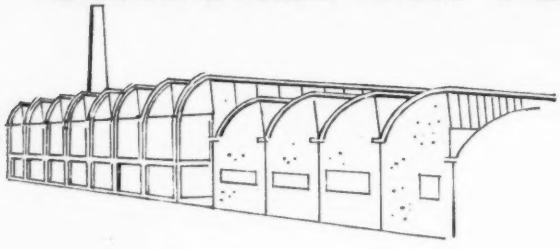

Shown in the act of being removed is a large, convex form of Canadian fir plywood used to mould the "thin shell" concrete roof at the new Cadbury factory* in Cheshire. Use of the big, 32-square foot, waterproof-bonded panels results in smooth, ridge-free concrete surfaces, with important savings in time and labour . . . one of the many ways British builders are taking advantage of lower cost Canadian fir plywood. Other uses for the strong, split-proof panels are: roof decking, floor underlay, laminated trusses and beams, hoardings and contractors' huts.

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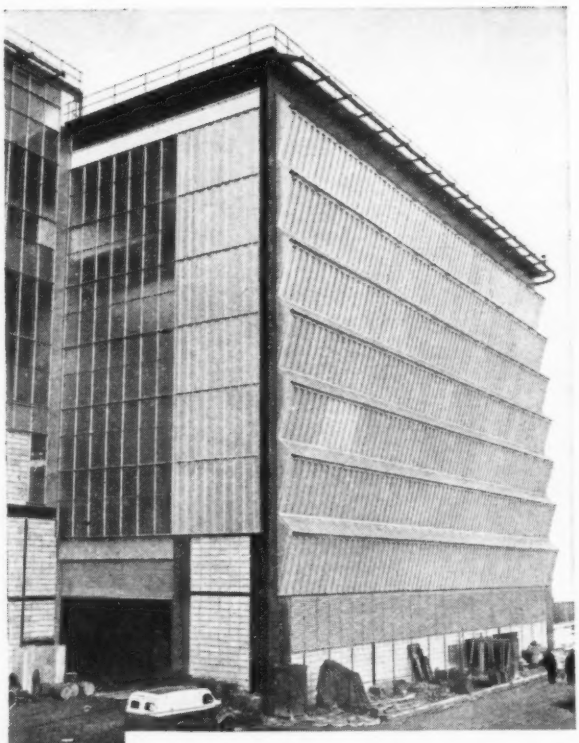

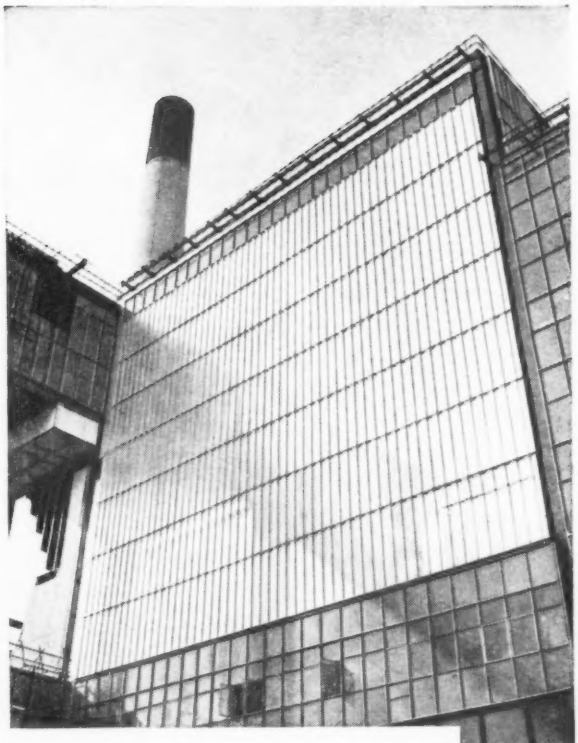

British Aluminium at Marchwood Generating Station (1)

Consulting Civil Engineers: Sir William Halcrow & Partners

Consulting Architects: Farmer & Dark, F./F.R.I.B.A.

On the west side of Southampton Water, immediately opposite the Ocean Liner Terminal, Marchwood presents a 'new look' in Electricity Generating Stations. Of major importance to its appearance is the curtain walling by Aygee Ltd., which uses a specially corrugated aluminium sheet. For curtain walling, aluminium is the obvious choice; light and easy to erect, it will give a life-time of trouble-free service.

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The nature of Sprayed 'Limpet' Asbestos coatings varies with the job in hand, but in all cases it is rot and vermin proof, will not be affected by vibration and for most applications is extremely light in weight. This is the ideal method of combining thermal insulation with sound absorption and admirably suits the needs of various types of auditoria, as well as for the reduction of noise levels in factories, offices and workshops. Full details are contained in our catalogue "Sprayed 'Limpet' Asbestos Insulation", sent on request.

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The photograph on the right shows the complete protection offered by Sprayed 'Limpet' Asbestos against corrosion. Both channels were subjected to the same conditions, the test being carried out in a dyeworks.

BIG NOISE REDUCTION

Sprayed 'Limpet' Asbestos has been used in this modern cotton weaving shed to reduce noise and for anti-condensation purposes. Photograph by courtesy of Richard Haworth & Co. Ltd., Hindley Green.

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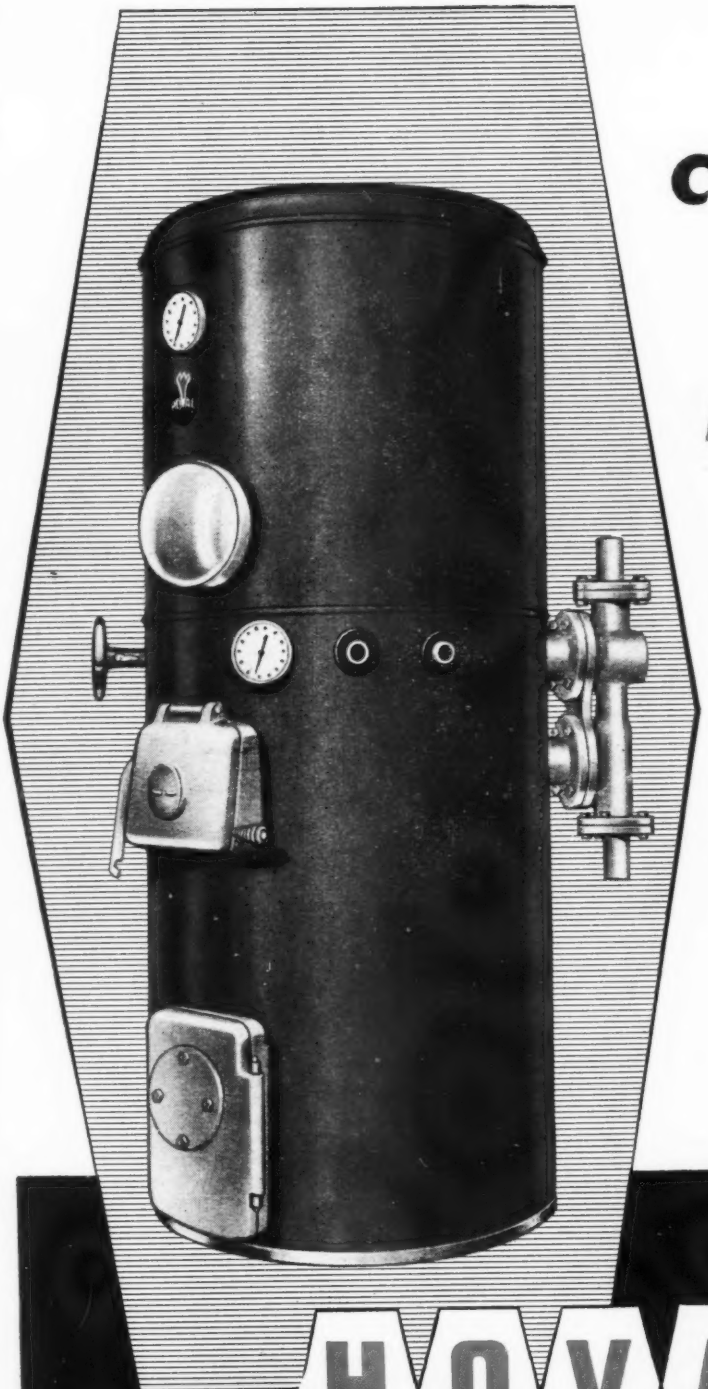

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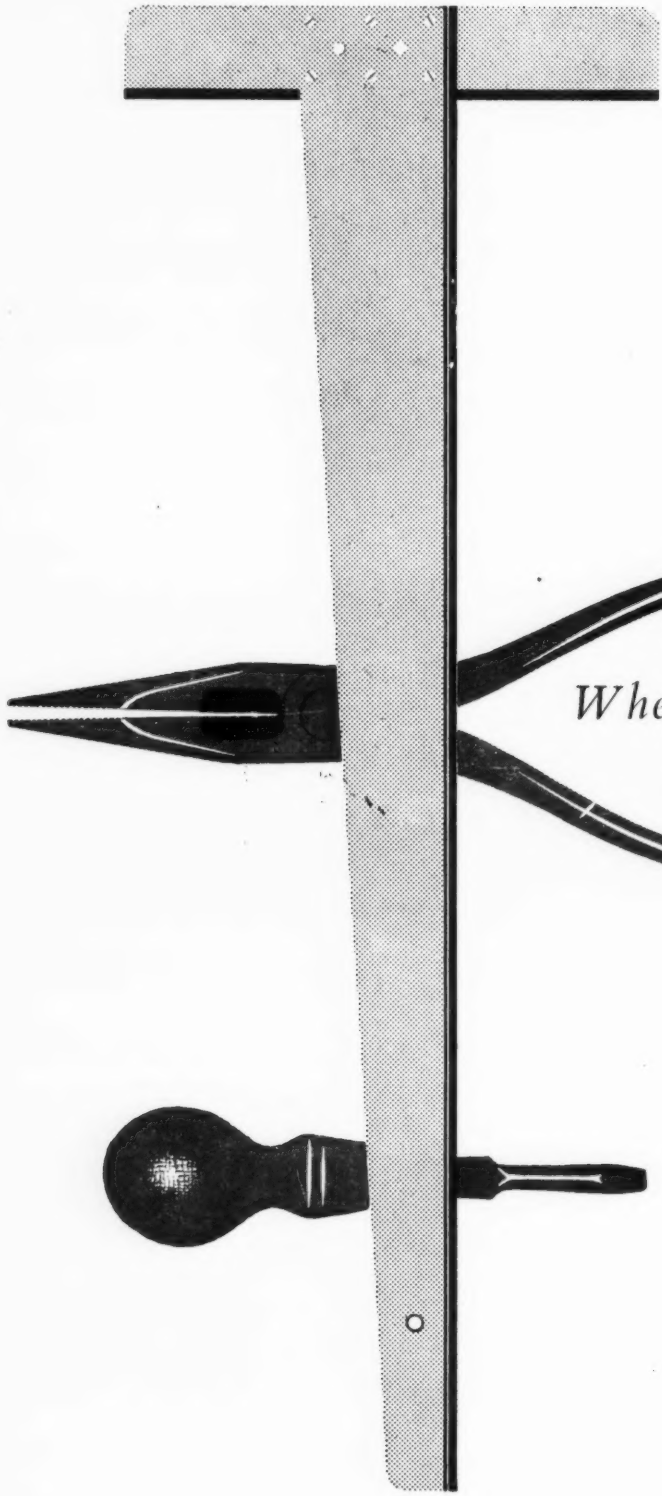

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This illustration shows the extension to Mayfield School, Putney (*Architects: Powell and Moya* FF./R.I.B.A.) which is fitted with CRITTALL STEEL WINDOWS WITH PROJECTED TOP-HUNG VENTILATORS POSITIVELY RUSTPROOFED by the hot-dip galvanizing process.

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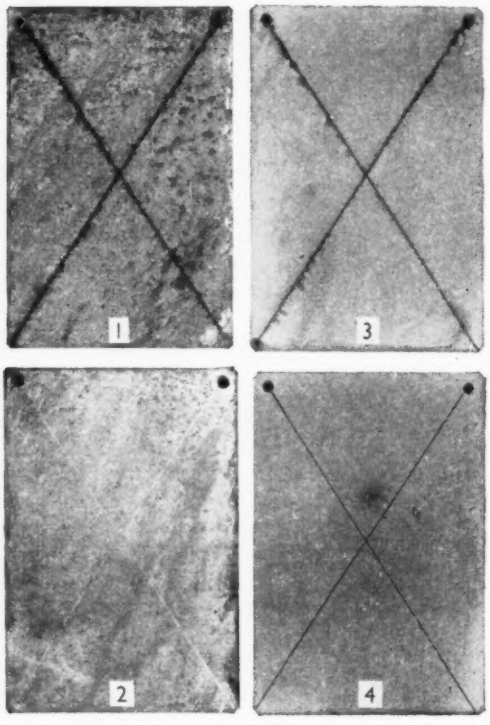

The test plates shown in the photographs have been damaged by deep diagonal scratches before 28 days exposure to the accelerated corrosion test in accordance with B.S. 1391 (SO_2 test).

1 Two coats of red lead paint

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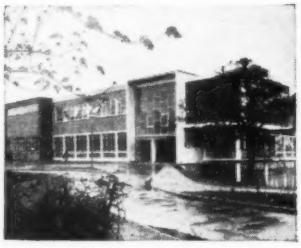
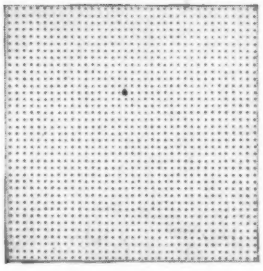


heated and acoustic FRENGER Ceilings

The Technical Service Laboratories at Egham, Surrey, of Shell Chemical Company Ltd.

(*On right*) interior of Surface Coatings Laboratory.

Architect: Philip Cranswick, A.R.I.B.A., A.M.T.P.I., of Walker, Harwood & Cranswick.



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Architects: T. P. Bennett & Son, F/F.R.I.B.A.
Consulting Architect: The late Gilbert P. Scott, A.R.I.B.A., F.R I C.S.

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THE ARCHITECTS' JOURNAL

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AIA CENTENNIAL CONVENTION

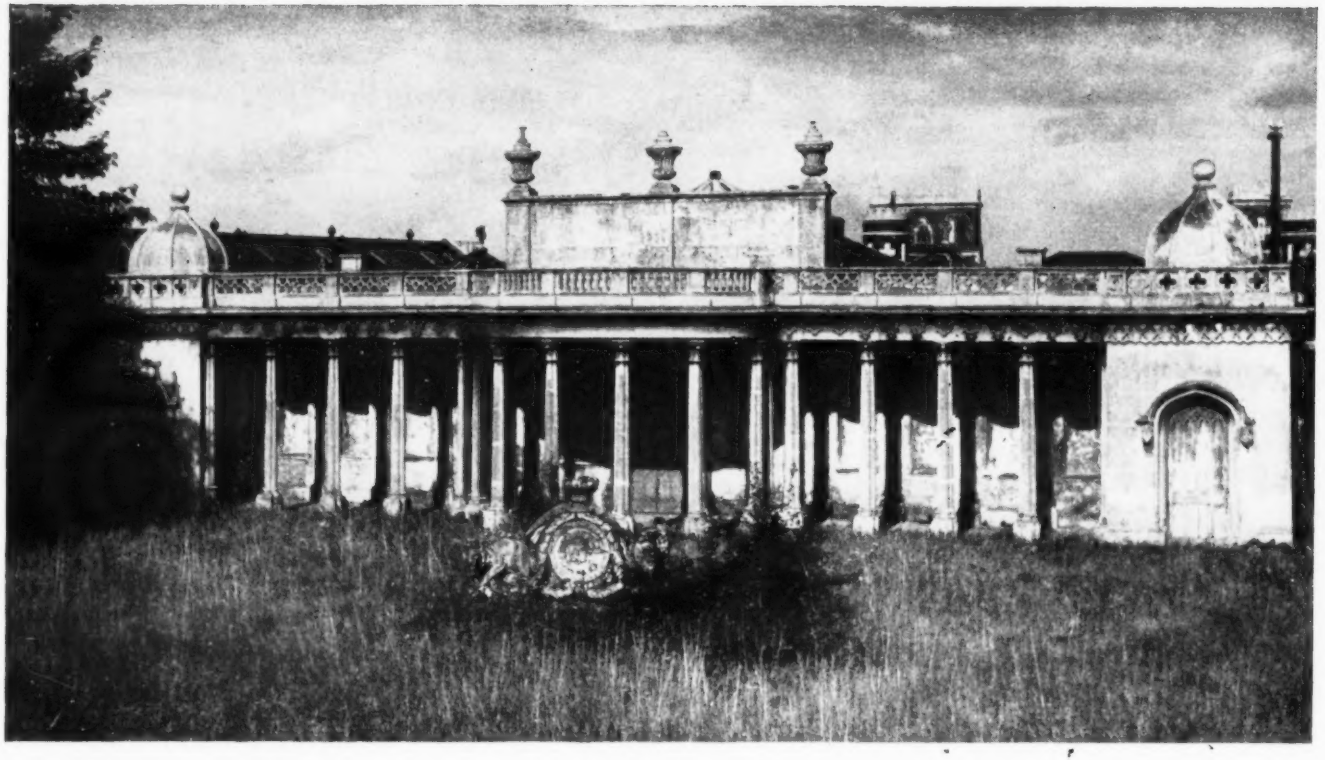
2. *The Laymen*

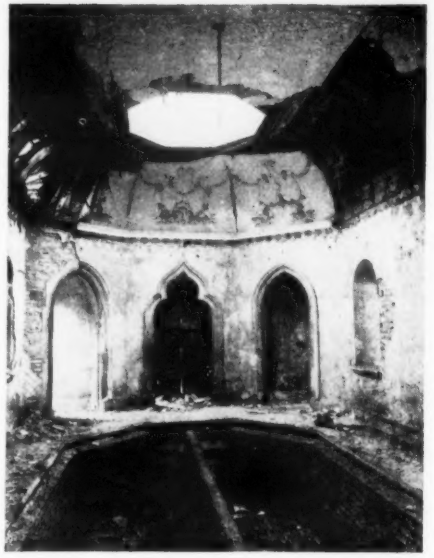
Assuming that there should be some serious talk between martinis, who does one ask to address an architects' convention?* Since no organizing committee may be expected to be brave enough to make a selection from local architects' ranks, the usual alternatives are distinguished foreign architects or distinguished local laymen. And since all the former are likely to be Americans anyway, one may as well concentrate on the latter. The AIA did. With the exception of Mr. Leon Chatelain, Jr., the President, at the beginning, and Dean Pietro Belluschi at the end, architects kept out of the public discussions. The huge Sheraton Hall's platform was decorated mainly with publishers, scientists, ferns, politicians, musicians, an actress, red and yellow imitation gladioli, and a sculptor.

*

Confronted with some 4,000 eager upturned architectural faces, the laymen reacted differently. Some felt compelled to colour their customary subjects with references to buildings. Thus Dr. D. W. Bronk, President of the National Academy of Sciences, after explaining that his confrères "have now achieved the power of pouring into the atmosphere pollution . . . which can destroy the very life of man," remarked that here was a challenge to his audience. Architects, he suggested, should be mulling over ideas for making radiation-proof houses for all. Mr. Edward Weeks, editor of the *Atlantic*, made his "keynote" address, *A New Century Beckons*, an attack on small-house developments. Everyone applauded loudly, for no one present felt responsible for them. The actress, who was Lillian Gish, attacked bulldozer develop-

*For Part 1 of Robin Boyd's AIA report see the JOURNAL of June 13.





Trustees for Civic Design

This colonnade (1765) from the garden of the rococo gothic Arno's Court, next to a trolley-bus depot in a squalid stretch of the Bath Road on the outskirts of Bristol, is to be saved from demolition to become a landscape ornament on a new site. The creative use of the old like this is one of the mainstays of Improvement—the name used in this month's *Architectural Review* to describe the policy of the newly established Counter-Attack Bureau. This has been formed as a result of the flood of requests for help that have come in to the *Review* as a result of their attack on Subtopia. The Bureau provides advice and publicity to all who want or need it. It obtains expert opinion or pulls what strings are at its disposal to preserve or enhance and, above all, *improve* the character of places. The JOURNAL hopes that readers who learn of existing, proposed, or suspected outrages will write to: Counter-Attack, 9, Queen Anne's Gate, S.W.1. This policy is an attempt to carry on the work begun by Clough Williams-Ellis in the 1920's and the ex-Bristol colonnade (shown above, with the interior top right as it was about 1900, and as it is today) is therefore a particularly apt illustration, for the "new site" is Williams-Ellis's Portmeirion (bottom) where it will stand at the back of the lawn facing the slipway. The fact that the *Review* felt that it must set up the bureau is a measure not only of the renewed interest in spoliation in town and country —a revival very largely due to *Outrage* and *Counter Attack*—but also of the need to go further than mere preservation and make a positive contribution towards the improvement, and the enhancement, of town and country—a task to which architects are above all fitted to contribute.

ments and they were assaulted again by Dr. Paul Tillich of Harvard, who dwelt on the difference between our animal surroundings and our human environment and described the hated mutual enemy—the miserable little house—as a symbol of the modern phenomenon of loneliness in a crowd. Mr. Bennett Cerf, publisher and writer, skirted architecture and told anecdotes (*e.g.*, the day when an address-plate jammed in the automated enveloper at Time Inc. and a lonely farmer out west received 12,600 heartrending pleas to renew his subscription to *Life*). He also told funny stories in support of People's Capitalism (*e.g.*, the English national-health doctor who simply rubber-stamped an expectant wife's middle with a minute message: "When you can read this without a magnifying glass send your wife to the hospital") and commented that "American arts, culture and—as you people well know—architecture, are now ahead of all Europe put together." He appealed to Americans, therefore, to drop their "ridiculously apologetic" ways, for they are the fountainhead. "Now we give the people of Europe not only our dollars but our ideas."

*

On the whole, however, such thoughts were swamped by warm waves of internationalism. Mr. Paul G. Hoffman, US Representative at the UN General Assembly, ignored architecture altogether and spoke of the problems of international understanding—especially in regard to Asia. How wrong, he said, to talk of these as "undeveloped nations." They are young nations coming up quickly and we can hardly expect them to understand us if we don't first try to understand them. Several foreign delegates presented illuminated addresses to the AIA and the Danes added a gold medal. They mentioned how much they admired American architects, especially Frank Lloyd Wright, absent, to whom they had given a similar medal the day before, all for himself. Several times Churchill was quoted. "We shape our buildings; then they shape us," came out two or three times and Dr. Bronk reminded us of the immortal line, as he put it: "There are so many who owe so much to so little." The laymen carried the convention well, and so politely. No suggestion was made that architects had any problems left to solve. Mr. Henry R. Luce, speaking in anything but *Time*-style, apparently saw no fault in the future which a few architects couldn't cure. The unofficial theme of the meeting was: "Give me enough architects and I will give you Utopia." Have laymen lost their punch?

ROBIN BOYD

The Editors

COST ANALYSIS—THE NEXT STEPS

ON page 949, we print the last two of the lecture-discussions organized by the JOURNAL and the Regent Street Polytechnic School of Architecture. Over the past year we have known that an increasing number of architects, surveyors (and builders) were becoming interested in cost analysis, and it was this that prompted the idea of holding such a course. But the number of enrolments, 350, took us by surprise. Such a widespread response, and certain leading problems thrown up during the course, clearly point the direction for the next step:

First, that there is a need for the yet more intensive publication and exchange of cost information and second, that the preparation of analyses should be, so far as possible, on an even more uniform basis, so that they are more useful and more easily comparable one with another. Present JOURNAL analyses do not conform with strict definitions, owing to differences of interpretation on the part of quantity surveyors. But this has not really mattered, for our purpose in publishing them has been to encourage people to prepare their own and accumulate the experience necessary before the technique can begin to be crystallized in a form which is generally agreed. To meet the needs thrown up by the course, we issued, at the last meeting, two invitations. One was to those with experience of cost analysis and cost planning to form a small study group with the purpose of reviewing the lists of elements and the definitions of elements now in use, in order to produce some (provisionally) standardized form which all architects and quantity surveyors may use so that their work is co-ordinated. The second invitation was to those who have no experience, but intend, perhaps as a result of the course, to prepare and use analyses. We asked them to give us their names and addresses to enable us to pass on to them the findings of the study group; and to help them where we can, with advice. We also propose to publish the analyses they prepare. By these means, we hope to improve the usefulness and increase the number of analyses published. We extend this latter invitation to readers who were not at the course.

One other step forward was announced at the last meeting. Michael Austin Smith told the gathering that the Council of the Architectural Association has just formed a "costs" com-

mittee. Terms of reference have yet to be formulated, but they will no doubt include the possibilities of the collection and exchange of cost information. This very encouraging news means that there are now five separate bodies with similar interests—the Cost Research Committees of the RIBA, the RICS and the AA; BRS and the JOURNAL. We have told them of our proposal and we are confident that close co-operation between us will secure uniformity in the presentation of cost data.

To conclude, we wish to thank all those who contributed to the success of the course, to the lecturers, to the chairmen and not least to the principal and staff of the Regent Street Polytechnic School for their wholehearted support and co-operation.

PROFESSOR OF BUILDING SCIENCE

The University of Liverpool's announcement on another page that it has established a Chair of Building Science and appointed its first tenant must be given a great welcome by the Industry and all the associated professions, for clearly it is a step in a sound direction.

We must be forgiven some qualification at this point, however. The step is worth while and it has no doubt demanded a great effort from those who took it; but relative to the potential field of activity it is pitifully small. It is not a Chair of *Building* which would have a single, relatively clear-cut field with which to deal. It is not limited to architecture, for it is linked to the faculties of Science and Engineering as well. It is presumably nothing less, therefore, than an appointment to organize education in the relevant sciences and technology for architects, for the associated professions, and for people wishing to enter the manufacturing or the assembling side of the Industry. And then, of course, there are both the undergraduate and the post-graduate aspects to cover, with the latter's special emphasis on scientific method and research. The field is therefore vast, and presumably too large to tackle all at once. Different kinds of courses and different degrees of specialization are needed in different combinations. Architects require some elements of almost all the branches—physical, chemical, sociological, economic, structural and others—brought together and focused upon design. Engineering professions have each a narrower front and much greater depth of penetration. The Industry calls for yet another balance of breadth and depth. The question facing the new Professor must be "where and how to begin"? Perhaps we can hope that, from among the contending interests, architects will have an early call upon his help, for it is no particular secret that they first brought the value of such a Chair into focus, and not only is their need urgent and substantial, but their drawing boards are now perhaps the most productive point to touch in the building cycle. Buildings begin here, and it is here that the main decisions affecting efficiency and economy are taken.

The new Professor will have the best wishes of architects as he takes up his appointment.

NO SENSE ON PROPORTION

The margin by which the motion in favour of proportional systems was lost at the RIBA's debate last week was sixty-odd to forty-eight with a great number of abstentions—enough abstentions, in fact, to reinforce ASTRAGAL'S suspicion that proportional systems are a dead issue again. The debate was not such as to force people to take sides, anyhow. Professor Pevsner set things going at a terrific pace with his lightning historical survey "from Genesis to the Modulor in fifteen minutes," but once this launching-boost had been expended, the rest of the stages of the rocket only fizzled, so to speak, and the debate was soon off-course and cruising at half-power. Peter Smithson, the last platform speaker, sounded more business-like than his immediate predecessors, but the debate was already beyond salvation.

*

There were authoritative interjections from the floor, by Professor Wittkower, who started the post-war craze for proportional systems, and from John Summerson. The former embarrassed Modulor-fanciers by quoting Corb himself as saying, "Le Modulor, je m'en fiche," and Summerson embarrassed Corb-fanciers by drawing a parallel with Lutyens, and saying that it was a problem in psychology, basically, that men of such powers of invention as

Corb and Lutyens should feel compelled to fool around with private systems of proportion. Rather more of this sort of contribution, and rather less metaphysical flannel about "The essence of a work of art is unity" and "A square is always a square," might have helped the debate along quite a bit.

*

Another way to have made this debate livelier would have been to hold it about five years ago, of course, when people really cared about proportion.

SUMMER VISITORS

The presence of Professor Wittkower amongst us has already been noted in this column, but he is neither the first nor the only summer migrant of importance to touch our shores. Professor Hitchcock has arrived with the inevitability of the passing seasons, but may already have passed on to hotter and more romantic climes by the time you read this. Rumour has it that he has been putting the finishing touches on his long-awaited *Pelican* history.

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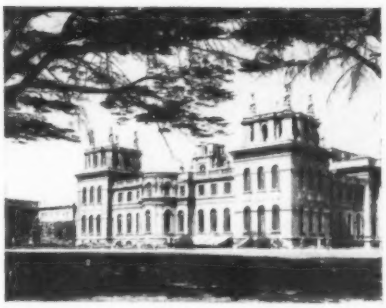
An even more welcome visitation was from Marcus Whiffen, late of the *Architectural Review*, and currently established in Colonial Williamsburg, where he has been writing what should be the definitive account of the restored Virginian capital's public buildings. It appears, however, that he hasn't had his nose to this particular grindstone all the time he has been in Virginia, for a recent issue of the *Journal* of the (American) Society of Architectural Historians contains some rather Whiffenish observations on the planning of some Virginia country houses—Whiffenish, particularly, in contrast to the usual contorted and over-footnoted style of US historical writing, by virtue of an easy familiarity with books and buildings from all over the place, and by virtue of an offhand reference to colonial Virginia as a "backwater"—who else could say that in Virginia and live to tell the tale?

LET THERE BE LIGHT

The York Institute of Architectural Study, that active little organization that is rapidly making its weight felt in the north and elsewhere, looks like pulling off something new and pretty good early this autumn. Dr. Singleton, who is its Director, has got together a team to do a special course on light and colour, and it looks like a rather special team too. He has got Allen, Hopkinson and Gloag from BRS, Medd from MOE, and Derek Phillips, Dykes Brown and Wilcock from the lighting industry. Between them they've largely built this subject up since the war into something that is a fundamental part of the modern architectural approach, and apparently they're going to be given a real opportunity to put it across in their own way—and even this is to be rather special—to a select few of lucky architects who can get in. They've given an opportunity to enrol, first of all, to teaching staff from the schools of architecture, and to the RIBA examiners, and obviously it is right that a concentrated effort should be made to get this material into the schools. But now the priority is off, and it is open to anyone to apply, at least up to the end of July. Here is something that's got on farther and faster here than anywhere in the world. It ought to be quite a thing to be in on it.

FOR BETTER, FOR WORSE

One point that Mr. Anthony Mealand, the City's planning officer, made on the City's and the LCC's plan for the Barbican at the Planning Forum last week deserves repeating: the City, he said, was in a "first-class position," because it not only possessed planning powers but also owned most of the land. Landownership, however, clearly does not solve all planning problems. Because the ground rents would be £6 a sq. ft. the rents of the flats planned for the Barbican will run from £300 to £500 a year. Mr. Mealand is looking for 2,000 families with £2,000 a year, and it was not surprising to hear him describe this housing scheme as "doubtful." The same problem afflicts multi-storey car parks: the City has just let a site for a 500-car park, at a rental of £12,000 a year, and the motorist is unlikely to be able to park his car in it for less than 10s. a day. The City is planning to provide parks for 10,000 cars, which would increase the number of cars coming into the City every day by 4,000. Is it not rather ludicrous to plan car parks on this scale when there is no reasonable probability that the roads will be able to cope with the traffic? Mr. Mealand himself admitted that the more parks he provides the more people will bring their cars in, and the worse the problem will become.



Just a reminder (below) that many of the usual visual amenities available to sightseers in this country are available at Blenheim Palace. A reminder, too, that the annual architects' conference, which is being held in Oxford from July 10 to 13, will hold, on Friday the 12th, a ball at the Palace—a ball which you can attend even if you are not a conference member, on payment of £2 2s. per ticket. (Apply to the Secretary, RIBA, 66, Portland Place, W.1.)

MATRIMONIAL ARCHITECTURE

Strange goings on at Crawley have come to ASTRAGAL'S notice. A Mr. J. Dean tried in vain recently to persuade the local Valuation Court to reduce the rateable value of his house in Goff's Park Road ("the best road in Crawley") from £82 to £66 on the ground that it was designed not by an architect, but by his wife. And she, Mr. Dean's lawyer admitted, "is the first to admit she made mistakes." The house was said to be "rather box-like," to have an "unattractive elevation"; the windows were "all different sizes," and the general appearance "not a good one." How is it that such an unpleasant house, as it appears to be from the description, got past the local planning committee in the first place? What on earth is the point of elevational control if it lets such things go by? It is only a minor consolation that Mr. Dean was unable to pass on to the rest of the community the cost of his mistaken economy in

allowing Mrs. Dean to try her hand at architecture.

WHAT THE EYE DOES NOT SEE

C. H. Aslin, putting on a charming-old-codger-but-young-in-heart act at the Central School diploma ceremony last week, produced, in his speech to the students, an account of what happened to the Herts art-work for schools programme, that differs somewhat from the official version.

*

Mr. Aslin said, in effect: At the beginning we had a tolerable sum to spend on works of art for schools, and we contrived to spend it in a way that seemed to please both pupils and staff. Then we got bolder and started putting up statues and things outside the schools where they could be seen from the road. That did it; persons signing themselves "Irate Ratepayer" started writing to the Education Committee about this scandalous waste of public money . . .

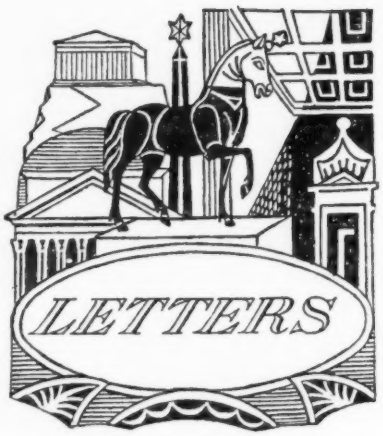
*

The Central School was faintly involved in the Herts Schools programme—to the extent of some mural paintings at least—and ASTRAGAL noted that both Aslin and members of the school staff seemed to think that the relationship might be revived in the pretty near future.

DOWN RIVER AND BACK

Each year the Thames barge race seems to fade just a little more, and it is now supported by five or six firms only, too often with vessels which are kept only for the race, and become more yacht-like and meaningless each year. Even the barges which have to earn their living are getting older and more tired each year, and barge profits are so small that only the rich firms can afford the loss of working time in racing them. For last week's race there was a fairly fresh north-easter and one was glad to see that the two purely racing machines were beaten, though among the working barges there were a few mishaps. Still, it was worth seeing, as always, with the usual sprinkling of architects on the Committee boat. But anyone who feels they ought to see the race once in a lifetime had better go pretty soon, for I don't think it will last much longer.

ASTRAGAL



P. E. Trench
H. S. Scorer, A.R.I.B.A.

The Right Price

SIR,—May I refer you to your report in THE ARCHITECTS' JOURNAL for June 20 on the lecture discussion at the Regent Street Polytechnic on Elemental Bills of Quantities, at which discussion I served as Chairman.

In my summing up I am reported to have said "We want really to get at not the cheapest price but the right price for the builder." That is quite a thought but not what I said, and for this you should substitute "building" for "builder."

I was differentiating between cost analysis and price analysis and inferring that the lowest tender price for a building does not generally coincide with its actual cost. There is I suggest a danger of inaccuracy in using a priced bill for a cost plan. True costs are historical facts.

P. E. TRENCH.

London.

"Architectural Insult"

SIR,—I would be grateful for space in your columns to ventilate what I can only describe as an architectural and educational scandal. An eighteenth century building, designed as a charity school, is being converted to a School of Art and Architecture Despite representations, the Authorities persist in carrying out the conversion of the building without appointing an architect. (Lincoln has a City Architect, and there are six architects on the staff of the school). The architectural quality of the work can best be summarized by the enclosed photograph!

Under the Town Planning Act the building is scheduled, which means that no alterations affecting the character should take place without two months notice. This notice has not been given by the Education Authorities. From an educational point of view it seems to me fatuous that the Education Authority should give grants to students and pay staff to teach architecture and design, and then decline to appoint an architect for the building work. It might even be considered a studied insult to the architectural profession.

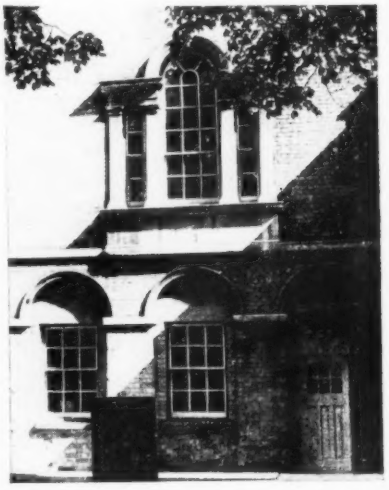
I hope that by ventilating the matter in your columns the Authorities may be persuaded to make a more rational decision.

H. S. SCORER.

Lincoln.

The editors write: Following the receipt of the above letter we have made some enquiries to try and establish the facts. The Leeke School, which was formerly a charity school, is being converted at a cost of £6,500 for use as a School of Art and Architecture. It is a scheduled building, but no notice of the intention to alter it has been given to the MOHLG. The chief clerk to the Director of Education says that this is unnecessary, because the alterations do not affect the "protected part of the building," apart from a new hatchway for the serving of meals. The City Architect, Mr. R. R. Alexander, says that the "protected part" is not affected at all. But the Ministry of Housing and Local Government say that the law is quite explicit: that no alteration may be made to any part of a scheduled building without two months notice being given to the local planning authority, and through it to the Ministry. The MOHLG itself has, however, sanctioned the loan for £6,500 without checking whether the building was scheduled or not.

Is an architect being employed? The chief clerk to the Director of Education says that "the City Architect was employed to do part of the work for us." The City Architect says that he was not consulted, except about certain drawings for "alterations to conveniences and that sort of thing." The principal of the Art School and members of the staff were, he says, "concerned in preliminary sketch plans." The City Architect was definitely not responsible, he says, for the design of the new door to which Mr. Scorer takes exception, and which is illustrated on this page. The Ministry of Education says that it approved the proposal to convert the Leeke School, and to do it "by direct labour under the clerk of works, and under the supervision of the City Architect." The detailed estimate, being less than £10,000, did not require its approval. From all this it does appear that the conversion as a whole was not designed and is not being supervised throughout by an architect.



An elevation of the Leeke School, Lincoln, showing the crude new door which has replaced a window, and is completely out of scale and keeping with the remainder of the facade. It is complained (see letter) that no architect has been employed on the conversion of this building into a School of Art and Architecture, and that no notice has been given of the intention to alter a scheduled building.

RIBA

Council Election Results

The results of the election for the RIBA Council were announced on June 18. The President, Kenneth M. B. Cross, and the Past-Presidents, C. H. Aslin and A. Graham Henderson, were elected unopposed. The following were elected members of the Council (* denotes a new member).

Fellows

Professor Basil Spence	2,023 votes
Frederick Gibberd	1,661 do
*Hubert Bennett	1,585 do

Associates

Donald E. E. Gibson	2,631 votes
*Peter F. Shepheard	2,031 do
Stirrat A. W. Johnson-Marshall	1,338 do

Licentiate

Gwyn H. Morris	2,627 votes

Ordinary

Professor R. J. Gardner-Medwin	1,322 votes
*Harry Durell	1,232 do
Percy E. A. Johnson-Marshall	1,199 do

The following candidates were not elected (in the order of votes received): W. E. Tatton Brown, Gontran I. Goulden, C. G. Stillman, J. H. Forshaw, Thurston M. Williams, Bryan P. Westwood, C. E. Culpin, S. E. T. Cusdin, H. J. Whitfield Lewis, Robert Mackellar, C. Max Lock, R. Llewelyn Davies, Alexander Steele, Harry Judson, Howard V. Lobb, Cecil Howitt, F. B. Pooley, C. H. Simmons, P. B. Dunham, A. Douglas Jones, Anthony Pott, S. W. Milburn, A. E. T. Matthews, H. R. E. Knight, S. E. Urwin, H. B. Allsopp, D. H. McMorran, R. F. Hutchison, P. V. E. Mauger, C. F. Bates, C. H. Bingham-Powell, Isaac Chaikin, C. F. J. Thurley, R. O. Vine, C. S. White, L. J. F. Gomme, G. W. Knight.

The representatives of the Allied Societies on the Council include the following new members: North of England: Cecil Leckenby. Midlands: E. W. Parkinson, H. A. Rolls, S. F. Barrell, Birkin Haward. South of England: A. G. Bazeley, R. F. Fairhurst, Colin Cooper, L. J. Selby. Scotland: J. A. H. Mottram, T. H. Thoms. Wales: Cyril A. Hughes. Overseas: G. R. C. Muston (New Zealand), Colin M. Sinclair (South Africa). The Architectural Association (London): John Brandon-Jones. Chairman of the RIBA Registration Committee: S. Vincent Goodman.

Two representatives of the RIBA Salaried and Official Architects' Committee, one representative from Scotland, one from Ulster and one from India remain to be appointed. Three vice-presidents, the honorary secretary and the honorary treasurer are to be appointed by the Council on July 2.

LIVERPOOL CHAIR

Of Building Science

Professor Arnold W. Hendry who was recently appointed to the new Chair of Building Science at the University of Liverpool—the first Chair of its kind in the country—has begun the preparatory work for his new department, which will start to operate next Session. Professor Hendry is 35. For the last six years he was Dean of the Faculty of Engineering at the University College of Khartoum, where he laid the foundations for a new School of Architecture within his Faculty. His proposals for the architecture course there included a strong basic training in building science. He is well known in this country for his photo-elastic studies in the behaviour of structures, and is a Bronze Medallist of the Institution of Structural Engineers.

Liverpool's new Department will be unique in that it will be linked to three University Faculties: Arts, in which the School of Architecture is established, Engineering and Science. This is intended to promote teamwork between architects, engineers, and scientists. Professor Hendry's Department will give undergraduate instruction, directly and by co-operation with present staffs, to students of architecture and engineering; it will also accept post-graduate research students—who may be scientists, architects, engineers or builders—for higher degrees. Building economics will be linked to the more strictly technical studies, and it is hoped that there will be strong ties with the building industry and its research and development organisations.

The Liverpool School of Architecture recently founded the post-graduate degree of Master of Architecture for research of a kind which contributes to the advancement of knowledge in the practice of architecture. With the arrival of the Building Science Department, the School hopes to widen the scope of its post-graduate research and to promote development work.

GENEVA

Competition Results

The result of the competition for the redesign of the Place des Nations, Geneva, has been announced. The first prize (12,000 Swiss francs) has been awarded to Professor Andre Gutton, Paris; the second prize (10,000 frs.) to Rainer Schell, Wiesbaden; the third prize (8,000 frs.) to V. Magastretti and M. Righini, Milan; the fourth prize (6,000 frs.) to D. Hein, Munich, and the fifth (4,000 frs.) to J. Otruba, Prague. There are no British prize-winners. The designs are on exhibition at the Palais des Expositions, Geneva, until July 6.

VISUAL EDUCATION

'Let Architects Lead'

Henry Morris was unfortunately overcome by the heat when he arrived at the Housing centre to speak at the annual meeting of the Council for Visual Education last week. But in his speech, which was read for him, he laid about him with characteristic freshness and vigour, contrasting the advances made in science and in the standard of living with the disintegration of the visual environment, particularly in countries with a long tradition of humanized landscape. The great failing today, he thought, was æsthetic, and he expressed astonishment that people of great taste in literature, scientists and other academic people were often æsthetically illiterate, or stone blind.

He contrasted, too, the success of the universities as leaders in science, with their failure as patrons of the arts and their inability to prefer the original in contemporary art. The universities dealt with the human arts as historians, critics or commentators on the past. For science the present was reality, but for art it was the past. As patron of architecture and the visual arts the universities had proved conventional, academic, imitative and backward looking.

Mr. Morris would like to see an end to metaphysical art theorising, and would banish art historians altogether. It was to the architects that he looked to maintain standards of æsthetic taste in all visual things, as an advance guard in every locality, with the local architectural societies as the trainers of local opinion, and with architectural journalists playing a similar role by recognising that "roaring is not enough."

Mr. Morris would like to see an end to for the artist to sustain human values in a world dominated by applied science and technology: and he contrasted those art forms which could be enjoyed privately with architecture, the great public art that could only be provided by society. Modern architecture, he said, was the result of new structures and principles, but modern architects must also express the significance of man's activities and give nobility to his environment and minister to his appetite for delight and beauty. It was not to be anticipated that modern architecture would fail to do this, although the task was indeed formidable.

Beauty and the æsthetic were as important as food and air, and we had to make the fostering of taste and style a first imperative in our culture, as important and necessary to man as science and scientific method. Nothing less than that would do. Architecture, landscape, colour and design should be a major part of all school life. People would say there was not enough time, but our visual environment was a priority. There was a great deal of wasted time in our secondary schools, but the golden rule in developing the visual senses was habituation (which required no place in the time-table or in examinations) not discourse or lecturing. The first instrument of habituation was the quality of the surroundings, and here Mr. Morris criticised modern school architecture for using far too much glass, and disregarding the fact that external texture and form contributed nobility to man's environment. Some architects were hag-ridden by speed, the enemy of art, and school-buildings, he urged, must be kind to schoolchildren; it was an unkindness to use school building as a medium for extreme doctrinaire experiments. School playgrounds, too, should be a demonstration of the use of beauty.

The aim of education in art was the stimulate and training of sensibility. Fortunately a great improvement had taken place in the schools: 25 years ago art was a "relief subject" for the boy exhausted by the laboratory. Now painting and art were given generous time in infant, primary and secondary modern schools. Children came under æsthetic influences they would carry forward into youth and maturity, and we could be certain of a marked advance in a generation's time. Time must be found for the inculcation of the elements of architecture, but the test of artistic training was, he suggested, the taste exhibited by men and women in their own environment, and not in talking about art. People could be scholarly in talking about art, yet have no taste in their own houses.

It was unfortunate that the modern universities had forgotten the lesson of Oxford and Cambridge, not only in providing a

corporate life, but also in providing an environment of beauty. There was a new interest at the universities in buying pictures, but pictures were not enough. Young people at the universities, and the dons too, should have a means of acquiring an appreciation of architecture, landscape and town and country planning. He would like undergraduates to be taught that architecture was "the mistress of the arts," for the proper approach to art was through architecture and town and country planning. Style, he concluded, was as important and necessary in life as science and technology, not least in the universities and places of professional training.

COMPETITION

For Jinnah's Tomb

An international competition with a first prize of Rs. 25,000 (approx. £1,875) for the construction of the Mausoleum of Qaide-Azam Mohammed Ali Jinnah at Karachi is announced by the Qaide-Azam Memorial Fund. The author of the project placed first will be employed as architect of the work. There is also a second prize of Rs. 15,000 (£1,125) and Rs. 10,000 (£750) will be at the disposal of the jury to reward the authors of other projects. The competition is open to all architects, engineers and town planners irrespective of nationality.

The jury consists of H. S. Suhrawardy, Prime Minister of Pakistan, Prof. E. Beaudouin (France), Prof. Robert Matthew, Prof. P. L. Nervi (Italy) Gio Ponti (Italy) and Georges Candilis, rapporteurs representing the International Union of Architects.

The complete programme is available (against a deposit of 3,000 French francs or the equivalent value in local currency) from the IUA, 15 Quai Malaquais, Paris 6, to be deposited with a national section of the IUA. Questions about the programme may be sent to the IUA before July 31, and will be answered before August 31. The competition closes on October 31.

LANDSCAPE

Institute's Conference

The Institute of Landscape Architects is holding its Annual Conference in Newcastle upon Tyne on September 6, 7, and 8.

The Conference theme will be *The Landscape of Industry.*

The Conference will be held in King's College and there will be an exhibition related to the Conference theme in the Hatton Gallery, which will be open to the public.

The speakers at the general session on "The Manufacturing and Extractive Industries" will be the Marquess of Normanby, R. E. Newell (Engineering Director, I.C.I., Wilton), D. E. Baird (Deputy Chairman of the Durham Division of the National Coal Board), and G. A. Jellicoe of the Institute of Landscape Architects.

The speakers at the general session on "Afforestation and Agricultural Landscapes" will be Sir Stephen Middleton, Bart., Lord Bolton, P. Garthwaite (Forestry Commission), and J. M. W. Adams, of the Institute of Landscape Architects.

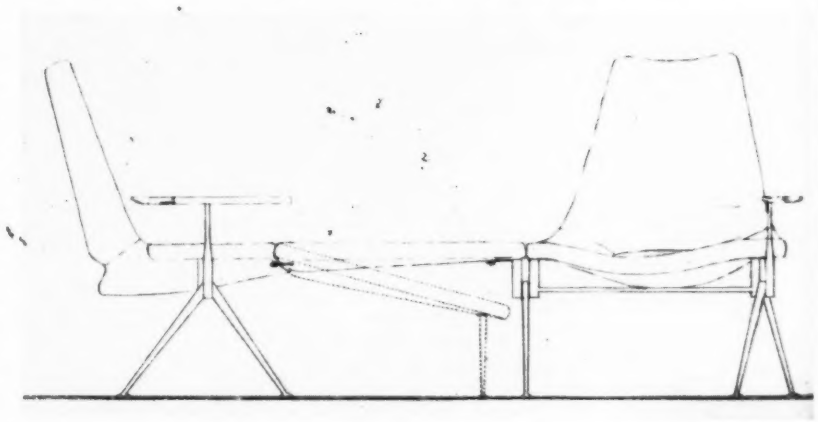
There will also be several papers given at a professional/technical session on subjects varying from pit heap planting to the restoration of the small woodlands and tree groups of the countryside.

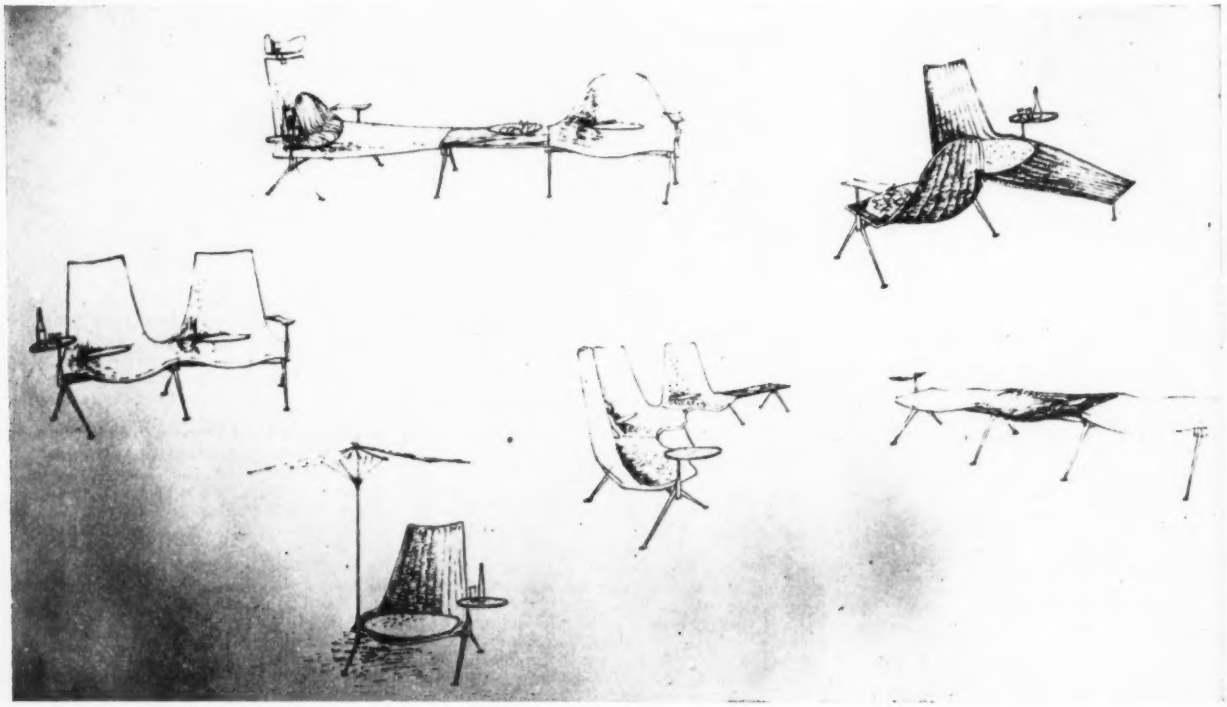
Visits will be made to examples of industrial landscaping in Durham and Northumberland.

The opportunity is also being taken to show the film "The Land of the Three Rivers," which will give visiting delegates an impression of the north-east region.

A full programme may be obtained from the Secretary, The Institute of Landscape Architects, 2, Guilford Place, W.1.

In the International Furniture Competition at Cantu, Italy, Nigel and Sheila Walters, of London, received an award of £130, approximately, for the design, below and right, for upholstered or cane (for outdoor use) chairs. The designer's object was to produce a system of elements capable of being arranged in a variety of traditional and novel forms, as shown. The elements were: a high-backed and a low-backed chair, a foot-rest, a low table, a head-rest, chair-arms, and a side table. The double prong at the apex of the cast brass or aluminium legs is designed to receive and support either a second chair, or a chair-arm. Construction: steel frame, with expanded metal infil covered with 2-in. foamed rubber.





CRITICISM

The architects reply

Last week we published in the JOURNAL a critical review by J. M. Richards of the housing scheme in Golden Lane, City of London, designed by Chamberlin, Powell and Bon. This week we print the architects' replies to the points made by Mr. Richards.

We are grateful to J. M. Richards for the generous tone of his article and will confine our comments to his more critical observations.

Treatment of courts: It is suggested that this may be too restless; possibly this is so, but we think it only fair to reserve judgment until the whole is complete, as Mr. Richards suggests. The courts are designed to be as different in character as they are in shape, and the community centre court which forms the focus of the estate has been most richly treated; the other three courts are detailed more plainly.

Concrete balcony fronts: We also are dissatisfied with these and the application of a finish is being considered. For cheapness and permanence exposed concrete has advantages; we hoped that it would weather uniformly—albeit dingily—and thus provide a dull matt surface in contrast to the brilliance of the glass panels but this process is taking longer than we thought.

Framework of staircases: Somewhat naturally, we do not admit that these are crude either in detail or in execution, although we appreciate Mr. Richards's feelings regarding the appearance produced by the atmospheric staining of concrete.

Curtains in the high block: We anticipated the importance of curtains to the external appearance of the high block and advised our clients to insist on uniform linings, uniform net curtains, or both; this would not inhibit choice regarding internal furnishings but would preserve unity in the external appearance. Whether this can be achieved is largely a problem of management outside our control as architects.

Roof structure on the high block: The following notes which briefly refer to our design intentions regarding this roof structure may be of interest.

The superstructure houses a number of necessary functional elements including the cold water storage tanks, the lift motor rooms, and the estate boiler flue which we have tried to group in such a way that their form contributes both to the high block and to the estate as a whole.

In order to reduce its appearance of bulk, this block is split from top to bottom down the north and south ends by the deep recesses containing the escape stairs; the roof canopy is planned on a cross-axis in order to tie together, visually, the two halves of the building below. The scale of the canopies, each of which hovers over one half of the estate was considered not only in relation to this particular building but also to the space between the several buildings at ground level. The cellular form of the 120 flats in this block suggested a strictly rectangular shape but—rather than echo this—we felt a contrasting form in the roof superstructure would be better. Thus the two water tanks are designed in the form of giant saucers flanking the vault over the lift motor rooms, the whole being raised well above the level of the roof terrace; the shape is a composition of flat planes and parabolic curves, although the latter are limited to curvature in one direction owing to the costliness of shuttering of double curvature or an irregular shape.

Community centre: Mr. Richards asks if the community centre was not the right place for the kind of sculptural flourish that takes place almost too excitingly on the roof, and suggests that the community centre and the roof structure ask to be interchanged. We think it fair to counter this suggestion with another rhetorical question: if there is truth in Mr. Richards's observation near the beginning of his criticism—where he suggests that there may be too many architectural components chasing too few plain surfaces in the community centre court—would not the inclusion of a quite different architectural form have aggravated this situation? Our view is that another shape within this court would have been too much, whereas, by the time the eye has travelled up the plain surface of the high block, a contrasting form is a welcome relief.

General criticism: Apart from the detailed points of criticism already referred to, we detect an emphasis which suggests in some respects, a difference in fundamental values between ourselves and Mr. Richards, which may be of sufficient interest to comment on. We notice his dislike of exposed concrete as such, his reference to the "unsubtle" shape of the roof structure on the high block, and his stricture of the bulbous heaviness of the black tubular handrailing round the sunken courts; on the other hand, he several times praises refinement of detailing. We feel strongly that other values besides refinement should be pursued, particularly clarity of form and —sometimes—robustness. It is a common criticism —and often a valid one—of architecture today that it is merely a collection of details, over-refined and without much substance. We try to take such oppor-

tunities as occur to express those elements in architecture which are naturally required to be strong (such as load-bearing walls, structural concrete, or guard rails), and to contrast these with those elements which are delicate and merely screenlike in character (such as windows, spandrel panels, etc.). This contrast between the rough and the smooth, the bright and the dull—even between the clean and the dirty—creates a tension which is of the essence of architecture—when the choice of materials and the balance between them is right, of course!

Finally, may we refer again to Mr. Richards's own reservation that the general treatment of the estate should be looked at again when the whole project is finished. We think that several features and details which may appear disturbing at the moment will appear more satisfactory when they are seen in the context of the scale in which they were conceived.

The estate from Barbican. In the foreground are the four-storey maisonettes and the background is the sixteen-storey block.

News continued from page 946

TIMBER

Manufacturers' Dinner

George Grosvenor, President of the Timber Building Manufacturers' Association, regretted in his speech at its AGM that the woodworking industry was not enjoying better grading, and called for the restoration of the pre-war quality of brands. There was evidence at the meeting of a widespread opinion among the members that the timber importers were making a misguided use of TDA (on which the importers hold a controlling interest) in that they were using research to develop new (and, in the manufacturers' opinion, not very likely) markets for timber—e.g. the timber engineering scheme—when research could have been more profitably employed in improving the quality of the raw material available in this country. Reference was made by Mr. Grosvenor to the approaching termination of the DSIR grant to TDA and the proposal to set up a new "Timber Research and Development Association" which, in order to attract further state aid, would be independent of the commercial interest of TDA.

RCA

Minister's Appeal

Speaking at the 25th Anniversary Dinner of the RCA at the Dorchester Hotel on June 18, the Minister of Works, the Rt. Hon. Hugh Molson, M.P., said that he would like to see reinforced and precast concrete used to a far greater extent in the British building industry because he was anxious to economise on steel and to keep down cost. Suggesting that progress would be faster if it were easier for architects to obtain designs, he gave it his opinion that the reinforced concrete companies should follow the example of the steel companies and set up departments to design completely preplanned concrete frames for the benefit of architects. He reported that his Advisory Council on Building Research and Development consider that the strength of completed structures in reinforced concrete is probably greater than is indicated by current conventional calculations, which do not make all possible allowances for the increase in strength which results from the inter-restraint of slabs, beams and columns; and that his Department is at present carrying out experiments with BRS on the design of floor slabs to test the truth of this opinion.

In Brief

The Victoria and Albert Museum is to hold an exhibition in November and December of this year to commemorate the centenary of the birth of the late Victorian architect and designer C. F. A. Voysey. The Museum has an excellent collection of Voysey's works, but is anxious to trace, and borrow for the exhibition, further examples of his furniture, embroideries, textiles and wallpapers. Any individual, institution, firm, etc. possessing such works or information about Voysey, is asked to send details to Peter Floud, Keeper of the Department of Circulation, Victoria and Albert Museum, London, S.W.7.

In the summer of this year the William Morris Society is arranging an exhibition devoted to Morris's association with printing. The object of this exhibition will be to bring before the public, who will be admitted free, an aspect of Morris's work which has not previously been comprehensively displayed, and so to enable an appreciation to be made of his influence upon good printing in the present century. The exhibition will be held at the St. Bride's Foundation Institute, London, E.C.4, during the first three weeks in August. From August 19 to September 7 it will be at Leighton House in Kensington and from September 16 until October 5 it will be at the Manchester Central Library. After that it will be shown in Glasgow, at the Mitchell Library. Arrangements are being made for the Exhibition to be shown in several places in Northern Europe under the auspices of the British Council.

The annual conference of the Housing Centre, to be held at County Hall, London, on July 3-5, will discuss "Housing, Slum Clearance and the Tenant." At the last session on July 5 a team of residents from the Lansbury Neighbourhood, Poplar, will give their views on what redevelopment has meant in practice. The chairman at this session will be Chris Chataway.

The RICS had an easy win over the LMBA in their annual match, played this year on the Holloway Bros. Ground at Earlsfield. The LMBA won the toss and batting first were all out for 165 of which S. G. Wright got 80. The RICS had no difficulty in knocking off the runs, and passed the LMBA score with the loss of four wickets. A. King scored 46, B. Lindsey 49 and A. Goater was 32 not out.

DIARY

The Country House of the 19th Century. SPAB Lecture by H. Goodhart Rendel. At the Victoria and Albert Museum, S.W.7. 6.15 p.m. JUNE 27

BR Modern Railway Travel. Exhibition at Battersea Wharf Goods Depot. Friday, 4 p.m.-9 p.m.; Saturday, 10 a.m.-9 p.m.; Sunday, 2 p.m.-9 p.m. JUNE 28 TO JUNE 30

Paisley Technical College Competition. Exhibition of prize-winning designs. At the RIBA, 66, Portland Place, W.1. Monday to Friday, 10 a.m.-7 p.m.; Saturday, 10 a.m.-5 p.m. JULY 3 TO 20

Cost control in building

Six lecture-discussions

The last two (numbers 5 and 6) of the lecture-discussions in the series organized by the AJ and the Regent Street Polytechnic appear below. The fifth was an account of the cost planning of a school by John Wilkinson (architect) and Arnold Towler (quantity surveyor), chairman: Cyril Sweett. The last was a Symposium at which all lecturers, under the chairmanship of D. E. Woodbine-Parish, answered questions, argued technical problems and discussed future developments. One future development will be the setting up of a study group. The AJ invited members of the course with cost analysis experience, to form a study group to consider the precise definition of elements. We also invited those who intend to prepare and use analyses to give us their names so that we may keep them in touch with the study group and publish analyses they prepare. More information about these developments will appear in future issues of the AJ. One other announcement made on Tuesday week was the setting up of a "Costs" Committee of the Architectural Association. See editorial comment on page 941.

ARNOLD TOWLER

JOHN WILKINSON

5 *Cost planning II*

speakers: JOHN WILKINSON and ARNOLD TOWLER
chairman: CYRIL SWEET

The CHAIRMAN: This is the fifth of this series of discussion evenings arranged by THE ARCHITECTS' JOURNAL and the Regent Street Polytechnic. I am sure we all congratulate them on having organized them. I personally, as Chairman of the RICS Cost Research Panel, am particularly interested, because we do think this is a subject which deserves a great deal of attention and thought.

As you probably know, this is the last of the actual discussion evenings. The next meeting, which is in a fortnight's time, is a Symposium at which all the speakers will be present, and that will be essentially a question and answer evening.

JOHN WILKINSON: The scheme we are going to deal with tonight is a four form entry Grammar school with 720 pupils and 816 cost places. At £270 per place the target net cost was therefore £220,320 and the maximum gross cost 10 per cent. more at £242,352. For the first time in our experience the clients stated, in a very full brief, that the total superficial area was not to exceed 57,000 sq. ft. or 70 sq. ft. per pupil. Therefore, by dividing the net cost by the total floor area, we had an immediate target for our cost plan of 77s. 4d. per sq. ft. The brief also contained indications of the standards the client wished us to achieve. Amongst these were:

Double glazing to all classrooms and the assembly hall.

Hardwood strip flooring to all classrooms and general teaching spaces.

A flush ceiling in the two gymnasia.

It was quite obvious from our own experience that these rather optimums optimisms made it absolutely essential that this design should be cost planned. So with the Ministry of Education limits and with the schedule of accommodation, and brief with its special requirements we began to work. The ratio of area of enclosing wall to floor area is a factor which we all know affects the cost, and no doubt you will remember Mr. Baines discussing the point last week. In this case, however, the site had an even greater influence on the plan form than this ratio. There were not any really flat plateaux or ledges on which to sit the most economic plan form, and we therefore determined that separate units were a more economic solution for this site. The blocks themselves were shaped by the necessity of running them along the contours. Our experience has shown that the element of work below ground level can be very high if one does not plan to avoid large cubes of cut and fill, to say nothing of special retaining walls, drainage and so on. The plan we eventually arrived at (Fig. 1) we knew to be expensive in form but economical in work below ground, and we realized it was essential that the structure should be economical. Here we were fortunate. Published in the AJ a few weeks earlier were details of the Mayfield School, Putney, by Powell and Moya, where the cost per place was £72 below the Ministry's allowance. The school had exceptionally high finishes, was extremely well designed, and had two beautiful murals. It was obvious that the major saving was achieved by the use of load-bearing 9 in. cross-walls, and that where a frame had been used in the assembly hall and gymnasia it was extremely simple. The job architect made a two-day visit to the school to study any other way in which economies had been made. The effect of published cost analyses of other buildings is quite amazing in the office. The

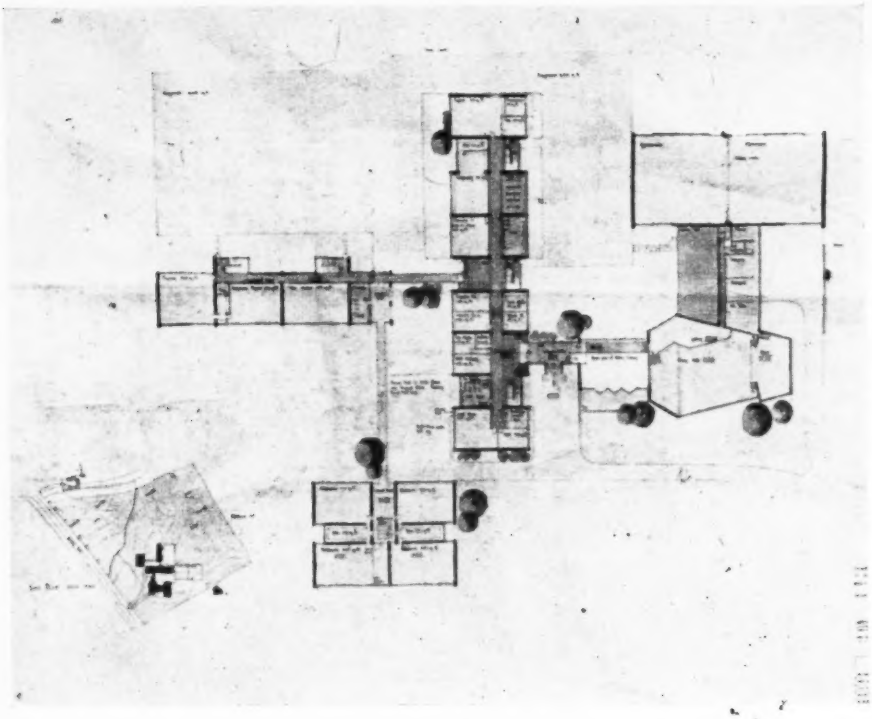
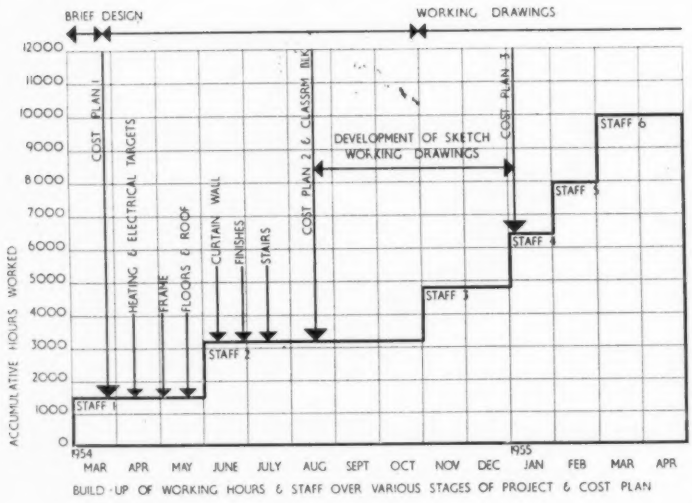


Fig. 1 (left). Plan of the school at Scarborough. The articulated layout allows for an uneven sloping site and keeps foundation cost down. Fig. 2 (below left). Programme of drawing office work for the school at Scarborough. Notice the points at which the 3 cost plans are prepared, the final one occurring after production drawings had begun.



BUILD-UP OF WORKING HOURS & STAFF OVER VARIOUS STAGES OF PROJECT & COST PLAN

effect of Mayfield could perhaps be described as shattering on our ideas of cost. Throughout all these initial considerations our quantity surveyors were always willing to help—although I think it is fair to say the initiative at this stage was still very much with the job architect. I would like to show you for a moment a break down of our drawing office programme, which will give you some idea of what lies ahead (Fig. 2). Between Cost Plan 1 and 2 we made a detailed study of most of the major elements of the building over which we had control. On those elements we could not directly control—heating, electrical, plumbing and certain structural portions—we gave our consultants definite capital cost targets based on Cost Plan 1.

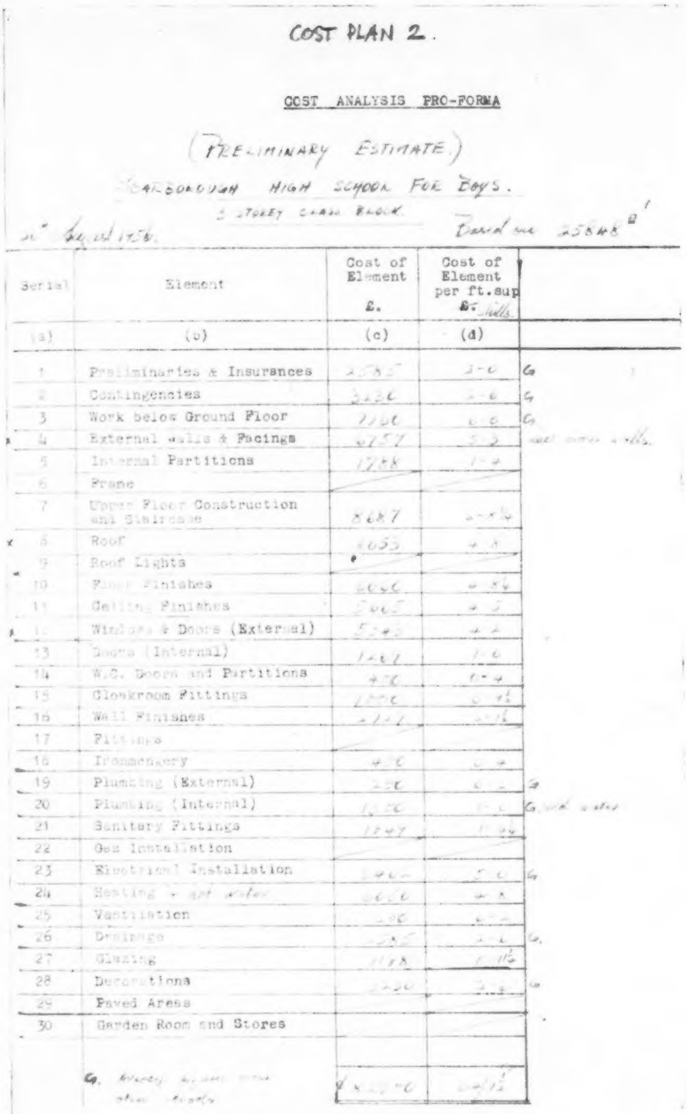
This study of the elements requires extremely close liaison with the quantity surveyor and we were able to have him sit alongside us whenever necessary, discussing alternatives, making suggestions, and producing approximate estimates.

ARNOLD TOWLER: First let me say a word on estimating. It is necessary to have in your mind two sets of figures. One for pricing approximate quantities and one for accurate quantities. My definition of approximate quantities here is not so much that they are approximate in amount but that they carry, as far as pricing is concerned, most of the "labours" which are otherwise measured separately. It means that you work out an overall price for, say, reduced brickwork, which instead of being, say, 40s. per yd. sup. in accurate quantities, becomes 45s. per yd. sup. in approximate quantities.

Obviously, if you are going to do hundreds of exercises for the architect all your quantities must be done like this to save time and office costs. By the time the quantity surveyor is ready to perform Cost Plan 1, the architect has made his preliminary decisions of siting, construction, etc., as Mr. Wilkinson has already told you.

Having seen where we are going, we come to Cost Plan 1, and the first essential of any form of cost planning is to have a clear cut definition of each element, so that everyone concerned—architects, quantity surveyors and specialist consultants—knows exactly where everything in the building is being included. We have our own definition of elements based on MOE Cost Bulletin No. 4 but differing slightly in one or two cases. The second essential is a cost planning sheet settling out the elements (Fig. 3). These are all that any office really needs to start cost planning in a simple form.

We had by now completed all our planning studies and had achieved the target set by the client that the total superficial floor area should not exceed 57,000 sq.



COST PLAN 2.

COST ANALYSIS PRO-FORMA

(PRELIMINARY ESTIMATE.)

SCARBOROUGH HIGH SCHOOL FOR BOYS.

3 STOREY CLASS BLOCK

August 1956. Based on 25848 ft²

Serial	Element	Cost of Element £.	Cost of Element per ft.sup shills.	
(a)	(b)	(c)	(d)	
1	Preliminaries & Insurances	[illegible]	3-0	G
2	Contingencies	3230	2-6	G
3	Work below Ground Floor	7760	6-0	G
4	External walls & Facings	6757	5-3	[illegible] walls.
5	Internal Partitions	1788	1-4	
6	Frame			
7	Upper Floor Construction and Staircase	8687	[illegible]	
8	Roof	6053	4-8	
9	Roof Lights			
10	Floor Finishes	[illegible]	[illegible]	
11	Ceiling Finishes	[illegible]	[illegible]	
12	Windows & Doors (External)	[illegible]	[illegible]	
13	Doors (Internal)	[illegible]	[illegible]	
14	W.C. Doors and Partitions	[illegible]	0-4	
15	Cloakroom Fittings	[illegible]	[illegible]	
16	Wall Finishes	[illegible]	[illegible]	
17	Fittings			
18	Ironmongery	[illegible]	0-4	
19	Plumbing (External)	[illegible]	[illegible]	G
20	Plumbing (Internal)	[illegible]	[illegible]	G [illegible]
21	Sanitary Fittings	[illegible]	[illegible]	
22	Gas Installation			
23	Electrical Installation	[illegible]	[illegible]	G
24	Heating + hot water	[illegible]	[illegible]	
25	Ventilation	[illegible]	[illegible]	
26	Drainage	[illegible]	[illegible]	G
27	Glazing	1178	0-11½	
28	Decorations	[illegible]	[illegible]	G
29	Paved Areas			
30	Garden Room and Stores			
		[illegible]	[illegible]	

Fig. 3. Cost Plan 2 for the Scarborough school. Items marked "G" are still target figures based on other school costs analyses.

ft. Therefore our target cost per sq. ft. was still 77s. 4d. We decided that Cost Plan 1 should be based on the Classroom Block only. The area was 25,848 sq. ft. or some 45 per cent. of the total floor area. Looking at the other blocks and basing our judgment on the areas involved and our experience of the cost on other jobs of similar types of accommodation we worked out that a balance could be struck. The Science Block with its services and fittings was obviously going to be higher than the average for the whole school of 77s. 4d., the assembly hall was going to cost the same or slightly more, the gymnasium, kitchen and workshop would be less than average. As you will see later, these calculations did turn out to be reasonably accurate. Published cost analyses of similar jobs were limited—and our knowledge of them was not detailed enough to use a comparative method as outlined in the recent MOE Cost Bulletin. Rightly or wrongly we took the average cost per sq. ft. of each element from seven published schools and expressed it as a percentage of the total cost per sq. ft. Using these percentages we distributed our 77s. 4d. over the elements and thus produced a target for each element.

JOHN WILKINSON: I do not want to waste time going through each element separately. The frame, as I have said, was settled as 9 in. load-bearing brick cross wall, estimates for which had to be made. The roof details were carefully worked out, and various forms of roof coverings and trusses were tried. We looked into the question of a flat r.c. roof against a pitched roof taken on a standard bay. This slide shows a quick roof calculation, the pitched roof is at the bottom. It proved conclusively that the pitched roof over this particular bay was about £200 cheaper and on £22,000 that would be about £1,000. That gives some idea of the quick calculation which the quantity surveyor is doing almost at your right-hand side as you are thinking about the details at this stage between Cost Plan 1 and Cost Plan 2. On foundations, studies were made of the use of brick as against concrete walls below ground level under the curtain wall. On the smaller elements we did quick comparative costs on the w.c. partitions, for example—sufficient to show that the cost of metal-faced plywood partitions was within our target for that element. I have asked my colleague to tell you of a major portion of our work at this stage—on the type of curtain wall to use—because he was able to give us some good advice on the subject.

ARNOLD TOWLER: We knew from experience that timber curtain walling was cheaper than metal and that a great deal of money could go in the solid panels below the windows depending upon what material was used. The architect was also keen to use double glazing and had heard of a simple system produced by a firm of joinery manufacturers. After preliminary discussions with the Principals of the firm, which revealed that the overall costs were likely to be reasonable, we got them to visit the office and went over the details of the construction. It was decided to use hardwood (mahogany or similar) and the result was that they gave us a figure of about 13s. 4d. per ft. sup. for the work including double glazing. This was then used in our calculations. So far we had not done anything to check the figure. The architect proceeded to work out his detail sizes and prepared a perspective which we asked for (Fig. 5). From this and other verbal details we produced an accurately measured estimate of one repetitive section of this unit (Fig. 4). At the same time the specialist was invited to check his own costing. His new quotation came to about 15s. 9d. per ft. sup. whereas mine came to about 14s. per ft. sup. Obviously a meeting was indicated and this took place in the architects' office. The approximate quantities which I had prepared proved of enormous value and showed, much

PRICE BUILD-UP ONLY

Standard Timber Panel.

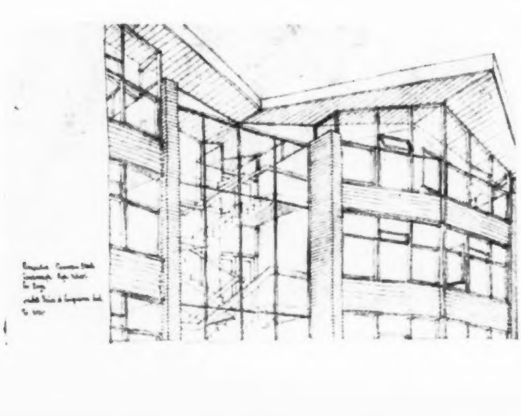
for Mahogany or similar.

FT.			£	s.	d.
11½	Run. 6⅞ × 2⅝" Head.	7/6	4	-	6
17	" 5⅞ × 2⅝" Transome.	7/3	6	17	9
11½	" 6⅞ × 2⅝" Sill.	9/-	5	3	6
22	" 6⅞ × 2⅝" Jambs.	7/6	8	5	-
14	" 5⅞ × 2⅝" Mullion.	7/3	5	1	6
11½	" 2" × 1" Weather strip tgd in.	2/0	1	3	-
24	Sup. 2" Casements.	8/-	9	12	-
43	Run. 3" × 2" Studding.	1/6	3	4	6
35	Sup. ⅞" Boarding.	5/-	8	15	-
35	" Building paper.	2		5	10
35	" 2" Fibreglass.	8 / 3/-	1	3	4
35	" ⅞" asbestos.	1/8	2	18	4
11½	Run. Zinc flashing. 6" g.	2/-	1	3	-
11½	" Jamb grounds. 3½" × 1½"	1/2		13	5
5¼	" 10⅞" × 3⅝" Mullion (50% add)	15/-	3	18	9
66	Sup. Glazing. 3/6 4/10	5/4	17	12	-
35	" Stain & varnish weather bds.	6		17	6
78	Run. ditto. frms ek. ov. 9" g. (Stdy)	4	1	6	-
78	" ditto. (outly ov 6" g)	3		19	6
35	Sup. Prime ek & paint asbestos.	8	1	3	4
No 3.	4" × 2½" angle anchor rag bolted to conc. & bolted to mullion.	10/-	1	10	-
	Window furniture.				
2 Prs.	Hinges.	6/9		13	6
No 2	12" case. stays.	15/6	1	11	-
No 1	Pr. friction pivots	30/-	1	10	-
No 1	Case fastener.	14/-		14	-
		£	78	11	3
		Say £	82	0	0

On 120□' this represents 13/8 per F.S.

Say 14/-

Fig. 4 (above). A page of guide calculations—typical of many prepared by the quantity surveyor using approximate rates. This was for the timber curtain walling. Fig. 5 (below). Perspective prepared at the quantity surveyor's request to help in working out the cost of the external timber curtain walling.



to my surprise, a greater degree of detail than the specialist had prepared (or at any rate than he disclosed at the time). We were able to show by reference to other current prices that the rates were on the high side, bearing in mind the repetitive nature of the work. The question of scaffolding also arose and it was clarified as to who would provide it and to what extent it would be required. The specialist returned to his office to look into his prices again, and his next quotation showed a revised figure of about 14s. 4d. per sq. ft. sup.

JOHN WILKINSON: At this stage a great deal of weight can be taken off the quantity surveyor by the architect. On the floor slabs, for example, we had consultations with and obtained quotations from various proprietary flooring firms and studied their costs in relation to the spans involved. On floor finishes quotations were obtained and compared with our records of other finishes already filed in our cost bible. Other job architects were consulted about elements of their own schemes for which cost studies had been made. All these studies can perhaps be summarized as a breaking down of the elements in detail and studying the alternatives in form and in cost. The studies culminated in Cost Plan 2 (Fig. 3).

ARNOLD TOWLER: We can see one or two sections are omitted at this stage. The cost of the frame went in with the external walls. We have not got anything in for fittings yet, nor for gas. At the bottom we have a figure of 64s. per sq. ft. or just over. Our target was 77s. but we had some money in hand, despite the fact that we had not got everything in. We had, therefore, sufficient confidence to go on with the next stage.

JOHN WILKINSON: Between Cost Plan 2 and Cost Plan 3 the sketch working drawings of pretty well all the blocks were completed, there were about 100 sheets done freehand, but to scale, on tracing paper all building up to Cost Plan 3 which was really the key one. There were certain items we could use again from our studies on the classroom block, the curtain walling, for example. A similar price could be used on the other blocks. But special studies had also to be made of the frame in the assembly hall, for example, and the gymnasia. We took a leaf out of the Mayfield school and used simple timber trusses, the TDA helped us and we could actually bill them in the bill of quantities instead of having a specialist on the site.

On the question of freezing the cost plan—it was done in stages—a paralleling of all the processes to save time. When we were absolutely confident that our cost studies and details were as accurate as we could make them, and that the cost of the element was within our target, we released the sketches to be made into final working drawings. So on the drawing office programme you can see that our final working drawings were paralleled with the sketch working drawings for two months by adding to the strength of the team. Here (Fig. 6) we have reached Cost Plan 3 which was made up of five cost plans, one for each block based on accurate sketch working drawings. The other block —the workshop—had become rather like the cow's

COST BREAKDOWN

Job Scarborough High School for Boys. Job No. PR 975 Stage Sketch Plan. Date Jan. '57
(Classrooms).
Area within Ext. Walls 25848 Sq.ft.

		Percentage of Nett Cost	Cost of Item £ s. d.	Cost per sq. ft. s. d.
1 - 2	Preliminaries	7.03	7000	5- 5.90
3 - 13	Building Shell	46.20	46013	35- 7.23
14 - 18	Finishes & Fittings	22.18	22095	17- 1.15
19 - 27	Services	24.59	24496	18-11.84
	DETAILS			
1	Preliminaries & Insurances	2.01	2000	1- 6.57
2	Contingencies	5.02	5000	3-10.43
3	Work below ground level	9.04	9000	6-11.56
4	Frame	-	-	-
5	Upper Floor & Staircases	10.82	10771	8- 4.01
6	Roof Construction	5.86	5837	4- 6.20
7	Roof Lights	.30	300	2.79
8	External Walls & Cladding	4.86	4837	3- 8.91
9	Windows & External Doors	7.84	7814	6- 0.55
10	External Glazier	1.45	1446	1- 1.43
11	Int. Partitions including glass	3.81	3796	2-11.24
12	Internal doors including glass	1.82	1812	1- 4.83
13	W. C. Partitions and doors	.40	400	- 3.71
14	Wall finishes	2.74	2729	2- 1.34
15	Floor finishes & Skirtings	7.09	7063	5- 5.58
16	Ceiling Finishes	3.96	3942	3- 0.60
17	Decorations	4.88	4861	3-9. 14
18	Fittings	1.00	1000	9.28
19	Plumbing (External)	2.51	2500	1-11.21
20	Plumbing (Sanitary Fittings)	.20	200	1.85
21	Plumbing (Internal)	1.95	1949	1- 6.10
22	Heating & Ventilating Installation	2.11	2100	1- 7.50
23	Electrical Installation	7.81	7780	6- 0.24
24	Gas Installation	6.49	6462	5- 0.00
25	Drainage	-	-	-
26	External Building Works	1.51	1505	1- 1.97
27		4.52	4500	3- 5.78
	NETT COST	100%	£ 99604	77- 0.82
28	Site Works & Landscape		£	
	GROSS COST		£	
	Increased Costs			
	TOTAL COST		£	

COST BREAKDOWN

ASSEMBLY HALL.

Job Scarborough High School for Boys. Job No. PR 975 Stage Sketch Stage. Date 5/2/57.

Area within Ext. Walls 6517 Sq.ft.

SERIAL	SUMMARY ELEMENT	Percentage of Nett Cost	Cost of Item £ s. d.	Cost per sq. ft. s. d.
1 - 2	Preliminaries	5.86	1500	4- 7.24
3 - 13	Building Shell	50.98	13049	40- 0.55
14 - 18	Finishes & Fittings	27.54	7050	21- 7.63
19 - 27	Services	15.62	3997	12- 5.20
	DETAILS			
1	Preliminaries & Insurances	1.95	500	1- 6.41
2	Contingencies	1.91	1400	5- 0.83
3	Work below ground level	8.60	2200	6- 9.02
4	Frame	8.60	2200	6- 9.02
5	Upper Floor & Staircases	4.84	1241	3- 9.70
6	Roof Construction	10.88	2784	8- 6.52
7	Roof Lights		Nil	
8	External Walls & Cladding	7.08	1813	5- 6.77
9	Windows & External Doors	5.51	1410	4- 3.93
10	External Glazier	2.41	617	1-10.72
11	Int. Partitions including glass	2.69	689	2- 1.37
12	Internal doors including glass	.37	95	3.50
13	W. C. Partitions and doors		Nil	
14	Wall finishes	5.18	1327	4- 0.87
15	Floor finishes & Skirtings	7.53	1928	5-11.00
16	Ceiling Finishes	9.23	2363	7- 3.02
17	Decorations	5.60	1432	4- 4.74
18	Fittings		Nil	
19	Plumbing (External)	.22	57	2.10
20	Plumbing (Sanitary Fittings)		Nil	
21	Plumbing (Internal)		Nil	
22	Heating & Ventilating Installation	5.08	1300	4-11.87
23	Electrical Installation	4.49	1150	3- 6.35
24	Gas Installation		Nil	
25	Drainage	1.37	350	1- 0.88
26	External Building Works	4.46	1140	3- 6.00
27				
	NETT COST	100%	£ 25596	78- 6.62
28	Site Works & Landscape			
	GROSS COST		£	
	Increased Costs			
	TOTAL COST		£	

GRENFELL BAINES & HARGREAVES

Fig. 6. Two sections of Cost Plan 3 (Assembly Hall and classrooms) shown on the standard pro-forma used by Grenfell Baines and Hargreaves. Compare with Cost Plan 2 (Fig. 3) prepared 5 months previously.

tail and was a little behind the others. However, on the basis of the cost studies made on this block and the quotations received we produced a cost breakdown. Although the five other blocks had come in more or less as we had expected in our original theoretical balance of one against the other, this cost break-down showed the block to be uneconomic, and it was immediately obvious why. The roof element was a proprietary roof structure and was obviously very expensive and this was tilting the boat. We tackled this with our structural engineer and q.s. and eventually came up with a roof using diagonal close boarding as a stressed skin which reduced the cost of the element by about 5s. per sq. ft. It rather emphasizes the danger of using proprietary systems without a very close study of their costs. We had almost reached the final stage of our programme and by this time were well into final working drawings. The sketch details made it easy to release a large amount of drafting work to quite a large staff, and you can see the quick build up here. With overtime included we were working with an equivalent of eight men at

COST ANALYSIS PRO-FORMA

[illegible]

Serial	Element	Cost of Element £.	Cost of Element per ft. sup £.
(a)	(b)	(c)	(d)
1	Preliminaries & Insurances	[illegible]	[illegible]
2	Contingencies	[illegible]	[illegible]
3	Work Below Ground Floor	[illegible]	[illegible]
4	External Walls & Facings	[illegible]	[illegible]
5	Internal Partitions	[illegible]	[illegible]
6	Frame	-	
7	Upper Floor Construction xxx Staircase	[illegible]	[illegible]
8	Roof	[illegible]	[illegible]
9	Roof Lights	[illegible]	[illegible]
10	Floor Finishes	[illegible]	[illegible]
11	Ceiling Finishes	[illegible]	[illegible]
12	Windows & Doors (External)	[illegible]	[illegible]
13	Doors (Internal)	[illegible]	[illegible]
14	W.C. Doors and Partitions	-	
15	Classroom Fittings	-	
16	Wall Finishes	[illegible]	[illegible]
17	Fittings	-	
18	Ironmongery	[illegible]	[illegible]
19	Plumbing (External)	[illegible]	[illegible]
20	Plumbing (Internal)	[illegible]	[illegible]
21	Sanitary Fittings	[illegible]	[illegible]
22	Gas Installation	-	-
23	Electrical Installation	[illegible]	[illegible]
24	Heating	[illegible]	[illegible]
25	Ventilation	[illegible]	-
26	Drainage	[illegible]	-
27	Glazing	[illegible]	[illegible]
28	Decorations	[illegible]	[illegible]
29	Paved Areas	-	-
30	Garden Room and Stores	-	-
		[illegible]	[illegible]

Fig. 7. An early estimate for the workshop block base partly on cost plan figures for the classroom block. Notice the high roof figure which led to a revision in the method of construction. Items marked "G" are uncertain prices.

our peak. We now come to the final cost check and as this is more the province of the q.s. I will leave it to him.

ARNOLD TOWLER: The final cost check is applied immediately upon completion of the draft bill of quantities which is then priced at competitive rates. To arrive at the correct figure certain things have to be added and these are: an allowance for preliminaries, contingencies, drains and playgrounds. This gives you a Net Cost figure in line with MOE Form S.B.16. Preliminaries are something of a gamble to price and drains and playgrounds have to be added at so much per ft. super from the analysis. From the result the architect will be able to decide whether to amend sundry specifications or to increase or decrease any P.C. Sums, but of course the main object is to obviate gross overspending and last-minute addendum adjustments after tendering.

Here are the final figures, on the classroom block; our last analysis gave a figure of £99,604, and this is the final estimate on the prices where the draft quantities at £83,000, preliminaries, contingencies and external works and drains added in, gave a result of £95,000 on the quantities and £99,000 on the last analysis. So we saved a little, to the tune of about £4,600 on the classroom block. This is the assembly hall block, and here the last analysis is £25,600 and the prices on the bill came to £28,900. That has come out more expensive than our analysis, and we balanced to a certain extent here. This is the science block, and the last analysis was £47,500. It came in at £49,000, so we lost on some blocks and gained on others, and we are keeping a check on the overall. The overall on the last analysis is £172,700 and our priced bill came to £173,700. We were, therefore, within about £1,000, so we are fairly happy. At the moment the bills are out to tender and we are keeping our fingers crossed. One of the results of working this system is that the quantities are best prepared in separate sections, one for each unit of the project. This entails extra work but is really essential for the sake of clarity and value in measuring variations, interim certificates, etc. Different types of units will carry different costs per ft. super, *viz.* classroom block, workshop block, assembly hall. The cost analysis of the different types of structure are valuable records for your files and for use on other projects.

Now a word on the other uses of cost planning.

I envisage some further subdivision of each element with costs attached, *e.g.* foundations into excavation, concrete in trenches, bases, ducts, floor slabs, reinforcement, formwork, hardcore, fill, etc., and frame into storey heights with separate costs for formwork, reinforcement, concrete and floor slabs. The analysis can also be used for clerk of works reports indicating percentage of work complete. Two warehouse jobs were reported in this manner and a check was kept on the comparison with our interim valuations. A remarkable parallelism was noticed which rather reinforces my opinion of the value as applied to interim certificates.

JOHN WILKINSON: To close, I would like to comment briefly on the cost of cost planning to the architect. We have a costing system in the office, which tells us at least on which jobs we are down. We have found that the most expensive jobs are the ones where redetailing is necessary, because of not hitting the cost target—the larger the amount of redetailing the more expensive. Therefore, in as much as cost planning, if successful, avoids redetailing it is economic. Cost planning also means that the job has to have been completely thought out and thus you get an accurate bill of quantities, with better site supervision and better post-contract administration. To sum up, the cost of cost planning is a little more than the cost of doing a straightforward job where you chance your arm and are lucky in your tenders. That does not take into account the many unpriceable advantages from which the office should benefit.

Discussion

J. M. POWELL (quantity surveyor): I noticed from the architect's programme that from the beginning of work up to the completion of working drawings was about fourteen months. I wonder at what stage during that time the drawings were sent to the quantity surveyor for him to start his final measuring for the bill.

JOHN WILKINSON: The first draft of the bill of quantities for the classroom block was ready one month after our Cost Plan 3. In January we first priced the draft bill of quantities for the classroom block, which gave up confidence to go on.

ARNOLD TOWLER: The planning was dealt with block by block, and as we came to a satisfactory conclusion on, say, the classroom block, the architect increased his staff of detailers to produce their working drawings. We were still doing cost plans on, say, the science block. As soon as he was ready to turn over his working drawings to us, which happened by about January, we started on the bills of quantities, and we managed to keep ourselves going by working out satisfactory cost plans for each block. The architect was doing his working drawings, so we were planning and doing bills of quantities one at each end of the office, if you like, until the last set of details came in.

G. T. WEST (architect): How did the tenders compare with the costing prices?

JOHN WILKINSON: I should explain that we took this school because it is the latest one we have done and obviously the most full one we have done on the cost planning basis. Tenders should be in at the end of June. We are pretty sure they will be all right.

We have studied the area. We have done work in that area before, and we know the way the builders price to some extent.

G. T. WEST: Can you give us some idea of the order of accuracy of the tenders on previous jobs compared with the cost plans, as this is the whole point of the exercise?

ARNOLD TOWLER: On one job which was not fully cost-planned, we estimated it to be £120,000, and the tender came out at £117,000. Another which we estimated to be about £95,000 came in at about £93,000. Generally, we seem to be at the price of the third tender.

G. HARRIS (quantity surveyor): How much of the total £172,000 is covered by prime costs for nominated sub-contractors on which you have received offers of tenders during the design stage?

ARNOLD TOWLER: Very little. We try for various reasons to cut out prime cost sums entirely.

G. HARRIS: You mentioned that you were dealing with comparatively proprietary structure. Do you deal with that as a prime cost?

ARNOLD TOWLER: It proved to be too expensive, and we went on to one the architect designed himself. Where we have specialist items, we do not put them in as prime cost sums if we can avoid it but specify them, and we do not always specify that particular specialist. We do try to cut prime cost entirely.

JOHN WILKINSON: It is part of the policy of our office. Recently we got an electrical consultant in our own organization, and we are wondering whether we dare start billing the electrics. Where the work is itemized he has managed to get prices from electrical sub-contractors now for a specific number of points. Whether we shall get right down to heating, I do not know, but it is part of our policy.

On this job the figure for prime costs was something like £65,000—a large proportion for the proprietary system of curtain walling which we discussed. We did check that very carefully; as Mr. Towler has told you. In another case, the workshop roof, we found that a proprietary system was very expensive. We therefore designed our own, and it came out much cheaper.

J. W. BURTON (architect): The example we have had tonight has been for an entirely new building on a virgin site. Would the team say whether they would advocate this system of cost planning for an addition, even a major addition, to an existing building?

ARNOLD TOWLER: If a large part of the addition was a new wing out in the adjoining ground, I should say why not? You may have to make some adjustments for the part where it joins the building. But where it was mainly alteration, we do not think you could do it.

D. A. AYRES (quantity surveyor): I wonder if you would give us some idea of the period of time between the receipt of the particulars and the issue of tenders, and whether Mr. Towler could give some idea of the additional time element spent by the quantity surveyor's office in preparing the cost plan over the normal time in producing the bills of quantities.

JOHN WILKINSON: I think we got the job in January, 1956, and began to collect information from the client. We started work in the latter end of February and we have just gone out to tender now. That is over a year—14 to 15 months.

ARNOLD TOWLER: We are not fully employed by any means on giving estimates of costs. We may only use half-an-hour a day, or one day and go a week without doing anything. I did not begin at the outset to keep separate records of the time spent, but I do now. Extra work is certainly involved, but very often it is to your own advantage. You do not have a lot of "argy bargy" after the tender comes in.

A. C. ALLEN (architectural assistant): When you design a particular element or a staircase or block system, do you find on your next job that you can stick to that? Would it tend to throw your estimates out to uncover any fresh information you might not have had in the first place?

JOHN WILKINSON: We have done it, but it was on jobs of a very similar nature. If you get the price for the frame of a warehouse, say, you can use the information gathered for that particular study again and again. But I think you would have to start from the beginning for any new building. One could not expect information to be transferred from one to another precisely. According to the new bulletin, No. 4, produced by the Ministry of Education, there is a very excellent method of using a building you really know to prepare a cost plan. I do not think you could use a building of a completely dissimilar nature. Comparison is made in quantity and quality. The quality will probably come more and more into it as time goes on. Even if you make a comparison in quantity, say, of partitions between a building of which you have an analysis and your own new building, you can by proportionate methods get at a target for your new building. Does that answer your question?

A. C. ALLEN: Yes, thank you.

The CHAIRMAN: We have had a most interesting evening. It has been an example of team work between an architect and a quantity surveyor. They have demonstrated very clearly to us how they have worked together with engineers and specialists and consultants, and they have also demonstrated to us the benefit that they hope for to the client from that collaboration. The idea of preparing three cost plans and pricing the draft bills, as well as preparing the bills of quantities, does rather appal me. It seems to be a great deal of work, and there can only be some occasions when the time can be found to do that amount of work. No doubt the main reason is that there is so little information at the moment that one can use. We have an example of the usefulness of publishing all this information in the reference to Mayfield. This, through the publication of cost information in THE ARCHITECTS' JOURNAL, inspired the architects to consider cross-wall form of construction for their school, with advantage to the client.

Estimating or costing, as you all well know, is by no means an exact science. There are so many things that can throw your estimate right out. It can only be a question of cost research and cost planning. The main purpose, I think, is to give you the relative costs of various ways of building with various techniques.

What has been demonstrated tonight is that the architect and quantity surveyor right through have been trying to achieve what the client wants, something satisfactory to the architect, at the lowest price. When we realize that a saving of 1 per cent. in the cost of building would produce a saving of some £20 million a year, we realize how important this is.

The great problem of cost research and cost planning is one of time and cost. I know how difficult it is to persuade people to collaborate in cost analysis which is necessary to produce this background of information, this library of cost information, which one hopes will be useful to the whole industry. The main reason is that the full significance of cost planning and cost research has not got hold of people. I think it will do so, and if we can only get people to think in that way and go forward together—architects, quantity surveyors, builders and the rest—evolving a common form of analysis and presentation, so that jobs are automatically analysed and the results published or reported in some way, we shall achieve something.

Cost control in building

At the final meeting of the course, on June 18, all the lecturers were present. Left to right, Frederick West (Howard Farrow Ltd.) deputising for Ivan Tomlin. Michael Austin-Smith, John Wilkinson, D. E. Woodbine Parish (chairman), G. Grenfell Baines, Clifford Nott, Arnold Towler (speaking) and James Nisbet.

6 Symposium

chairman D. E. WOODBINE-PARISH

all speakers were present

The CHAIRMAN: I would like first to express our thanks and appreciation to THE ARCHITECTS' JOURNAL, and particularly to John Carter, for having promoted this series of lectures by very eminent people.

The purpose of this meeting is to recap the discussions which you have had and to provide an opportunity for some real audience participation. The pattern of this evening will be that each speaker will recap on what he has said, for some two or three minutes, and then the meeting will be open for a general discussion by way of comment and question.

We started with the general and went to the particular, and in the recap now we shall do it in reverse.

ARNOLD TOWLER: We find that the incentive is from the architect, who must approach his quantity surveyor with inquiries on cost of different systems of construction. The quantity surveyor will then begin to produce estimates of cost for each type, until a certain type is decided upon. Another basic consideration which he must have is a list of elements. You can get these from published information, or you can compile your own for your own requirements. Another important thing is definitions. Published information is a big source of information here, and you may have some views on how this can be improved. Having cost-planned the job, do you bill it by elements or by blocks? By blocks you get different sets of costs for different types of building; the big, aching void of an assembly hall as contrasted to the compactness of a classroom, with its fittings and services.

The next step is to price the draft bill before it is typed. Having produced three cost plans at various stages, we must then see where we are, hoping that we are on the nail and perhaps make some final adjustments. The object of cost planning is to achieve value for money rather than to effect rigid economies in all types of building. It allows you to spend money in the wisest way, getting as much as you can in each element throughout the building within the set total. Finally, there are the uses of cost analysis and planning after the contract is let—uses to the works representatives and uses to the contractor in planning his job—planning the costs and ordering the materials, etc. I leave you with that.

JOHN WILKINSON: We cost plan in three stages—beginning with cost plan 1, which is the target cost based on either experience or published information. In the example we gave we did it from seven published schools, of which we took the average. That is a point with which some of you may disagree, and I hope that we shall get some questions. Having got cost plan 1, we go into preliminary cost questions—for alternative erections and for different elements, so as to make comparisons. Here we have our quantity surveyor to help us. Half way through the process we do cost plan 2, which is an interim statement of the position in relation to the whole building, to see that we are not going off the rails and that the overall cost has not gone outside the cost limits. That can be done quite quickly. Being assured, we go into sketch working drawings—which is quite a normal process in architects' offices—for the whole job, so that we have fairly definite details settled before the bills of quantities are prepared or the final working drawings are started. The object of this is to assure ourselves that *we* do not then have a lot of drawings to rehash should the cost plan not work out. We next have cost plan 3, which is the final check before we go into working drawings. Some may think that this is a very long-winded way of working, but we have found that it gives the right answer. The tenders come in to the cost plan. We are fortunate in having a very co-operative quantity surveyor. I should like to hear the views of quantity surveyors, as to whether they work to a similar system (I see one or two sceptical smiles) and whether they think there are any short cuts that

can be taken. On the general question, we should consider the ultimate purpose of this cost planning—whether we should accept the architect's traditional rôle, in which a certain price is given him by the client as to the amount of money to be spent, and which he spends in the best possible way. I feel that that is right, but there may be other opinions.

G. GRENFELL BAINES: I began by trying to show how, as a designer, I could see that skill in the distribution of money could add content to a design. I felt quite sure that you would sense that economy came naturally, just as did a sense of proportion and the rest. It is not merely a question of cheapness, but of cost control.

I went on to give acoustic and structural analogies, where a better knowledge of the distribution of sound or the distribution of physical stresses could inspire form and surface treatment. We have at least 25 years' experience in acoustics and many more in structures, whereas the tools for cost distribution at the moment are few and are still being forged. No doubt there will be a Mark X tool before we are finished. Architects must be responsible for giving a lead and telling quantity surveyors what is needed in the way of tools.

I also spoke about the combination of performance and of standardization with costs. The establishment of a number of cost performance norms will be very helpful in our profession. Anybody's ideas on the sort of combinations of those things which would help in design will be very welcome. I spoke of the importance of "through-prices"—not merely the floor finish but the preparation for it, and even its potentialities for taking surfaces. I would underline Towler's point of the importance of standard definitions so that we can compare our cost plans with those of other people, just as we now compare the photographs of finished jobs.

That brings me to my final point about the various uses. One of the most valuable uses is in obtaining the exact requirements of the client and establishing an understanding with him. He is just as interested in a cost plan as in a sketch plan, and when it is presented diagrammatically it can help him to understand what we are getting at. Another use is in programming. Building programmes can definitely be framed on cost analyses. One of its most valuable uses is the way in which it brings the quantity surveyor into close contact with the job as a designer. A change of mind may be necessary but it will brighten his outlook and enrich his experience to work with us as a co-designer, and thereby enjoy all the creative possibilities. I feel that we should make a teaching technique of this, possibly at post-graduate level.

CLIFFORD NOTT: I want to start with the fourth member of the team—the contractor. He is looking for some improvements in the bills of quantities. As competition is getting keener he will need a better bill if he is to put in properly considered prices.

Without a doubt every contractor interested in the technique of costing and programming jobs and time-and-motion studies will find that some form of elemental bill will probably be as good a tool as he will get for some time to come. There are all sorts of future developments to consider, such as bills of quantities divided to show labour, material and overheads as separate items, and that sort of thing. We find that some sort of elemental bill gives the contractor more information upon which to put in a considered tender. Tonight you may like to consider a slightly modified system which we are now trying out, to reorganize the bill back into trade order, but to divide the trades up into elements. That gives the contractor the chance to price each trade right through. But the breakdown into elements will give an annotation, which so many contractors are calling for. The day after I gave my lecture we met at Herts some 15 contractors who had built our schools, with the object of seeing how we could speed erection on the site and improve other contract relations. The cry there was that the contractors want fully annotated bills so as to allow of simple one-column explanations. They want trade bills divided into elements, with every possible indication of where those quantities are in the actual building. Whether you leave the estimator to price each individual quantity in each place or adopt some method of setting out by which you collect the total of every similar item after the analysis is made to bring it through to one figure, I leave you to think over. Mr. Baines said that the client is interested in cost planning, and I bear out his statement. There is nothing more encouraging both to architect and to quantity surveyor than to go in front of a committee which is considering a project and to present it with an estimate which is in the form of approximate quantities. With cost analysis behind you you have got prices for group and bulk quantities—or the price right through from the floor to the other side of the ceiling. Committees, architects and clients can see that the quantity surveyor has made a genuine attempt to price every item of which he knows the story, and the gaps in his information are quite patent to the architect and client, and they can be brought forward and filled up as necessary. Jobs can be tailored in the early stages. Mr. Towler mentioned that his firm did three cost plans for a job. That may be essential when individual jobs have to be planned, but with repetitive programmes you have not got to lay down a cost plan for every job three or four times. What appears to be quite a labour in repetitive cost planning is reduced considerably.

FREDERICK WEST: I am standing in for my colleague, Mr. Tomlin, but I am not under the party whip! He told you that to a contractor the bill of quantities had to serve more than its prime use, which was providing an instrument in tendering. That being the case, the conventional bill has many disadvantages. Mr. Tomlin went on to outline the various uses the bill had to serve. He took you through the tendering procedure in a contractor's office and outlined the advantages and disadvantages of the elemental bill from the contractor's point of view. It is new, and largely unknown to contractors. This means that we have to have a certain reorientation of our ideas in order to appreciate it and make better use of it. At the tendering stage the estimator must work through the

bill, pulling out his various items and put them together in one trade total. That will give you a more accurate tender, but it means a great deal more work for the estimator to do and it takes longer to prepare inquiries for sub-contractors.

On the other hand, it gives the estimator a much better idea of the operational sequence of the work, and will lead to more realistic pricing. That must always be to the client's advantage, in that all the difficult pieces of work will be shown up at their true value. It is more useful in planning. When planning a contract with the conventional bill the quantities have virtually to be taken off completely. The quantity surveyor will never let us see his dimension sheets, so we have to do that work over again. That is largely obviated with the elemental bill. It helps to produce more accurate costing. The work done can be much more quickly related to the work in the bill. It means the quicker assessment of work done by the main contractor and a quicker assessment of that done by the sub-contractors, leading to a quicker settlement of their accounts. It leads to much quicker valuation. There is one point made by Mr. Nott which I should like to repeat. The elemental bill loses 50 per cent. of its advantages when it loses its annotations. They are the real grist for the contractor.

JAMES NISBET: First, on the method of cost analysis. The unit: square foot of floor area was chosen mainly because we decided that it was the best unit of accommodation, bearing in mind that we generally live in two dimensions and not three. Secondly, the breakdown of that cost per square foot is related to the functions of the building—the groups of functions in which the architect designed. In other words, we are trying to cost the main functions of the building as they are envisaged by the architect. That immediately brings in the question of the relationship between the architect and the quantity surveyor. So often the quantity surveyor's training is isolated from that of the architect, and it is not until he gets into practice and has had a good deal of experience that he comes up against the architect and his thoughts and philosophies. One of the things that will happen with the use of analyses is that quantity surveyors and architects will get together earlier and learn each other's job. The third point is the benefit of cost analysis in a much wider field. I do not think that anybody would disagree with the statement that there is a lack of public confidence in the building industry when it comes to the matter of cost. Most quantity surveyors would probably agree that they are not brought into the building project early enough. It seems to me that these two situations have something in common, namely, that we have not established a common language between the quantity surveyor, architect, client and builder. The client may have a very large sum of money to provide, and he is a little at a loss to know why it should be so much. In most cases he will check up to see if he is getting value for money. He will go off and try to relate some other buildings to the one he is having designed for him. What we must do is to present costs in such a way that they are meaningful to the client. Mr. Baines has also suggested that he has found cost analysis by elements helpful in that way. I think that it is this lack of a common language which causes the quantity surveyor not to be brought in sufficiently early. He deals with the prices of materials—and these are not the terms in which the architect is thinking in the early sketch design stage. He is thinking in a wider context. As quantity surveyors we must try to produce some system which will give the architect the costs of this wider concept. We feel that this use of elements at least forms the basis from which to start. Some people may say that if we start giving the client and lay people more information we shall create tremendous difficulties for ourselves. But I feel that the professions and the industry as a whole are bound to benefit if we can do something to dispel the *mystique* which seems to those outside to exist within the industry. If we can dispel that, the professions and the building industry as a whole are bound to benefit.

MICHAEL AUSTIN-SMITH: I shall refer to only three of the main principles. First, this idea is still in its infancy, and there is still an enormous amount of work to be done. You will not go away with a cut-and-dried scheme. Secondly, I think this technique of cost control is only one of many management techniques which we must introduce into our offices. One is that of getting sufficient information from the client. If you do not do that, in the middle of your cost control the client may change his mind. You have to have the client in the proper frame of mind. The question is posed: Do we introduce these techniques one by one, and wait until we have perfected one before starting on another, or do we advance on a broad front, with all the members ticking over together? I have my own views on that question. Thirdly, it must be emphasized that this is a team effort. It is not an individual thing, it is a team effort between the client, the architect, the quantity surveyor and the building contractor. What is required is the right attitude of mind among all those four people. This attitude of mind must admit of change, and it must also be able to appreciate the other's point of view. With it must go a really burning fire of conviction that we can, by building fact upon fact, make advances towards our real goal of better architecture.

The CHAIRMAN: There is now one hour available for members of the audience to participate in this evening's session, raising questions, making points, and so on. You should know that the gentlemen sitting on the platform have lunched together today and, as a result, quite a number of subjects were thrown up. It may be that one or two may arise this evening which will be a little off the wavelength. If so, I hope that you will be favourably disposed if I keep you within certain limits; otherwise we shall have the building industry reorganized too soon, possibly to no great advantage.

Part of the audience at the symposium on June 18.

Discussion

M. H. THACKRAY (quantity surveyor): The main hurdle which we must surmount is that of the swapping of information. We have heard from Mr. Baines how satisfactory this cost control is working in a group; it has worked well in the Ministry of Education and in the Hertford County Council, and many other places where they are working within a group. I heard the suggestion that it was merely a matter of the wish to preserve secrecy which was preventing the exchanging of information. I do not think that that is true. I think that most people realize that there is frightful danger in exchanging this information without exchanging the whole facts. When a group prepares this information the composite parts know what goes in where, and so on. That is the biggest hurdle. We must get over it if we intend making information available. THE ARCHITECTS' JOURNAL had a shot at it, and I think it would be just to say that that is the difficulty—to make sure that everybody is putting the same things in the same elements. That is something which one of the lecturers may care to reply to. I want to make a really earnest appeal to everybody not to muddle or confuse terms, such as the terms "annotated bill" and "elemental bill." We were interested to hear that Mr. Nott was experimenting with a hybrid, somewhere between the annotated and the elemental bill. In a report of this meeting the two terms might get confused, and I earnestly appeal to those concerned to see that that does not happen.

CHAIRMAN: In case anybody wishes to cross swords—we are adopting the same principle as Humpty-Dumpty, who made words mean what he wanted them to mean. "Cost control" really means "expenditure control." "Cost control" is historical and "expenditure control" is a bit of "Piddington" work; we are looking into the future. But we must not produce any confusion.

G. GRENFELL BAINES: I would not like individual practitioners to feel that there is any really great difficulty in their being able to practice the technique of being able to distribute costs as desired; there is not. It can be helped enormously by published information, but we must define the basis upon which the information is published in order that people are not led astray. I do not think that individual architects are so lacking in intelligence that they would not make some intelligent adjustments if there were some discrepancies in the cost plans. Nevertheless, the accuracy of the basis upon which information is exchanged is important, and a study group might get to work on that as quickly as possible, so that journals doing cost information would do it on the same basis. I think that even a little information is better than none, however.

JOHN CARTER (ARCHITECTS' JOURNAL): I want to follow up Mr. Thackeray's point about definitions. We have been publishing analyses now for about two years and we are well aware that there is not always enough information given for you to know what each element contains; therefore the prices are not as useful as they might be. Our main object in publishing was to interest people in analysed costs; to get them to think about breaking down the costs. It is obvious that you cannot be precise about a technique until some experience of it has accumulated. The time has now come when we can begin to be a little more precise about the definition of elements. THE ARCHITECTS' JOURNAL is proposing to invite those who have knowledge or experience of cost analysis to form a small study group —by small I mean ten or twelve members— who must appoint their own secretary to do the donkey work. The JOURNAL will provide some hospitality, and the premises for their meetings. The object of the study group is to examine the possibility of a standardized list of elements, with definitions as to what each element contains. The purpose is to produce a little *aide memoire* which can be handed to quantity surveyors, so that all analyses produced will be comparable, one with another. At the same time, those of you who have no previous experience of cost analysis but who, as a result of coming here, want to go away and try it, we would like to keep in touch with you. I have arranged for paper and pencils to be provided in the foyer, and if those who are interested will leave their names we will compile a list. If you have any problems, write to us and we will try to help you. If you produce any analyses we would like to publish them. The form of publication would obviously be related to whatever standardized form the study group arrives at. Would those who wish to form the study group please write to us at the JOURNAL?

MICHAEL AUSTIN-SMITH: I think that that is a very good thing. One of the vital problems is what is contained within these elements. If we have that the door begins to open for various groups and bodies of people to begin to collect their analyses on some common basis. We will start on a common basis and improve by means of facts and not mere opinions. I am instructed to tell you that the council of the Architectural Association have now set up a committee of their council to look into this matter of how cost analyses can be collected, analysed and disseminated. If THE ARCHITECTS' JOURNAL will consolidate the ground they have gained and produce a standard method of analysis which they can publish, anyone finding that his building does not quite fit can easily say in which respects, and he can give the reasons. It is a very fine thing for the JOURNAL to do, and it is good to know that they are prepared to publish cost analyses on top of their own. As a commercial magazine they have hitherto had to pick out buildings of interest to the people buying their magazine, when they have published analyses, but it will now be possible to achieve what we need to get at the real facts—possibly up to 30 or 40 buildings a month being analysed, instead of 30 or 40 a year. [The Editors: steady on!]

P. A. DIXON (architectural assistant): Mr. Wilkinson gave us a very good idea of the work of designing that went into a building before it was finally billed and tendered. Was that formerly the practice? If not, how much does he consider that contributes to more accurate tendering at the final stage?

JOHN WILKINSON: The system of sketch working drawings was not the common practice before we started this cost planning system—at least, not to the present extent. On the job which I mentioned we have done nearly 100 sketch working drawings, and they help to produce a more accurate cost plan. Possibly the process of producing them also tends to give a more accurate picture of the cost, but how much that influences it, I cannot say.

GRENFELL BAINES: It is always interesting to know what goes on in the office when you are away from it so much! We did

not do it in the past. We used invariably to go wrong and put a lot more work into putting things right. Now we do less work in the end. It is merely that we have pulled a lot of work forward to where it should be—at the beginning. I agree that the technique of sketch working drawings has developed very much from cost control and has shown that our whole procedure of doing work or production drawing was wrong in the past.

H. G. EDWARDS: (quantity surveyor): That is one of the most interesting features of the whole discussion—the fact that cost control is compelling quantity surveyors and architects to pre-plan.

It might interest you to know that after some false starts my partner and I formulated three rules to give consistent results in allocating items to elements. Rule 1 is to allocate each item by its cause. For example, to the element "Windows" in a building of traditional construction we allocate the lintols and items of construction around the windows which would not be there if the windows were not there. That is different from the Ministry of Education's, but it seems to me that they are inconsistent. The application of that first rule usually leaves only a few small items. Rule 2 is to allocate by order of construction. For example, if an item does not belong either to the frame or to the external walls we would allocate it to the frame because that is erected before the external walls are built. That is a quite arbitrary rule, but it gives the answer. We use this rule only in so far as small items are concerned, which are usually of no significant value. Unfortunately we get the awkward item, such as expensive stanchion casings, which we deal with by Rule 3. In the case of stanchion casings we would divide the cost between the frame and the internal finishings and make a note about it on the analysis. I do not suggest that we cannot devise better rules, but we have tried them in about 20 analyses and we find them workable, and they keep our analyses consistent. We also keep a separate element of builders' work in connection with services. On a recent contract we found that this worked out at £6,753, which was equivalent to 2s. 9½d. per sq. ft. of the building. That was a significant figure and it led to an investigation. In the end reasons were found for it, but in the ordinary way we would not have discovered it. Lastly, I would like to cast your minds back to a few years ago, when we were dealing with prices per foot cube of building, with no idea of the effect which the shape and size of the building had on the price. How much farther we are on the road now to a sensible approach to cost building, thanks to Mr. Nisbet and his colleagues.

CLIFFORD NOTT: We have come to the same solution, but one point is worth thinking about. Mr. Edwards referred to the knotty case of stanchion casings, and the question whether they should be put with the frame. If the frame had been a decent job to look at, you might not have put a stanchion case on. Is it part of the external walls? It might be worth considering that item in relation to the difficulty in pricing. If you are going to use elemental bills, it is probably better not to split the item as to cost partly between the frame and partly the walls. A hypothetical splitting does not help the estimator to price an item any better; in fact, it might mislead him into thinking that it is done in two separate operations.

GRENFELL BAINES: I liked the first rule, but I must take up the second one. You cannot break the frame up into the various parts that it serves, but if you do decide to have a frame individually it helps to combine a number of items in groups when making comparisons. As an example, an exposed concrete frame can contribute as much as 10 per cent. of the external wall area, whereas with a curtain wall job it is just a question of running past the columns, without combining the two things. You must compare by groups.

JAMES NISBET: I would refer you to my own talk, when I said that the choice of elements—elemental bills apart—depended on a number of considerations. One might be the form of construction and the second might be the sort of functions or the units in which an architect designs. When you bring in elemental bills you have to bring in the quantity surveyor and his procedures, and the builder and the way he works. You have four separate things to consider; in the analysis you have only two.

H. F. KERLEY (quantity surveyor): In cost planning and cost analysis there is danger of too great an accuracy, when one bears in mind the considerable variation in tenders, owing to the state of the market and the area. I think it was Mr. West who referred to the impossibility of access to the quantity surveyor's dimensions and abstracts. I have never been asked for them, but it occurs to me that photostat copies might be provided. It would be helpful to the contractor pricing bills, if much more notice were taken of the note advising that the basic drawings were sent to contractors tendering. That would obviate the necessity of putting 200 yards of concrete in one place and 500 yards in another, because the contractor would be able to see the distribution.

CLIFFORD NOTT: You do not only want dimensions; you want the take-off drawing. If you have to give them to contractors they have to be complete and self-readable. A taker-off working under pressure will short-circuit a number of things and although the dimensions are properly signposted the thing would still not be complete. In general it would be dangerous for quantity surveyors to offer their work, however good, for open use by the contractor. If the contractor thinks he requires more information for planning we ought to be able to produce that information by one simple process. In other words, I think that the contractor would be happy if he got good annotation, without seeing the dimensions.

FREDERICK WEST: He would be happier, but during planning stages one often wants far more detail even than the annotations give. If we had access to the dimensions and abstracts, and the taker-off's drawings it would save us an awful lot of work which has already been done once. Mr. Kerley is an exception, and I should like to leave him my business card! The usual answer when one approaches a professional quantity surveyor is "You would not understand them"—given in a very scathing manner. I say again, with Mr. Kerley, that the more information you can give us in the way of working drawings at the tendering stage the more accurate our pricing will be.

GRENFELL BAINES: On this question of over-accuracy and market fluctuations, I do not think that our concern about that is valid on the whole question of cost analysis operation. Prices can either be up or down. If they are down it is a pleasant surprise—and very few architects are stuck for ideas how to spend extra money! If they are up you have with cost analysis a much better basis upon which to do something about it. I do not want to misunderstand Mr. Kerley, but I do not think that this question of fluctuations is a serious one.

ARNOLD TOWLER: In collecting information for cost planning we must beware of the exceptionally low tender, which may, with the first, second, third and fourth close together, be another £8,000 away. As to sending out drawings with the bill of quantities, we have started to do that and contractors have found it a great help. We have also started to annotate bills on the outside page. I shall be interested to know in more detail just what information the contractor would get from the take-off at the tendering stage or any other stage.

CYRIL SWEET (quantity surveyor): If the contractor wants to see the dimensions and abstracts I think that he should be shown them. It seems to me ridiculous to expect him to do all that work over again and arrive at a different answer and then produce documents to prove that you are right or wrong. Mr. Thackray drew attention to possible confusion between annotated bills, which is a new expression we have heard this evening. Some contractors want elemental bills and some want annotated bills, but we have no evidence that contractors, *as a whole*, want either one or the other, as a matter of preference. Another point is the question of where you stop with an element. Mr. Baines referred to the necessity of including stanchions with curtain walls, but how much does he include? On cost analysis, we should consider broader things and take the structure as a whole with the external cladding walls and partitions, and compare them with the different types, and with any other form of framework. We could do a theoretical analysis to establish the relative cost of one technique as compared to another. The important thing is what it costs to do a thing in one way as compared to another. The importance of this course is that it has made us all cost-conscious. It we are cost-conscious we plan properly and spend our clients' money sensibly, and there is a proper distribution and the avoidance of disillusionment when the tender comes in and work has to be cut out. We need to know the relative costs of different techniques. If the architect, from the inception of the job, thinks about what he is doing and what the cost will be, and whether he

could do it cheaper and satisfactorily, he will have learned the main lesson to be derived from this subject.

GRENFELL BAINES: I did not want to mislead Mr. Sweet, and I hope that I have not misled you when giving my example of the way in which the frame can contribute to the cladding. I used the example merely to emphasize the importance of classifying by broad groups.

G. T. WEST (architect): Mr. Nisbet, in the second lecture, was at pains to show us the difference between a cost analysis and a cost plan. Cost analysis is an attempt to find out why costs vary, and what factors make them vary. In cost planning, on the other hand, we take target figures, which we have to accept, and take percentages and make a simple average. Cost analysis is a much more exact activity, and if there is one way in which schools of architecture can help it is in the theoretical study of the way in which various factors affect cost. We could mention twenty different factors, given us during this course, which affect cost. We do not know how they affect it, and a study of that subject is essential if we are to make cost plans more realistic. For cost analysis, we must take figures seriously. We may find that the elements we need for cost analysis are different from those that we need for cost planning.

JAMES NISBET: I agree 99½ per cent. with that, but I want to stress that cost analysis and cost planning are very closely related because the cost analysis provides the data for setting our targets. Hence, the choice by the MoE of the set of elements and their relation to cost planning. If you are trying to decide whether a steel frame is cheaper than a concrete frame, Mr. Sweet's suggestion of grouping fits in perfectly well, but if you want to take that information on to cost planning you may have to break it down into little bits, bearing in mind that the little bits of each group are not necessarily comparable, like with like. Secondly, cost analysis does not give you the answer to any specific problem: it is designed to give you a method by which you can find the answer to your own problem. It is a method of working rather than a final answer.

G. POWELL (quantity surveyor): Mr. Baines said that he had so far not made use of elemental bills of quantities. Knowing how interested he is in this problem of cost control, I wondered whether there was some positive reason for this. Could his quantity surveyor tell us if, not having to put elements together in a bill, it frees him in preparing his analyses?

GRENFELL BAINES: The reason why we do not use elemental bills *at the moment* is that we have been getting all the information we wanted from our quantity surveyor without them. Having quite a lot of things to attend to ourselves we do not worry ourselves unduly as to how he gets at the answers. They have been fairly correct up to now. I underline the words "at the moment" because I have a feeling that, just as we have been driven to developing our design details much more than we used to do, by having to give our quantity surveyor lots of information, he may also be compelled to change his methods because of the questions we shall be asking him in future.

ARNOLD TOWLER: I have not yet produced an elemental bill. I should think that the main call for an elemental bill will come from the contractor. I cannot see that it would help the architect very much more than what I am producing at the moment. Its real value appears to be in estimating and thereafter in other spheres, which I can satisfy with the present techniques. I can usually get out an analysis within 36 hours (of working time, not consecutive, of course). If I can see advantages to be gained in building time I am quite willing to adopt elemental bills, but this is something which must be developed, and I think that the contractors should be consulted.

J. P. COUSINS (builder): I was extremely interested in Mr. Nott's suggestion of a hybrid elemental bill classified by trades. I rather feel that from the contractor's viewpoint such a bill would be very much more useful than a pure elemental bill, in which one might find bits of concrete appearing from Folio 10 to Folio 510. Before Mr. Nott made his suggestion I was very much in favour of the standard method, with very thorough annotation to a specification. One of our major problems is to ascertain where certain things are going in a job, particularly with the Joiner, where there are thousands of feet of frame and it is almost impossible, without going to the quantity surveyor, to find where it goes. The second very important problem is that of complete drawings before tender. In the past we have found that one of the greatest difficulties arose from sections of the bill which appeared to have been produced by the quantity surveyor using his imagination as to what the architect was likely eventually to design for a certain stage of the job. That has caused us endless problems to sort out after we have gone through a very detailed progress and cost plan. From a contractor's angle, two of the most important things are detailed drawings and elemental bills classified by trades.

CLIFFORD NOTT: That confirms the opinion I have developed as a result of what I have heard from many contractors in my area, and I would like to ask his opinion as to whether or not he thinks the old form of elemental bill with a trade index was better than a bill divided into trades, in the same order as they now appear, but the index consisting of the elements, made in such a way that you can price it and bring out a total?

I am proposing to include in the description column of a bill an open summary to allow a contractor, if he so wishes, to subtotal the elements within his trade. He can carry them to his element summary, which will give him a planning summary, which will give him assistance in planning his job while pricing. Mr. Sweet mentioned the question of the quantity surveyor showing his dimension sheets to the contractor. I agree that he does not do this, but the trouble lies in the timing. The contractor wants them not when the job has started but when he is pricing, and there may be 12 contractors. It may be that photostat copies are the answer. We would like to be able to help, but I think that the information should be given in the form of a summary.

CYRIL SWEET: I should have thought that if the bill were prepared properly, and important points such as repetition were brought out in the bill the contractor would have all he wanted.

FREDERICK WEST: I think that I have been misunderstood. I was not suggesting that contractors wanted a sight of the dimensions and abstracts at the tendering stage, but contractors today are using modern management techniques, planning costing and budgetary control, and if contractors could have a sight of these documents it would avoid much duplication of work.

ARNOLD TOWLER: Some revisions to the bill are obviously necessary. The main thing that a contractor will get from the elemental bill is a knowledge of the distribution of materials throughout the various parts of the building. I am quite surprised to hear people referring to the Joiner, with so many thousands of feet of material, being baffled as to where it is. The joinery trade is the very one which does not need annotation. An item saying "Plaster to walls," obviously belongs to the walls. Anything which cannot be put into the description of the item should be done by way of annotation. In a bill of 100 pages, you would need to annotate only about 40, and the descriptions should take care of the rest. With a schedule of finishings at the back, which the quantity surveyor has used for his taking-off, his plans and scale drawings, should give the contractor a good picture of the building.

PETER TRENCH (Bovis Ltd.): I want to make three quick points. I want to take Mr. Nisbet up on his statement about public confidence in the building industry. That is a big point. All four members of the building team have some responsibility in this matter. I leave the builders aside at the moment. Of architects, I say that many has been the occasion in the past where estimates have been made by architects on a foot-cube or foot-super basis without consulting the quantity surveyor, let alone the builder. They have produced prices which have been wildly out. That is one of the factors which has caused a certain amount of lack of public confidence in the building industry. If this course has done nothing else but sound the death knell of foot-cube and foot-super "guesstimates"—in other words, if we have found out how to work out how much a building will cost with some form of scientific analysis—it will be bound to do an enormous amount of good. The word "fact" has been used by several speakers. I ask quantity surveyors and architects whether they are in possession of those facts. As I understand it, cost analysis is price analysis, and we have heard that the lowest tender is not always the right price. The day will come when builders themselves know how much things cost and when that day comes they may share their secrets with the others. The only people who should know are the builders. Mr. Thackray talked about cost analysis and cost control, and I think that the Chairman

said that the terms should be "price analysis" and "expenditure control." That is something which follows from these lectures. Cost planning and analysis is one thing, but controlling the cost of building once it is started is another. We could easily run a course for builders and others showing how you should first measure your work and see whether or not you are making a profit and, secondly, how to find out how much the ultimate cost of the building is likely to be.

The CHAIRMAN: I shall now give the lecturers an opportunity of adding a postscript on the evening's discussion and upon any points which have been raised.

GRENFELL BAINES: For me the course has shown the importance of information and of the exchange of information for all the designers who have not the time to build it up in their own offices. If what has been suggested about a better basis for information is followed out that will perhaps be the best service that can be carried out either by the profession or the Press.

CLIFFORD NOTT: From this course of lectures I have learnt one thing, at least, namely, that although we have now been doing this for two or three years and have done £2 million or £3 million worth of work with pure elemental bills I have not yet decided whether the system that we are using is 100 per cent. the answer. Only last week, as you have heard, I thought of rearranging the bill, but any new development will have to be something very much better.

ARNOLD TOWLER: I should like to say something about the publication of analysed results and also the fact that the various associations are, in varying degrees, making investigations of costs. I have a feeling that at the moment they are not running parallel, but are diverging slightly from each other. I think that they should get together and institute a form of liaison, working upon a common basis. THE ARCHITECTS' JOURNAL has done a wonderful job. Architects derive much inspiration from these results and if they are keen enough they go to see the job. They are not satisfied just with the analyses; they send their staff to the jobs to photograph and report. That is a further development arising from the reading of these published results. The other professional journals should take this up. There are so many buildings being constructed that we cannot have enough of these analyses, provided that they are all upon the same basis, with the same list of elements and the same items going into them. That is something which could come out of this course of lectures, and which would be a step in the right direction.

JAMES NISBET: Somebody made the point that drawings were not always complete when bills of quantities were prepared. One factor in this is the architect's lack of confidence in the preliminary costings. If, by analysis and cost planning, we can help the architect to produce the drawings quickly we shall be making a contribution to pre-contract planning.

I want it to be known that the success of this course of lectures is very much due to THE ARCHITECTS' JOURNAL and in particular to John Carter, who had the idea in the first place and the courage to go to the Regent Street Polytechnic and persuade them. Our thanks are also due to them for having the courage to stage this course, which has been extremely successful.

JOHN WILKINSON: I want to address my remarks to architects. After a course of this sort there is apt to be a general feeling that the matter is a little complicated. My plea to architects is not to wait until the next job comes along before starting cost planning, but to take the one that they are already half way through. All that is needed is a simple list of elements. Put in the prices and gradually build the thing up into a complete cost plan. If you wait until you have got everything in the office organised, with long lists and various information filed away and you wait until you have assimilated all that you will be moving very slowly.

MICHAEL AUSTIN SMITH: I think that that answers the question that I posed, namely, whether you should start on a broad front or wait until you have one thing completely buttoned up before you start on the next one. I think that you must move along generally. I was asked whether I knew what was going on in America. I managed to get hold of an American magazine. It does not go into terrific details, but it is a regular publication and is called *Costs and Trends in the Building Industry*. I also received this pamphlet which says, "Once you start to plan you soon find a way of going wrong."

FREDERICK WEST: What impresses me as a result of listening to the previous speakers is that this question is one of team work. The architect, quantity surveyor and builder

List of articles and publications on cost control in building

Title	Author	Publication	Date
Cost Study	MOE	Building Bulletin No. 4	March, 1951
Elemental Bills of Quantities	C. M. Nott	AJ	September 16, 1954
Cost Analysis	The Guest Editors	AJ	February 24, 1955
The Quantity Surveyor's Control of Costs	The Guest Editors	AJ	July 14, 1955
Cost Planning	The Guest Editors	AJ	July 28, 1955
Economics of Multi-storey Flats	J. C. Weston (BRS)	RIBA Booklet	August, 1955
Factors Affecting Economy in Multi-storey Dwellings	C. N. Craig (BRS)	*RIBA Journal*	April, 1956
Cost Analysis and Cost Planning	James Nisbet	AJ	May 10, 1956
Architectural Economics (the Elemental Bill)	C. M. Nott, K. Norman, D. L. A. Stracey	AJ	May 24, 1956
Flat and House Costs	James Nisbet	AJ	July 17, 1957
More About Flat Costs	R. O. Whittington	AJ	July 26, 1957
Programming and Costing	R. B. Hellard, R. J. Playle	AJ	August 23, 1957
Cost Control (report of discussion at the Building Centre)	—	AJ	November 8, 1957
Structural Economics of High Flats	Peter Dunican	*RICS Journal*	February, 1957
Architectural Economics (report of lecture course organized by the AJ for the Birmingham school of Architecture)	J. Carter, H. Swain, C. Wooster, R. Hellard, P. Bottle, F. West, P. Dunican, O. Cox	AJ	March 14, 1957
Standardized Quantities	H. M. Stafford	AJ	April 18, 1957
The Elemental Bill (for and against)	—	AJ	April 25, 1957
Elemental Bills (report of discussion at the RICS)	—	AJ	May 2, 1957
Cost Study	MOE	Building Bulletin No. 4 (revised)	May, 1957
Value for Money in Flats (report of paper at Scarborough Health Congress)	C. N. Craig (BRS)	AJ	May 30, 1957
Cost Control in Building (report of lecture course organized by THE ARCHITECTS' JOURNAL and the Regent Street Polytechnic School of Architecture)	M. Austin Smith, J. Nisbet, C. Nott, I. Tomlin, G. Baines, J. Wilkinson, A. Towler	AJ	June 13, 20, 27, 1957

Next week we shall print a complete list of cost analyses published in THE ARCHITECTS' JOURNAL.

are all members of a team, and it is obvious that somewhere in our training we have to get together. It would be an excellent idea if architects could spend their final year with a contractor so that they could get to learn our building techniques (and we could get to know what makes them tick!) To the architects I would say, "You are the natural leaders of the team. For heaven's sake be the leaders."

JOHN CARTER: First, I should like to express my thanks to Mr. Nisbet for his kind words. Secondly, to take up Mr. Towler's remark about several different bodies being interested in this business and tending to go at variance to each other—that is not really true. We keep in touch with each other and co-ordinate as much as possible. Thirdly, I want to give a reminder of our invitation to volunteers for the study group, to write to us, and for those who intend to cost plan to leave their names, so that we can keep in touch.

The CHAIRMAN: I am delighted to hear that it is the intention of THE ARCHITECTS' JOURNAL to set up a study group. There is a tremendous need for a work study of the whole process by which a building is designed, and afterwards put up. Until recently we have not realised that we have to do that work study together and address ourselves to the problem in the offices of architects, quantity surveyors and builders, and also on the site. I believe that a reduction in building costs generally, or an increase in productivity, of the order of 7 per cent., is not outside the realms of practical possibility if we address ourselves to these problems, which stem from an acceptance of the fact that management has a very much larger part to play in the industry than we have realised in the past.

We have to address ourselves to developing the training of the leaders in all sections of the industry—those who will directly encourage and inspire the people who design and carry out the building. On the development of management techniques, we realise that we need all the tools in the kitbag, or the weapons in our armoury, to deal with our problems. These must all be integrated for the architects, quantity surveyors and builders, and anybody concerned with directing the activities of other people. As a result of these six lectures we have begun to see that the road lying ahead of us is a hard one in connection with which we must do some courageous, bold and imaginative thinking in order to put right some of the conditions which exist today which are not satisfactory. I should like to express our thanks to the Polytechnic for having provided an opportunity for these meetings to be held, and also to those speakers who have come here tonight for the second time to take part in this final symposium. Once again we thank THE ARCHITECTS' JOURNAL for its inspiration, which has made these lectures possible. May it go further in the work that it has started, and may it have the full blooded support of those who are here tonight, and all those whom they may be able to influence as a result of what they have been told in these lectures.

technical section

8 ESTIMATING

current wage rates, market prices and measured rates

Almost all the changes this quarter are accountable to the wage increase of May 27. This naturally has a greater effect on items where the labour content is relatively high (e.g. items under *Excavator*); but since it is a recent event we can assume that we shall soon see some further small advances on the materials side also. Prepared by Davis, Belfield and Everest, Chartered Quantity Surveyors. Market prices and measured rates last appeared in the JOURNAL for March 28, 1957.

Wage rates

Rates of wages rose on May 27, 1957, and are now as follows:

	Craftsmen	*Labourers*
London District	*s d*	*s d*
Within 12 miles radius	4 7½	4 1
From 12 to 15 miles radius	4 7	4 0½
Liverpool and District	4 7½	4 1
Grade classifications		
A	4 6	3 11½
A1	4 5½	3 11

Market prices

Prices are given for the major items in each trade, they are intended as average prices and include delivery in the outer London area. They do not include overhead charges and profit.

Measured rates

Prices are for work carried out in the Outer London area and include 10% to cover overhead charges and profit except in the case of work which would be carried out by specialists when 5% has been allowed.

The prices given in italic represent the total value of the materials included in the measured rates, including an allowance for waste and 10% for overhead charges and profit. The cost of labour included in the measured rates (including its proportion of overhead charges and profit) can be ascertained by subtracting the prices in italics from the prices in heavier type.

Abbreviations

Inches: in. Feet: ft. Yards: Y. Yards cube: YC. Yards super: YS. Feet cube: FC. Feet super: FS. Ton: T. Feet run: FR. Thousand: M. Square: Sq. Number: No. Hundredweight: C. Pound: lb. Gallon: Gal.

Preliminaries

To all estimates based on prices for measured rates add for Preliminaries, water, insurances, etc., depending on the nature of the job, say 10%

Price changes

* Shows changes in market prices and measured rates since the last issue (March 28, 1957).

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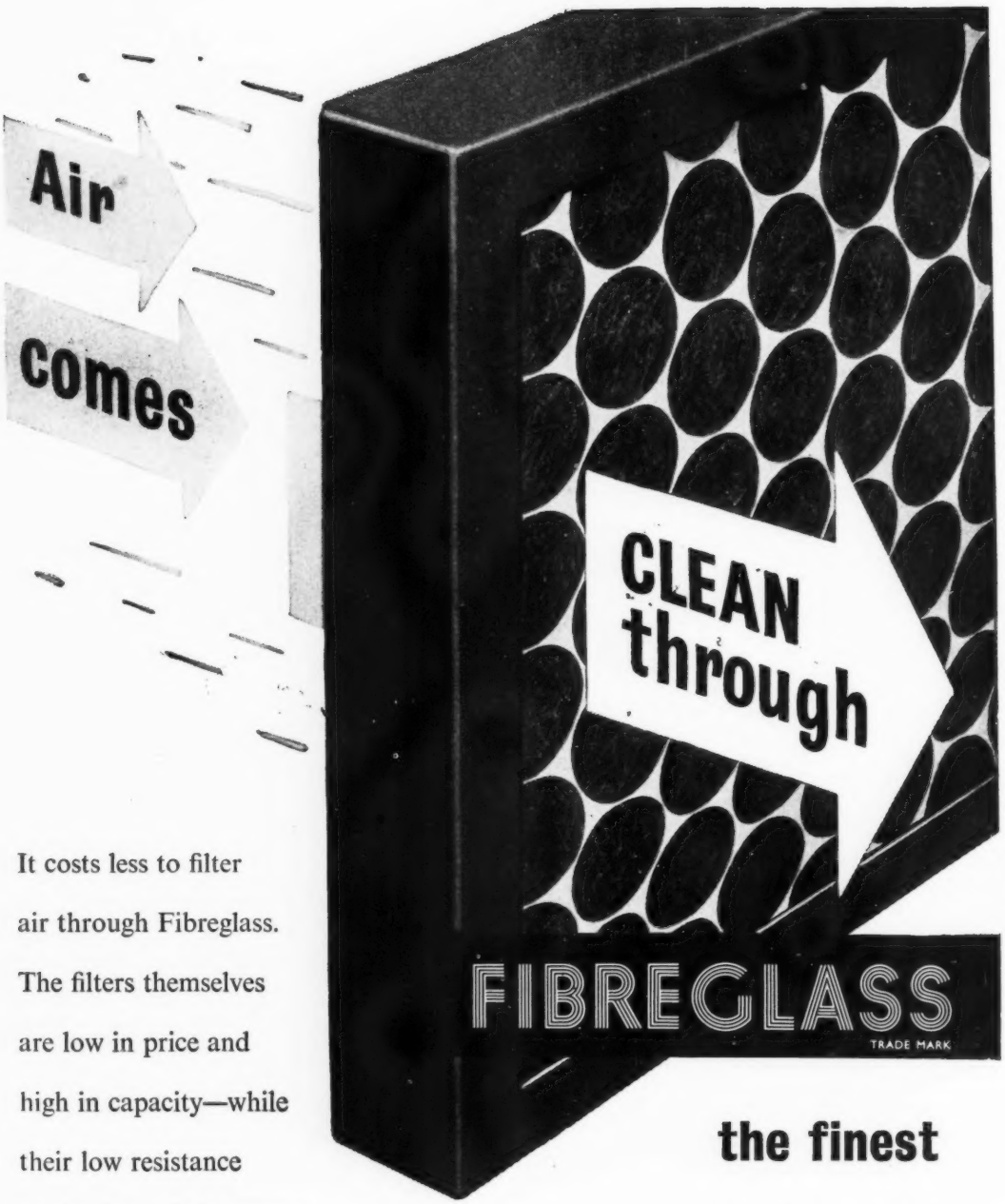
technical section

EXCAVATOR

		s	d
Market prices			
Carting away, up to 8 miles	YC		
Hand loaded		8	0
Machine loaded		7	0
Hardcore	YC	*11	0
Ashes	YC	*11	6
Measured rates			
Hand excavation and disposal			
NB: the following are applicable to excavation in heavy soil.			
Excavating over site to remove top soil and vegetable matter, 6 in. deep	YS	1	2½
As above, 12 in. deep	YS	*2	5
Excavating over site to reduce levels and getting out	YC	*9	9
Excavating for basement and getting out	YC		
Depth up to 5 ft.		*11	0
Depth between 5 & 10 ft.		*15	10
Depth between 10 & 15 ft.		*20	9
Excavating surface trenches and ditto	YC		
Depth up to 5 ft.		*13	5
Depth between 5 & 10 ft.		*18	3
Depth between 10 & 15 ft.		*23	2
Excavating basement trenches and ditto	YC		
Commencing 5 ft. below existing ground level		*18	3
Commencing 10 ft. below existing ground level		*23	2
Commencing 15 ft. below existing ground level		*28	0
Wheeling surplus excavated material not exceeding 100 yards and depositing	YC	*4	10½
Add to last for:			
Roughly spreading and levelling	YC	*1	5½
Spreading, levelling and consolidating to make up levels	YC	*3	2
Returning, filling-in and well ramming excavated material around foundations	YC	*4	3½
Loading surplus material into lorries and carting to tip, not exceeding 8 miles	YC	*15	10
Excavating from spoil heaps selected top soil, wheeling not exceeding 100 yards, and spreading, levelling and consolidating, not exceeding 6 in. to receive turf	YS	*2	2
Mechanical excavation and disposal			
Excavating for shallow surface excavation and loading into lorries or dumpers (using ⅝ yd. cube excavator)	YC	3	0
Excavating for surface excavation and removing, spreading and levelling not exceeding 200 yds. (using 6 yd. cube scraper)	YC	*2	7½
Removing excavated material and depositing, not exceeding 200 yds. (using 3 yd. cube dumper)	YC	*2	0
Planking and strutting			
Planking and strutting to sides of surface or basement excavation	FS		
Depth up to 5 ft.		8	
Depth up to 10 ft.		*10	
Depth up to 15 ft.		*11½	
Planking and strutting to sides of surface and basement trenches	FS		
Depth up to 5 ft.		2	
Depth up to 10 ft.		3½	
Depth up to 15 ft.		4	
Hardcore, etc.			
Hardcore filled-in in layers, each layer well rammed	YC	*21	9
		15	*2*
Bed of ditto, 4-in. thick	YS	*3	6½
		1	*8*
Ash filled-in in layers, each layer well rammed	YC	*21	3
		15	*10*

CONCRETOR

		s	d
Market prices			
Portland cement, 6 tons and over	T	106	0
Rapid hardening, 6 tons and over	T	116	6
¾-in. down, washed, crushed and graded shingle	YC	18	1
1½-in. ditto	YC	17	2
Sharp sand	YC	22	1
⅝-in. diam. mild steel rods to BS 785 delivered station	T	764	0
⅜-in. ditto	T	856	0
Measured rates			
Portland cement mass concrete in foundations etc.	YC		
1 : 12, 1½-in. "all-in" aggregate		*59	6
		39	*5*
1 : 3 : 6, 1½-in. aggregate		*67	4
		47	*4*
1 : 2 : 4, ¾-in. aggregate		*74	3
		54	*3*
1 : 1½ : 3, ½-in. aggregate		*75	7
		55	*7*
Add for:			
Working around rod or mesh reinforcement	YC	*4	10½
Walls not over 6-in. thick	YC	*24	5
Walls 6-in. to 12-in. thick	YC	*17	1
Walls over 12-in. thick	YC	*12	2
Columns not over 72 sq. inches	YC	*46	4
Columns 72 to 144 sq. inches	YC	*36	7
Columns over 144 sq. inches	YC	*29	3
Suspended floors and roofs not over 4½-in. thick	YC	*19	6
Suspended floors over 4½-in to 6-in. thick	YC	*17	1
Suspended floors over 6-in. to 12-in. thick	YC	*14	7
Beds not over 4½-in. thick	YC	*9	9
Beds 4½-in. to 6-in. thick	YC	*7	4
Beds 6-in. to 12-in. thick	YC	2	5
Hollow tile floor of clay tiles 4-in. thick at 15-in. centres laid on formwork (measured separately), nibs filled in with concrete (1 : 2 : 4) and finishing top of tiles with bed of concrete 1½-in. thick including tamping around reinforcement (measured separately)	YS	*17	3
		10	*3*
Ditto, but tiles 8-in. thick	YS	*26	9
		17	*10*
Sundries			
Finishing concrete with trowelled face to receive linoleum	YS	1	2½
Applying horizontal damp-proof membrane of Synthaprufe in three coats to surface of concrete and blinding with sand to form key	YS	*5	9
		4	*1*
Supplying floor clips (p.c. 6d. each) and fixing	No.	1	1½
Formwork			
Formwork including strutting easing and striking:			
Vertical faces of foundation	YS	*18	0
		9	*5*
Vertical faces of wall	YS	*18	6
		6	*10*
Soffite of floors not over 12-ft. high	YS	*18	5
		8	*5*
Sloping soffite of stairs	YS	*22	3
		9	*2*
Sides of columns	FS	*2	5
			10½
Sides and soffites of lintols and beams	FS	*2	7
		1	*0*
Add to the above for wrot formwork including rubbing down concrete	YS	*2	5
Reinforcement			
⅝-in. diameter mild steel rods, hooked, bent and tied and fixing	C	*62	3
		46	*6*
½-in.	C	*69	4
		50	*2*
⅜-in.	C	*75	8
		52	*0*



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technical section

Concretor continued		s	d
¼-in.	C	*89	1
		56	8
Steel wire mesh fabric weighing 4·32 lb. per yd. super and laying in concrete	YS	*3	9½
		3	2
Ditto weighing 6·57 lb. per yd. super	YS	5	7
		4	10
Ditto weighing 9·32 lb. per yd. super	YS	7	11
		6	10
Precast concrete			
Precast concrete (1 : 2 : 4) finished fair on exposed faces and hoisting setting and jointing:			
4½-in. × 6-in. lintols reinforced with one ¼-in. rod	FR	*2	8
		2	2½
4½-in. × 9-in. ditto with two ¼-in. rods	FR	*4	0
		3	3½
Piling			
Reinforced pre-cast concrete piles, approximate prices for supplying, unloading, pitching and driving			
12-in. × 12-in. up to 30 ft. long	FR	*34	0
14-in. × 14-in. up to 50 ft. long	FR	*40	0
Sheet steel piling, ditto	T	1176 to 1680	0 0

BRICKLAYER

Market prices

Soft sand	YC	18	0
Hydrated lime	T	117	6
Plain Flettons	M	*118	0
Second hard stocks	M	*282	6
Lingfield Engineering wire cuts Grade B	M	250	0
Partitions			
Clinker concrete, solid	YS		
2-in.		3	11
2½-in.		4	6
3-in.		5	6
4-in.		6	8
Thermalite-Ytong	YS		
2½-in.		*7	0
3-in.		*8	5
4-in.		*11	0
Hollow clay	YS		
2-in.		4	5
2½-in.		4	8
3-in.		5	5
Normal quality wood wool slabs	YS		
2-in.		*8	10
2½-in.		*10	2
3-in.		*11	5

Measured rates

		s	d
Reduced brickwork in cement lime mortar.			
Lingfields in cement mortar	YS		
Flettons		*32	9
		17	4
Second stocks		*50	6
		35	1
Lingfield Grade B		*49	8
		31	11
Half brick wall ditto	YS		
Flettons		*18	0
		8	3
Second stocks		*26	10
		17	2
Lingfield Grade B		*27	0
		15	6
11-in. hollow wall with 2-in. cavity and wall ties	YS		
Flettons		*39	2
		16	11
Second stocks		*56	11
		34	7
One brick wall built fair and pointed both sides	YS		
Flettons		*39	2
		17	4
Second stocks		*56	10
		35	1
Lingfield Grade B		*55	0
		31	11
Sundries			
Extra over common brickwork for internal fair face and flush pointing	YS	1	4
Horizontal damp proof course of two courses of slates and bedding and pointing	FS	*4	4½
		2	8
Horizontal damp proof course of hessian base bitumen	FS		11
			9
Facings			
Extra over ordinary brickwork with bricks P.C. 118s. per 1,000 for facings as described			
To solid wall in Flemish bond	YS		
Facings P.C. 250s per M		*15	7
		9	7
Facings P.C. 350s per M		22	11
		16	11
Facings P.C. 450s per M		*30	2
		24	2
To cavity wall in stretcher bond	YS		
Facings P.C. 250s per M		12	10
		7	4
Facings P.C. 350s per M		18	5
		12	11
Facings P.C. 450s per M		23	11
		18	5
Half brick wall in facings built fair and pointed on one side	YS		
Facings P.C. 250s per M		*29	8
		15	11
Facings P.C. 350s per M		*35	3
		21	6
Facings P.C. 450s per M		*40	9
		27	0
Partitions			
Clinker concrete solid partition blocks and setting in cement lime mortar	YS		
2-in.		*9	2
		4	10
2½-in.		*10	7
		5	8
3-in.		*12	8
		6	11
4-in.		*15	3
		8	4
Thermalite-Ytong ditto	YS		
2½-in.		12	6
		8	6
3-in.		14	10
		10	3
4-in.		18	11
		13	4
Hollow clay ditto	YS		
2-in.		*9	9
		5	5
2½-in.		*10	9
		5	10
3-in.		*12	6
		6	10
Wood wool slabs ditto	YS		
2-in.		*13	11
		10	6
2½-in.		*16	2
		12	1
3-in.		*18	4
		13	9

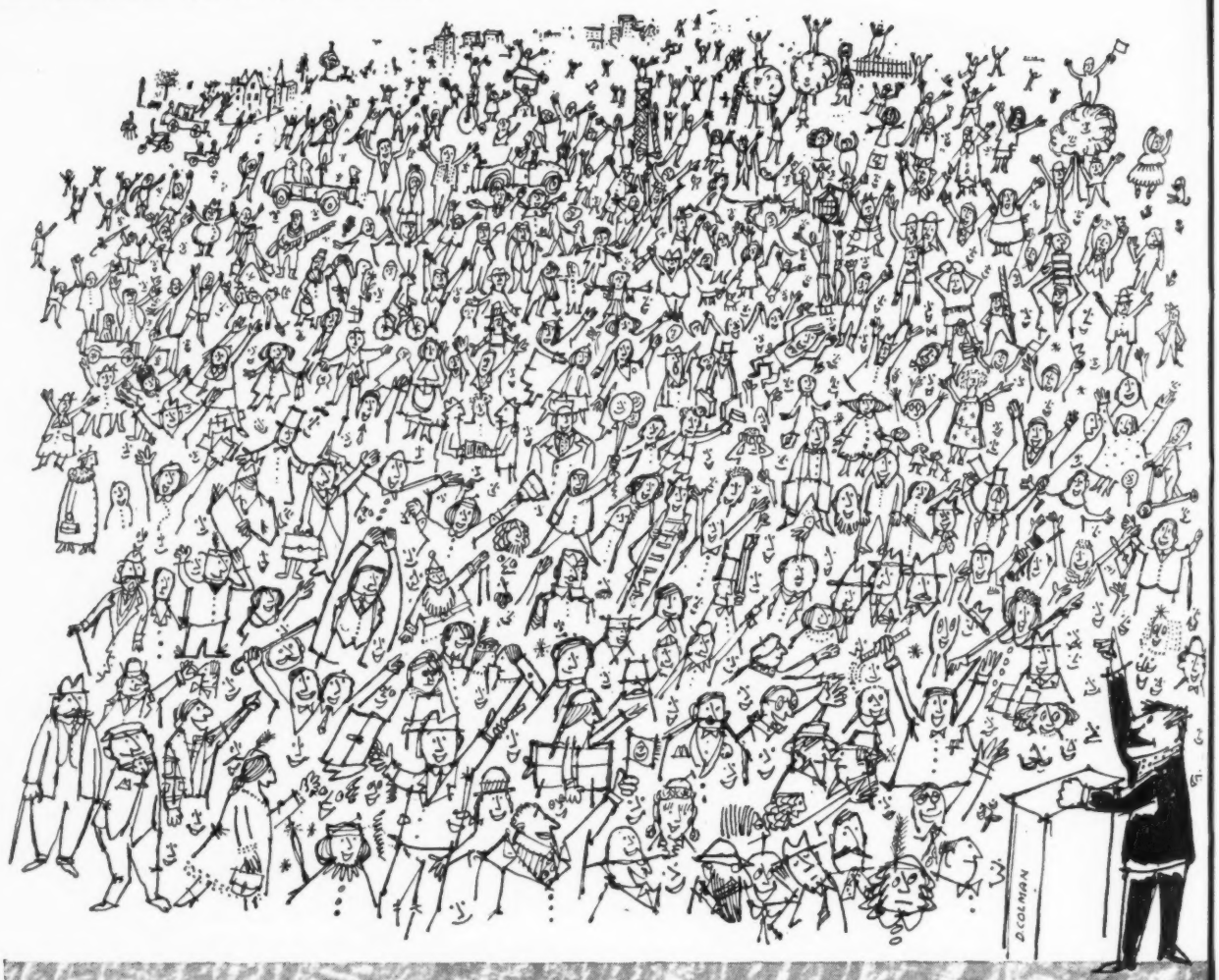
DRAINLAYER

Market prices

Salt glazed stoneware pipes and fittings, " Best " quality:			
Ordinary pipes	FR		
4-in.		1	6½
6-in.		2	3¾
9-in.		4	2
Bends	No.		
4-in.		4	7½
6-in.		6	11¼
9-in.		9	4½
The above are Standard List prices less 7½%.			
Pitch fibre pipe	FR		
3-in.		*1	10¾
4-in.		*2	6
6-in.		*5	0¾
Cast iron s. and s. pipe to BS 437	YR		
4-in.		26	6
6-in.		38	11
9-in.		72	8
Spun iron s. and s. pipe to BS 1211, Class B	YR		
4-in.		12	8
6-in.		20	4
9-in.		34	1

Measured rates

		s	d
Trenches and beds			
Excavate trenches by hand in heavy soil, including planking and strutting, part returning, filling and ramming and wheeling and spreading surplus, for pipes 4-in., 6-in. and 9 in. dia.	YR		
Average depth of trench 3-ft.		*16	2
4-ft.		*21	6
6-ft.		*38	2
9-ft.		*70	3
Excavate trench as last but by mechanical trencher	YR		
Average depth of trench 3-ft.		12	3
4-ft.		16	9
6-ft.		*31	5
9-ft.		*51	10



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technical section

Drainlayer continued

		s	d
6-in. concrete bed and benching for 4-in. pipes	YR	*9	3
		5	8
As above, for 6-in. pipes	YR	*10	10
		6	8
6-in. concrete bed and surround for 4-in. pipes	YR	*15	0
		9	3
As above, for 6-in. pipes	YR	*18	2
		11	2

Stoneware drains

" Seconds " quality salt glazed stoneware drain pipes and laying and jointing in trench

	FR		
4-in.		*2	4
		1	7
6 in.		*3	4
		2	4½
9-in.		*5	5
		4	4

" Best " quality salt glazed stoneware drain pipes and laying and jointing in trench

	FR		
4-in.		*2	7
		1	10
6-in.		*3	8½
		2	9
9-in.		*6	2
		5	0½

Extra over " Seconds " quality pipes for:

Bend	No.		
4-in.		3	7
		3	1½
6-in.		*5	3
		4	8
9-in.		*15	3
		14	6
Single junction	No.		
4-in.		*6	2½
		4	9
6-in.		*8	10½
		7	1½
9-in.		*19	1
		17	0
Double junction	No.		
4-in.		*10	4
		7	11
6-in.		*14	10
		11	11
9-in.		*29	1
		25	8

Stoneware gullies

Salt glazed trapped gully with galvanized grating including setting gully on and surrounding with concrete and jointing to drain No.

6 in. × 6 in. grating 4 in. outlet		*25	3
		21	2
9 in. × 9 in. grating 6 in. outlet		*46	7
		41	5

Grease and mud gully 9-in. diameter with 4-in. outlet, galvanized bucket and grating and setting gully on and surrounding with concrete and jointing to drain No. *87 8

77 2

Road gully set with 6-in. outlet including setting on and surrounding with concrete and jointing to drain No.

15-in. dia. 30-in. deep		*103	10
		82	4
18-in. dia. 48-in. deep		*206	8
		171	2

	s	d
Pitch fibre drains		
Pitch fibre drain pipes and laying and jointing in trench FR		
3-in.	*2	3
	2	1½
4-in.	*2	11½
	2	9½
6-in.	*5	10
	5	8
Extra over pitch fibre pipe for 45° bend No.		
3-in.	*13	11
	13	1
4-in.	*22	1
	21	3
6-in.	*35	3
	34	3
Cast iron drains		
Cast iron spigot and socket drain pipes and laying and jointing in trench FR		
4-in.	12	5
	10	5
6-in.	18	1
	15	6
9-in.	*34	6
	28	10
Extra over cast iron pipes for bend No.		
4-in.	*30	5
	24	4
6-in.	*70	8
	61	10
9-in.	*179	10
	164	5
Spun cast iron spigot and socket drain pipes and laying and jointing in trench FR		
4-in.	*7	3
	5	3
6-in.	11	2
	8	7
9-in.	*20	1
	14	5
Cast iron gullies		
Cast iron gully trap with high invert and setting on and surrounding with concrete and jointing to drain No.		
4 in.	*44	3
	35	11
6 in.	*107	5
	95	5
9 in.	*238	5
	222	0

ASPHALTER

Measured rates

Damp proof course and tanking

		s	d
½-in. vertical damp proof course in two thicknesses on brick or concrete	YS		
	BS1097	16	3
	BS1418	24	8
½-in. horizontal damp proof course in one thickness on brick or concrete	YS		
	BS1097	11	0
	BS1418	17	4
Vertical tanking in three thicknesses	YS		
	BS1097	23	8
	BS1418	33	7
Horizontal tanking in three thicknesses	YS		
	BS1097	18	5
	BS1418	29	5

Roofing

¼-in. flat laid to falls in two thicknesses on and including felt underlay	YS		
	BS988	13	2
	BS1162	22	0
6-in. skirting with angle fillet at bottom and rounded edge at top turned into groove	FR		
	BS988	2	4
	BS1162	2	8
6-in. fascia with solid water check roll at top and undercut drip at bottom	FR		
	BS988	4	6
	BS1162	5	3

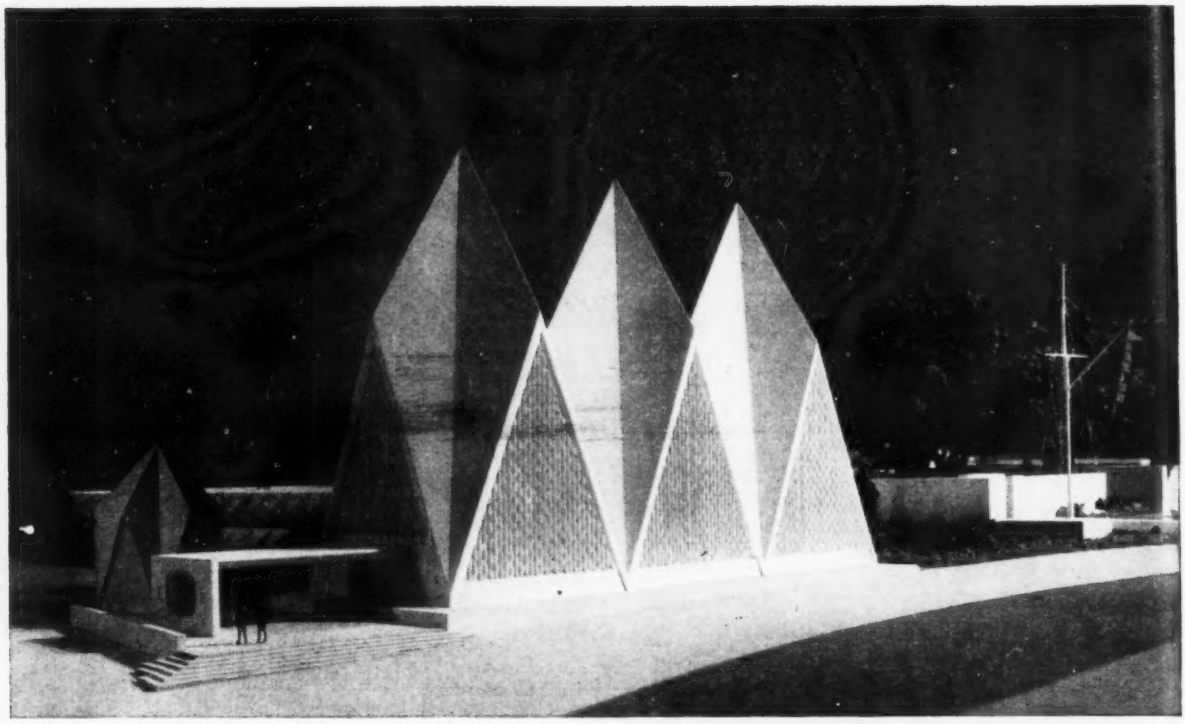
PAVIOR

Market prices

Granite chippings, ¼-in. to dust	T	*49	8
Buff quarry tiles, 6 in. × 6 in. × ⅞ in.	YS	21	9
2-in. Noelite paving	YS	13	11

Measured rates

Cement and sand floated screed to receive pavings	YS		
¾-in.		*4	0
		2	3
1-in.		*4	10
		2	11
1¼-in.		*5	5
		3	5
Cement and sand paving trowelled hard and smooth	YS		
¾-in.		*4	6
		2	3
1-in.		*5	4
		2	11
1¼-in.		*5	11
		3	5
Granolithic paving laid on concrete	YS		
1-in.		*7	3
		5	2
1½-in.		*9	2
		6	9
⅛-in. red composition paving laid on prepared screed	YS	16	6
⅜-in. terrazzo paving laid on prepared screed	YS	38	4
⅛-in. rubber flooring and laying in rolls	YS	55	2
⅛-in. rubber flooring and laying in rolls	YS	73	6
⅛-in. cork tile flooring, 12 in. × 12 in. and fixing with mastic and including polishing	YS	45	11
⅛-in. thermoplastic tile flooring and laying-on screed	YS	*12	0 to *21 0
⅛-in. coloured linoleum and fixing with mastic to cement screed or boards	YS	*25	6



All U.K. buildings at Brussels Exhibition

At the 1958 World Exhibition at Brussels the British Government Pavilion and the British Industries Pavilion will occupy approximately five acres.

The Architects for the Government Pavilion are Messrs. Howard V. Lobb & Partners, who are also the co-ordinating Architects for the whole of the U.K. site.
The Architects for the British Industries Pavilion are Messrs. Edward D. Mills & Partners, and the Consulting Engineer for both Pavilions is Mr. Felix J. Samuely, B.Sc., M.I.C.E.

to be constructed by

Building & Civil Engineering Contractors

111 WESTMINSTER BRIDGE ROAD, S.E.1
TELEPHONE: WATERLOO 4977

Richard
COSTAIN
Limited
in association with
BLATON AUBERT

technical section

Pavior continued

		s	d
⅛-in. coloured linoleum and fixing with mastic to cement screed or boards	YS	*20	3
⅞-in. buff quarry tiles laid on prepared screed	YS	*36	6
⅞-in. blue black quarry tiles laid on prepared screed	YS	*33	8
2-in. Noelite paving laid on prepared bed, in random sizes and mixed colours	YS	*20	0
		16	*1*
12 in. × 12 in. anchor steel plates laid complete	YS	*54	9

MASON

Market prices

Stone in blocks in truckloads at stations in the London area:			
Beer	FC	8	5
Portland	FC	8	5
Woodkirk Blue building quality	FC	17	2
Broughton Moor slate in blocks at stations in the London area	FC	65	0
Marble in blocks at works: Dove	FC	70	0
Roman stone	FC	*65	0

Measured rates

Stone and all labours in pilasters and quoins	FC		
Portland		*53	10
Beer		*51	2
Jambs	FC		
Portland		*56	2
Beer		*53	4
Lintols	FC		
Portland		*57	3
Beer		*54	4
Arches	FC		
Portland		*70	1
Beer		*66	7
Ashlar average 7-in. on bed with plain dressed face	FS		
Portland		*31	9
Beer		*30	2
Extra for each additional 1-in. thickness	FS		
Portland		*4	1
Beer		*3	11
4½ in. × 4 in. sill sunk, weathered, throated and grooved for water bar, set and jointed in cement mortar	FR		
Portland		*11	5
Beer		*10	10
Artificial		*4	8
4 in. × 12 in. coping, weathered and twice throated	FR		
Portland		*22	1
Beer		*20	11
Artificial		*11	3

Marble and slate

½-in. Dove marble lining and fixing on brick backings	FS	*37	10
½-in. Roman stone lining	FS	*35	9
½-in. Broughton Moor slate lining	FS	39	11

SLATER TILER AND ROOFER

Market prices

Welsh slates, best quality	M		
16-in. × 10-in.		*1038	6
20-in. × 10-in.		*1914	3
Best hand made sand faced plain tiles, 10½-in. × 6½ in.	M	311	0
Grey corrugaged asbestos cement sheets	YS	*6	10

Measured rates

16-in. × 10-in. best Welsh slates laid 3-in. lap	Sq.	*310	0
20-in. × 10-in. best Welsh slates 3-in. lap	Sq.	*412	0
Westmorland green slates in random sizes laid 3-in. lap	Sq.	*632	9
Best hand made sand faced plain tiles, 10½in. × 6½in. laid to a 4-in. gauge	Sq.	*215	0
Best hand made sand faced plain tiles, 10½-in. × 6½-in. hung vertically to 4½-inch gauge	Sq.	*240	0
Berkshire hand made sand faced red pantiles, 14½-in. × 10-in. laid 2½-in. head and 1½-in. side lap	Sq.	*206	0
Grey corrugated asbestos cement sheets fixed to wood roofs	Sq.	*123	0
Grey corrugated asbestos cement sheets fixed vertically	Sq.	*133	0
Cedarwood shingles laid 5-in. gauge	Sq.	*280	0
Metal roof decking and fixing with hook bolts, finished with ½-in. insulation board and three layers self finish felt roofing	YS		
18 gauge for spans up to 10 ft.		57	6
20 gauge for spans up to 8 ft. 6 in.		*50	0
Two layer one ply bitumen felt and fixing with bitumen to concrete or boarding	YS	10	2
Three layer bitumen felt	YS	13	8
Patent ribbed aluminium roofing and fixing to purlins	Sq.	287	6

CARPENTER

Market prices

Softwood, carcassing quality	Std.	*1940	0
Softwood, joinery quality	Std.	*2140	0
½-in. imported insulation board	Sq.	46	6
⅛-in. imported hardboard	Sq.	40	0

Measured rates

Softwood and fixing in plates, sleeper joists and lintols	FC	*15	10
		14	*1*
In floor and ceiling joists	FC	*18	2
		14	*1*
In stud partitions, purlins and struts	FC	*20	3
		14	*1*
In hip and valley rafters	FC	*22	9
		14	*1*

Battening and boarding

Slate or tile battens 1½ in. × ½-in. and nailing to fixing for	Sq.		
16-in. × 10-in. slating to 6½-in. gauge		*39	3
20-in. × 10-in. slating to 8½-in. gauge		*32	0
10½-in. × 6½-in. plain tiling to 4-in. gauge		*58	9
14½-in. × 10-in. pantiles to 12-in. gauge		*22	3
S.E. boarding in batten widths close jointed and fixing to flat or sloping roofs	Sq.		
¾-in.		*121	0
		89	*0*
1-in.		*149	6
		117	*3*
T. & G. boarding in batten widths close jointed and fixing to flat or sloping roofs	Sq.		
¾-in.		*138	2
		98	*0*
1-in.		*169	3
		129	*0*
½-in. wrot and cross tongued eaves soffit	FS	*2	3
		1	*0*
½-in. × 6-in. wrot and grooved eaves fascia p.o.	FS		10
			6

Wall and ceiling boards fixed to softwood

½-in. insulation board	YS	*6	8
		5	*0*
⅛-in. hardboard		*5	10
		4	*5*
7/16-in. asbestos cement flat sheeting		*8	3
		4	*7*
¼-in. asbestos cement flat sheeting		*9	9
		6	*2*
2-in. Stramit, showerproof quality fixed to joists with butt joints		*15	6
		11	*5*

JOINER

Measured rates

Floors and skirtings

Tongued and grooved soft-wood flooring and nailing to joists	Sq.		
⅞-in.		*164	0
		126	*6*
1-in.		*181	9
		144	*0*

1-in. nominal double grooved t. and g. Swedish softwood

technical section

Joiner continued

		s	d
block flooring set in mastic and polished	YS	**29**	**5**
European beech	YS	**33**	**7**
African Muhuhu	YS	**41**	**0**
Burma teak	YS	**52**	**6**
Moulded skirtings, 3-in. to 6-in. sectional area planted on (per inch in sectional area)	FR		
Softwood		*3½	2½
Oak		*9	7½
Extra for grounds plugged to brickwork	FR		
Softwood		9	2
Windows			
2-in. rebated and moulded sashes divided into squares	FR		
Softwood		3	8
Oak		10	9
Extra for side hanging	Each		
Softwood		*2	9
Oak		*4	1
Doors			
2-in. framed, ledged and braced doors, filled in with 1-in. T and G and V jointed boarding and hanging	FS		
Softwood		*6	1½
		5	5
Four panelled door square both sides and hanging	FS		
Softwood		6	8
		6	0
Oak		*19	6
		18	6
1¼-in. Standard flush door, hardboard faced size 2-ft. 6-in. × 6-ft. 6-in. and hanging	No.	*42	0
		31	1
Linings and frames			
Window and door linings, 6-in. to 12-in. sectional area (per inch sectional area)	FR		
Softwood		4	
		3	
Oak		9	
		8	
Frames wrot all round and framed (per inch sectional area)	FR		
Softwood		3½	
Oak		*8	
Mullions, transomes and cills (per inch sectional area)	FR		
Softwood		4	
Oak		*9	
Mouldings, architraves, etc. 4-in. to 6-in. sectional area (per inch sectional area)	FR		
Softwood		*5	
		3½	
Oak		*11	
		9	
6-in. window boards, 1-in. thick with rounded nosing tongued at back and including bearers	FR		
Softwood		*3	0½
		1	8
Oak		*5	6
		3	7
Shelving and fittings			
¾-in. shelving of 2-in. slats spaced 1-in. apart on bearers (measured separately)	FS		
Softwood		*2	5½
		1	11
¾-in. solid shelving on bearers	FS		
Softwood		2	3½
		1	11
Oak		*4	8
		4	1
2-in. shelf bearers plugged to wall	FR		
Softwood			7½
			5½
Oak		1	2
			11½
Staircases			
1-in. treads and ¾-in. risers tongued together on and including framed carriages	FS		
Softwood		*4	7½
		3	6½
Oak		*13	6
		12	0
1¾-in. × 11-in. wall string plugged to brickwork	FR		
Softwood		*4	5
		3	5
Oak		*11	5
		10	1
1¼-in. × 11-in. outer string	FR		
Softwood		*3	4½
		2	10
Oak		*6	11
		6	2
Ends of treads and risers housed to strings	No.		
Softwood		1	4½
Oak		*6	2
2½-in. × 3-in. moulded handrail	FR		
Softwood		*3	1½
		2	6
Oak		*6	5
		5	7
1¼-in. × 1¼-in. square balusters	FR		
Softwood			7
			5
Oak		1	4
		1	1
Framed ends to balusters	No.		
Softwood			*6½
Oak			9

IRONMONGER

Market prices

As prices for ironmongery vary so greatly depending upon the type and quality required no prices are quoted here

Measured rates

The rates which follow are for fixing only and are inclusive of profit

		s	d
3-in. steel butts	Pr.		
to softwood		*4	4
to hardwood		*5	9
Double action floor springs	No.		
to softwood		*21	9
to hardwood		*29	0
6-in. barrel bolts			
to softwood		*2	0
to hardwood		*2	8
Cupboard locks			
to softwood		*4	1
to hardwood		*5	5
Cylinder night latch			
to softwood		*6	10
to hardwood		*9	1
Mortice latch			
to softwood		*5	5
to hardwood		*7	3
Mortice lock			
to softwood		*6	10
to hardwood		*9	1
Casement fastener			
to softwood		*1	8
to hardwood		2	2
Casement stays			
to softwood		*1	8
to hardwood		2	2

STEEL & IRONWORKER

Market prices

Structural steel joist sections, basis sizes, ex mills	T	767	6

Extras for other than basis sizes vary between 10s. and 70s. per ton

Measured rates

Rsj in steel framed structures hoisted and fixed complete	T	*1540	0
Riveted compound girders including plates and rivets	T	*1810	0
Rs stanchions including caps, bases, cleats etc.	T	*1785	0

Metal windows including cutting and pinning lugs to brickwork and bedding frames in cement mortar No.

Domestic type 4 ft. high to BS 990			
Type ND2F 3 ft. 3¼ in. wide		*88	1
		72	7
Type HD2F 3 ft. 3¼ in. wide		*95	1
		79	7
Type ND11F 6 ft. 6½ in. wide		*150	11
		123	7
" Z " range, 4 ft. high			
Type ZND1 2 ft. 0¾ in. wide		*59	10
		49	6
Type ZND4F 6 ft. 0¾ in. wide		*152	5
		125	0

PLASTERER

Market prices

Plastering sand	YC	22	1

Plaster to BS 1191

technical section

Plasterer continued

		s	d
Class B in loads of 4 tons to 5 tons 19 cwt.	T		
Browning	*160	9	
Fibred browning	*163	9	
Board finish	*160	9	
⅜ in. plaster lath, over 600 yds.	YS	2	4
⅜ in. × 6 in. × 6 in. cream glazed wall tiles	YS	*27	2

Measured rates

Metal lathing

No. 24 gauge expanded metal lathing and fixing	YS		
To softwood soffits		*6	6
		4	1
To metal		7	2
		4	1

Lime plaster

Render float and set on brick walls and partitions	YS	*7	0
		2	3½
R.F. and S. on concrete including hacking	YS	*8	8
		2	3½
R.F. and S. on expanded metal lathing	YS	*7	1
		2	5

Gypsum plaster

Render in cement-lime-sand (1 : 1 : 6) and set in gypsum plaster on brick walls and partitions	YS	*5	9
		1	11
Render in gypsum fibred browning-sand (1 : 1½) and set in gypsum on concrete soffits including bonding coat	YS	*8	11
		3	6
Render and set on expanded metal lathing including pricking up coat	YS	*8	6
		3	10

Plaster board

⅜-in. gypsum plaster lath fixed to softwood soffits finished to receive plaster	YS	4	8
		2	10½
Gypsum board finish setting coat on last	YS	*4	1
		1	1
⅜-in. gypsum plaster wall board fixed to softwood studding finished to receive decoration	YS	*5	8
		3	3

Plain face

½-in. Portland cement and sand (1 : 3) plain face trowelled smooth on brick walls	YS	*6	4
		1	10

Tyrolean rendering

Render in cement, lime sand (1 : 1 : 6) and finishing with three coats patent coloured mix preparations applied with			
hand operated machine	YS	*9	8
		2	5

Sprayed "Limpet" asbestos

Approximate prices for sprayed "Limpet" asbestos on the following surfaces to the thickness shown for quantities of 1,000 yds. super. Normal pressed finish.

New concrete soffits and beams	YS		
½-in.		14	5
¾-in.		19	8
1-in.		21	9
New structural steelwork	YS		
½-in.		16	6
¾-in.		21	9
1-in.		23	10
Extra over the above prices for coloured texture finish	YS	3	3

Wall tiling

6 in. × 6 in. × ⅜ in. standard quality white glazed wall tiles set and jointed on prepared screed	YS	*48	0
Egg shell matt or glossy glazed enamelled tiles	YS	*60	0

EXTERNAL PLUMBER

Market prices

Sheet lead, 3½ lb. and upwards, in quantities of 5 cwt. to 1 ton	C	*138	6
Copper sheeting, 23 gauge, in 1-ton lots	C	330	0
Zinc sheeting, 14 gauge, in 1-ton lots	C	132	0
Aluminium sheeting 20 SWG	C		
Super purity		522	8
Commercial quality		336	0

Cast iron rainwater and soil goods

Medium weight pipe to B.S. 416 and B.S. 460 in 6 ft. lengths	No.		
2½-in.		18	4
3-in.		20	7
4-in.		26	4
Half round gutter in 6 ft. lengths	No.		
3½-in.		7	9½
4-in.		10	1
6-in.		16	7

The above are Standard-List prices plus 20%.

Measured rates

Milled sheet lead	C		
Flat roofs		*221	6
Gutters and flashings		*221	6
24 SWG copper sheet	FS		
Flat roofs		5	7
Gutters and flashings		5	7
23 SWG copper sheet	FS		
Flat roofs		6	4½
Gutters and flashings		6	4½
14 gauge zinc	FS		
Flat roofs		3	6
Gutters and flashings		3	6
20 SWG super purity aluminium	FS		
Flat roofs		5	5
Gutters and flashings		5	5
20 SWG commercial quality aluminium	FS		
Flat roofs		4	4½
Gutters and flashings		4	4½

Rainwater gutters and pipes

½-in cast iron half round eaves gutter jointed and fixed to fascia with brackets	FR		
4-in.		*3	5
		2	2½
6-in.		*4	11½
		3	6½
18 gauge pressed steel half round eaves gutter	FR		
4-in.		*3	1
		1	11
6-in.		*4	1½
		2	8
Asbestos cement half round eaves gutter	FR		
4-in.		2	9
		1	7
6-in.		4	0
		2	7
Aluminium half round eaves gutter	FR		
4-in.		3	10
		2	8

Cast iron medium section rain water pipes jointed and fixed to walls with pipe nails

	FR		
3-in.		*5	9
		4	4
4-in.		*7	2
		5	7
Pressed steel	FR		
3-in.		*4	5
		3	0
4-in.		*6	2
		4	7
Asbestos cement	FR		
3-in.		3	7
		2	2
4-in.		4	7
		3	0
Aluminium	FR		
3-in.		5	1½
		3	9
4-in.		6	11
		5	4

Soil and ventilating pipes

Lead soil, waste and ventilating pipes (15 lb. per yd. for 3-in. and 19 lb. per yd. for 4-in. diameter) fixed to walls with lead tacks	FR		
3-in.		*12	7
		10	0
4-in.		*17	2
		12	5
Cast iron soil, waste and ventilating pipes with caulked joints fixed to walls with pipe nails	FR		
3-in. heavy		*6	11
		5	1
4-in. heavy		*8	6
		6	4
Asbestos cement soil and ventilating pipe fixed to walls with holder bats	FR		
3-in.		3	7
		2	2
4-in.		*4	8
		3	0

technical section

INTERNAL PLUMBER

Market prices

Lead pipe in quantities of 5 cwt. to 1 ton — C

	s	d
BS 602*140		9
BS 1085*148		9

Polythene tubing, heavy gauge, in quantities of 500 to 999 ft.

	per 100 ft.	
½-in.	118	0
¾-in.	160	6
1-in.	205	0

Steel tubes to B.S. 1387 class B galvanised

FR		
¾-in.	0	7½
1-in.	0	10¾
1¼-in.	1	2¾
1½-in.	1	6¾

The above are Standard List prices plus 14¼%.

Galvanised malleable fittings.

Bend	No.	
1-in.	2	7½
1¼-in.	3	11½
1½-in.	5	8

Tee	No.	
½-in.	0	11¼
¾-in.	1	4
1-in.	1	10½
1¼-in.	2	7½
1½-in.	3	9½

The above are Standard List prices less 28%, less 6¼% plus 40%.

Copper tubes to B.S.659

FR		
½-in.	0	11¼
¾-in.	1	3¾
1-in.	2	0
1¼-in.	2	5

The above are calculated on a basic price of 2s. 3¼d. per lb. plus C.T.A. extras.

Measured rates

Lead pipe to BS 602

Main supply and laying in trench (measured separately) at the following sizes and weights in lbs.

FR		s	d
½-in.	7	*4	5
		3	6
¾-in.	11	*6	7
		5	5
1-in.	16	*9	4
		8	0
1¼-in.	28	*15	10
		13	10
1½-in.	35	*20	4
		17	3

Main supply fixed to walls and ceilings

FR		s	d
½-in.	7	*5	0
		3	7
¾-in.	11	*7	4
		5	6
1-in.	16	*10	2
		8	1
1¼-in.	28	*16	10
		13	11
1½-in.	35	*21	9
		17	4

Distributing pipes fixed to walls and ceilings

FR		s	d
½-in.	4	*3	6
		2	1
¾-in.	5	*4	2
		2	8
1-in.	7	*5	5
		3	9
1¼-in.	9	*6	6
		4	10
1½-in.	12	*8	5
		6	4

Flushing and warning pipes fixed to softwood

FR		s	d
¾-in.	4	*3	9
		2	0
1-in.	5	*4	9
		2	6
1¼-in.	6	*6	0
		3	1
1½-in.	7	*6	6
		3	6

Waste pipes and fixing to softwood

FR		s	d
1¼-in.	6	*6	0
		3	1
1½-in.	7	*6	6
		3	6

Joints to fittings

	No.		
½-in.		6	2
		1	8
¾-in.		*7	1
		2	6
1-in.		7	8
		3	4
1¼-in.		*8	1
		4	2
1½-in.		9	3
		5	0

Extra for:

	Bend	No.	
1¼-in.		*2	7
1½-in.		*3	8

	Branch joints	No.	
½-in.		*6	9
		1	8
¾-in.		*9	0
		2	6
1-in.		*9	5
		3	4
1¼-in.		*11	1
		4	2
1½-in.		*12	9
		5	0

Polythene tubing to B.S. 1972

Heavy gauge as supply pipe laid in trench (measured separately)

FR		s	d
½-in.		1	8½
		1	4
¾-in.		2	2½
		1	10½
1-in.		2	9
		2	4½

Heavy gauge as supply or distributing pipe fixed to walls

FR		s	d
½-in.		2	9½
		1	7½
¾-in.		3	4½
		2	3
1-in.		4	0½
		2	10½

Steel tubing to BS 1387

Class C with screwed red lead joints as supply pipe laid in trench (measured separately)

FR		s	d
½-in.		2	6
			8½
¾-in.		2	11
			10½
1-in.		3	0
		1	2
1¼-in.		3	9
		1	8
1½-in.		5	0
		2	1

Class B tubing fixed to walls

FR		s	d
½-in.	2	5½	
			8½
¾-in.	2	9½	
			10½
1-in.	2	11	
		1	1
1¼-in.	3	6	
		1	6
1½-in.	4	8	
		1	11

Extra for malleable iron:

	Bend	No.	
1-in.		*4	10
		2	11
1¼-in.		*7	1
		4	4½
1½-in.		9	0
		6	3

	Tee	No.	
½-in.		3	0
		1	0½
¾-in.		3	4
		1	5½
1-in.		3	11
		2	1
1¼-in.		5	4
		2	11
1½-in.		6	7
		4	2

Copper tube

Copper tube to BS 1386 as supply pipe laid in trench (measured separately) to the following size and gauges

FR		s	d
½-in.	18	2	0
		1	5
¾-in.	17	*2	9½
		2	2
1-in.	16	3	10
		3	3
1¼-in.	16	*5	1½
		4	3½
1½-in.	15	*6	5½
		5	8½

Copper tube to BS 659 as distributing pipe fixed to walls

FR		s	d
½-in.	19	2	1
		1	4
¾-in.	19	*2	6½
		1	9½
1-in.	18	*3	3½
		2	8½
1¼-in.	18	*4	2½
		3	3½
1½-in.	18	*4	11
		4	0

Extra for brass compression fittings joining copper to copper

	No.		
Coupling ½-in.		*5	10
		3	3
¾-in.		*6	8
		4	0
1-in.		*9	3
		5	10
1¼-in.		*11	11
		7	7
1½-in.		*16	4
		11	0
Bend ½-in.		*7	4
		4	6
¾-in.		*8	7
		5	6

technical section

Internal plumber continued

	s	d
1-in.	*12	2
	8	3
1¼-in.	*15	5
	10	6
1½-in.	*25	0
	18	11
Tee ½-in.	*9	6
	6	1
¾-in.	*10	10
	7	0
1-in.	*16	2
	11	4
1¼-in.	*22	8
	16	5
1½-in.	*34	8
	26	5

GLAZIER

Market prices

		s	d
Sheet glass cut to size	FS		
24 oz.			9¾
32 oz.		1	3⅞
¼-in. Polished plate glass, glazing quality in plates not exceeding:	FS		
2 ft. super		3	10
5 ft. super		4	9
45 ft. super		5	7
100 ft. super		6	0
Rolled plate glass	FS		
⅛-in. rolled plate			10⅞
¼-in. Georgian wired		5	6

Attention is drawn to reduction in certain glass prices offered by manufacturers for acceptance of specified minimum quantities of one size and substance delivered to one address at one time

Measured rates

Glazing to wood

		s	d
Ordinary quality sheet glass and glazing with putty in squares	FS		
24 oz. O.Q.		1	4½
32 oz. O.Q.		1	11
⅛-in. rolled plate glass		1	6
3/16 or ¼-in. rough cast glass		1	9
Prismatic glass		2	7½
¼-in. wired glass		2	0
¼-in. Georgian wired plate glass		7	8½
¼-in. Polished plate glass (glazing quality) in plates 5 to 45 ft. super		*7	10

Glazing to metal

		s	d
Add to above rates 1d. per ft. super			

Sundries

		s	d
Hacking out broken sheet glass	FS	1	3
Black ribbon velvet and bedding to edge of glass	FR		8

Double glazing

		s	d
Insulight units of two skins of glass in copper channel and glazing with mastic or beads (supplied). In panels 15 to 20 ft. super	FS		
32 oz. sheet		8	6½
¼-in. polished plate		18	2

Patent glazing

		s	d
Patent glazing with rolled steel lead capped bars for 8-ft. spans and glazing with ¼-in. Georgian wired cast	FS	*4	5
Aluminium alloy patent glazing	FS	*4	10

PAINTER

Market prices

		s	d
Washable distemper	C.	120	0
Emulsion paint	Gal.	45	0
Hard gloss paint:	Gal.		
Undercoat		46	0
Finishing		48	0

Measured rates

On walls and ceilings YS

	s	d
Twice whiten plastered ceilings	*1	4½
	3	
Two coats distemper on plastered walls or ceilings	*2	2½
	1	0½
Two coats distemper on fair-faced brick or concrete walls	*2	8
	1	3
Two coats emulsion paint on walls or ceilings	*2	9½
	1	8
Prepare, prime and apply one coat oil colour on plastered walls	*3	9
	1	9
Add for each additional coat	1	8
		10

On metal

		s	d
Prepare, prime and apply one coat oil colour on general surfaces	YS		
Basis price		*3	6
		1	6
Add for each additional coat		1	7½
			10
On metal casements	YS		
Basis price		*5	6
		1	6
Add for each additional coat		*2	5
			10
On bars, angles etc., not exceeding 6-in. girth	YR		
Basis price			11
			3
Add for each additional coat			5
			2
On small pipes	YR		
Basis price			11
			3
Add for each additional coat			5
			2
On large pipes	YR		
Basis price		1	10
			6
Add for each additional coat			10
			3½

Prepare, prime and apply one coat heat-resisting paint on heating surfaces of radiators YS

	s	d
Basis price	*4	2
	1	5½
Add for each additional coat	*1	10½
		9

On wood

		s	d
Knot, prime, stop and apply one coat oil colour on general surfaces	YS		
Basis price		*3	10½
		1	7½
Add for each additional coat		1	7½
			10
On work not exceeding 3-in. girth	YR		
Basis price			6
			1½
Add for each additional coat			2½
			1
For each additional 3-in. girth	YR		
Basis price			5½
			1½
Add for each additional coat			2½
			1

Stain and varnish

		s	d
Prepare, size, stain and twice varnish on general surfaces of woodwork	YS	*4	3
		1	8
On work not exceeding 3-in. girth	YR		*7
			1½
For each additional 3-in. girth	YR		6
			1½

Oiling and polishing

		s	d
Twice oiling general surfaces of hardwood with linseed oil	YS	*1	4
			10½
On work not exceeding 3-in. girth	YR		*2
			1
For each additional 3-in. girth	YR		1½
			1
Staining and wax polishing general surfaces of hardwood	FS	1	0½
Staining bodying-in and fully French polishing on general surfaces of hardwood	FS	*2	7½

Papering

		s	d
Preparing and sizing walls and hanging plain lining paper	Piece	*10	5
		3	3
Hanging wall paper, p.c. 10s. per piece	Piece	*20	4
		12	9
Hanging border p.c. 1s. per yd.	YR	*1	9
		1	3

WALL FINISHES METAL

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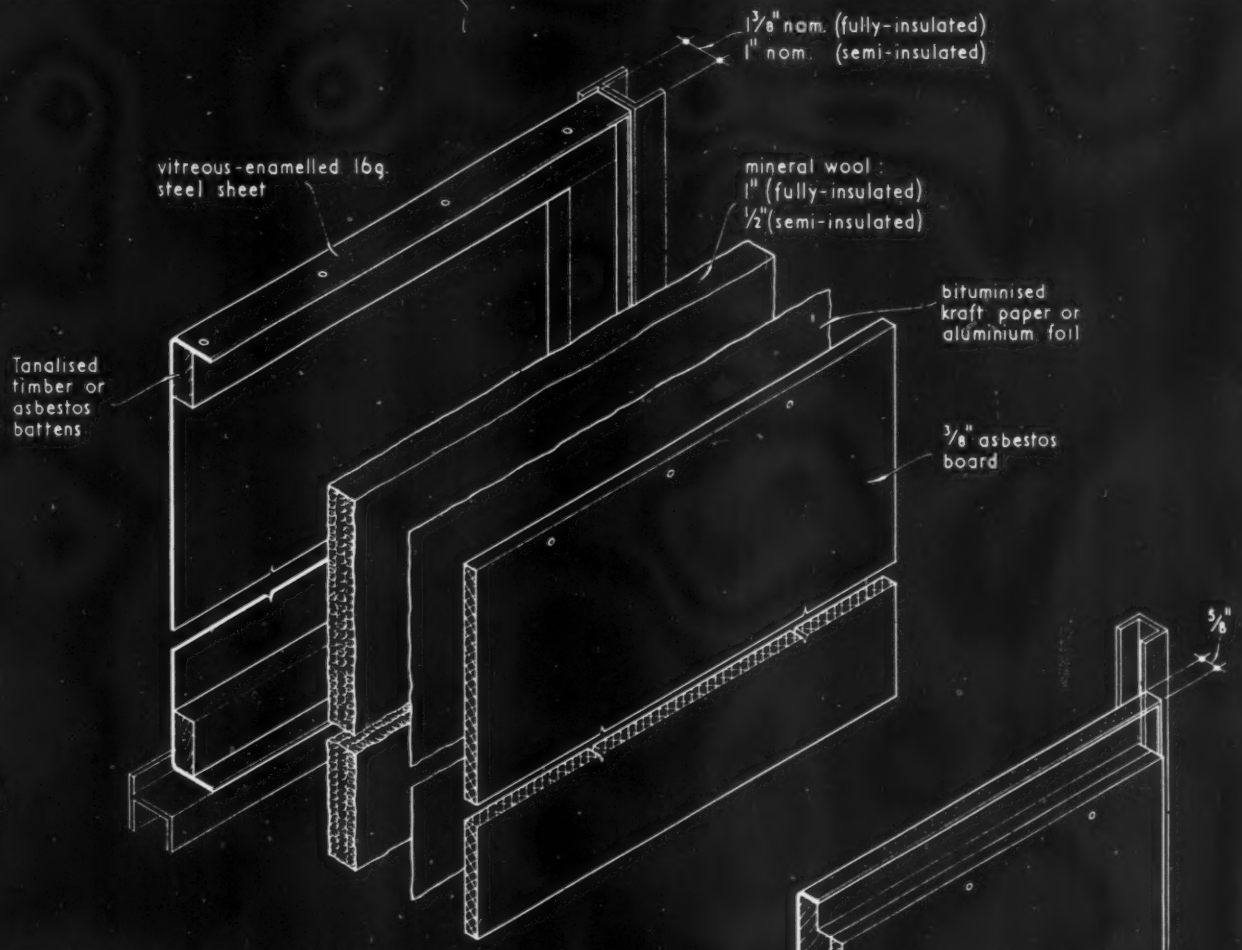
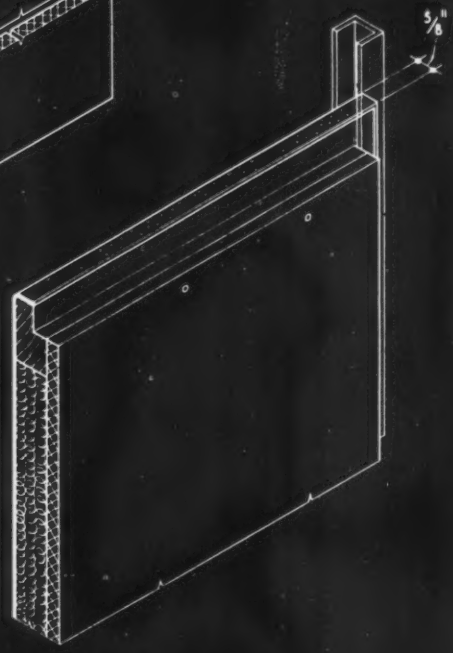
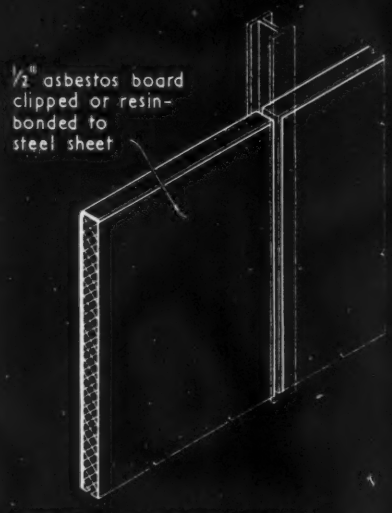


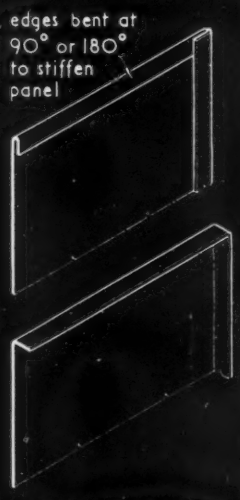
FULLY-INSULATED AND SEMI-INSULATED PANELS.



rebated panel for use with narrower framing sections



ASBESTOS-BACKED PANELS.



PANELS FOR PURELY DECORATIVE USES.

VITREOUS-ENAMELLED CURTAIN-WALL INFILLING PANELS.

Manufacturer : Vitreous Enamelling Works (V.E.W. Ltd.)

19.H1 VITREOUS-ENAMELLED CURTAIN-WALL INFILLING PANELS

This Sheet describes vitreous-enamelled panels for infilling for curtain walls or as facing material. These panels are extremely durable, easily maintained, and available in an unlimited range of colours.

Material

The panels are of 16 g. sheet steel of guaranteed enamelling quality. The outer surface is finished with vitreous porcelain enamel which consists of a layer of glass melted at about 850° C. on to the steel, with which it forms both a chemical and mechanical bond. The glasses used have been specially developed for this purpose and have a high degree of resistance to thermal and mechanical shock. The thermal expansion of the sheeting is very low.

Types

The following four types of panel are available:
Fully insulated, for use where the panels form the complete wall.
Semi-insulated, for use with a backing wall.
Backed with asbestos board, for use where insulation is not the main consideration.
Unbacked, for purely decorative uses.

Construction

The insulated types of panel have all edges of the steel sheet bent to an angle of 90° to form a tray. Battens are screwed to the inside of the tray on all sides through the turned up flanges. The battens are normally of Tanalised timber, but asbestos battens can be provided where it is necessary to use completely incombustible materials. The tray is filled with mineral wool of heavy density to provide the required degree of insulation, a vapour barrier of bituminised kraft paper or aluminium foil incorporated, and a back panel of asbestos board screwed to the battens. Any other suitable insulation or backing for the panels is available on request.
Where insulation is not important the steel sheet is backed with asbestos boarding either clipped into the tray or resin-bonded under pressure to it, the latter method being the more expensive.
Unbacked enamelled sheeting for decorative purposes only is usually bent over at the four edges, either at 90° or 180°, to stiffen the panel.

Sizes and Weights

The panels can be supplied as required in sizes up to 4 ft. 0 in. in width and 6 ft. 0 in. in length. It is possible to produce longer panels but it is not recommended.
The approximate weights of panels are as follows:

Fully insulated:	4¾ lb. per sq. ft.
Semi-insulated:	4½ lb. per sq. ft.
Asbestos-backed:	4 lb. per sq. ft.
Unbacked:	3 lb. per sq. ft.

Thermal Insulation

The "U" values for the types of panel previously described are given below, but the thickness of panels can be adjusted to give any required figure.

Fully insulated:	0·19 B.t.u./ft.²h.deg. F.
Semi-insulated:	0·28 B.t.u./ft.²h.deg. F.
Asbestos-backed:	0·55 B.t.u./ft.²h. deg. F.

Colours and Finishes

There are no limits to the number of colours which can be produced: any colour in BS. 2660: 1955 or the Munsell range, or intermediate shades, can be produced. Designs or lettering can be incorporated without difficulty.
Three types of finish are available as follows:

Plain glazed which has the maximum corrosion resistance but has a highly reflecting surface, which is a disadvantage, especially where large areas are used.

Semi-matt or eggshell finish which is an attractive finish but has a rather lower resistance to acids and alkalis than the glazed finish and is therefore less suitable in areas of heavy atmospheric pollution. Colours in which red is predominant cannot be produced in this finish.

Glazed and figured finish. The figured surface breaks up reflections but has all the advantages of the plain glazed surface, e.g., it has the maximum resistance to corrosion, can be produced in any colour, etc. This finish is strongly recommended by the manufacturer for walling purposes.
A surface with stone chippings fused into the enamel is also produced but it holds the dirt and is difficult to clean.

Fixing

The panels are intended for individual mounting in frames of suitable section which are obtainable from most window manufacturers. Frames are sealed with normal window mastic but they should be so designed as to be mechanically waterproof without relying on the mastic. Where the frames are of inadequate depth to accommodate the full thickness of the insulated panels, a rebated edge can be provided ⅜ in. thick, as shown in the drawing on the face of the Sheet.

Applications

Vitreous-enamelled panels may be used for infilling in curtain walls of any construction either decoratively applied or functioning as part of the structure. Their use makes possible the incorporation of name-panels or other devices as a permanent part of the building. The backing board of insulated panels may be of polished hardboard or similar material where a finished surface is required.

Maintenance

The panels are normally kept clean by rainwater, but should it become necessary to clean them a damp leather is all that is required.

Further Information

The manufacturer maintains a technical advisory department which is available to answer questions and advise on problems relating to this subject generally.

Compiled from information supplied by:
Vitreous Enamelling Works (V.E.W. Ltd.).
Address: Osborne Road, Acton, London, W.3.
Telephone: Acorn 5081.

WATER SUPPLY AND SANITATION | DETAILS | COPPER

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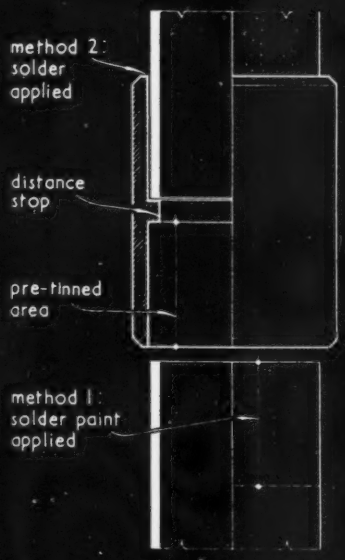
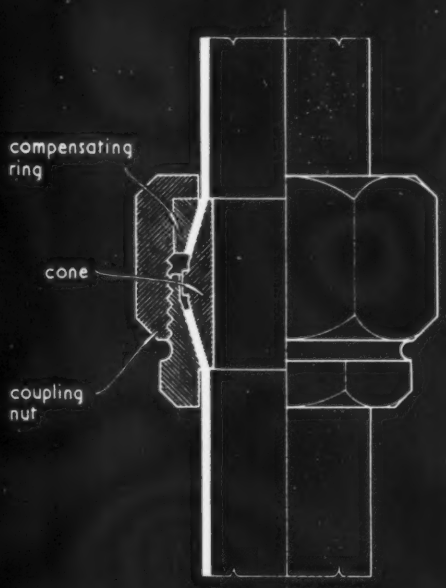
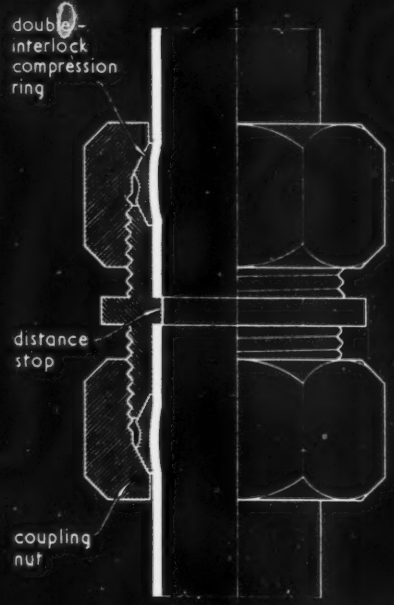


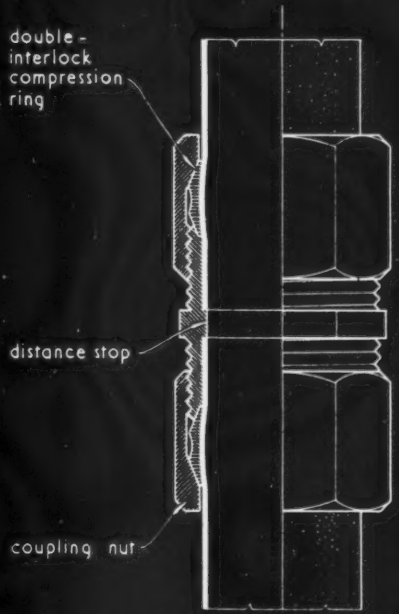
INTEX P.T. PRE-TINNED CAPILLARY FITTING.
(for tubes ⅛" to 2" nominal bore)



CONEOR MANIPULATIVE COMPRESSION FITTING.
(for tubes ½" to 1" nominal bore)



INSTANTOR NON-MANIPULATIVE COMPRESSION FITTING.
(for tubes ⅛" to 2" nominal bore)



KUTERLITE LIGHTWEIGHT NON-MANIPULATIVE COMPRESSION FITTING. (for tubes ½" to 1¼" nominal bore)

CAPILLARY AND COMPRESSION FITTINGS FOR LIGHT GAUGE COPPER TUBES.

Manufacturer: Imperial Chemical Industries Limited, Metals Division

33.B3 CAPILLARY AND COMPRESSION FITTINGS FOR LIGHT GAUGE COPPER TUBES

This Sheet describes various types of capillary and compression fittings for jointing light gauge copper tubes. The drawings on the face show details of different fittings; given below are notes on making the joints and the range of fittings available and their uses. The fittings comply with B.S. 864 : 1953 and suit light gauge copper tubes to B.S. 659 : 1955 and B.S. 1386 : 1947.

Capillary Fittings

Intex P.T.: These are pre-tinned brass fittings made from hot stampings or castings or hydraulically formed from seamless tube; they are for use with tubing from $\frac{1}{8}$ in. to 2 in. nominal bore.

The joint depends on the principle of capillary attraction, therefore cleanliness and accuracy of fit are essential if it is to be successfully made. Tube ends should be checked with a sizing tool and any deformation corrected; they must also be thoroughly cleaned with steel wool. The interior of the fitting is pre-tinned and wiping with a clean rag to remove dust is all that is necessary.

There are two methods of assembly (see face of Sheet):—

1. P.T. brand solder paint (a specially prepared mixture of solder and flux) is used to coat the tube ends before insertion in the fitting. Heat from a blowlamp is applied and the solder, which is liberated from the paint, seals the joint.

2. A good quality solder wire, melted by a blowlamp applied to the joint, is run between the fitting and the tube, the tube ends having been previously coated with a non-corrosive flux. In either case a temperature test should be made by removing the blowlamp and touching each end of the joint with solder wire. If the wire melts, sufficient heat has been applied to make a perfect joint, which should be allowed to cool undisturbed.

These fittings may be used for general domestic installations including hot and cold water services, gas services, space and panel heating installations employing hot water and waste and vent pipe services. As there are no coupling nuts, installations can be easily chased into walls, if required.

Endex: These fittings are similar to the above but are not pre-tinned, therefore the interior must be thoroughly cleaned with steel wool before assembly. They are for special installations that require brazing or silver soldering.

Compression Fittings

The range includes Instantor and Kuterlite (non-manipulative, to B.S.864. Type A.) and Coneor (manipulative, to B.S.864. Type B.).

Instantor: These fittings are manufactured from hot stampings or hard castings in brass only and are for use with tubing from $\frac{1}{8}$ in. to 2 in. nominal bore. They are also available in special sizes for tubing not covered by B.S.659.

Kuterlite: These fittings are all manufactured from high quality hot stampings in brass and are for use with tubing from $\frac{1}{2}$ in. to $1\frac{1}{4}$ in. nominal bore. These fittings have been designed to meet the need for a reliable fitting, lighter than the Instantor but embodying the same double-interlock principle.

With Instantor and Kuterlite fittings no preparation of the tube is needed, but the outer surface should be free from reeds or deep scratches.

When the coupling nut is tightened an annealed brass ring is compressed on to the tube giving a permanent and positive grip.

These fittings may be used for hot and cold water services, heating installations and waste and vent pipe services. They may also be used in the engineering industry for jointing tubes conveying lubricating oils and other liquids, and generally for jointing polythene tube (e.g. I.C.I. Alkathene) to B.S. 1972.

Coneor: These fittings are manufactured from first-quality gunmetal castings for use with fully-annealed copper tube to B.S.1386 (e.g. I.C.I. Kuterlon). These fittings, available in sizes $\frac{1}{2}$ in. to 1 in. nominal bore, have an integral cone except in straight couplings. A simple forming tool is used to flare the tube end before assembly. The coupling nut compresses the shaped end of the tube between a chamfered compensating ring and the cone.

Joints made with these fittings are unaffected by vibration of lateral pressure and are therefore particularly recommended for underground services.

Fittings

All the above fittings are available in a wide range of straight couplings, bends, tees, crosses, stopcocks and valves.

Finish

When required the fittings may be supplied with polished, plated or tinned finishes.

Further Information

Further details of the full range of fittings for all joints may be obtained on request from the manufacturer.

Compiled from information supplied by:

Imperial Chemical Industries Limited, Metals Division.

Address: P.O. Box 216, Witton, Birmingham, 6.
Telephone: Birchfields 4848 (68 lines).
Telegrams: Icimetal, Telex, Birmingham.

working detail

WINDOWS: 54

SHOPFRONT, SHOP IN SOUTHAMPTON

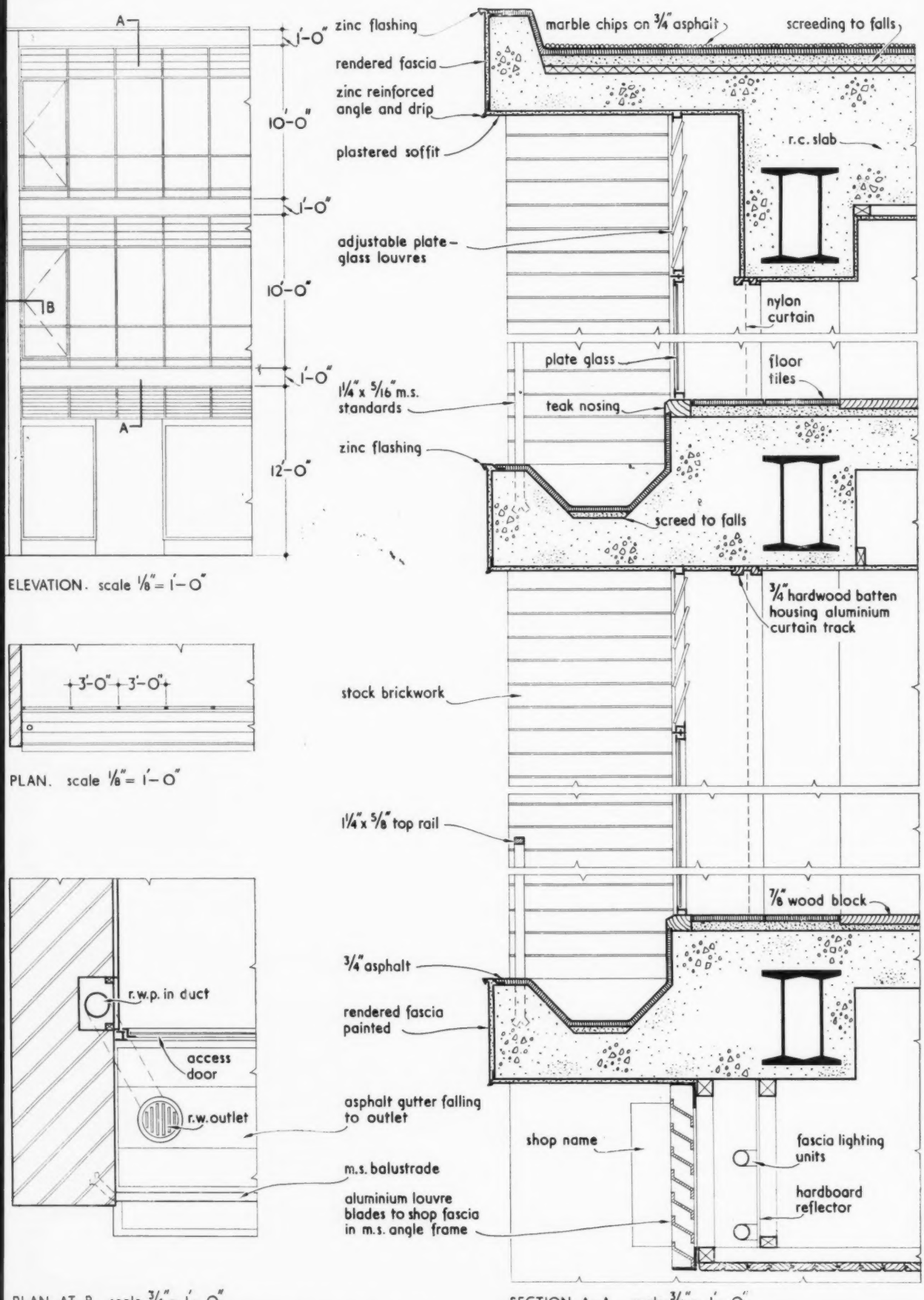
Oliver Carey, architect

Points to notice about this shopfront are the manner in which the glazed front is recessed to provide a walkway for easy cleaning, the consistent use of one-window ventilators to avoid the need for opening lights (the extreme right- and left-hand lights on the upper floors are in fact french doors to give access to the walkway) and the total concealment of the rainwater outlet and down pipe.

working detail

SHOPFRONT, SHOP IN SOUTHAMPTON

Oliver Carey, architect

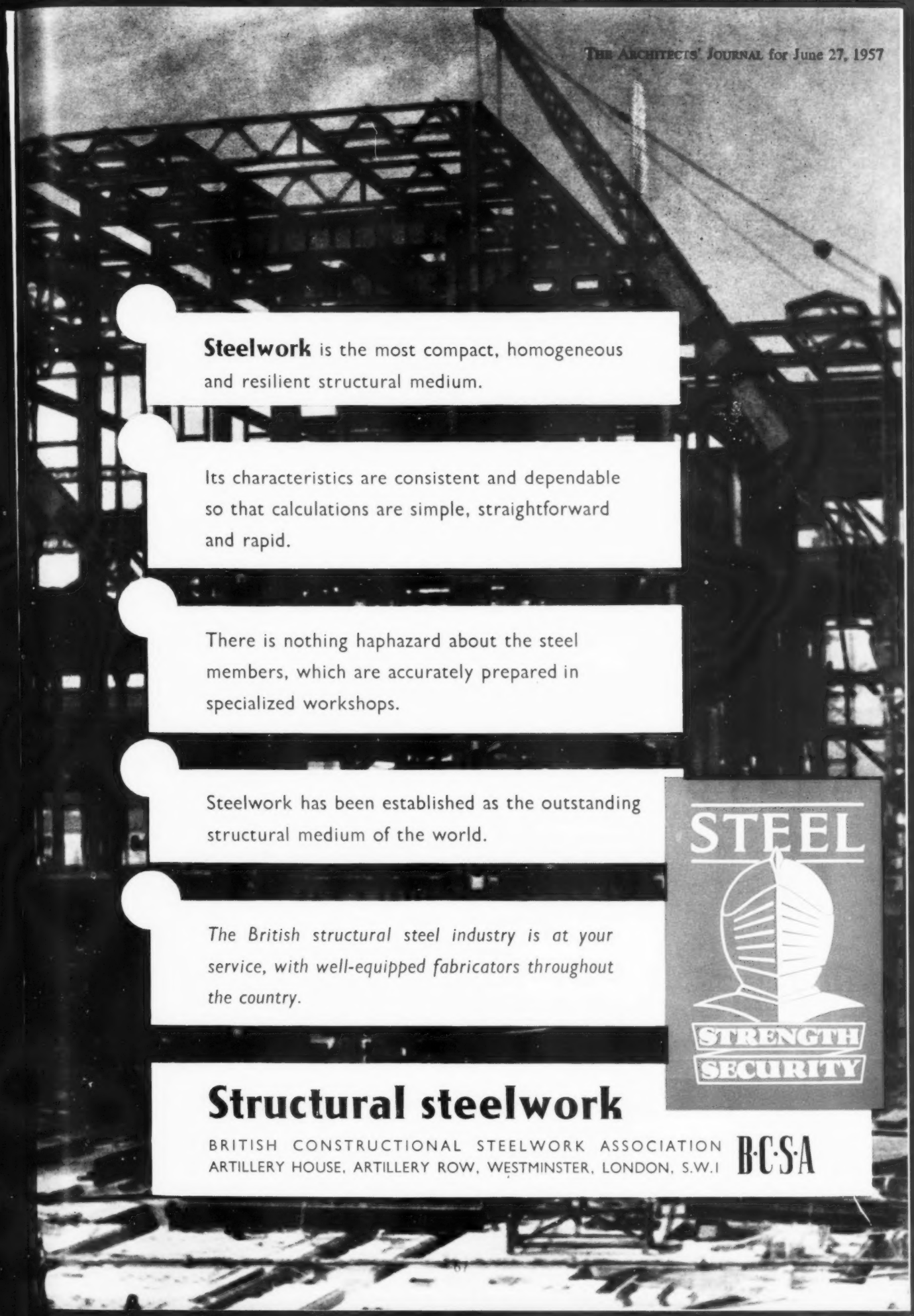


ELEVATION. scale 1/8" = 1'-0"

PLAN. scale 1/8" = 1'-0"

PLAN AT B. scale ¾" = 1'-0"

SECTION A-A. scale ¾" = 1'-0"



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STEEL

STRENGTH SECURITY

Structural steelwork

BRITISH CONSTRUCTIONAL STEELWORK ASSOCIATION
ARTILLERY HOUSE, ARTILLERY ROW, WESTMINSTER, LONDON, S.W.1

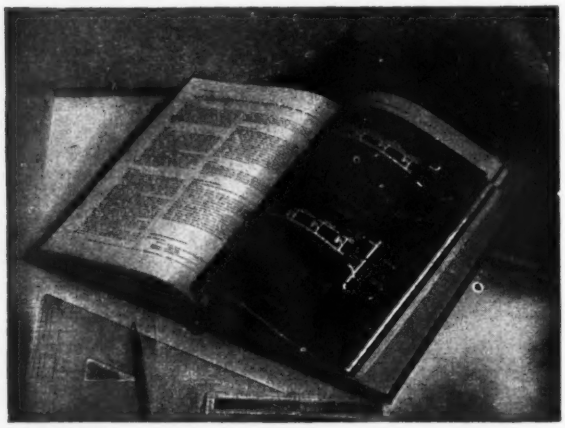
B·C·S·A

B U

This
grid,
reinf
panel
sheet
far e

BUS SHELTER IN ALBERT SQUARE, MANCHESTER

This bus shelter, in Albert Square, Manchester, was designed by Leonard C. Howitt, Manchester City Architect. It is based on a 9-ft. grid, and is constructed with an in-situ reinforced concrete roof on 3½-in. by 3½-in. aluminium columns which are in effect casings to reinforced columns. The panels between the columns are heavy section aluminium windows glazed with armourplate glass, with a kicking panel faced externally with a light blue porcelain enamelled steel sheet, bonded to a core of asbestos and with a heavily stippled aluminium sheet internally. The guard and handrails are aluminium. The shelter is electrically lit, and incorporates a timekeeper's office at the far end. The contract figure was £7,559, and the general contractor was G. & J. Seddon Ltd., Walkden.



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Announcements

Ervin Katona, A.R.I.B.A., of 23, Old Burlington Street, W.1, has changed his telephone numbers to Regent 1945/6.

Johnston & Baxter, L.R.I.B.A., have moved to 20, South Tay Street, Dundee.

Robert G. Mason, F.R.I.C.S., Chartered Quantity Surveyor, has moved to 14, The Close, Norwich (telephone Norwich 20471/2).

Peter Dunham, Widdup and Harrison, F/A/A.R.I.B.A., have opened a branch office at 14/15, Stephyns Chambers, Bank Court, Hemel Hempstead, Herts, where they will be pleased to receive trade catalogues, etc.

C. A. Parker, A.R.I.B.A., and J. A. Roberts, Dip. Arch., A.R.I.B.A., of 47, Silver Street, Lincoln (telephone Lincoln 11371/2) have opened a branch office at 16a, Southgate, Sleaford, Lincs (telephone Sleaford 350). J. L. Burnett, Dip.Arch., A.R.I.B.A., the assistant in charge, will be pleased to receive trade catalogues, etc.

John McLaren, B.SC., A.C.G.I., A.M.I.C.E., Chartered Consulting Engineer, has moved to 13, Victoria Street, Westminster, S.W.1 (telephone Abbey 4047).

H. Owen Luder, A.R.I.B.A., has opened new offices at 79, Regency Street, Westminster, S.W.1 (telephone Tate Gallery 5250).

Correction

The British Institute of Management and the Institute of Industrial Administration have moved their headquarters to Management House, 80, Fetter Lane, E.C.4 (telephone Holborn 3456).

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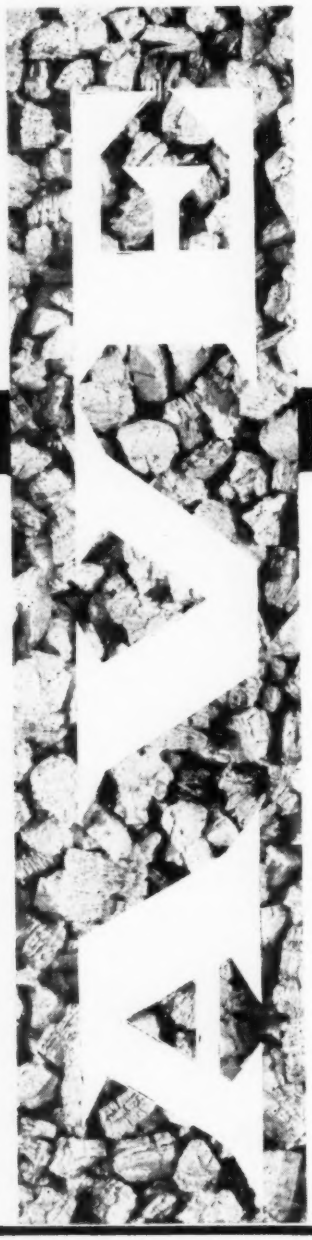

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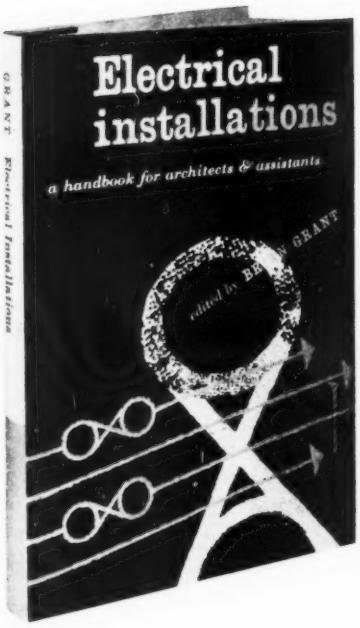

THIS BOOK DOES NOT SET OUT TO be a technical work on electricity, but is designed to provide architects and their assistants with all the essential information they need for the efficient planning and supervision of electrical installations in cases where no consultant has been employed. The book will also help them to specify and obtain good materials and workmanship, as well as to choose the most suitable available fittings and accessories for the job in hand. In addition it will give them a fair understanding of questions they are likely to be asked by consultant engineers or contractors when working on larger jobs, and so enable them to deal intelligently with any problems that may arise.
The majority of the contents were first published in the *Architects' Journal*, but they have now been revised and enlarged for presentation in book form.
The size of the book is 8½ x 5½in.
It contains 100 pages including some 100 line diagrams and half-tone illustrations.
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THE ARCHITECTURAL PRESS 9-13 Queen Anne's Gate, S.W.1

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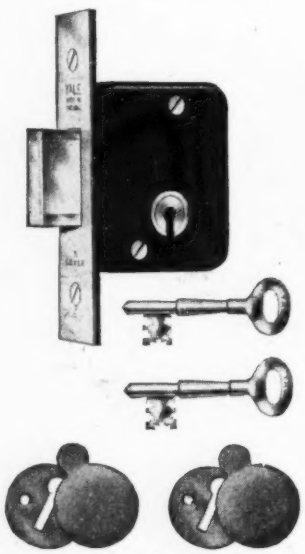
It wasn't supposed to be an invitation. The trouble is so many old locks do no more than just keep the door closed (and sometimes not even that) whilst real security measures are non-existent. The safest course if you value your property is to re-equip all important doors inside and out with the world's most reliable locks – YALE. There are YALE locks and padlocks to meet every security risk. Here is an example:



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THE ARCHITECTURAL PRESS 9-13 Queen Anne's Gate, London, S.W.1.

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

30s. per inch; each additional line, 2s. 6d.

LONDON COUNTY COUNCIL
ARCHITECT'S DEPARTMENT

Selections for appointment are now being made from students at architectural schools who will take their final examinations this summer. Starting salary up to £676. Vacancies also for ARCHITECTS of experience at starting salaries up to £1,036. Full programme of houses, flats, schools and many other interesting buildings.

Application forms and full particulars from the Architect (Ref. AR/EK24/572), The County Hall, S.E.1. (895) 6290

NORTH RIDING EDUCATION COMMITTEE. ASSISTANT QUANTITY SURVEYOR required in the Education Architect's Department A.P.T. Special Grade, salary £707 5s. to £861. A.R.I.C.S. or equivalent required. Previous experience may be taken into account in fixing commencing salary and experience with Local Authority not essential. Car, travelling and subsistence allowances. Local Government Superannuation Act. Canvassing disqualifies. Further particulars from the undersigned, to whom completed applications should be returned not later than 12th July, 1957.
F. Barraclough, County Hall, Northallerton. 6680

THE DEPARTMENT OF HEALTH FOR SCOTLAND. The Architectural Division of the Department of Health for Scotland which provides services for all four of the Secretary of State's Departments has vacancies for temporary architects. Work covers housing, hospitals, schools, local, authority buildings and agricultural colleges and includes development work.

Applications are invited for temporary vacancies of ASSISTANT ARCHITECT with Headquarters in Edinburgh.

Salary range £749—£1,160 (Women £744—£1,088). Starting pay according to age and experience.

Further particulars and application form from Establishment Officer, Department of Health for Scotland (Room 30), St. Andrew's House, Edinburgh, 1. Closing date for applications 12th July, 1957. 6615

CITY OF WINCHESTER

Applications are invited for the post of ARCHITECTURAL ASSISTANT in the City Engineer's Office (C. C. Steptoe, A.R.I.B.A., Chief Assistant Architect). It is essential that the applicant should be a neat and accurate draughtsman and have had previous experience in an architect's office. Salary, according to experience, will be within Grade II of the National Scales, and the appointment is subject to the Local Government Superannuation Act.

Applications stating age and details of experience, together with the names and addresses of two referees, should be addressed to the City Engineer, Guildhall, Winchester, and should reach his office not later than Monday, 8th July, 1957. Canvassing, either directly or indirectly, will disqualify.

R. H. McCALL.
Town Clerk.

Guildhall,
Winchester.
6th June, 1957. 6671

WORTLEY RURAL DISTRICT COUNCIL
(Population 46,500—Rateable Value £451,790.)

Applications are invited for the following appointments:—

(1) SENIOR ASSISTANT ARCHITECT. Salary in the range £737—£921 per annum.

(2) ASSISTANT ARCHITECT. Salary in accordance with A.P.T. III of the National Scales (£656—£784 per annum).

Housing accommodation offered with both appointments.

Applications, with the names of two referees, should be submitted not later than 13th July, 1957.

ADRIAN M. KELLY,
Clerk.

Council Offices, Grenoside, Sheffield. 6701

BOROUGH OF BARKING
BOROUGH ENGINEER AND SURVEYOR'S DEPARTMENT

Applications are invited for the undermentioned appointment:—

TOWN PLANNING ASSISTANT, Grade A.P.T. I/III Special (£543 5s.—£861 per annum), plus appropriate London weighting.

Application forms and particulars are obtainable from the Borough Engineer and Surveyor, and should be returned to the undersigned not later than 9 a.m. on 6th July, 1957.

E. R. FARR.

Town Hall, Barking, Essex. 6708

FIFE COUNTY COUNCIL

DRAUGHTSMAN required for the County Architect's Department, Cupar. Salary scale £595/£715. Must be quick and accurate. House may be available. Applications by 6th July to the County Clerk, Cupar. 6762

COUNTY BOROUGH OF GATESHEAD

Applications are invited from qualified and experienced persons for the following appointments, which are subject to N.J.C. Conditions:—

SENIOR ASSISTANT ARCHITECTS, A.P.T. VI (£902—£1,107).

Applicants must be Registered Architects and should be Corporate Members of the Royal Institute of British Architects. They should have had good experience in the design and construction of Public Buildings, Schools and/or Municipal Housing Schemes.

ASSISTANT ARCHITECTS, A.P.T. IV-V (£727 15s.—£994 5s.).

Applicants for Grade IV must have passed Parts I and II of the Final Examination of the Royal Institute of British Architects, and for Grade V must be Registered Architects. Previous experience with a Local Authority would be an advantage.

All above posts pensionable, subject to medical examination and one month's notice on either side.

FAVOURABLE CONSIDERATION WILL BE GIVEN TO THE PROVISION OF HOUSING ACCOMMODATION IN CERTAIN CASES, ON A RENTAL BASIS.

Applications, on forms obtainable from the Borough Surveyor, Swinburne Street, Gateshead, 8, must be returned to him not later than Tuesday, 9th July, 1957.

C. D. JACKSON,
Town Clerk.

Town Hall, Gateshead, 9.
June, 1957. 6700

CORBY DEVELOPMENT CORPORATION

Applications are invited for appointments on the staff of the Chief Architect. The immediate vacancies are for ASSISTANT ARCHITECTS within the salary grades:

A.P.T. IV (£728 to £907).
A.P.T. V (£815 to £994).

The work of the Corporation affords wide experience in the design and construction of houses, Town Centre buildings and factories, both in large schemes and in individual buildings.

Appointments will be subject to superannuation under the Local Government Superannuation Scheme, for which medical examination will be required.

Assistance may be available with housing and removal expenses.

Applications, stating age, education, training, qualifications, experience, present and past appointments and salaries, together with the names of two referees, must reach the undersigned by Tuesday, 9th July, 1957.

R. F. BROOKS GRUNDY,
General Manager.

Spencer House, Corby, Northants. 6719

BOROUGH OF EDMONTON
BOROUGH ARCHITECT'S DEPARTMENT

ARCHITECTURAL ASSISTANT (temporary) required. Work includes interesting redevelopment schemes involving multi-storey flats and an industrial estate. Unique opportunity to gain valuable experience of unified control of building work in direct labour organisation responsible for all facets of building, with special regard to the integration of contemporary design with up-to-date mechanised building methods.

Candidates must be qualified A.R.I.B.A. Alternate Saturdays free. Appointment subject to satisfactory medical report.

Grade A.P.T. VI, £902×£41—£1,107, plus £10/£30 London weighting, according to age.

Applications must be made on forms obtainable from the Town Clerk, Town Hall, Edmonton, and be delivered by 5th July. 6741

INVERNESS COUNTY COUNCIL invite applications for the following superannuated appointments:—(*a*) CHIEF ARCHITECTURAL ASSISTANT, not less than 40 years of age. Salary: £1,200 per annum. (*b*) ASSISTANT ARCHITECT. Salary: £930—£1,005 per annum. (*c*) SENIOR PLANNING ASSISTANT. Salary: £875—£950 per annum. (*d*) DRAUGHTSMAN. Salary: according to age, £355 per annum at age 21, rising to maximum of £535 per annum. Applicants for (*a*) and (*b*) must be Associate Members of the Royal Institute of British Architects, and for (*c*) Associate Members of Town Planning Institute. Applications, stating age, training, qualifications and experience, with copies of recent testimonials, to County Clerk, County Buildings, Inverness, by 2nd July. 6742

CORPORATION OF LONDON
require
TWO ASSISTANT PLANNERS
in the
CIVIC DESIGN SECTION
of the
CITY PLANNING OFFICE,

primarily for assistance in design, detailing and modelling of redevelopment proposals for Barbican and other areas in the City of London. Ability to prepare perspectives in colour required for one post. Preference given to candidates with good architectural background and a sensitive and contemporary approach to design.

Salary: £589 7s. 6d. to £922 10s. in 10 increments; superannuation; medical examination.

Local Authority experience not essential. Point of entry on salary scale dependent on age and experience. Applications, with details of training, age, experience, present salary, and the names and addresses of two referees, to the City Planning Officer, 55/61, Moorgate, London, E.C.2, within 14 days of the date of this advertisement. 6743

COUNTY BOROUGH OF BARNSLEY
BOROUGH ENGINEER AND SURVEYOR'S DEPARTMENT
APPOINTMENT OF JUNIOR ARCHITECTURAL ASSISTANT

Applications are invited for the above appointment on the temporary establishment at a salary in accordance with Grade A.P.T. I (£543 5s.—£625 5s. per annum). The point of entry into this Grade may be fixed above the minimum.

The post is suitable for a young man in his early architectural training, and offers a good opportunity for gaining further experience.

The appointment will be subject to (i) the Scheme of Conditions of Service for A.P.T.C. Staff; (ii) any other general conditions of employment operating within the Corporation from time to time; (iii) one month's notice on either side, and (iv) to a medical examination.

Applications, stating age, present and previous appointments, qualifications, experience, etc., together with the names of two persons for reference, should reach the Borough Engineer, Town Hall, Barnsley, by Friday, 12th July, 1957.

Canvassing will disqualify.

A. E. GILFILLAN,
Town Clerk.

Town Hall, Barnsley.
June, 1957. 6745

WILLENHALL URBAN DISTRICT COUNCIL

Applications are invited for the appointment of JUNIOR ARCHITECTURAL ASSISTANT, Grade A.P.T. I (£543 5s. to £625 5s. per annum). Applicants must have had experience in an architect's office, but not necessarily in local government. Appointment terminable by one month's notice on either side and subject to the National Scheme of Conditions of Service and Local Government Superannuation Acts.

Applications, stating age, qualifications, if any, experience and names and addresses of two referees, should reach the Clerk of the Council, Town Hall, Willenhall, Staffs., by 8th July, 1957. 6744

DERBYSHIRE COUNTY COUNCIL
COUNTY ARCHITECT'S DEPARTMENT

Vacancies for ARCHITECTS. Salary range £707 5s. to £994 5s., on grades Special, IV and V of the National Joint Council A.P.T. scales. These three grades are merged to provide a continuous progression to the maximum of Grade V, subject to satisfactory service. Commencing salaries in accordance with experience and qualifications. Pensionable posts. Canvassing disqualifies. Students at Architectural Schools who are taking Final Examination this year will be specially considered. Programme includes Schools, Ambulance, Fire and Police Stations and other interesting work.

Details and application forms from F. Hamer Crossley, Dipl.Arch(L'pool), F.R.I.B.A., County Architect, County Offices, St. Mary's Gate, Derby. 6760

COUNTY BOROUGH OF HASTINGS
APPOINTMENT OF ARCHITECTURAL ASSISTANT
(Special Grade—£707 5s. to £861 per annum.)

Applications are invited for the above appointment in the Borough Engineer's Department from persons suitably qualified and experienced in housing, education and general municipal work.

HOUSING ACCOMMODATION WILL BE AVAILABLE IF REQUIRED.

Applications, stating age, qualifications, present and previous appointments and salary, and the names of three referees, to be sent to the Borough Engineer, 37, Wellington Square, Hastings, not later than 15th July, 1957.

Canvassing will disqualify.

N. P. LESTER,
Town Clerk.

Town Hall, Hastings. 6740

ROYAL BOROUGH OF KINGSTON-UPON-THAMES
APPOINTMENT OF PLANNING ASSISTANT, A.P.T. GRADE II (£609 17s. 6d. to £691 17s. 6d.).

Applications are invited for the above-mentioned appointment. Experience in development control essential. Preference will be given to candidates who have passed the Intermediate Examination of the Town Planning Institute or equivalent.

Details and application forms obtainable from Borough Surveyor, Guildhall, Kingston-upon-Thames. Applications to be returned by 15th July, 1957.

A. B. ROGERS,
Town Clerk.

Guildhall, Kingston-upon-Thames.
17th June, 1957. 6739

UNIVERSITY OF BIRMINGHAM
CLERK OF WORKS

CLERKS OF WORKS are required for new buildings in the course of erection as part of extensive development plan. Salary within the range £800 to £1,000, according to qualifications and experience. Option of Pension benefits available. Applications, together with copies of three recent testimonials, should be sent to the Secretary, The University, Edgbaston, Birmingham, 15, not later than 13th July, 1957. 6720

DEVON COUNTY COUNCIL require TECHNICAL ASSISTANT at Plympton. Salary: £543 5s.—£625 5s. Applicants should be good Draughtsmen and have experience in architecture or surveying. Casual User car allowance available. Applications with full particulars to Divisional Planning Officer, Council Offices, "Treverbyn," Plympton, by 1st July, 1957. 6739

BOROUGH OF OSSET
APPOINTMENT OF ARCHITECTURAL ASSISTANT

Applications are invited for the above appointment at a salary in accordance with present Grade A.P.T. IV. Candidates should hold a recognised Architectural qualification and be experienced in local authority housing work.

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

HOUSING ACCOMMODATION WILL BE MADE AVAILABLE TO THE SUCCESSFUL APPLICANT IF REQUIRED.

Applications, including the names of two referees and declaring any relationship between the applicant and any member or senior Officer of the Council, are to be received by me not later than Wednesday, 10th July, 1957.

Canvassing in any form will disqualify.

(Signed) B. FREEMAN,
Town Clerk.

Town Hall, Ossett.
19th June, 1957. 6735

SURREY COUNTY COUNCIL

Applications invited for following appointments:—

(1) ASSISTANT ARCHITECT, Grade IV, £727 15s.—£907 2s. 6d. p.a., plus £30 p.a. London allowance.

(2) ARCHITECTURAL ASSISTANT, Grade II, £609 17s. 6d.—£691 17s. 6d. p.a., plus L.A. up to £30 p.a. Must be of good general training, preference given those who have passed Inter. R.I.B.A.

Full details of experience and qualifications, present salary, and three copy testimonials, to County Architect, County Hall, Kingston, as soon as possible. 6718

WOKING URBAN DISTRICT COUNCIL
APPOINTMENT OF SENIOR ARCHITECTURAL ASSISTANT

Applications are invited for the appointment of Senior Architectural Assistant in the Architectural Section of the Engineer and Surveyor's Department, at a salary in accordance with A.P.T. Grade III (£656×£25—£784). Applicants should be Students of the R.I.B.A. and have had good general experience.

The appointment is subject to the National Scheme of Conditions of Service and the provisions of the Local Government Superannuation Acts and the passing of a medical examination.

Forms of Application to be obtained from and returned to Mr. H. P. Tame, A.M.I.C.E., M.T.P.I., Registered Architect, Engineer and Surveyor, Council Offices, Woking, not later than 10th July, 1957.

M. SHAWCROSS,
Clerk of the Council.

Council Offices, Woking.
17th June, 1957. 6717

BOROUGH OF LUTON
TECHNICAL STAFF

Applications invited for SENIOR QUANTITY SURVEYING ASSISTANTS, salary A.P.T. V (£814 17s. 6d.—£994 5s.). Fully qualified, preferably R.I.C.S., with experience of taking off for large contracts of all types and settlement of final accounts.

Housing accommodation available. N.J.C. Service Conditions.

Application forms from Borough Architect, Town Hall, Luton, returnable by 3rd July, 1957. 6655

UNIVERSITY OF NOTTINGHAM

Applications are invited for the appointment of SURVEYOR AT THE SCHOOL OF AGRICULTURE, Sutton Bonington, near Loughborough. Salary within the scale £900 to £1,300. Candidates should hold a qualification in Architecture or in Surveying, and preferably have a knowledge of farm buildings. A house is available. Form of application and conditions of appointment, which should be returned not later than Saturday, 20th July, 1957, from the Registrar, the University, Nottingham. 6737

CITY OF BIRMINGHAM EDUCATION COMMITTEE
COLLEGE OF ART AND CRAFTS
BIRMINGHAM SCHOOL OF ARCHITECTURE

Principal: MEREDITH W. HAWES, A.R.C.A., A.R.W.S., N.R.D.

Director of the School of Architecture: DOUGLAS JONES, Dip.Arch.(L'pool), F.R.I.B.A.

RESEARCH APPOINTMENT IN MODULAR DESIGN AND STUDIO WORK.

Applications are invited for the above full time appointment for a period of one year for the purpose of studying and carrying out experimental work in the field of Modular Design and of assisting in the studio. Two-fifths of the time will be devoted to research and three-fifths to the studio.

Salary in accordance with Burnham (Further Education) Scale, 1956 (Grade A), men—£475×£25 to £900. In fixing commencing salary up to twelve increments may be allowed initially for approved professional experience. The successful applicant will be required to take up duty in October, 1957.

Forms of application, obtainable from the Principal, College of Art and Crafts, Margaret Street, Birmingham, 3, must be returned not later than 10 days after the appearance of this advertisement.

E. L. RUSSELL,
Chief Education Officer. 6702

ESHER URBAN DISTRICT COUNCIL
APPOINTMENT OF JUNIOR ARCHITECTURAL ASSISTANT

Applications are invited for the above appointment from persons with previous training and experience in architectural work in the office of a private Architect or Local Authority.

Salary according to qualifications and experience, Grade A.P.T. I, £543 5s.—£625 5s. per annum, plus London weighting allowance of £10, £20 or £30, according to age.

Form of application and further particulars may be obtained from the Engineer and Surveyor, Council Offices, Esher, to whom applications must be returned by 13th July, 1957.

FREDERICK EDWARDS,
Clerk of the Council.

Council Offices, Esher. 6712

FIFE COUNTY COUNCIL

JUNIOR DRAUGHTSMAN required for County Architect's Department, Cupar. Salary scale £565, rising to £640 per annum. House may be available. Superannuation Scheme. Applications by 1st July to the County Clerk, Cupar, Fife. 6736

MIDDLESEX COUNTY COUNCIL

DEPUTY AREA PLANNING OFFICER, A.P.T. VI (commencing salary £902 p.a., rising to £1,107, plus London weighting). Responsible under Area Planning Officer for development control, survey and planning. Experience and suitable qualifications required. 5-day week. Prescribed conditions. Application forms from County Planning Officer, 10, Great George Street, Westminster, S.W.1, returnable by 8th July (quote V.397, A.J.). Canvassing disqualifies. 6709

CITY OF PORTSMOUTH
CITY DEVELOPMENT DEPARTMENT

Applications are invited for appointments as GENERAL ASSISTANTS on the Technical Staff of the City Development Department. The vacancies are in respect of A.P.T. Grade II (£609 17s. 6d. to £691 17s. 6d.), A.P.T. Grade III (£656 to £784 2s. 6d.), and A.P.T. Grade IV (£727 15s. to £907 2s. 6d.).

Application forms for the above appointments can be obtained from the City Development Officer, 1, Western Parade, Portsmouth, and must be returned duly completed not later than Monday, 15th July, 1957.

V. BLANCHARD,
Town Clerk. 6716

CITY OF PETERBOROUGH
CITY ENGINEER AND SURVEYOR'S DEPARTMENT

Applications are invited for the appointments (two) of ASSISTANT QUANTITY SURVEYORS on the staff of the City Engineer and Surveyor, at a salary on A.P.T. Grade II (£609 17s. 6d., rising by annual increments to £691 17s. 6d.).

The successful candidates will be required to undertake, under the direction of a senior assistant, a wide variety of duties, from preparing, or helping to prepare, Bills of Quantities through the preparation of Interim Certificates to Variation Accounts, to the settlement of final accounts.

The Department handles contracts for housing, education and police authorities, and the posts offer valuable experience for young men already studying for professional examinations.

Applications, stating age, qualifications and experience, accompanied by copies of not more than two recent testimonials and suitably endorsed, must be delivered to the undersigned not later than 11th July. Housing accommodation will be provided, if required.

C. PETER CLARKE,
Town Clerk.

Town Hall, Peterborough.
June, 1957. 6703

EASTERN ELECTRICITY BOARD
CHILTERNS SUB-AREA
SENIOR DRAUGHTSMAN—SUB-AREA HEADQUARTERS

Candidates should have had experience of Building and Civil Engineering work for sub-stations, service centres, workshops, offices, etc.

The successful candidate will be required to supervise staff engaged on the preparation of drawings, be capable of the design of simple reinforced concrete structures, and be able to carry out site surveys.

Salary: N.J.B. Schedule D, Grade V (£760—£860).

The successful applicant will be required to contribute to a Superannuation Scheme, and may be required to undergo a medical examination.

Apply by letter within 14 days to S. F. C. Whitmore, A.M.I.E.E., Manager, Chilterns Sub-Area, Eastern Electricity Board, Prebend Street, Bedford. 6714

CAERNARVONSHIRE COUNTY COUNCIL

Applications invited for post of SENIOR PLANNING ASSISTANT in County Planning Department.

Salary within scales A.P.T. IV/V—commencing rung according to qualifications and experience.

Candidates must be Corporate Members of the Town Planning Institute, and should hold, in addition, a recognised qualification in architecture, engineering or surveying, and must have had extensive practical experience in preparation of development plans, particularly town maps preferably including comprehensive re-development areas.

Further particulars and application forms from Clerk of the County Council, Caernarvon. Closing date: 5th July. 6713

COUNTY COUNCIL OF ESSEX

ASSISTANT ARCHITECTS, Grade IV. Salaries according to qualifications and experience, but not exceeding £907 2s. 6d.

Candidates must be Associates of the R.I.B.A.

The appointments offer opportunities for design and supervision on a variety of buildings—colleges, libraries, day and boarding schools, police and fire stations, and health buildings—and successful candidates will have much responsibility within the group system.

Application form from H. Conolly, C.B.E., F.R.I.B.A., County Architect, County Hall, Chelmsford, to be returned with copies of three testimonials by 12th July, 1957.

Canvassing disqualifies. 6715

SHEFFIELD REGIONAL HOSPITAL BOARD

Applications are invited for the post of ASSISTANT ARCHITECT in the Architectural Division of the Board's headquarters staff. Applicants must be Registered Architects and have passed the requisite examinations. Salary £680—£985. The appointment is subject to the Whitley Council terms and conditions of service, to the National Health Service (Superannuation) Regulations, and to one month's notice on either side. Applications, together with the names of three referees, should be sent by 13th July, 1957, to the Secretary to the Board, Fulwood House, Old Fulwood Road, Sheffield, 10. 6710

Tenders Invited

6 lines or under, 15s.; each additional line, 2s. 6d.

BOROUGH OF EALING
LITTLE EALING SCHOOLS

Tenders are invited for the removal of galleries and the replacement of strip boarded flooring at the above schools. Such works to be carried out between the 19th July and 9th September, 1957.

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

Forms of Tender and Conditions of Contract may be obtained from the Borough Surveyor, Town Hall, Ealing, W.5, on deposit of £2 to be refunded on receipt of a bona fide tender.

Tenders (in plain, sealed envelopes, endorsed "Little Ealing Schools" but bearing no name or mark indicating the sender) must be delivered to my office not later than 9.30 a.m. on the 1st July, 1957.

E. J. COPE-BROWN,
Town Clerk.

Town Hall,
Ealing, W.5.
11th June, 1957. 6672

Architectural Appointments Vacant

4 lines or under, 9s. 6d.; each additional line, 2s. 6d. Box Number, including forwarding reply, 2s. extra.

RONALD WARD & PARTNERS require ARCHITECTURAL ASSISTANTS with contemporary outlook and willing to use own initiative. Salary range £600 to £850. Congenial working conditions. Apply 29, Chesham Place, Belgrave Square, S.W.1. Telephone Belgravia 3361. 6322

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

APPLICATIONS are invited for the following appointments:—(*a*) SENIOR ASSISTANT ARCHITECTS with experience of work on commercial and industrial projects (salary range £820 to £975 per annum). (*b*) ASSISTANT ARCHITECTS capable of preparing working drawings from preliminary details (Salary range £560 to £820 per annum). There is a five-day week in operation and both appointments offer prospects of upgrading. Applications stating age, experience, qualifications and salary required to G. S. Hay, A.R.I.B.A., Chief Architect, Co-operative Wholesale Society Ltd., 1, Balloon Street, Manchester 4. 6023

ARCHITECTURAL ASSISTANT required in busy London Office with varied practice. Good salary and prospects for suitable applicant. Five-day week. Write, giving particulars of age, qualifications, experience, etc., to Box 851 c/o 7, Coptic Street, W.C.1. 6376

SENIOR ARCHITECTURAL ASSISTANT required by progressive Company of Building Designers and Contractors, operating on a National scale from pleasant part of South Midlands and engaged on important industrial projects. The position is permanent and progressive. Pension Scheme. Box 6584.

JUNIOR ASSISTANT of Final standard and with office experience required at once for expanding office in South Kensington. Good opportunity offered for general experience with interesting work. Salary according to experience. Box 6751 or phone KENsington 1242.

ASSISTANTS £400—£600 p.a., required. Schools, offices, important work abroad. Five-day week, good conditions, holidays honoured. Harrison Potter, Hare & Macfarlane, F.F.R.I.B.A., 19, Broadstone Place, W.1. WELbeck 0694. 6759

SENIOR and JUNIOR ARCHITECTURAL ASSISTANTS required immediately. Salary according to ability and experience. Please apply stating age and qualifications to Bertram Butler & Company, Chartered Architects, 6, Tettenhall Road, Wolverhampton. 6758

ASSISTANT, Intermediate standard, required, busy West End office. State age, experience, and salary required.—Box 6046.

W. H. WATKINS, Gray & Partners require ASSISTANTS up to Final Standard for interesting hospital work, pension scheme in operation.—Write or phone, 57, Catherine Place, S.W.1. Victoria 7761. 6366

RAMSBY, MURRAY, WHITE & WARD require recently qualified ASSISTANTS, with two to five years' practical experience, to work on interesting industrial and office buildings. Salary by arrangement.—Apply 32, Wigmore Street, W.1. 6329

ASSISTANT ARCHITECT. Co-operative Wholesale Society, Ltd., invite applications for the position of Assistant Architect. Must be capable of preparing working drawings from preliminary details. The post is superannuable, subject to medical examination. 5-day week in operation. Applications, giving details of age, experience and salary required, to—W. J. Reed, F.R.I.B.A., Chief Architect, C.W.S. Ltd., 99, Leman Street, London, E.1. 6350

SENIOR ASSISTANT required in busy West End Office, interesting commercial work and must be prepared to take responsibility. Please write giving details of experience etc. Box 6447.

LONDON office with widely varied practice urgently requires all grades of ASSISTANTS, preferably with London experience. Five-day week. Lewis Solomon, Son & Joseph, 21, Bloomsbury Way, London, W.C.1. Holborn 5106. 6531

NORTH & PARTNERS, Chartered Architects with extensive practice, seek partner's personal ASSISTANT. Position will afford excellent opportunity for capable assistant. Reply: 40, Broadway, Maidenhead. 6562

ARCHITECTURAL ASSISTANT for busy private office. Applicants need not necessarily be qualified but starting salary would depend on experience and ability. The work is interesting and mainly connected with Industry. Apply stating age, experience, salary required, to: A. J. Elder, A.R.I.B.A., Grosvenor Buildings, 65, Albert Road, Middlesbrough. 6564

ARCHITECT'S ASSISTANT required in the Chief Architect's office of a large multiple retail firm with offices in London. Five-day week, pension scheme, dining room available for use of staff. Applicants should state age, qualifications, experience and salary required. Box 6332.

WELL-KNOWN London Architects require ASSISTANTS between Intermediate and Final standard. Interesting projects. Five-day week. Write Box 853, c/o 7, Coptic Street, W.C.1. 6583

NORTH AND PARTNERS, Chartered Architects, with large and varied practice, require a capable experienced ASSISTANT for drawing office, salary by arrangement. Reply: 40, Broadway, Maidenhead, Berks. 6573

ARCHITECTURAL ASSISTANT of Intermediate R.I.B.A. standard required in varied practice in Croydon. Good draughtsman with practical knowledge of building construction essential. Salary according to experience. Apply Hugh Macintosh & Partners, 33, High Street, Croydon. 6568

GOLLINS, MELVIN, WARD & PARTNERS are looking for staff who will help in the planning and design, and will eventually be responsible for schemes of major importance. The vacancies call for assistants of diverse capabilities rather than of long experience, but all must appreciate the implications of today's architectural thought. Five-day week, overtime, bonus and pension scheme. Telephone WEL 9991. 6560

SCHERRER & HICKS, 19, Cavendish Square, W.1, require ARCHITECTURAL ASSISTANTS. Variety of work, including research laboratories, industrial buildings, schools and housing. Must be good draughtsmen with an appreciation of contemporary design and a sound knowledge of building construction. Salary £460 to £800 according to experience. 6632

SENIOR ASSISTANT required to take charge of large interesting jobs from design stage. Salary £800 to £1,150 p.a. according to capabilities. Apply Morris de Metz, F.R.I.B.A., CITy 4086. 6557

TWO ARCHITECTS' ASSISTANTS required of Intermediate standard capable in design and working drawings, able to work on own initiative. Holiday arrangements respected. Applications to Nicholson & Rushton, 2, New Square, Lincoln's Inn, W.C.2. Holborn 6228. 6600

MORRISON AND PARTNERS require ASSISTANTS for the following:—

(a) Various schools: primary, secondary and technical.

(b) New neighbourhoods in Huntingdonshire, Bedfordshire, Derbyshire and elsewhere.

(c) Various research projects: timber houses, lighting fittings, etc.

These are key posts which offer considerable interest and commensurate salaries with good prospects. Applicants (either qualified or of Intermediate standard) should have keen and agile minds and pleasant personalities with proven ability in architecture.

The office is well situated in peaceful surroundings and has a five-day week.

Please furnish full particulars of age, experience, education and salary to Morrison and Partners, St. Alkmund's House, 103, Belper Road, Derby. 6627

WELL-KNOWN and progressive practice requires SENIOR ARCHITECTURAL ASSISTANT and ASSISTANTS of both qualified and Intermediate standard. London office in pleasant surroundings, five-day week, holiday commitments honoured. Generous salaries commensurate with qualifications and experience. Box 6556.

ARCHITECTURAL ASSISTANT required in small, good class West End office. Excellent opportunity to gain wide and varied practical experience. Five-day week. Box 6635.

COMPETENT ASSISTANT required in Architect's Department. Good opportunity for capable man, 5-day week, and Superannuation Scheme in operation. Applications giving details of age, qualifications, experience and salary required. Box 6636.

ARCHITECTURAL ASSISTANTS urgently required for private practice in Glasgow with interesting and varied work. Seniors must be capable of working independently with minimum supervision from Principals. Juniors must be at least Intermediate Standard. Good prospects in salary. Holiday arrangements met. Box 6696.

ARCHITECTURAL ASSISTANT required for senior position in private practice in Norwich. Applicants should be qualified and have at least five years' office experience and fully competent to see contracts through from start to finish under principal's guidance. Wide variety of buildings in hand covering an extensive area of East Anglia and London and great scope and prospects for the right man. Salary between £750 and £1,000 per annum according to ability. Interviews granted in London, Ipswich or Norwich. Reply giving full particulars including age, qualifications and details of preyious office experience to Box 6681.

ASSISTANT ARCHITECT required, qualified with about eight years' office experience for work in small London practice. Write stating experience and salary required or ring for an appointment. Maxwell Gray, M.B.E., A.R.I.B.A., 40, Bedford Street, Strand, W.C.2. COVent Garden 0565. 6692

BURLES & NEWTON require an ARCHITECTURAL ASSISTANT in the salary range £600 to £700 per annum. Interesting and varied practice includes Churches, Schools, Housing and Commercial Buildings. Apply 25, Bedford Row, W.C.1. Telephone Chancery 9538. 6689

LANCHESTER & LODGE urgently require MALE ASSISTANTS of all grades up to £750 p.a. Five-day week and luncheon vouchers. Ring Museum 0845 for appointment or write full particulars, 10, Woburn Square, W.C.1. 6688

YOUNG ARCHITECTURAL ASSISTANT (male) required in West End office. Write stating age, experience and salary required. Box 6683.

WHITE-COOPER & TURNER, F./F.R.I.B.A., require JUNIOR ARCHITECTURAL ASSISTANTS with two years' drawing office experience for London Office. Telephone Chancery 5615 for appointment. 6682

ARCHITECTURAL ASSISTANT, Intermediate standard, required in Cirencester. Applications stating experience and salary required to: Eric Cole & Partners, Dyer Street House, Cirencester. 6767

SENIOR ASSISTANT ARCHITECT required. Must be experienced in Commercial work and capable of carrying through new works to completion and alterations and extensions. Thorough knowledge of specification writing, contract procedure and site supervision essential. Apply stating experience and salary to George Baines & Syborn, Chartered Architects, 121, Victoria Street, Westminster, S.W.1. 6662

EXPERIENCED ARCHITECTURAL ASSISTANT required immediately by City Architects. Prospects and commencing salary up to £1,000 p.a. for suitable applicant. Box 6660.

ARCHITECTURAL ASSISTANTS required in Architects' Department dealing with new office buildings, alterations and adaptations. Write giving details of age, experience and salary required to Chief Architect, Co-operative Permanent Building Society, New Oxford House, Bloomsbury Way, London, W.C.1. 6643

IMPERIAL CHEMICAL INDUSTRIES LIMITED
PLASTICS DIVISION

WE are expanding our manufacturing facilities and require:—

(i) An ARCHITECTURAL ASSISTANT of Final standard.

(ii) A STRUCTURAL/CIVIL ENGINEERING DESIGN DRAUGHTSMAN of H.N.C. standard.

The work is interesting and varied and will include site development, with multi-storey R.C. and steel frame buildings to house manufacturing plant and all ancillaries such as offices, laboratories, amenity and welfare buildings.

It is implicit in the function of the CIVIL/ARCHITECTURAL section that it should co-operate easily with other technical staffs both inside and outside the Chief Engineer's Department.

Five-day, 39-hour week. Restaurant and Recreation Club facilities. Pension and Profit Sharing Schemes in operation. Apply briefly to the Staff Manager, Imperial Chemical Industries Limited, Plastics Division, Black Fan Road, Welwyn Garden City, Herts. 6747

NAIROBI. INTERMEDIATE ASSISTANT required by a large firm of Architects with Headquarters Office in Nairobi. Applicants must be competent at the preparation of working drawings, details and specifications, design ability is not a first requirement. Partner will be in London for the months of July and will interview suitable applicants. Apply in writing with references, full personal details and a detailed record of experience to: G. B. A. Williams, F.R.I.B.A., 45, Great Ormond Street, London, W.C.1. In due course applicants will be advised of time and place for interview. 6768

JUNIOR ARCHITECTURAL ASSISTANTS required in the Architect's Department of Multiple Retail Company, Birmingnam Area. Applicants must have had sound architectural training up to Intermediate standard, and are required to prepare working drawings and details under supervision of senior staff. Salary within the range of £450 to £500 p.a. Five-day week. Staff canteen and pension scheme available. Replies to Box 6763.

GABY SCHREIBER & ASSOCIATES have vacancies for two ARCHITECTURAL ASSISTANTS, one qualified and one Intermediate standard. Varied work on stores, factories, etc. Attractive office and working conditions. Please ring SLO 6127. 6764

ARCHITECTURAL ASSISTANT required, Final standard preferred, for varied and interesting work. Good salary to suitable applicant. Apply, giving full details, to: T. I. Frith, Newcastle Chambers, 45, Carlton Road, Worksop, Notts. 6765

NOTTINGHAM. (1) ARCHITECT urgently required for development work on Precast Concrete Structures. Will work with structural engineer and other specialists. The right man will eventually take charge of this section. (2) INTERMEDIATE ASSISTANT to the above also required. Bartlettt & Gray, Dip. Arch. A./A.R.I.B.A., Castle Gate, Nottingham. Tel. 53214. 6766

REQUIRED for Manchester Architect's small and busy office, keen JUNIOR ASSISTANT. Box 6769.

AN experienced ARCHITECT is required, willing to take responsibility for the section of a private practice dealing with the development of petrol stations. A first class salary for the right man. Offices: London and Birmingham. Box 6667.

ARCHITECT'S DEPARTMENT of BOOTS PURE DRUG CO. LTD., NOTTINGHAM, need:—

(a) ASSISTANT ARCHITECTS.
(b) ARCHITECTURAL ASSISTANTS.
(c) ASSISTANT QUANTITY SURVEYORS.

Qualifications are of less importance than ability. The work involved is of a most diverse character ranging from large new shops and the extension and alteration of existing ones to multi-storey office blocks, laboratories, warehouses and factories. Generous initial salaries and prospects of advancement for competent and experienced people. The posts are permanent and there is an attractive contributory pension scheme. Five-day week, sports, welfare and canteen facilities. Quantity Surveyors should preferably be experienced in the preparation of quantities for both alterations and new buildings, specification writing for minor works and the settlement of final accounts. All applicants should write to the Chief Architect, Boots Pure Drug Co. Ltd., Station Street, Nottingham, giving full particulars—i.e. name, address, age, whether married or single, present appointment, training, details of experience and salary required. 6746

FARMER AND DARK have a vacancy in their Poole office for a qualified ASSISTANT. Write, giving full particulars, to Farmer & Dark, 14, High Street, Poole, Dorset. 6750

BROMILOW, WHILE & SMEETON require ASSISTANT aged 30-35, £850—£950 p.a. according to qualifications and experience. Reply 72, Newhall Street, Birmingham. 6757

LEEDS. ASSISTANT required, starting September, to work on new University Hostel and Schools. Design and administrative capabilities essential. Salary range £1,000. Write stating experience, age, etc., to: Jones & Stocks, F.R.I.B.A., 7, Blenheim Terrace, Leeds, 2. 6756

ARCHITECTURAL ASSISTANTS of all grades required for Cotswold Office with varied practice. State age, qualifications, experience and salary required. Pyle & Saint, Chartered Architects, Thomas Street House, Cirencester, Glos. 6707

CHIEF ASSISTANT, A.R.I.B.A., aged over 30, required for busy office with mixed practice. Salary £1,000 p.a. Robertson & Wigley, Architects, 44, The Parade, Cardiff. 6706

TWO ASSISTANTS required in City Architect's Department. Salary range £600—£800 with good prospects of advancement and secure future for suitable applicants. Write giving particulars of experience, age and salary required. Box 6705.

NAIROBI: ASSISTANT with minimum five years office and site experience, preferably single, wanted for three years contract period. Salary £80 per month according to experience. Return passage paid. Living accommodation can be provided. Write: Louis Erdi, 27, Knightrider Street, London, E.C.4. 6704

TWO ARCHITECTURAL ASSISTANTS urgently required for expanding department of Contractor's office in N.W. London. Wide scope and prospects for persons with initiative and sound technical knowledge, able to work with minimum supervision. Salary range £650—£850 p.a. Box 6755.

STUDENT ARCHITECT required for the Divisional Architect's Office, National Coal Board, Longbenton. Applicants should be studying or be prepared to study for the R.I.B.A. examination. Salary within scale 55s. per week at 15 years rising to 122s. 6d. per week at 21 years and 175s. per week at 25 years.
Applications giving date of birth and full details of education, qualifications and experience to Staff Department, National Coal Board, Northern (N. & C.) Division, Whitley Road, Longbenton, Newcastle-upon-Tyne, 12, by 28th June, 1957. Please quote A1. 6722

HEAL & SON seek young qualified ARCHITECT for interior design, general building, small house design, decorating work of interesting variety, and developments to own premises. Write stating salary, age, experience to Design Director, 196, Tottenham Court Road, W.1. 6734

ASSISTANT required, Intermediate standard; also JUNIOR, in West End office. Write stating age, experience and salary required to Box 6724.

WESTERN WELSH OMNIBUS CO. LTD., CARDIFF, require a JUNIOR ARCHITECTURAL ASSISTANT in their newly created Architect's Department to prepare designs, working drawings, details, etc., under the supervision of a qualified Architect. Apply in writing stating age, education and experience to Chief Engineer, 253, Cowbridge Road West, Cardiff. 6730

EXPERIENCED ARCHITECTURAL ASSISTANTS and ARCHITECTURAL ASSISTANTS Intermediate standard required by Architects with general practice in Barnet, Hertfordshire. Apply Box 6729.

ARCHITECT / INTERIOR DESIGNER. Enthusiastic and practical man 25-35 years, to develop display and layout and supervise some maintenance in retail furnishing stores, working with family business, offering interesting position with opportunities. A good salary and car supplied to successful applicant. Experience of working drawings, specifications and costings required. Apply in writing to J. R. Perring, John Perring Ltd., Sheen Lane House, S.W.14. 6728

SMALL progressive West End Office requires energetic SENIOR and JUNIOR ARCHITECTURAL ASSISTANTS. Senior Assistant must be capable of carrying out Contracts and Sketch Plans to completion. Holidays will be respected. Applications in the first place in writing giving full particulars of experience and salary required to Box 6725.

YOUNG ASSISTANT required to work with Principal. Cumberland, Westmorland and Lancashire. Payment related to ability. Real prospects for rapid advancement. First class education and references essential. C. B. Martindale F.R.I.B.A., Castle Street, Carlisle. 6514

COMPETENT and experienced SENIOR ASSISTANTS required to take charge of jobs. Good prospects, holiday this year. C. H. Elsom, F.R.I.B.A., 10 Lower Grosvenor Place, S.W.1. VIC 4304. 6723

Architectural Appointments Wanted

4 lines or under, 9s. 6d.; each additional line, 2s. 6d. Box Number, including forwarding reply, 2s. extra.

SENIOR Architectural Assistant requires post. Registered architect, age 54, varied London experience. Present salary £900. Apply Box 6761.

A.R.I.B.A., A.A.Dip., nine years' experience with leading architects at home and abroad would like to hear from commercial organisation requiring salaried services of architect. Will consider private practice if prospects genuine. Box 6640.

ASSISTANT taking professional practice in September seeks post with small contemporary firm in S.W. London or Waterloo area. School trained, nine months' experience. Keen to get some responsibility. Box 6754.

ASSISTANT (24), passed Final, school trained, three years varied office experience. Salary £750. Preference for Domestic and Church work. Edinburgh essential. Box 6727.

Other Appointments Vacant

4 lines or under, 9s. 6d.; each additional line, 2s. 6d. Box Number, including forwarding replies, 2s. extra.

TO QUANTITY SURVEYORS

VACANCIES occur in our "taking off" and "working up" sections, and applications are invited from Surveyors who have had a sound training and considerable practical experience, preferably in connection with large industrial buildings.
There may also be a vacancy for a Surveyor of particular initiative and administrative ability to co-ordinate the work as a whole and be responsible for estimating, adjudicating in settlement of accounts, etc.
Applications from first class Surveyors only can be considered and salaries will be negotiated according to qualifications and experience.
Applications will be treated in confidence and full particulars should be given to enable selections to be made for interviews.
E. R. Collister and Associates, Chartered Architects and Industrial Consulting Engineers, 70, Victoria Street, London, S.W.1. 6603

OLD-ESTABLISHED Mutual Life Assurance House wants a few men of initiative and integrity to act as Agents. Architects and Surveyors have the necessary knowledge and contacts to make business most profitable to us and them. Full details from Box 123.

DESIGNER/DRAUGHTSMAN urgently required by old established West End firm of Interior Decorators and Furnishers. Experience of ship, hotel, period and contemporary work desirable. Progressive permanent situation for suitable candidate. Apply stating full details, salary required, etc. Box 6711.

SECRETARY. City Architects require Secretary for Partner. Salary about £9, according to age and experience. Tel. CLE 4414. 6732

WILLIAM WOOD & SON of Taplow, Bucks, require a young DRAUGHTSMAN or Trainee in their Landscape Department. The duties will be to work up rough drawings to finished landscape plans including the development of detail in conjunction with experienced designers. Good prospects for a young man interested in this field. Pensions scheme and five-day week. Please give full details of career to date and state salary required in first application. 6733

SURVEYOR/DRAUGHTSMAN required in Buildings Department for preparation of details and working drawings in connection with modernisation, extension and fitting out existing and new shop premises. Salary £650. Apply to Buildings Surveyor, The Worlds Stores, Ltd., 33, Trinity Church Square, London, S.E.1. Telephone HOP 0162. 6749

Services Offered

4 lines or under, 9s. 6d.; each additional line, 2s. 6d. Box Number, including forwarding replies, 2s. extra.

GOOD LETTERING is essential for Commemorative Wall Tablets, Foundation Stones, etc. Designs prepared and estimates given for the finished work in any suitable material. Renowned as a Centre for Lettering since 1934. Sculptured Memorials, 67, Ebury Street, S.W.1. 9170

ARCHITECTURAL, Reinforced Concrete and Steel design and detailing work required. Over 30 Assistants available. MUS 8753. 5145

QUALIFIED ENGINEER, with design and contracting experience in drainage, offers his services to the profession. Prepared to vet any scheme—no savings—no fees.—Box 5185.

THE SITE SURVEY COMPANY,
Blackheath, S.E.3. Tel.: LEE Green 7444-5.
Fully equipped to undertake urgent Engineering and Architectural surveys in any part of the country and abroad. Specialists in ½ in. scale detailed surveys for extensive city development areas. 1890

SITE Surveys and Surveys of Buildings prepared at short notice anywhere in Britain. MUSeum 8753. 3103

"DON" ARCHITECTURAL MODEL MAKERS. We offer the highest grade work with speed and reliability.—Please 'phone Erith 3843 or Hastings 1366. 1673

SURVEYS of land and buildings for housing, schools, factories, conversions, etc., carried out promptly by competent Surveyor. Box 5961.

QUALIFIED SURVEYORS offer confidential services to the Profession for Surveys of Land and Buildings. Detailed drawings with levels and adequate dimensions prepared. LIV. 1839. 6244

THE NORTH LONDON SECRETARIAL SERVICE specialises in Typewriting and Duplicating for professional firms. Prompt postal service. Strictest confidence guaranteed. 3, Whitley Road, Bruce Grove, N.17. Phone Tot 0680. 6633

CAPABLE ASSISTANT, available any time, offers drawing service to other architects. Phone BAL 5140. 6471

ARCHITECT and STRUCTURAL ENGINEER with wide experience offers to assist others in the profession in a temporary or part-time capacity during quiet period in own office. Box 6753.

QUALIFIED Landscape Architect Surveys; soil, ecological reports; plans, perspectives, specifications; quantities, estimates; working drawings; planting, maintenance schemes; certificates. Box 6726.

Partnership and Financial

6 lines or under, 15s.; each additional line, 2s. 6d. Box Number, including forwarding replies, 2s. extra.

ARCHITECT with reasonable size practice in Hertfordshire wishes to amalgamate with an Architectural practice in London. Write in confidence to Box 6565.

ACTIVE and capable PARTNER required for general practice in North West. Initial interview in London. Enquiries treated in strict confidence. Highest references given and required. Box 6731.

Miscellaneous

4 lines or under, 9s. 6d.; each additional line, 2s. 6d. Box Number, including forwarding replies, 2s. extra.

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

ARCHITECTURAL METALWORK of all types supplied and fitted. Gates, doors, balustrades, staircases, steel structures. Design staff available.—Clayton & Bamber, Ltd., Carterfield Road, Waltham Abbey, Essex. 5823

GUILDWOOD CEDAR PANELS were chosen for the House of Design and Productivity, Festival of Women, at Wembley. We supply, in addition to complete packaged bungalows, a wide variety of standard load-bearing panels—speedy erection—enhanced appearance. Go ahead with Guildwood! Guildcrete Limited, Artington, Guildford. 6748

Practice Available

OLD established Chartered Architect's practice (with substantial clients) for sale; London area. Enquiries in first instance in writing to Davies & Co., Certified Accountants, 23, Peterborough Road, Harrow, Middx. 6752

Educational Announcements

4 lines or under, 9s. 6d.; each additional line, 2s. 6d. Box Number, including forwarding replies, 2s. extra.

R.I.B.A. Inter. and Final EXAMS. TUITION BY POST.—C. W. BOX, F.R.I.B.A., 115, Gower Street, W.C.1. Tel.: MUS. 3906 1942

R.I.B.A. and T.P.I. EXAMS.—Stuart Stanley (Ex. Tutor Sch. of Arch., Lon. Univ.), and G. A. Crockett, M.A./B.A., F./F.R.I.B.A., M./A.M.T.P.I., prepare Students by correspondence, 16, Adelaide Street, Strand, W.C.2. TEM 1643/4.

CITY OF LEEDS EDUCATION COMMITTEE
LEEDS COLLEGE OF ART
SCHOOL OF ARCHITECTURE AND TOWN PLANNING
CERTIFICATE COURSE IN TOWN PLANNING
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