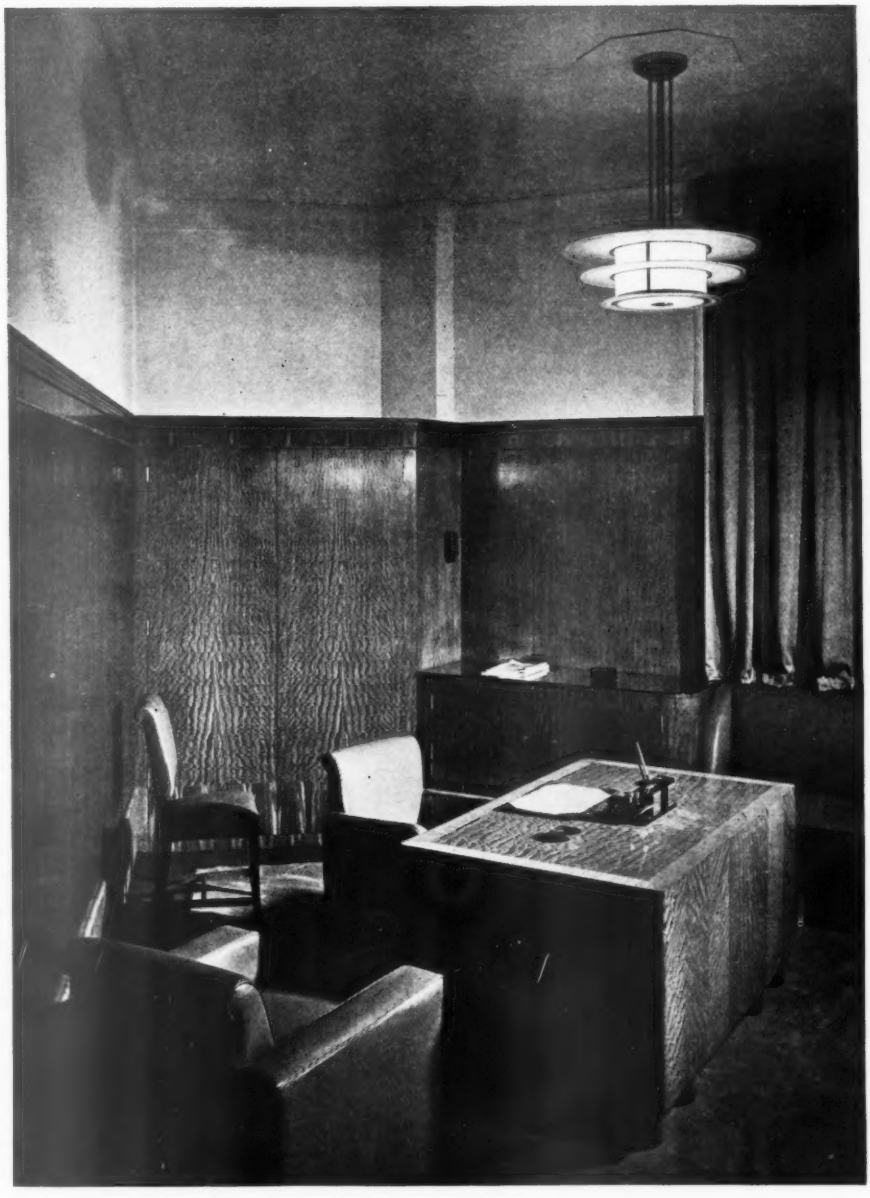
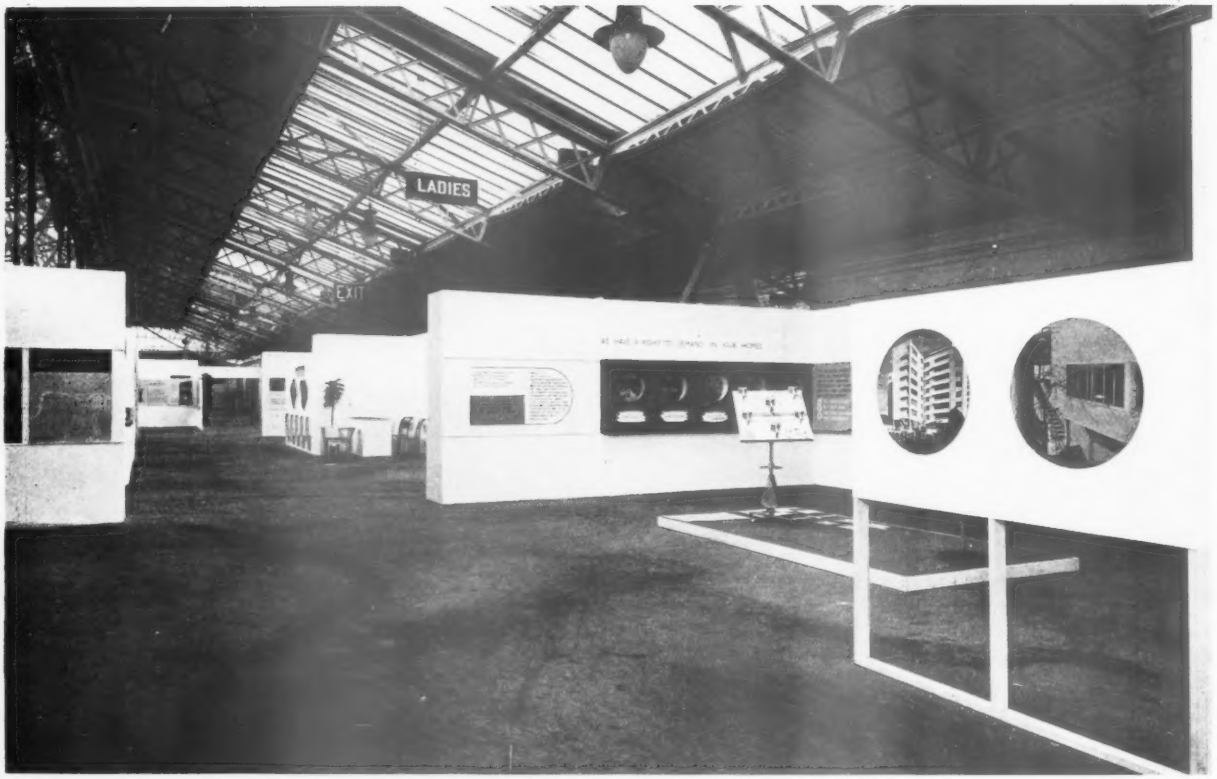
DIRECTORS' OFFICE AND FURNITURE

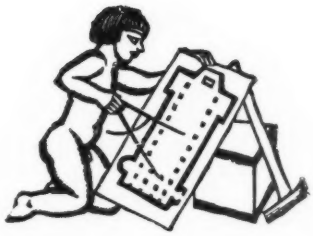


THE photograph shows the visiting directors' room in a company's offices at Millbank. The furniture, flush-panelling and built-in fittings are in cherry mahogany and walnut veneers. Chairs are upholstered in red-brown hide. The carpets and curtains are varying reds and browns. Desk sets and cupboard top are in chromium plating and black glass. Ceiling and walls are painted and finished stippled pink. The architect was Mr. Frankland Dark.



HOUSING AT OLYMPIA

A general view of the Housing Centre's display at the Building Exhibition at Olympia. The organisers have defined the scope of "housing" very widely, including social services such as nursery schools and clinics, town-planning and the siting of future housing development, and a display of recent architectural solutions. The layout and setting of the screens are by Mr. Misha Black, and the exhibit was organised by the Housing Centre and Miss Ledeboer, help being given by MARS and the A.T.O.



CONTEMPORARY DESIGN

THE correspondence columns of *The Times* last week showed some signs that, with the least possible additional encouragement an old, old outcry might once again be generated and suffered by an unwearied public. That this evergreen bogy was what finds a jaded description in the phrase "modern architecture" is neither surprising nor particularly welcome to architects.

The modern version of the battle of the styles has been fought so often, every parish in the neighbourhood of a town-planning committee has become so thoroughly entangled with it, that one more flourish of trumpets on either side is not likely to cause victory or disaster.

But the letters in *The Times* have been interesting in their first cause. It all began with the new postage stamps. The designer of these stamps, having left out the scrolls, fish and odds and ends which had sentimentally survived from days of engraving, has obviously had a bad time with the few symbols which remained.

The public has now noticed the absence of a lot of litter at which they formerly never looked, and feels upset about it. Why is it—one can almost hear them thinking—that we have no good modern decoration? Why must we always get more and more bare in everything we design? Their eyes, perhaps for the first time, begin to look at things. And one of the first things seen is a contemporary building.

Mr. Harold Speed therefore takes up his pen, forestalls all rivals by being the first in the field with "packing cases," and makes a splendid attempt to spike opposing artillery at once by including "fitness for purpose" in a pleasantly bracketed derision. A very pretty opportunity was then ready for a quite harmless display of indignation about architects.

That the display did not really come off is not to be regretted. None of the real causes of the trouble were likely to have been expressed, just because the public is not readily persuaded to analyse its own ideas too closely. And the origin of those ideas is as old as battles of the styles.

The feeling that the new stamps are not well designed may be true, and it may be true that we suffer from a poverty of imagination in decorative design; but these failings have old causes.

Mr. John Steegman has recently stated in *The Rule of Taste* that we owe to the eighteenth century in the arts quite as much as we do to the nineteenth in commerce, finance and world power. In the eighteenth century a person of quality was a person of taste—studied to achieve good taste and regarded that possession highly.

Things are not like that today. During the prosperity of the nineteenth century good taste was lost sight of. Materialism enhanced the costliness, intricacy and solidness of everything; form, colour and texture, despite a few gallant efforts, sank lower and lower. Only one exception, the form of machines, still excited a critical faculty in the public's mind which did not depend on price.

Democracy now makes it difficult to decide what is a person of quality, but of the patrons of architecture and design there will not be found many who have deliberately studied to achieve good taste. They are, perhaps, too busy; so busy that men and women of culture and intelligence in all other respects will be found living without any financial necessity in surroundings composed of the prosperous ill-assortments of twenty different decorative schemes and furniture manufacturers. And they will never really have looked at any one of them.

This state of affairs is deplorable, and it is altogether too easy a solution to seize upon architects as the criminals. A better education for the next generation, and a general public determination to take an interest in, and to encourage, good design, are more difficult to bring about and are not so likely to be advocated in the daily press.

Poverty of composition and imagination in decorative design can easily seem a failing. Put in another way, however, the matter appears in rather a different light.

There will be few architects who do not feel that the increasing simplicity in the surroundings of living has resulted in more gain than loss. Simplicity has brought with it restfulness; the fewer elements in modern living rooms have made each more important and more noticed. The colour and texture of all plain surfaces now excite far more attention, and in consequence have immensely improved. And once the public has become accustomed to and able to recognize good colour and texture in surfaces, they will be halfway to good taste in decorative pattern and composition.

The stands and products at the present Building Exhibition show the existence of such an appreciation, and at the same time emphasize that the return to simplicity has still a long way to go before its good influence is exhausted.

Exhibits which combine the modern needs of "labour saving" and roominess in little space with an excellent appreciation of form and colour are still surrounded by products featuring every influence and method known in the history of British building—but with each become, by being aimed at the limited purse and knowledge of the public, a flimsy caricature of its prototype.

Until the general taste in building rejects such caricatures, and becomes equal to the public judgment of the design of cars and aeroplanes, simplicity had better continue. At the lowest estimate, when public opinion has become accustomed to a vacuum, it may begin to think about, and to look at, that with which it fills it.

The Architects' Journal
Westminster, S.W.1
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9212-7
Telegrams
Buildable
Parl
London

NOTES & TOPICS

RIBBON DEVELOPMENT

A MOTOR tour, a week or so ago, from London to the Scottish borders did not seem to prove that the Restriction of Ribbon Development Act was having very much effect. Around every town development is going on alongside the main roads, with only in the rarest instances any provision of access roads to serve the development.

*

In fact, despite the fuss that was made when it was passed, the Act is really little more than a farce.

TRADITIONAL BUILDING

Another thing which is painfully noticeable in touring the country is the almost complete stoppage of local traditions of building. And not only are local materials ceasing to be used, but the traditional shape of buildings is being abandoned, which is in some ways more unfortunate.

*

In at least one northern village, which up to the end of the war was entirely built of stone with stone-flagged roofs, the whole aspect of the place has been altered by all the new houses and buildings having hipped roofs instead of gables.

*

But perhaps the most potent cause of changed appearance is the increase in the height of cottage rooms to comply with bye-laws. It is now almost impossible to find a new detached cottage which does not appear to be higher than it is long.

AERODROMES

Anyone who travels about the country must be struck also by the number of new aerodromes that are being built. A friend of mine informs me that he counted fourteen between London and Hull.

*

One or two people have complained to me about the apparently extravagant height of the various hangars, but civil machines are gradually getting bigger and a clear opening door height of 35 feet or so is none too much.

*

And when one realizes that the door runs down the long side and that the trusses cannot very well bear on the unfortunate unsupported lintol, it's easy to see that the ridge of the roof is bound to be a good long way from the ground.

CHINESE SQUEEZE

Most Europeans who have run a house in China know something of the charming and on the whole harmless habit of "squeeze." The house boy, for example, gets a salary and squeezes so much from the cooks and coolies for getting them their jobs. The cooks squeeze in kind on the daily marketing and both boy and cook squeeze the provision merchants, or, for that matter, anyone with whom the house deals in any way whatsoever.

*

And now a blatant case is reported of squeezing in architectural big-business. A contractor, one Loh Kau-zien, an honest man, secured a contract of $378,000 (Mex.). But he could not start the work, because the cunning architect refused to give him any drawings—except for a consideration of $55,000, or 13 per cent. on the contract.

*

After some polite reference to penalty clauses and non-completion of contract, the contractor was obliged to pay the "commission." The building owners discovered the transaction and sacked the architect, leaving an assistant to take charge of the supervision. And now the assistant has been taken into custody for demanding a squeeze of $7,000 from the contractor.

*

These demands seem to me to break all the rules of honest squeezing—but I would like to see a copy of the rules of extortion as practised in China. Think of all the chances in building—specialists and experts, sub-contractors and merchants, foremen and gangers, the workers and those who are merely born tired.

ARCHITECTURAL JARGON

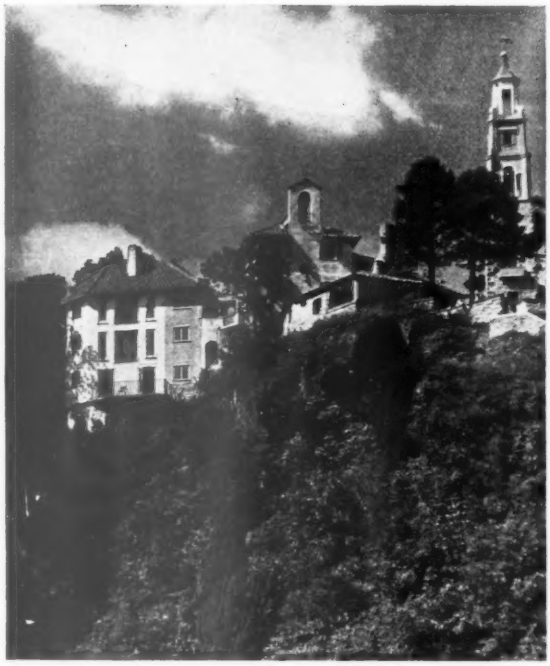
Perhaps I am feeling my age, or perhaps I am myself a pre-war period piece, but I am getting terribly impatient of the jargon that puts a hedge of thistles round the nourishing pastures of architectural discussion and criticism. I have been reading with delight and agreement the first of two articles by that gifted writer, Mr. R. A. Duncan, on "Architecture—the Social Art," in the September number of the *London Mercury*.

*

Unfortunately, his next article is to be entitled: "Reintegration." Blessings on you, A. P. Herbert, for writing that fighting book, *What a Word!* Although as a book it fairly drips with assorted prejudices, it punctures the blown-out technicalities that have invaded the art of writing; and I wish Mr. Duncan would turn his pen into a sword for slashing the cumbersome jargon out of contemporary architectural criticism.

O.K. COMPS.

An evening paper tells of "Architect-M.P. Alfred C. Bossom, boss designer of 100 American skyscrapers, who wants to see beautiful, up-to-date, light, bright, airy school-buildings in this country. 600-700 new schools;



A refuge in Wales. An architect's holiday photograph of Port Meirion, Mr. Clough Williams-Ellis's Baroque colony on the Welsh Coast.

local authorities of large cities should open competitions for best designs. Comps. stimulate."

*

I cannot believe that Mr. Bossom used these exact words, but I am all for local authorities holding competitions.

THATCH

Correspondence about thatch and thatching in *The Times* has been really quite amusing; but not even the lady, quoted by the leader writer as saying "he is a good thatcher but not at all a nice man," can equal the leader writer himself who informs us that "signs are not wanting of a disposition in some quarters to use thatch as a stick to beat concrete." Thatch, I am afraid, would prove to be but a broken reed.

THE BUILDING EXHIBITION

Two years ago this JOURNAL made a brave attempt to secure some reasonable degree of planning at the Building Exhibition, and even went so far as to circulate a questionnaire among exhibitors, most of whom, so far as I remember, said that they thought a plan was a very good thing but of course they couldn't think of moving themselves.

*

So this year I went expecting to find it much as before, only to be confronted with a plan in the electrical industry —for the larger firms have grouped themselves next door to one another, and what is more have agreed upon a uniform stand design.

*

Now I do *not* pretend for one moment that a uniform stand is possible for the Building Exhibition, or even desirable. Maybe the allied trades could find a generally acceptable solution, but what I want is a plan; with all the people exhibiting the same sort of thing next door to each other, so that I shouldn't have to listen to a wireless set next door to a circular saw.

*

The youngest of the building groups has given us an example of intelligent co-operation. Can't the older ones carry on with it next year?

TOO OLYMPIAN

And now a complaint. At a technical show I do my best to ask reasonably intelligent questions, but far too often I can't get an answer. Obvious mistakes are forgivable —the unfortunate youth at Olympia last week who told me his excellent roofing was 9s. a square presumably meant square feet.

*

But I can find no excuse for a man who knows nothing at all and excuses himself by saying that he's only just arrived on the stand. Or, rather, I can find no excuse for the firm who employs him.

*

An exhibition is hard work, I know ; standing about eleven in the morning till nine at night isn't *my* idea of fun, but architects are, after all, technical people, and expect to be treated as such.

NEW HOMES FOR OLD

The example of real co-operation is to be seen in the gallery where the Housing Centre, Mars and the A.T.O. put up between them probably the best housing exhibit that has been seen in this country.

*

As the members of these bodies are not drawing profits, it is assumed that there is nothing odd in the fact of their collaboration. Odd? Have you, dear reader, ever belonged to what for want of a better word must be called an "art" group? You will know, if you have, that the vendettas of industry, the rivalry of firms, pales into insignificance before the intense, the innate passion with which every member of every art group asserts his sovereign right not to co-operate with any other member or any other group.

THE KING

Such at least is the English tradition, a tradition which Mars and the A.T.O. and the Housing Centre seem to be breaking down. More of this insidious foreign influence, perhaps. Anyway, I for one take off my hat to them, as they very politely took off theirs to our Monarch on Thursday last, who debouched with startling suddenness from a lift and actively studied their contribution to housing lore.

*

Furthermore, if my eyes did not deceive me, he actively commented on it to his attendant, Elizabeth Denby, a bulwark both of Mars and the Housing Centre. In our little world Miss Denby and Miss Ledeboer wield more influence—and get more work done—than any six pompous and prating males, with the possible exception, of course, of your devoted

ASTRAGAL

NEWS

POINTS FROM THIS ISSUE

THE KING AT OLYMPIA

The King paid an unexpected visit to the Building Exhibition at Olympia on Thursday. He was received by Mr. H. Greville Montgomery, founder of the exhibition, and his brother and son.

After examining the trade shows on the ground floor, the King inspected the exhibits of the Housing Centre, the Building Research Station, the National Physical Laboratory and trades training schools.

Most of his time was spent at the Housing Centre's display, which he said he hoped large numbers of the public and representatives of public bodies would see, so that they might discover what still had to be done in the provision of good housing.

He stated his appreciation of the need for trees and grass for children, and inquired particularly about the provision of nursery schools.

Sir Reginald Rowe, chairman of the executive of the Centre, and Lord Balfour of Burleigh, accompanied the King.

INN SIGNS EXHIBITION

The Exhibition of Inn Signs which is to be held in November at the Building Centre, has already had over 300 signs offered for display. In addition, many photographs and drawings of signs which could not be removed will be on view. Thirteen signs have been offered by Trust Houses, Ltd., and 17 by the Carlisle State Management.

Sir Edwin Lutyens and Professor A. E. Richardson are to serve on the selection committee.

This exhibition is only the second of its kind to be held, the last being in 1762.

THE DARTFORD COMPETITION

Mr. P. D. Hepworth, the assessor of the Dartford Municipal Offices Competition, has made his award as follows :

Design placed 1st (200 guineas).—Design 34. Mr. Donald G. Walton, A.R.I.B.A., 18 Highfield Road, Maidenhead.

Design placed 2nd (100 guineas).—Design 13. Mr. Charles H. Pike, A.R.I.B.A., 32 Buckland Crescent, N.W.3.

Design placed 3rd (50 guineas).—Design 6. Mr. A. W. Kenyon, F.R.I.B.A., 21 Bedford Square, W.C.2.

THE ARCHITECTS' DIARY

Until Wednesday, September 30
THE BUILDING EXHIBITION, OLYMPIA. 11 *a.m. till 9 p.m.*

Friday-Sunday, October 2
TOWN PLANNING INSTITUTE. *Eighteenth Annual Country Meeting. At Norwich. Until October 4.*

Wednesday, October 14
NATIONAL SMOKE ABATEMENT SOCIETY. *Eighth Annual Conference and Smoke Abatement Exhibition. In London. Until Saturday, October 17.*

Friday, October 16
LONDON SOCIETY. *Miss E. Jeffries Davis on "The Story of Bloomsbury." 5 p.m.*

Friday, October 23
ARCHITECTURAL ASSOCIATION. *Annual Exhibition of Water-colours, Etchings and other Drawings by Members. Until November 6.*

Tuesday, October 27
ARCHITECTURAL ASSOCIATION. *Presidential Address by Mr. L. H. Bucknell, F.R.I.B.A. 8 p.m.*

THE FROGNAL HOUSE

An interesting point has arisen in connection with the proposed three-storey reinforced concrete building in Frognal, Hampstead, to which local residents raised objections.

It is reported that, in its reply to objectors, the L.C.C. stated that the Minister of Health, in his explanatory memorandum on the Town and Country Planning Act, 1932, had expressed the view that taste in the design and external appearance of buildings is not a matter for dogmatism, and that town planning powers should be used for preventing what may reasonably be regarded as buildings out of keeping with their surroundings and an offence to the neighbourhood.

The use of the word "dogmatism" to describe any view not supported by a majority of persons happening to live in a neighbourhood, seems worth notice. Decisions on questions of æsthetics by the method of counting noses may be democratic, but it has also disadvantages.

MOSAICS IN U.S.S.R.

A mosaic factory affiliated to the Academy of Arts has recently been opened in Leningrad. The young men attached to the factory, under Professor V. A. Frolov, recently completed the restoration of the ninth century mosaic decorations in the Kiev Cathedral. The frieze for the wide façade of the new Meyerhold Theatre in Moscow is being made by the factory. Composed of over 300 million particles of mosaic, it consists of eight panels showing scenes of Gogol's comedy, "The Inspector General," from Meyerhold's production. A decorative panel for the building of the Frunze Military Academy in Moscow, with a design of military trophies, flags and garlands, is also to be made by the factory.

BUILDING DEFECTS

The recent action taken by the Manchester City Council in censuring a builder for defective work has resulted in correspondence in the press in regard to the present lack of public protection against bad workmanship.

Following are some extracts from a letter by Mr. G. L. Greaves in the *Manchester Guardian* : "Let us suppose that, in direct contravention of by-laws, a contractor has built the floor joists into the chimney breasts of a pair of houses to within an inch or two of the fire, and that no brick underwork has been provided beneath the ground-floor hearths. These are by no means uncommon defects. The owner, on having these points brought to his notice, interviews the builder, pointing out to him the grave risk of fire, but cannot get him to move in the matter. What then is the owner's position? His only redress is through the law, and if he takes the advice of a solicitor, he learns that if the matter is reported to the corporation the responsibility of complying with the by-laws rests with the householder, who may subsequently recover damages by civil action from the builder. He may then pursue the matter a step farther and take counsel's opinion as to whether he would be likely to succeed in an action against the builder, only to learn that even though his case be a very good one, the costs would amount to between £25 and £30 per house if he were successful, and considerably more if he lost, so that in any circumstances it would not be advisable to proceed in the matter. In other words, it would cost more to fight a successful action than to repair the property.

"It seems to me that some scheme ought to be devised to protect would-be purchasers against unscrupulous contractors. I would suggest that builders should be licensed, and that deliberate contravention of by-laws and obvious breaches of good faith with purchasers should be punishable by the summary annulment of such licence—subject to arbitration by the Builders' Federation, the Ministry of Health, or the Royal Institute of British Architects."

REVISED B.S.I. SPECIFICATION

The British Standards Institution have just issued a revision of B.S.S. No. 217 Red Lead for Paints, which has now been extended so as to include non-setting red lead which was originally the subject of a separate specification, B.S.S. No. 315. The latter specification has accordingly been superseded.

It is hoped that by including the three types of red lead in one publication, the specification will be more serviceable to industry.

In the revision of the specifications the technical requirements have not been altered to any material extent except that in the case of non-setting red lead the limit for the coarse particles has been reduced from 1·0 per cent. to 0·75 per cent. The clauses have, however, been reworded and the methods of test modified to be brought into line with the standard methods now adopted.

No depression at this year's Building Exhibition. Mr. H. Hanson (right), sales director of Messrs. Turner's Asbestos Cement Company, and Mr. J. Paravicini, works director of the company's Widnes factory, discuss—without tears—the upward trend of trade.

Copies of the specification (No. 217–1936) may be obtained from Publications Department, British Standards Institution, 28 Victoria Street, London, S.W.1. Price 2s. 2d., post free.

NOTTINGHAM NURSERY SCHOOL EXHIBITION

A two-day exhibition of nursery schools and housing was held at Nottingham last week in order to arouse interest in the subject.

A lecture was given by Miss Lilian de Lissa, Chairman of the Nursery School Association of Great Britain, entitled "The Principles underlying Early Education" and a film was shown called "A Day in a Nursery School."

It is hoped that in the future all schools in Nottingham will be provided with a nursery unit, the first being the Whitemoor School where the building of a new block is just about to be begun.

ALTERATIONS FOR THE NEW REIGN

The alterations and redecorations which have been begun at Buckingham Palace will still take some time to complete. Some further changes are contemplated with regard to the offices for the King and his secretarial staff, and the Belgian Suite is to be redecorated. The seven Belgian rooms near the grand entrance of the Palace were arranged, decorated and furnished as the London residence of Leopold I during his visits to his niece, Queen Victoria. The Belgian rooms have always been reserved for Imperial and Royal guests.

Considerable building activity has also been going on at Fort Belvedere, and a new wing is under construction mainly to provide additional guest accommodation. It is generally in keeping with the rest so far as the elevations are concerned. George IV's old fishing temple and some boat houses which adjoin it on the banks of Virginia Water, are also being demolished.

THE BATH ASSEMBLY ROOMS

Bath City Council proposes to make the historic Assembly Rooms, designed by John Wood the younger, into a social centre, and to-day a Ministry of Health inquiry will be held into the proposal to borrow £25,000 to meet the cost of restoration. Opened in 1771, the Rooms were offered to the city two years ago by an anonymous purchaser.

NEW THAMES POWER STATION

The Central Electricity Board has completed negotiations for the building on the Thames, 3½ miles from Dartford, of an electricity power station even larger than those at Battersea and Fulham. It will cost £5,500,000.

MUNICIPAL BUILDINGS INQUIRY

Stockton's municipal buildings scheme was the subject of an inquiry at the Stockton Town Hall today, by an inspector of the Ministry of Health (Mr. R. N. Stuart). Opposition was raised to the proposed Housewife Lane clearance site by two members of the Council, Mr. Basil Robson, chairman of the Housing Committee, and Mr. O. Atkin, and by Miss Theobald, a ratepayer.

The total cost of the scheme, it was stated, was £62,762, of which £4,000 was for furniture, and application was made for consent to a loan of this amount. The value of the site, it was stated, was £3,498, but this had been acquired some time ago by the Corporation.

The opposition agreed that municipal buildings were necessary and desirable, but objected to the site. Councillor Atkin maintained that although the slums had been cleared, there was still a slum environment. The site had a poor aspect and was close to an industrial area, and he asked what would be the effect of the cattle market, with its noises, every Wednesday.

Opposition to the scheme was also offered by Alderman J. Goldston, who said that it was ridiculous to build municipal buildings without a Council chamber. He expressed the opinion that the site should be reserved for industrial purposes.

PROGRESS IN HOUSING

Following are some of the points mentioned by Sir Kingsley Wood in a speech at the Council House, Bristol, last Friday.

Over 420 local authorities had already submitted proposals to deal with overcrowding in their districts. The overcrowding programme would require a considerable percentage of the larger type of house because the recent survey had shown that the average overcrowded family was larger than the normal family.

The five-year plan for slum clearance, outside the six largest towns, would be completed in the time specified. In a number of areas the programmes had been completed. Already some 500,000 slum dwellers had removed to new and decent homes and there were more going at the rate of about 26,000 every month.

It was possible that some 200,000 additional dwellings were still needed.

Cost, particularly from the point of view of low rents, was always an important factor. Whilst increases in the cost of local authority dwellings had been noted in certain areas, it was not general. This matter had to be kept under constant review, particularly since the overcrowding programme would require a considerable percentage of the larger type of house. The reasonable cost of the larger house was a proper cost from the point of view of good housing, and it must be faced, and without derogation from the proper rehousing standard of the local authorities.

CHANGES OF ADDRESS

Owing to the proposed clearance of the Abingdon Street site for the King George Memorial, Messrs. Harry Barnes and Partners are removing to 10 Charles Street, St. James's Square, London, S.W.1. (Telephone: Whitehall 9883 as before.)

Mr. H. S. Goodhart-Rendel is moving his office from 60 Tufton Street, Westminster, to 13 Crawford Street, W.1. (Telephone: Welbeck 5156.)

ARCHITECTS' REGISTRATION COUNCIL

The eighteenth Ordinary Council Meeting of the Architects' Registration Council of the United Kingdom will be held, at 5 p.m., on Wednesday, September 30, at 66 Portland Place, W.1.

R.I.B.A. INTERMEDIATE EXAMINATION

The following are the dates on which the forthcoming R.I.B.A. Intermediate Examination will be held: November 6, 7, 9, 10 and 12, 1936. (Last day for receiving applications: October 6, 1936.)

NEW PRACTICE

Mr. Wilfrid E. Edlestone, A.R.I.B.A., has resigned from the firm of Messrs. Toms and Partners to begin independent practice at 7 Park Lane, W.1.

LETTERS FROM READERS

The Birmingham Flat Competition

SIR,—Recently the City of Birmingham has held a competition for working-class flats. This competition is of special importance in that up to now the policy of the Corporation has been to build only cottage estates. Having now decided that the problem of replacing the slums of the central areas can only be solved by building large blocks of flats, this competition was presumably held to make sure that a really high standard of flat design should be set which the city could confidently adopt for their future housing schemes.

The result of this competition has now been announced and the designs illustrated. In our opinion, however, the design placed first does not seem to be successful in avoiding all those points in flat block planning which are now generally accepted to be undesirable.

Points at which criticism might be levelled from this standpoint are :

(1) The provision of closed courts, with the consequent tendency towards shaded angles and the accentuation of noise from children playing in them.

(2) Access by fairly long balconies on to which a proportion of the bedrooms face.

(3) The provision of cupboard accommodation, which appears to fall short of modern needs.

(4) Refuse-chutes of the "letter box flap" type at some distance from individual flats.

(5) A number of bedrooms facing north.

(6) The treatment of the private balconies as purely architectural features and not as an extension to the living-room accommodation.

(7) It is contended in the winner's report that wooden windows give the most satisfactory result. It is doubtful whether the advantages of steel windows in strength, durability, ease of cleaning and glass area support this statement.

These criticisms are not put forward with any special reference to the winners of an isolated competition, but because we feel that there is an urgent necessity for some central government advisory committee which could co-ordinate all the latest advances in housing design, bring these to the notice of the municipalities, and assist in the formulation of official standards of design for all working-class housing.

We feel that a very large amount of time and trouble which has been expended by many architects on recent flat block schemes would be, in the future, much better directed if some such advisory committee could prepare a schedule of draw-backs now proved to be avoidable, and if the avoidance of these faults were made part of the conditions of subsequent competitions.

THE A.T.O. EXECUTIVE
(F. SKINNER, *Hon. Sec.*)

THE ARCHITECTS' AND TECHNICIANS' ORGANIZATION

LEONARD S. DYER

The Building Centre

SIR,—I read with interest that the Building Centre is to be open on Wednesday evenings during the winter.

This concession should afford a welcome opportunity for the majority of salaried architects (who for obvious reasons cannot attend during the daytime) to get acquainted with the Centre and to make every use of its activities, and one hopes a good weekly attendance will reward the enterprise of the Directors.

LEONARD S. DYER

Competitions Open

OCTOBER 26.—Sending-in Day. Layout and individual design of a group of camp buildings for a holiday camp, in timber, for the Timber Development Association. Assessors : E. Guy Dawber, R.A., F.S.A., F.R.I.B.A., G. A. Jellicoe, F.R.I.B.A., G. Langley Taylor, F.R.I.B.A., and John Gloag. Premiums : £150, £50, £25 and three special mention awards of £10 each. Conditions may be obtained on application to The Timber Development Association, 69-73 Cannon Street, London, E.C.4.

OCTOBER 29.—Sending-in Day. Central Baths, Leeds. (Open to architects of British nationality.) Assessor : Kenneth M. B. Cross, F.R.I.B.A. Premiums : £350, £200 and £100. Conditions of the competition and instructions with a plan of the site can be obtained on application to Mr. Thos. Thornton, Town Clerk, at Room 57, Civic Hall, Leeds, 1. (Deposit £1 1s.)

OCTOBER 31.—Sending-in Day. Shops and offices, Newcastle-under-Lyme, for the Newcastle-under-Lyme Borough Council. (Open to architects of British nationality.) Assessor : Harry S. Fairhurst, F.R.I.B.A. Premiums : £300, £200 and £100. Conditions of the competition may be obtained from the Town Clerk, Town Clerk's Office, Newcastle-under-Lyme. (Deposit £2 2s.) The latest date for submission of designs is October 31.

OCTOBER 31.—Sending-in Day. Council offices, Farnham, for the Farnham U.D.C. (Open to architects practising in the United Kingdom.) Assessor : E. Vincent Harris, A.R.A., F.R.I.B.A. Premiums : £250, £150 and £100. The last day for questions was August 31. Conditions of the competition may be obtained on application to A. A. Minns, Clerk of the Council, Council Offices, Farnham, Surrey. (Deposit £1 1s.)

OCTOBER 31.—Sending-in Day. New hospital at Llandudno, for the Committee of the Llandudno and District Hospital. (Open to registered architects of British nationality.) Assessor : R. Norman Mackellar, F.R.I.B.A. Premiums : £250, £150 and £75. The last day for questions was August 28. Conditions of the competition may be obtained on application to the Honorary Secretary, New Hospital Scheme, Town Hall, Llandudno. (Deposit £1 1s.)

NOVEMBER 7. — Sending-in Day. The four main railway companies (L.N.E.R., L.M.S., G.W.R. and Southern) invite British-born architects to submit in competition designs for Joint Receiving Offices. Assessors : Messrs. L. H. Bucknell, C. Grasemann, W. H. Hamlyn, Charles Holden. Premiums : £300, £125, £50 and £25. Last day for questions : September 17, 1936. Conditions of the competition may be obtained on application to Mr. W. H. Hamlyn (F.), Chief Architect, L.M.S. Railway, St. Pancras Chambers, London, N.W.1. Deposit £1 1s.

NOVEMBER 30.—Sending-in Day. New civic buildings, which include a town hall, municipal offices, law courts and police station, Newport (Mon.), for the Newport Corporation. (Open to architects of British nationality.) Assessors : E. Berry Webber, A.R.I.B.A., and C. F. Ward, F.R.I.B.A. Premiums : £750, £500, £300 and £200. The last day for questions was September 1. The conditions are obtainable from O. Treharne Morgan, Town Clerk, Town Hall, Newport (Mon.). (Deposit £2 2s.)

DECEMBER 15. — Sending-in Day. The Corporation of Gloucester invite architects of British nationality, domiciled in the United Kingdom, to submit in competition designs for a new Technical College, etc., at Brunswick Road, Gloucester. Assessor : Mr. Henry V. Ashley. Premiums : £350, £250 and £150. Last day for questions : September 26, 1936. Conditions of the competition may be obtained on application to The Education Officer, Belsize House, Brunswick Square, Gloucester. Deposit £2 2s.

DECEMBER 31. — Sending-in Day. The Metropolitan Borough of Holborn invite architects to submit in open competition designs for new Public Baths, etc., to be erected in Broad Street and Endell Street. Assessor : Mr. Kenneth M. B. Cross. Premiums : £300, £200 and £100. Last day for questions : October 1, 1936. Conditions of the competition may be obtained on application to Mr. Lionel J. Walford, Town Clerk, Town Hall, High Holborn, London, W.C.1. Deposit £2 2s.

FEBRUARY 28, 1937. — Sending-in Day. Extension of St. Andrew's Cathedral, George Street, Sydney, for the Authority in the Diocese of Sydney of the Church of England. (Open to architects who are British subjects, and members of the Royal Australian Institute of Architects, the R.I.B.A., or the Allied and Associated Societies.) Assessors : His Grace the Archbishop of Sydney, Sir Giles Gilbert Scott, R.A., F.R.I.B.A., and Bertrand J. Waterhouse, F.R.I.B.A. Premiums : £500, £300 and £200. The last day for submitting designs (which must be forwarded direct to Sydney) is February 28, 1937. The last day for questions was August 11.

UNDERGROUND CAR DEPOT, NORTHFIELDS

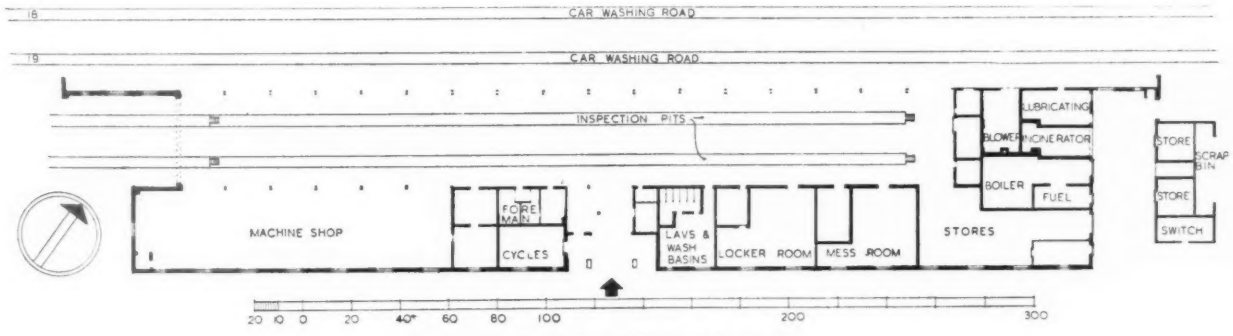
DESIGNED BY STANLEY HEAPS.

ADAMS, HOLDEN AND PEARSON, CONSULTING ARCHITECTS

GENERAL PROBLEM — *A depot for the London Passenger Transport Board for stabling, cleaning, washing and repairing the rolling stock of the Tube and District Railways. The car sheds include seventeen tracks with inspection pits, 450 ft. long, and two tracks for car washing. Adjoining the car sheds are two tracks in a lifting bay, 300 ft. long and provided with a travelling overhead crane. Accommodation is also provided for the office staff.*

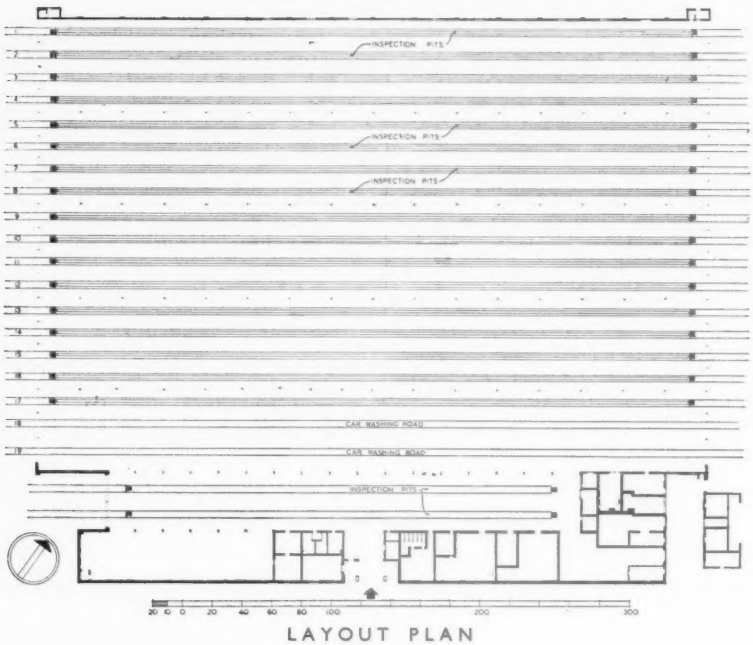
SITE — *To the south of the railway line between Northfields and Boston Manor stations, Middlesex. The depot is planned with the car shed tracks lying parallel to the main line, so that the entrances and the exits for the rolling stock can be made from either the east or west ends.*

Above is the main entrance to the depot.



PLAN OF WORKSHOPS

UNDERGROUND CAR DEPOT, NORTHFIELDS:

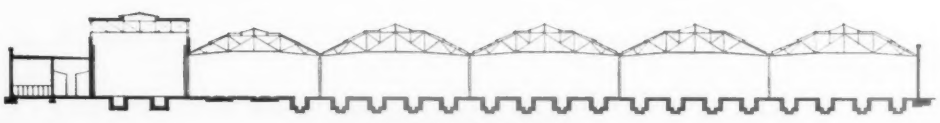


LAYOUT PLAN

CONSTRUCTION—*The exterior walls are in multi-coloured bricks, flush pointed, with a plinth to sill height in red Sussex bricks, weather pointed. Red Sussex bricks are also used around the main entrance. The copings are of precast concrete with a smooth white finish; the lintols are of concrete and the window sills are brick on edge. Windows are steel sash. The interior walls of the sheds generally are fair face brickwork, with a dado painted elephant grey, a 3-in. red dado band, and the walls above distempered broken white. Steelwork generally is painted light green.*

OFFICE FINISHES—*The offices have plastered walls with a dark green painted dado, the walls over distempered cream, and the ceiling broken white. The mess rooms have cream tiled dados, with black borders, and cream distempered walls above; floors are of red tiles. The lavatory walls have a dado to door height of brown glazed bricks, and a red tiled floor. Above the dado the walls, which are fair faced brickwork, are distempered cream.*

The photograph shows a general view of the buildings.



CROSS SECTION

DESIGNED BY STANLEY HEAPS

ADAMS, HOLDEN AND PEARSON, CONSULTING ARCHITECTS

EQUIPMENT—*The exteriors of the railway coaches are washed by a machine on one of the tracks. The machine is fitted with water sprays and vertical rotary brushes. Water is sprayed on both sides of the coach as it is driven slowly through the washing shed. After passing the brushes, the coach is again sprayed on both sides as the coach leaves the machine. The water sprays and the vertical rollers are automatically synchronized, the washing being controlled by the speed of the coach.*

The interiors of the coaches are cleaned by a vacuum plant, with connections on all tracks. The heavier refuse, such as newspapers, etc., is deposited in manholes placed at intervals along the tracks. The manholes are connected with an air blower plant which transports the refuse and delivers it direct into the incinerator.

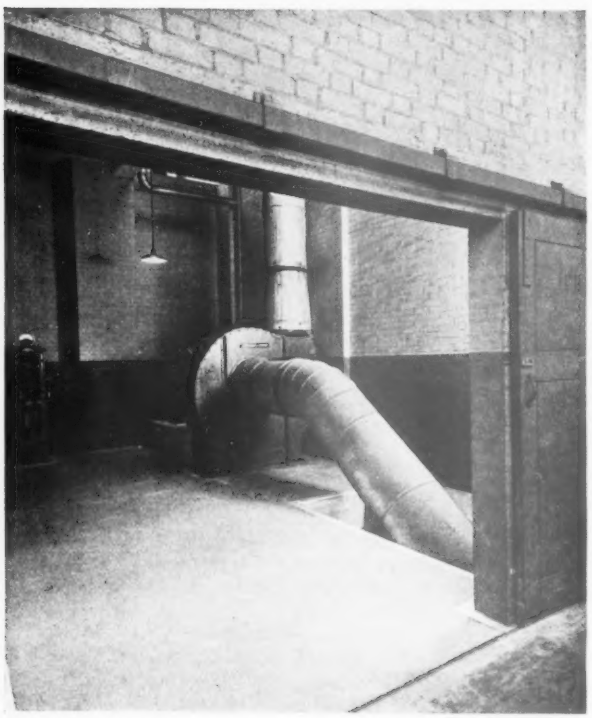
The photograph is of the railway coach washing machine.

UNDERGROUND CAR DEPOT, NORTHFIELDS

DESIGNED BY

STANLEY HEAPS

The photograph on the right is of an inspection pit taken from underneath a railway coach. There are seventeen pits and each is 450 ft. long. The photograph below, left, is of the air blower plant. The refuse collected from the railway coaches is deposited in manholes placed at intervals along the tracks, and is transported by the "blower" from the manholes into the incinerator. The photograph below, right, is of the lavatory and shows the circular washing troughs. The water is controlled by foot pressure on the circular hoop at the base of the trough.



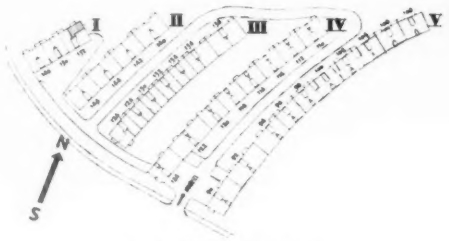
ADAMS, HOLDEN AND PEARSON, CONSULTANTS

FLATS IN DENMARK

PROBLEM—*Scheme of five blocks of middle-class flats near Copenhagen. The site is in well-wooded parkland, and each block has been orientated to secure a good amount of sunshine.*

PLAN—*Accommodation varies from two rooms to eight, with kitchen and bathroom in addition. All flats are centrally heated. Laundries with electric washing-machines and driers are provided to each block. Shops are placed at the entrances to each block and, since everyone rides a bicycle in Copenhagen, cycle sheds are provided as well as garages.*

The blocks have been built at Ordrop, Jorgenshave and Frederiksburg, and two views of the lay-out at Jorgenshave appear on this page.

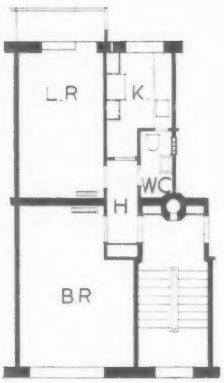


LAYOUT PLAN

DESIGNED BY

A. SKJOT-PEDERSEN

FLATS IN DENMARK:



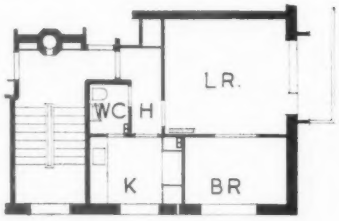
TYPICAL TWO-ROOM FLATS

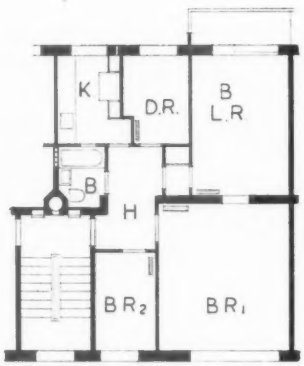
RENTS—*By English standards the rents are low, a schedule being as follows :*

Two rooms — £45 a year plus £4 10s. for central heating ;
Four rooms — £85 plus £9 ;
Five rooms — £117 plus £12 12s. ;
Eight rooms — £158 plus £16 6s.

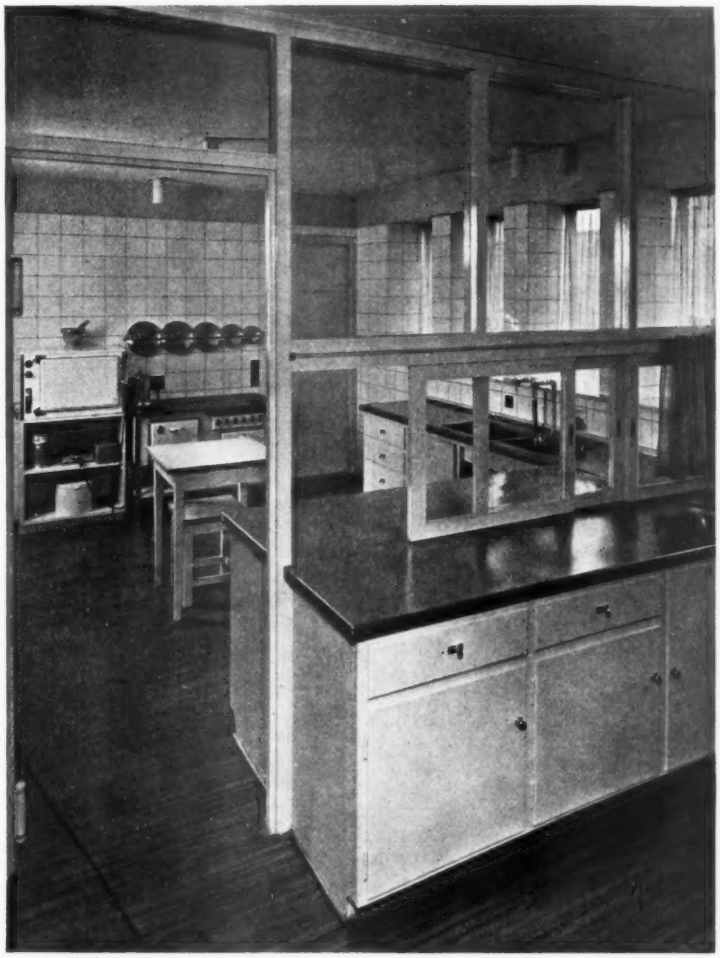
On this and the facing page are four typical flat plans. The photographs are a detail and a general view of the sun-balconies, the surface finishes being in various shades of plastic paint.

DESIGNED BY A. SKJOT PEDERSEN





TWO-ROOM AND FOUR-ROOM FLATS



Top, one of the kitchens and sculleries in a large flat. The kitchens are equipped with electric cooker, stainless steel work-table and sink, refrigerator and refuse shute. The walls are white tiled to frieze height and floors are of rubber. Above are two views in flat living-rooms, one showing a sun-balcony and the other a corner fireplace designed to burn wood. The flush lighting panels in the corridor and sitting-room are in pearl frosted glass.

L I T E R A T U R E

THE CASE FOR ARCHITECTURAL SCULPTURE

BY E. H. W. ATKINSON

The New Architectural Sculpture. By Walter R. Agard. Oxford University Press. Price 10s. 6d.

PROFESSOR AGARD has here set out all the material for the kind of argument that might appeal to the purist—may a contemporary building properly have upon it any sculptural decoration less functional than, for instance, a caryatid; or even any decoration at all? *Lector, si responsum requiris, circumspice*, if one may coin a phrase.

The series of illustrations that fills two score pages of the book, indeed, supplies the answer. It is a pity that a technique of reproduction has been chosen that frequently makes the illustrations singularly unillustrative—the photograph of the R.I.B.A. building, for instance, comes out so poorly that it is impossible to learn anything about the sculptures by Copnall and Woodford that adorn it, or even very much about the building itself. The effect is rather like that of the cheaper kind of continental postcard. "Close-ups" of such things as the Epsteins on the London Transport offices, of the Eric Gills on Broadcasting House, of the Jan and Joël Martel reliefs at St. Jean de Luz, of the reliefs by Lee Lawrie at Lincoln, Nebraska, and by Alfred Bottiau at Hartford, Connecticut, and of several other works are far, far better things, and it is the reader's good fortune that most of the more intimate photographs, if not those of the complete buildings, come out very well. With Professor Agard's text the reader is consistently fortunate. He has an impressive acquaintance with recent and current work in both the old world and the new, and he knows how to pick the best out of both worlds.

Professor Agard claims to deal, and does deal, with that sculpture of a creative character which has been made for buildings freshly planned to meet the needs of to-day. It is clear that sculpture owes more to architecture—for all that Professor Agard says that "it is doubtless . . . true that sculpture sacrifices some of its freedom when it engages in this co-operation"—than architecture does to sculpture. The perfect building would be one, no doubt, whose form was completely satisfying and self-expressive. Professor Agard puts it that "Architecture has been given additional beauty, its bareness enriched; and sculpture, sharing the dignity and vigor of the buildings it has served, has more easily achieved the monumental power of which it is capable, avoiding the temptation to become merely an art of exquisite fragments."

Just how far architecture needs to be given additional beauty or to have its "bareness" enriched is, of course, the core of the question. General practice gives Professor Agard sufficient excuse, as one has suggested, for avoiding it. At any rate, he is able to produce plenty of evidence that architects (and more especially their clients) find themselves with sufficient reasons for having sculpture about their buildings. There can be no quarrel with Professor Agard's addition of sculpture's side of the balance sheet. Any collection of illustrations, almost any intelligent holiday photographer's snapshot album, would be enough to prove it. Nor is there anything for sculpture to be ashamed of in this. As an independent art it is limited, if this is properly a limitation, only by the preconceptions in the minds of its beholders—the generality looks upon it more than any other as a strictly representational art. But as an ancillary art, which, strictly speaking, it is when it allies itself with architecture, it has its reasons and even its excuses ready-made. They may have been made at the expense of the purest and strictest ideas of architecture—but here some of them are, in Professor Agard's own words. ". . . Even more important than . . . representational meaning is the formal contribution of sculpture, which enriches the surface, softens transition and reduces the angularity of profiles. It may even contribute to the organic strength of the structure . . . (and) . . . Especially in its attempt to create the effect of spatial depth, architecture relies upon sculpture." But, he adds, "Its (sculpture's) design must make an organic contribution, accentuating those parts that the architect wishes to emphasize."

His argument leads to the point where he can say that "the standards by which sculpture is judged are fundamentally those by which we must judge architecture itself"—a building will frankly express the material of which it is made, it will be in harmony with its natural surroundings, it will be designed in accordance with the purpose for which it is intended, it will indicate the most important activities and attitudes of the people who live and work in it, and it meets certain traditional aesthetic requirements. Changing terms where change is necessary, these simple words are fair enough. But quite strictly speaking, again, they beg the question. Professor Agard, however, again in justification, points to a good deal of recent work which he calls "antiseptic architecture." It is part of his argument that is quite fairly put, that such architecture "is not sufficient to meet the emotional demands of men, that the machine must not be allowed to dominate." Let disagreement, if any, have a mind that way, with the author on that point lead to no disparagement of a very valuable and interesting book. If architecture is truly an art that needs no added ornament, the argument from the antiseptic is a condemnation either of the particular buildings concerned or of the whole contemporary conception of the art itself. But if ornament be admitted, then Professor Agard has indeed the backing implied in the practice of such liberal minds, as he describes them, as Louis Sullivan and Frank Lloyd Wright, and a host on this side of the Atlantic, too.

ELECTRICAL WATER HEATING

Water Heating by Electricity. By J. Russell Hickmott. Published by Percy Marshall & Co., Ltd. 63 pages. 26 illustrations. Price 1s. 6d.

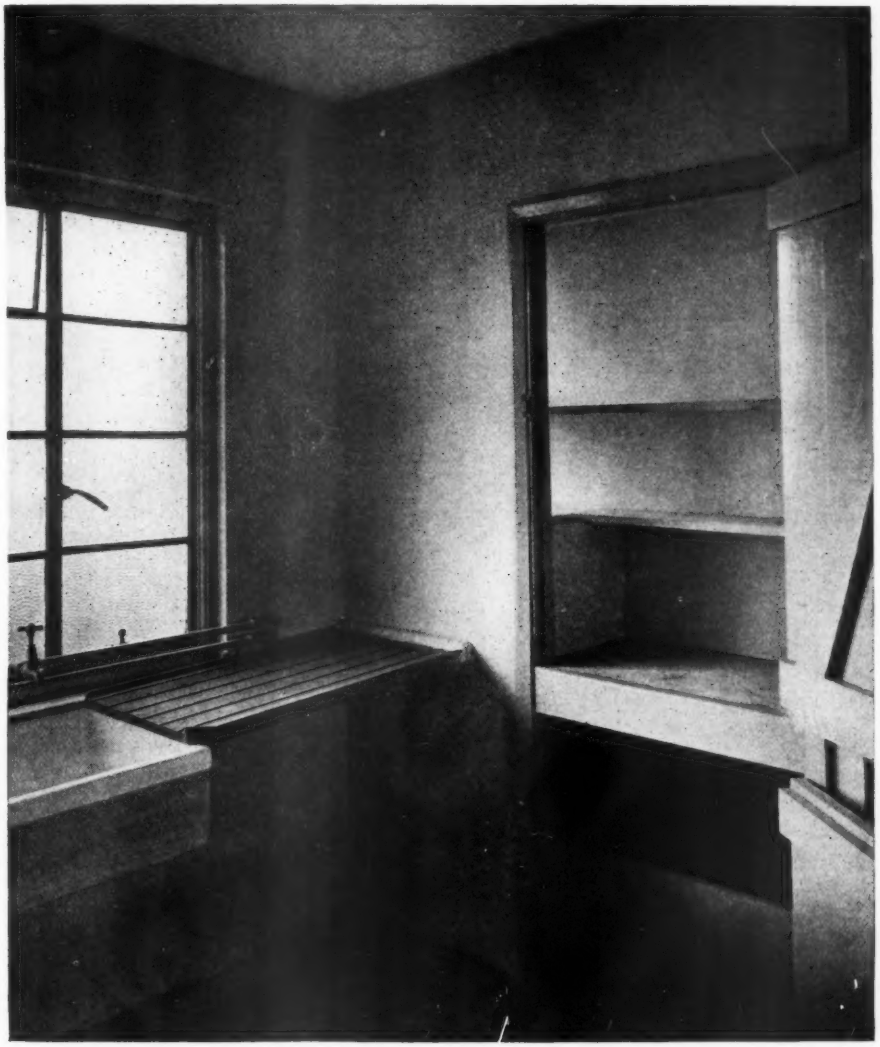
THIS little book confines itself to explaining the methods of heating domestic hot water electrically. The various types of storage heater are illustrated and discussed. The adaptation of existing boiler and cylinder systems is dealt with and some interesting notes are given on faults commonly found and their rectification. It covers only the question of hot water supply to houses and does not attempt the larger field of other types of building.

The case for electricity is taken for granted at the outset and is not discussed.

So far as it goes it is a comprehensive little treatise and may be recommended to those faced with the difficult problem of choosing the right method of supplying hot water to domestic establishments.

WORKING·DETAILS: 495

LARDER AND COAL CUPBOARD • COMMODORE COURT, POPLAR • POPLAR BOROUGH COUNCIL



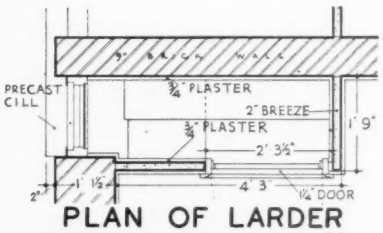
A combined larder and fuel store at the Commodore Court Housing Scheme for the Poplar Borough Council, designed by Rees J. Williams, A.M.Inst.C.E., P.A.S.I., and Thomas Sibthorp, P.A.S.I. The external vertical sliding hatch to the coal store covers the larder ventilator when open, so that no coal-dust enters the larder when the store is being filled.

An axonometric and details appear overleaf

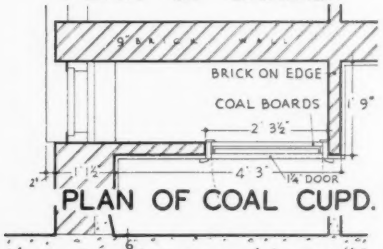
WORKING DETAILS : 496

LARDER AND COAL CUPBOARD • COMMODORE COURT, POPLAR • POPLAR BOROUGH COUNCIL

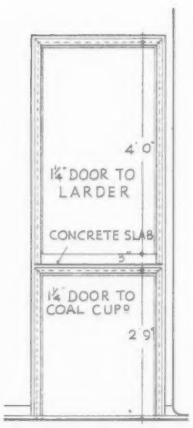
COMBINED LARDER & COAL CUPBOARD



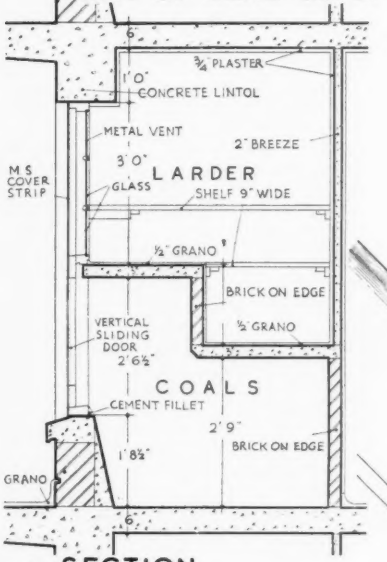
PLAN OF LARDER



PLAN OF COAL CUPD.



ELEVATION OF DOORS

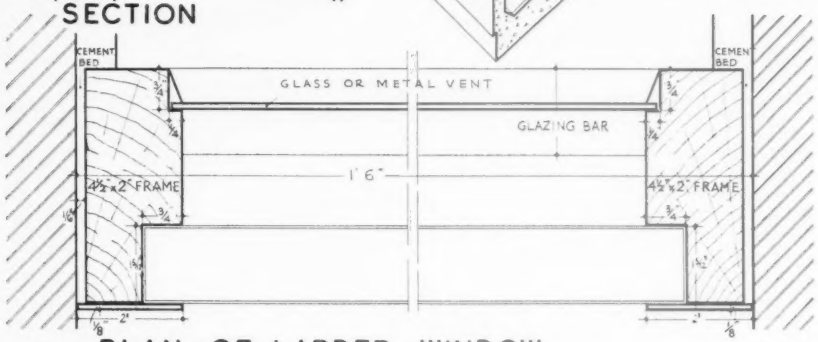


SECTION

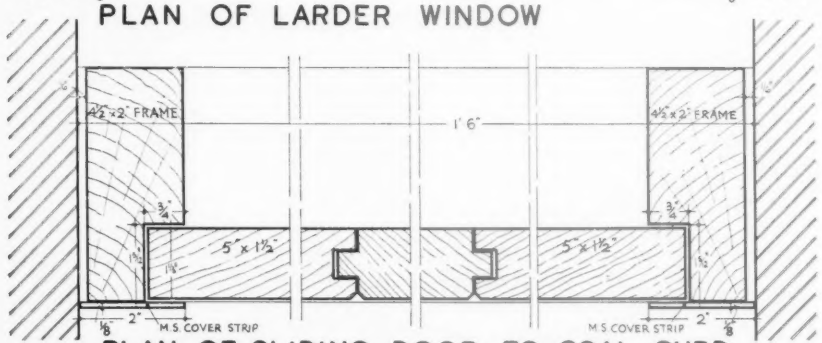
AXONOMETRIC

SCALE FOR DETAILS

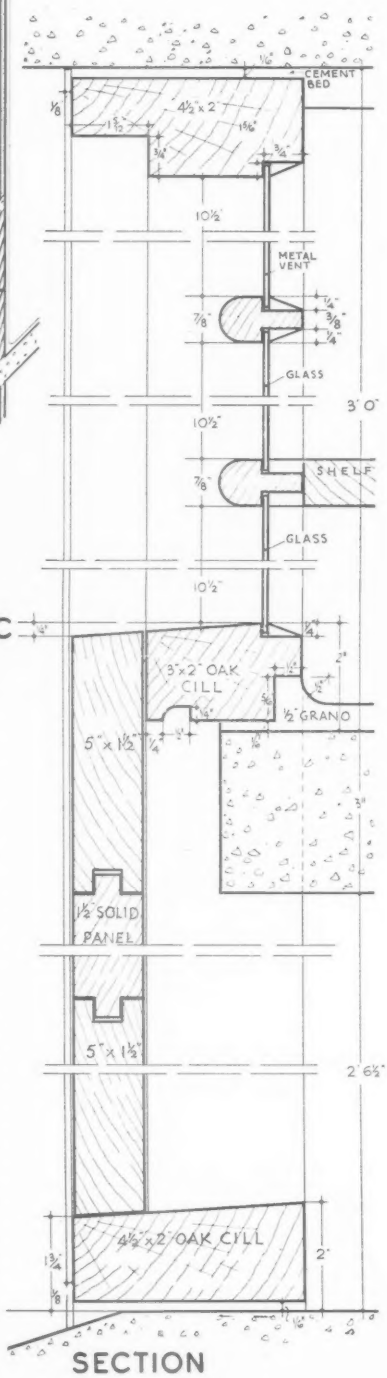
SCALE FOR GENERAL PLANS AND AXONOMETRIC



PLAN OF LARDER WINDOW



PLAN OF SLIDING DOOR TO COAL CUPD.



SECTION

WORKING DETAILS: 497

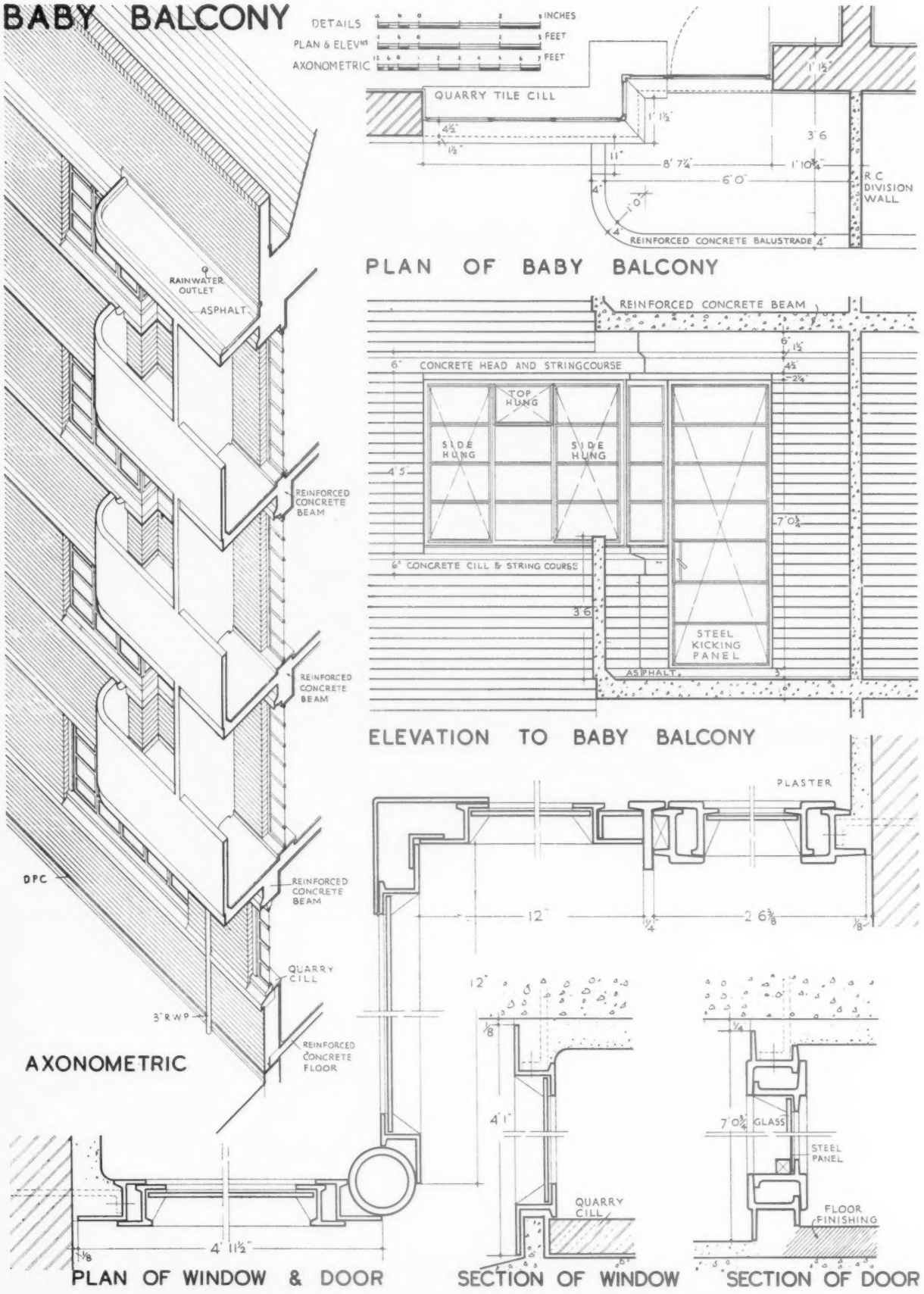
BABIES' BALCONIES • COMMODORE COURT, POPLAR • POPLAR BOROUGH COUNCIL

The photograph shows the reinforced concrete babies' balconies at the Commodore Court Housing Scheme of the Poplar Borough Council designed by Rees J. Williams, A.M.Inst.C.E., P.A.S.I., and Thomas Sibthorp, P.A.S.I. Details of the setting-out and construction appear overleaf.

WORKING DETAILS : 498

BABIES' BALCONIES • COMMODORE COURT, POPLAR • POPLAR BOROUGH COUNCIL

BABY BALCONY



BRADFORD CO-OPERATIVE STORE

DESIGNED BY W. A. JOHNSON
(Chief Architect, Co-operative Wholesale Society, Manchester).
J. W. CROPPER, ASSISTANT

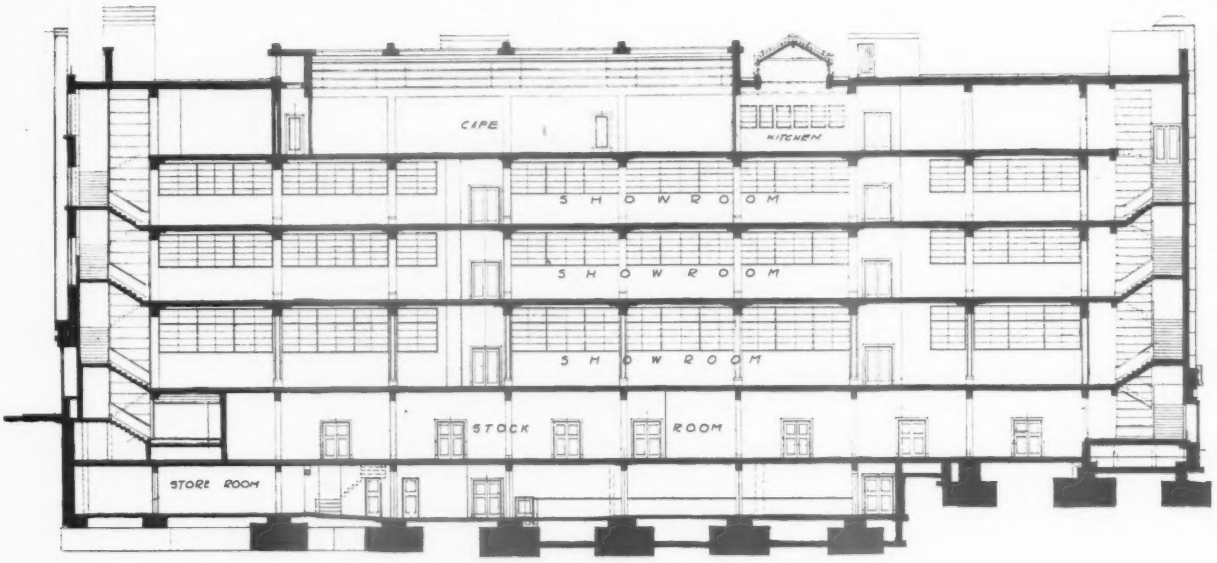
GENERAL PROBLEM—*Shopping premises on the open-store principle; incorporating a large restaurant on the top floor, and rooms for private receptions.*

SITE—*An island, bounded by Sunbridge Road and Southgate on the north. The site is on steeply sloping ground in the shopping centre of the city, the contours being such that on the rear, south, elevation it has been possible to provide natural light and ventilation to sub-basement and basement. The erection of the building affected the rights of light and air of existing properties in the rear. Settlement was reached by payment of compensation.*

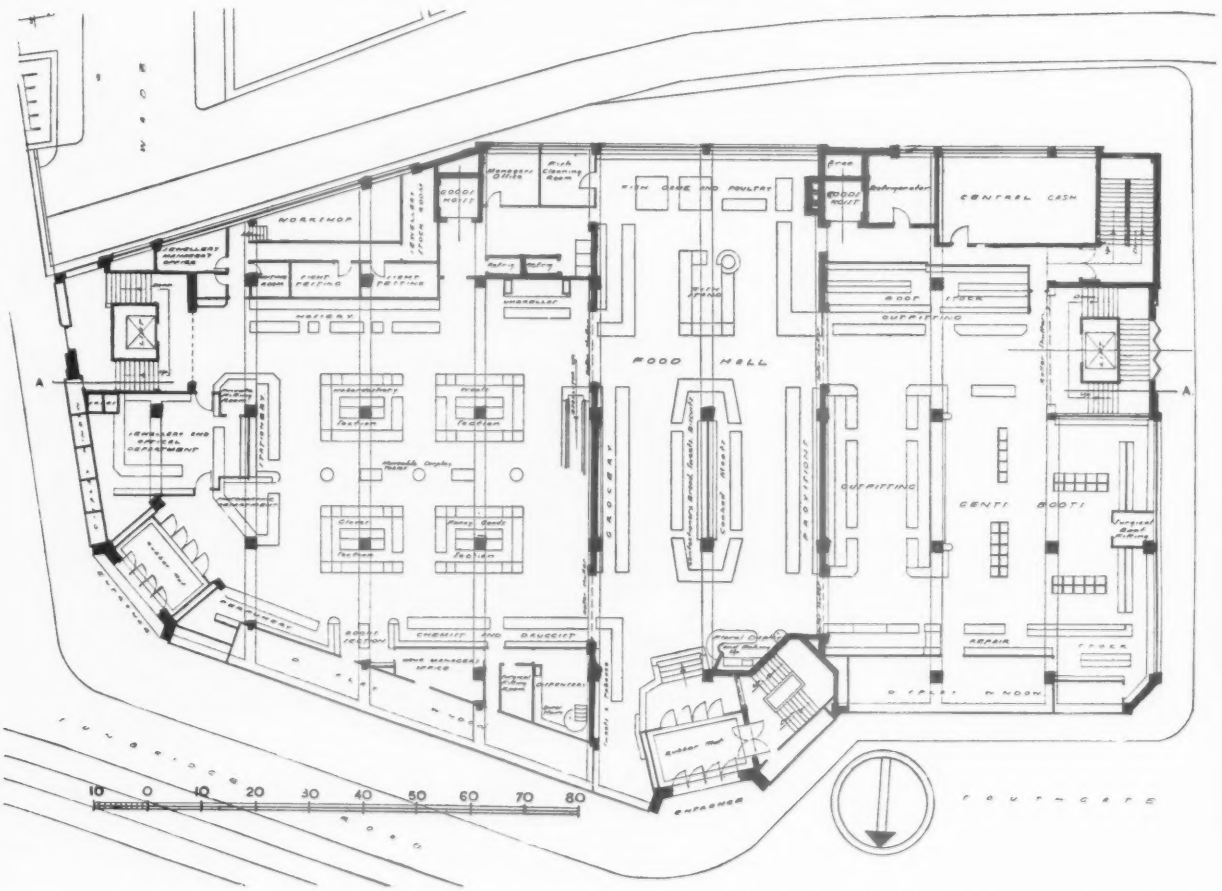
CONSTRUCTION—*Steel frame, with concrete-cased stanchions and girders. All walls are 14 ins. thick, and are of brick with York stone facings. Roofs are reinforced concrete, screeded and finished with ¾-in. asphalte. Between the screeding and concrete flat is placed 2 ins. of pumice concrete as insulation. Internal walls and partitions are brick. The whole of the floors throughout are concrete, finished with 1-in. screeding, with rubber-faced tiling to all showroom floors.*

The photograph shows the principal front to Sunbridge Road.

BRADFORD CO-OPERATIVE STORE:



GROUND FLOOR PLAN AND SECTION A-A



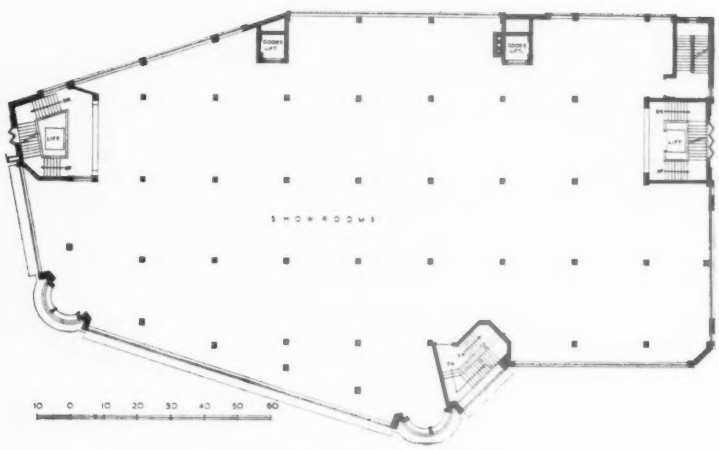
PLAN—*It was attempted to provide spacious, convenient and up-to-date shopping premises with the maximum of natural light and ventilation and with easy access and circulation between all departments. Large entrances are placed at points on the three main frontages, with staircases and passenger lifts giving access to the several floors. Loading docks are placed in a central position at the rear of the premises. Advantage has been taken of the contours to place the loading docks at sub-basement level, and to give direct access to the stock rooms and the packing and despatch departments.*

From the side of the loading docks, goods lifts are carried up to each floor and serve all departments.

BY W. A. JOHNSON; J. W. CROPPER, ASSISTANT

A detail of the Southgate elevation.

BRADFORD CO-OPERATIVE STORE:



PLAN OF SHOWROOM SPACE ON UPPER FLOORS

INTERNAL FINISHES—*The ceilings are finished with fibrous plaster slabs, with the walls plastered and the ceilings and walls finished ivory white. Pilasters and columns are cased and finished in walnut veneer. The whole of the shop fittings are in walnut and bronze.*

Staircase steps and landings are in York stone and dados of faience. Lift enclosures are wood framed and glazed with obscured glass.

The photograph shows the shoe department of the store.

BY W. A. JOHNSON; J. W. CROPPER, ASSISTANT

SERVICES—*Heating is by panel system; ventilation to basement and food hall by mechanical means; and natural ventilation to all other floors is by steel casement windows. A central vacuum cleaning plant and an internal telephone system are installed.*

The building is protected from fire by a sprinkler installation supplemented by a fire hydrant service. A pneumatic tube cash carrier system serves all floors and departments and is connected to a central cash office. All pipes and pipe runs are concealed in the ceilings and columns, access being obtained by removable sections.

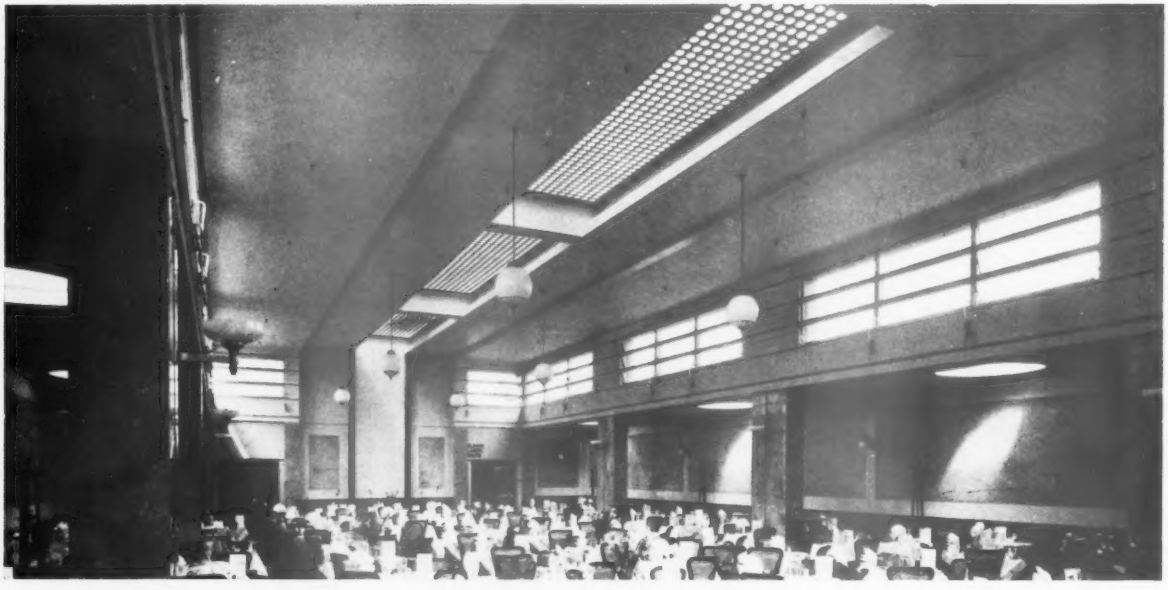
The heating and ventilating plants are installed below the loading docks in a central position on the site.

COST—*The cost of the building, fittings, shop fronts and equipment is in the neighbourhood of £140,000, exclusive of land.*

For list of general and sub-contractors see page 434.

Above is a detail of one of the staircases showing the continuous steel mullions to the staircase windows and, on the right, the glazed casing to the lifts. The treads are York stone and the dados faience. On the left is the café on the first floor, showing the recess in the continuous bay window on the main front.

BRADFORD CO-OPERATIVE STORE

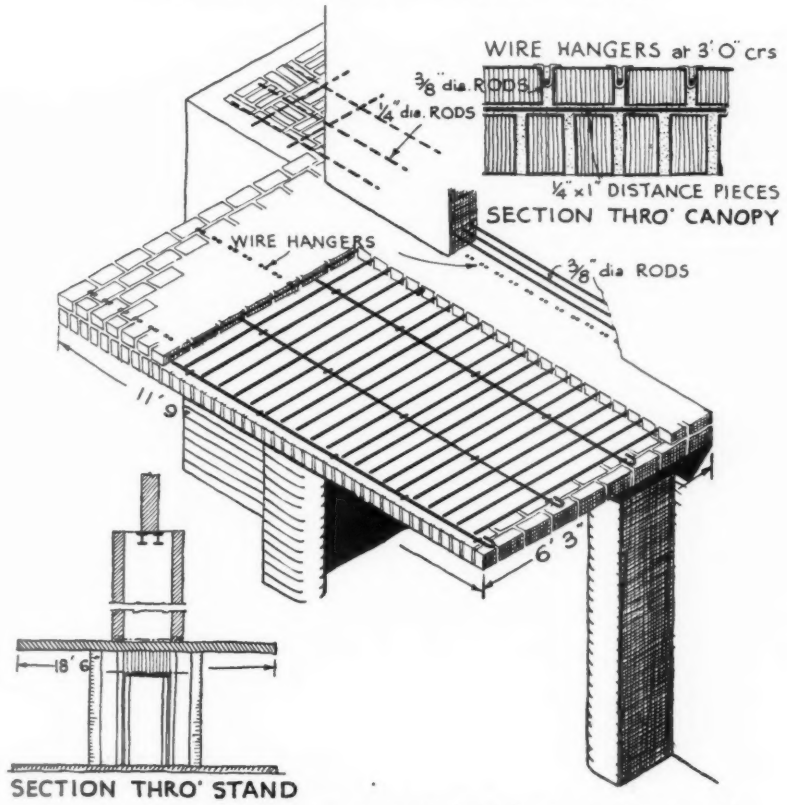


BY W. A. JOHNSON.

J. W. CROPPER.

ASSISTANT

Above is a general view of the clerestory and ceiling lighting in the restaurant.
The two photographs on the left show a new development in the equipment of food departments in stores. The upper photograph is of one of the display cases, which is double-glazed and equipped as a refrigerator with cooling coils. The lower photograph shows one of the batteries of coils in the basement immediately below the showcase floor.



A hood in reinforced brickwork on the London Brick Company's Stand (173 J).

EXHIBITION VISIT

A Survey of the More Noteworthy Exhibits

Since there are nearly 400 different firms or associations exhibiting at Olympia it is obvious that no report can possibly attempt to describe them all. Inevitably, therefore, some of the old-established firms whose names are common currency for the materials they make have been omitted, and preference has been given to firms which are showing new devices and materials which have only come into the market during the two years which have elapsed since the last Exhibition.

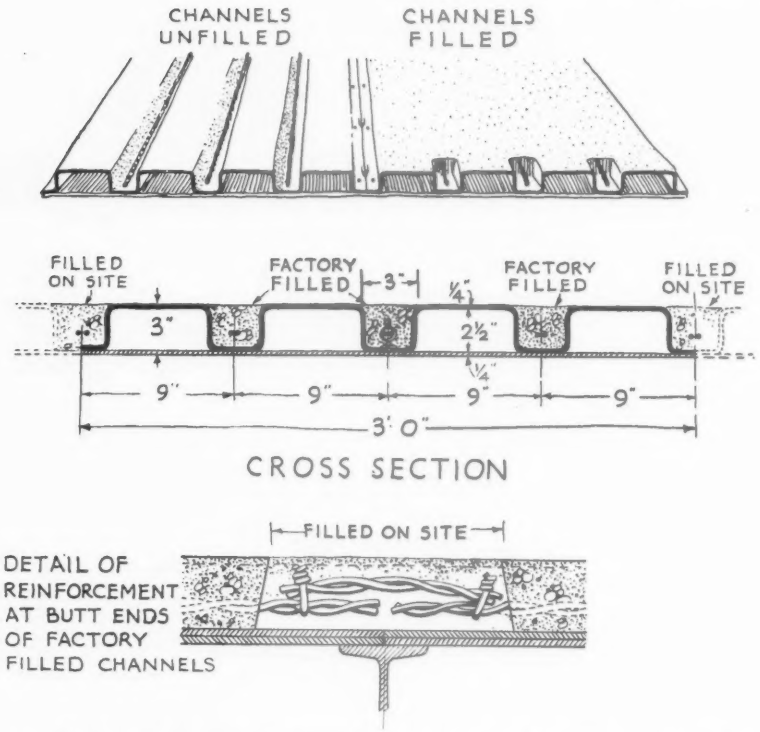
THE first thing that a visitor notices is that Olympia is trying to brighten itself up, for the depressing Addison Road entrance has grown a series of outbuildings in Mr. Emberton's most cheerful manner. The extensions themselves, by the way, are in reinforced concrete, which has been given a most attractive rendering with quite a definite sparkle in it, the product of a firm, called Modern Surfaces, Ltd.

Inside the Exhibition things seem to be very much as before—the number of architect-designed stands seems to be about the same, and a coherent plan is still lacking. One encouraging fact is, however, to be noticed : several of the larger electrical firms like the G.E.C., Belling, Berry's and Jacksons have grouped themselves together in the annexe, a move presumably inspired by the Electrical Development Association, who also have an adjoining information bureau. Moreover, these firms have a pleasingly uniform stand design which is obviously helping them to sell their goods instead of wasting money on useless attempts to outdo the next man. Now that one industry has had the courage to set an example, is it too much to expect uniformity among the other trades?

And now there crops up another question which is often debated after other exhibitions, notably the Motor Show. There the ignorance of salesmen is proverbial, but at the Building Exhibition the staffs of the exhibitors generally know something about what they are trying to sell. This year, however, there are a distressing number of salesmen who have either "only been with the firm a fortnight" or "only came on the stand yesterday;" another excuse is that "Mr. —— who knows all about that isn't here at the moment." Manufacturers must realize that the Building Exhibition is for technical people who are liable to ask technical questions, and that ignorance among salesmen is liable to give an impression of general lassitude which may be difficult to remove. This criticism does not apply to the various stands indulging in collective publicity, like the clay, lead and concrete groups, or to the better known manufacturers, but several of the newer firms and one or two of the older-established ones adopt a distant "take it or leave it—look if you really *want* to" attitude that can only be discouraging even to the best intentioned inquirer.

None the less, the exhibits are more important than the exhibitors.

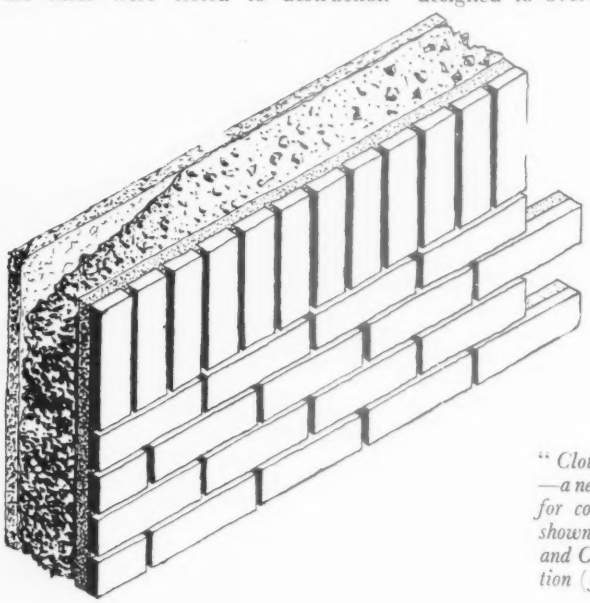
New possibilities in brick construction are illustrated by the cantilevered slabs on the London Brick Company's stand (173 J) (see sketch above). The bottom of these slabs, which project over six feet



A roof decking in asbestos cement with Isteg twisted rod reinforcement. This roof is supplied and fixed for a cost of 9s. a square yard. The Universal Asbestos Manufacturing Co., Ltd. (304 T).

from their supporting walls, is a course of bricks on edge; in the joint above these, cross-reinforcement is laid while the main tensile reinforcement is in the joints of the top course, which is of bricks laid flat. Shear is apparently safely resisted by the adhesion between the bricks and the mortar. No special bricks are used. While we understand that the stresses have been fully calculated, it would be interesting if the slabs were tested to destruction before the stand is demolished. Possibly a batch of surplus salesmen of the type already referred to could be used as a test load. There are enough of them (not on the London Brick stand) to break any slab.

The Marston Valley Brick Co. (Stand 7 B) also have two novelties—a new "Webcel" brick which gives a 20 per cent. saving in weight, and a new type of brick, for use in cavity walls and designed to overcome the old trouble of mortar droppings bridging the cavity. This is fully explained in the sketch on page 428.



"Clothed Concrete"—a new type of facing for concrete buildings shown by the Cement and Concrete Association (53 Gal.).

Of topical interest, especially to architects whose clients are asking awkward questions as to the safety of existing or proposed buildings against air attack, is a booklet issued by the Cement and Concrete Association (53 Gal.) called Air-Raid Protection. This gives a useful summary of information already published on the Continent, where this subject is treated much more seriously than it has hitherto been in this country.

On this stand also is an example of "clothed concrete" construction, a somewhat unhappy title for a facing treatment of reinforced concrete buildings. Whether one is attracted or repelled by any material which enables a reinforced concrete building to look "just like a brick building," the method is well worth studying because it does provide a surface, containing many joints, which should enable the inevitable shrinkage and other movement of the concrete behind it to be taken up without showing unsightly cracks.

The principal idea of the scheme, which is patented by Harold G. Dyke, is to abolish external shuttering of the normal type and use instead precast panels of facing material. These panels, which are approximately 3 ft. 6 ins. long by 3 ft. high, are made in the following way: thin bricks of coloured cement construction, having the appearance of normal facing bricks, are laid face down in very accurate moulds, separated by pieces of rubber tube of normal brick joint width. An inch of strong, fine concrete is then run over the whole mould and fills the joints down to the rubber tubes. In this concrete wire mesh reinforcement and projecting loops are placed, and when this concrete has set the units are ready for erection. Projecting "bricks" are left at ends to "bond" into the adjoining units. No external shuttering is used, but the units are fixed from a special form of rising scaffold, which is operated from the inside of the wall, and which retains the blocks in their correct position and gives them lateral support while the concrete for the wall behind is being poured. An internal shutter is used to which cork slabs are lightly tacked, and a 4- or 5-in. concrete wall is cast between the cork and the facing units.

When the units are lifted from the moulds the rubber tube spacers are pulled out, leaving about one-third of the depth of the "brick" joints unfilled. These joints are pointed up in the ordinary way after erection.

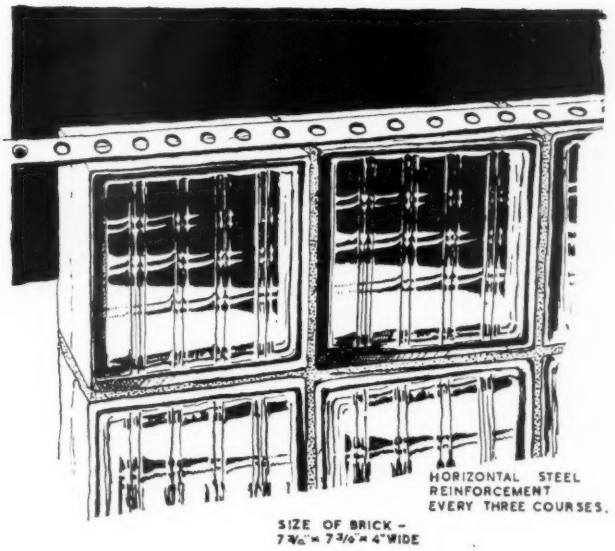
The system has been used on Apsley

House in London, a block of 71 flats, and is embodied in Mr. G. Grey Wornum's scheme which has recently won the Birmingham Corporation's Competition for working-class flats.

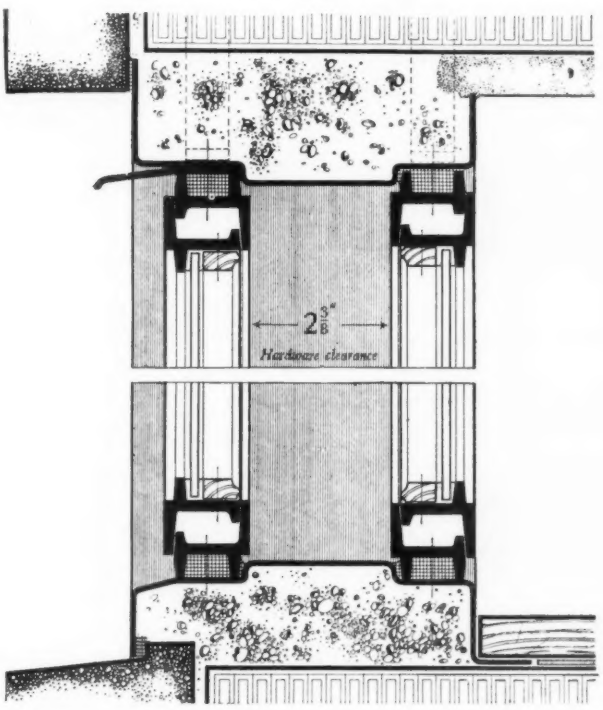
Concrete technique has improved considerably in the last few years, and one of the most striking advances is in the use of vibration as an aid to placing the comparatively dry and heavily reinforced concrete which engineers and architects now require for high strength and good appearance. For precast products the practice is by no means new, but it is only very recently that machines have been developed for the exacting conditions of use on an ordinary job. Concrete Vibration, Ltd. (68 Gal.) show a range of these machines suitable for slabs, roads, walls, beams or columns. They are either pneumatically or electrically operated. The former require a compressed air supply at about 60 lb. per sq. in. For the electric machines a robust transformer with tappings for various A.C. supply voltages from 110 to 230 volts is supplied, into which a number of vibrators taking current at the low, and therefore completely safe, pressure of 37 volts can be plugged. Stout leads to the machines are supplied to stand the unfair treatment which any temporary wiring gets on all construction jobs.

Both pneumatic and electric vibrators are arranged to give over 5,000 shocks a minute to the concrete. Below this rate apparently the advantages of vibration are not much more than that of extremely good hand tamping. Above this rate, for reasons which are not yet clearly understood, the properties of the plastic concrete change considerably for the better and enable, for example, shuttering for precast products to be struck almost immediately after casting. Messrs. Concrete Vibration have anticipated the question which every engineer raises as to the harmful effect on partly set concrete of vibration in its immediate vicinity, by carrying out strength tests on successive lifts of a concrete wall. Uniformly high strengths were attained on cubes cut from various heights of the wall, in spite of the fact that each lower 3-ft. lift wall was subject to vibration from the next lift above only three hours after it had been placed. A special U-clamp with a patent coupling is used for attaching the vibrators rigidly to the shuttering.

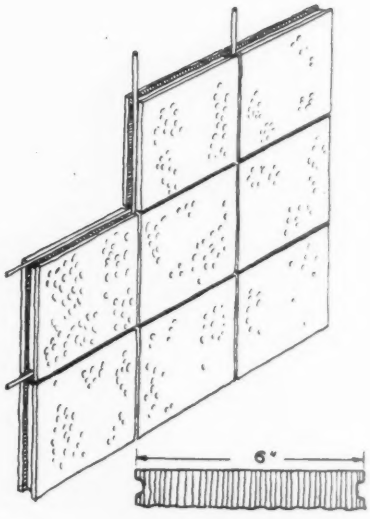
Isteg Steel Products, Ltd. (54 Gal.) are able this year to show photographs of an increasing number of jobs on which their reinforcing steel has been used. This reinforcement consists of two bars of ordinary mild steel twisted together into a helix of predetermined pitch while the ends are kept a consistent distance apart. The stretching, caused by the twisting, besides testing the bars, raises the yield point and authorities are now allowing such reinforcement to be stressed to 27,000 lb. per sq. in. This is 50 per cent. higher than the allowable stress on reinforcement of ordinary mild steel and Isteg, in spite of its greater price, should therefore be well worth considering for any job with large quantities of tensile reinforcement. Increased difficulties of

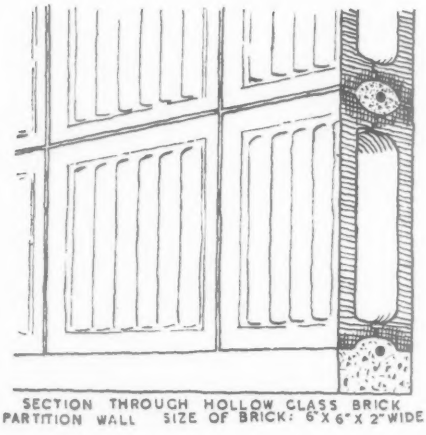


The glass wall shown by Lenscrete, Ltd. (193 K) and Pilkington Bros. (307 T). Semi-vacuum units are used, sealed at high temperatures, and the joints are reinforced horizontally every three or five courses as necessary.

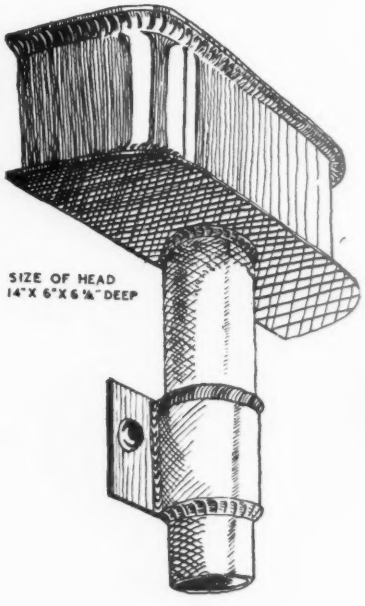


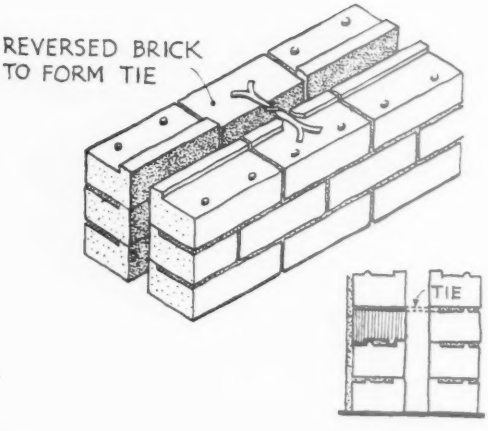
A new type of double window evolved by Henry Hope & Sons, Ltd., for hotel use or on other sites where external noise is excessive. (178 J)





Above, two types of glass partition wall shown by J. A. King & Co. (137 G) : left, a rainwater head built up of plain milled lead sheet shown by the Lead Industries Development Council (83 Gal.).





Above, a new type of cellular brick shown by the Marston Valley Brick Co. (7 B), and left, another type designed to prevent mortar-droppings in cavity walls.

bending and fixing have been urged against it on account of the shape of the bars, but a demonstration on a bending machine on the stand showed that these difficulties are largely imaginary. To assist benders, Messrs. Isteg suggest using a special ferrule on the bending machine, with a spiral groove, into which the helex of the bar fits.

Messrs. Twisteel Reinforcement, Ltd. (82 E) also supply steel reinforcement with the yield point raised so that a higher working stress than for ordinary mild steel is possible. In this case, single bars are twisted. In addition to its use as beam reinforcement this material is woven into square mesh fabric for road work, and an ingenious arrangement of spacers enables this to be made up into double layer reinforcement for various thicknesses of road slabs. Various special sheets for trimming manhole openings, etc., are stocked. The sheets are delivered cut to length and flat for simple handling. The square twisted wires have a natural lock and are only fixed by spot welding the crossings at the edges.

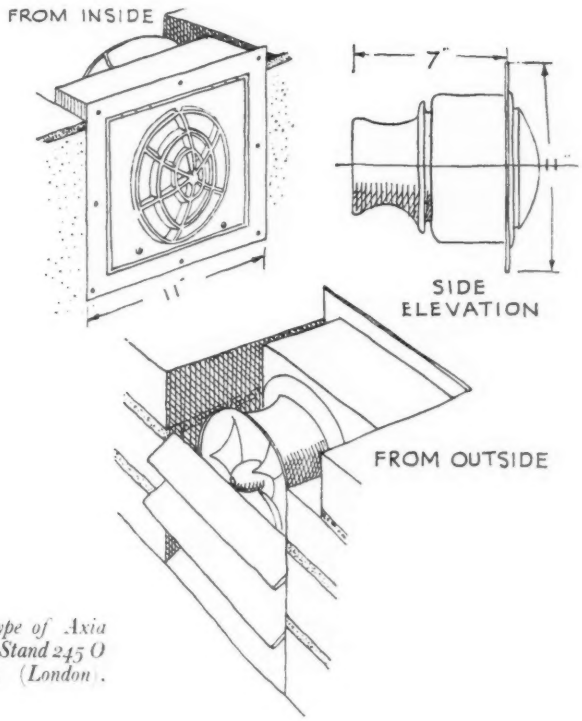
The Universal Asbestos Mfg. Co., Ltd., show a new type of flat asbestos roof consisting of ribs of reinforced concrete formed in troughs of asbestos sheeting (see sketch, page 426). The slabs, which are normally 8 ft. long by 3 ft. wide by 3 ins. deep, are sent out with all but the side troughs and a small length at the ends of the middle troughs already filled with concrete. On the site reinforcing rods are laid, in as long lengths as possible, in the side troughs and short connecting pieces of rods are attached to the projecting rods in the centre troughs, and the remainder of the ribs are filled with concrete. The completed weight of the units is only 14 lbs. per sq. ft. and tests show that on a span of 6 ft. loads of over 400 lb. per sq. ft. were carried without failure.

Glass and concrete construction is becoming increasingly popular. Where any form of double glazed construction is attempted, however, trouble will be experienced with condensation unless the cavity is perfectly dry before it is sealed, especially where the construction forms part of an external face. Messrs. J. A. King & Co., Ltd. (137 G), are showing a form of double glazed construction for roof work in which (see sketch, page 428) the condensation bother is avoided by not fixing the inner lens until the remainder of the construction has dried out.

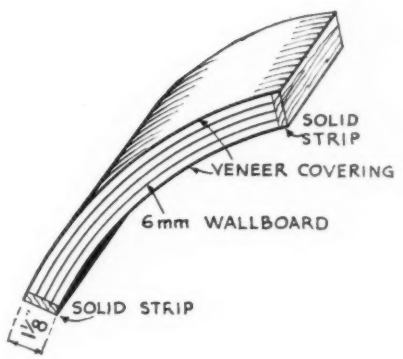
Lenscrete (193 K) and Pilkingtons (307 T) are also showing the "glass wall" which has been so earnestly publicized by the daily press. In this form of construction hermetically sealed semi-vacuum glass bricks are used (see sketch on page 427) and the degree of heat insulation is claimed to be the same as a 9-inch brick wall. This method of construction has been developed in America by the Owens-Illinois Glass Company, who are producing about half-a-million bricks a month. The price is about 12s. 6d. a square foot, supplied and fixed.

It is definitely "Flush Door Year" in the wood section, for without a flush door a wood exhibit would appear to be incomplete. Sometimes construction is featured, sometimes variety in veneers, sometimes both. In a multitude of counsellors there should be wisdom, and certainly the architect is offered many forms of construction from which to choose. These range from the cheap lightly-framed doors for the speculative builder, and which the makers themselves will readily admit (thereby becoming accessories before the fact) to be by no means warp-proof, to many varieties of really substantial framed and solid doors. Messrs. F. Hills and Sons, Ltd. (276 Q), have sections cut from their "Aristocrat" doors lying immersed in boiling water on the stand to show no damage to the construction therefrom. Eleven veneers of wood are fused together with Bakelite bonding glue under high pressure.

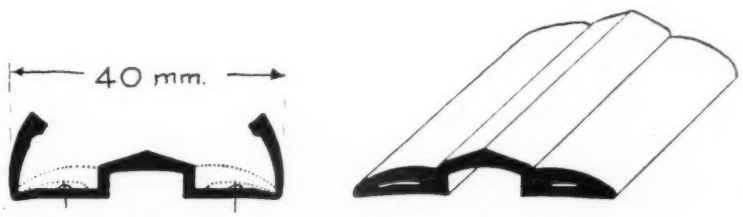
Cross-lattice or "egg-box" framing is a popular method of construction where lightness prohibits the use of more solid forms. Occasionally this or similar constructions are ventilated, slots being cut in the lattice and vent-holes in the top and bottom of the doors to allow the free passage of air, which, by keeping the inside at the same temperature as the outside, should prevent distortion. Constructionally this may be sound, but is it a very happy idea, sanitarily speaking? Apart from appearance, flush doors were introduced to the house (*via* hospitals) to do away with the dust traps formed round the panels. To remove these dust-traps, but to make the whole inside of

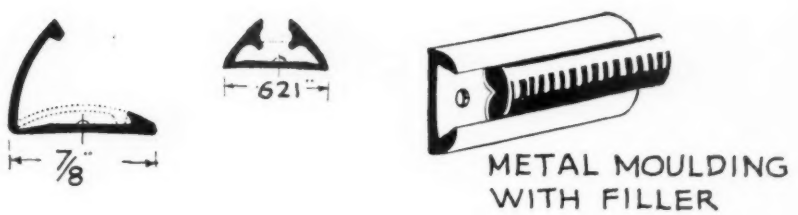


A built-in type of Axia fan shown on Stand 245 O by Utilities (London), Ltd.



Right, a built-up curved wallboard unit shown by Edward Lloyd Wallboards, Ltd. (108 F): below, invisibly fixed mouldings by Metal Mouldings, Ltd. (77 Gal.).





A rubber-silenced bucket shown on the Rubber Growers' Association Stand (169 J). Handle, base and lid are all rubber covered at points where noise is likely to occur.

the door one large uncleanable receptacle—not only for dust—does not seem to be a big improvement.

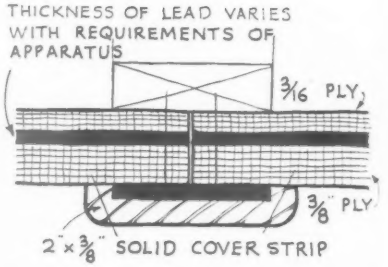
The joint between the plywood facing and the solid edge is a point stressed by several firms. Amongst these are Messrs. Shapland and Petter, Ltd. (109 F) who are showing three different methods of finishing, the two better having the joint cut on the splay, thereby tending to hold the plywood additionally securely in place.

Messrs. R. G. C. Panels, Ltd. (50 D) have produced two sound-resisting doors. The three sections of the inner core are separated from one another by a thin layer of sound-resisting material. On the second door there is an additional layer of this material between the core and the plywood facings, making four layers in all.

Veneers and facings are legion. There would seem to be no limit to the fancy woods which have appeared in the last few years. One could gaze everlastingly at the grains and textures and shades that have made their bow—or one might think one could. But there are now so many woods that as a result one learns (oh, horror) that "Australian walnut is going out of fashion." If a wood be good to look upon it must continue to be so, one supposes, with or without fashion's permission.

Not content with discovering themselves to the public, woods are now rediscovering themselves under different names. The Canadian Government Exhibit (171 J) is showing some panelling in Silky Wood, which is Birch with a different name. On the same stand this versatile wood is masquerading again, this time as Maple. A portion of the floor has been laid in Maple next to a portion in Birch. The two are practically indistinguishable and the Birch, which is nearly as hard as the Maple, has the advantage of being cheaper. Another feature of this exhibit is a bay panelled out in knotty Pine. Over here knots are things to be avoided; over there, not. They are accepted and treated as pattern, as may be seen from time to time in American films, and as may be seen in this particular panelling here.

Influence of the colonial log-cabin is evident in the Red Cedar log-siding which Messrs. Gabriel Wade and English are showing as an alternative to weatherboarding for timber buildings. The log-sidings are formed from 9 in. by 2 in. timbers and are tongued and grooved.



Lead-filled plywood for the insulation of X-ray rooms. Venesta, Ltd. (136 G).

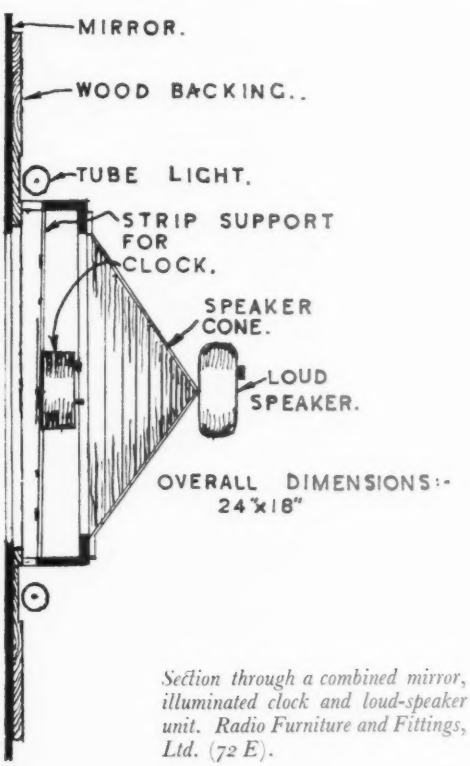
Messrs. Venesta (136 G) show a new use for plywood in the panelling of hospital X-ray rooms with plywood centrally lined with sheet lead, together with lead-lined cover fillets (see sketch above).

On the plywood exhibitors' stands one is shown all kinds of wood veneers. Metal facings one also knows, but where are the Plastic veneers?

A tongued and grooved flooring block cross-grooved on the underside for ventilation is being shown by Messrs. Jos. F. Ebner, Ltd. (49 Gal.) in their "Eclipse" Ventiloc. The tongueing and grooving are near the base of the block, thus giving a much greater wearing depth than is usually found on either tongued and grooved or dowelled blocks.

Messrs. Lloyd Wallboards (108 F), in addition to the panel of Hardboard carved in relief by C. W. Glover, are featuring four thicknesses of curved hardboard glued together to form one rigid curved panel, while the Tentest Fibre Board Co., Ltd. (152 H) have introduced a "T" shaped metal cover strip to support their Tentest sheets when used as a lining to steel frame buildings. The strip needs no bolting to the permanent structure. It is "T" shaped with double thickness metal in the tail, and with the edges of the top of the "T" cupped to prevent damage in handling is designed to fit purlins at 4 ft. centres. The inverted "T" is laid across the purlins from ridge to eaves, the Tentest sheets being laid with their edges butting the tail of the "T." The roofing or outer casing is laid over the Tentest and holes pierced through the Tentest to take the holding bolts of the roofing or casing which are fixed in the usual manner.

The advantage of Ensoflex, the flexible wallboard which Messrs. Wood Products, Ltd. (164 J) are showing, is that it can be obtained in sizes



Section through a combined mirror, illuminated clock and loud-speaker unit. Radio Furniture and Fittings, Ltd. (72 E).

as large as 10 ft. by 75 ft. This means that almost any size wall to a room may be covered in one piece without a join.

Although furniture does not have a large place in the exhibition, there are yet one or two exhibits of note. The Rowley Gallery (Gal. 32) are showing a 16 ft. by 12 ft. one-room flat where as much space as possible has been saved. A dining-room table and seats in oak fold away into a wall-fitting which also acts as sideboard. A sofa-bed and disappearing dressing-table, and a wall bureau and fireplace all occupy the minimum amount of room. This exhibit also includes some hand-woven fabrics, as does the suggested scheme for an office shown by Messrs. Fredk. Tibbenham (87 E). Here the walls are panelled in cherry mahogany.

Messrs. Radio Furniture and Fittings, Ltd. (72 E) are demonstrating radio diffusion for blocks of flats, a simple wall plate with two dial-knobs corresponding to an electric light switch-plate being the only control in each flat. This firm is also showing several methods of concealing or building in the loud-speaker, and for houses with individual sets, amongst suggestions is a built-in set with mirror, illuminated clock and loud-speaker (see sketch on page 430).

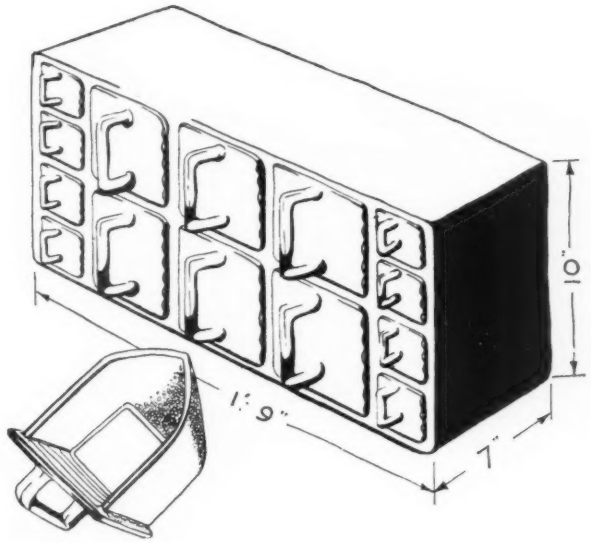
Aluminium primers for wood which combine priming and knotting are being shown by Messrs. Turner and Sons (236 N) and The Turnbridge Manufacturing Co. (Gal. 51), while Messrs. Nobel Chemical Finishes (176 J) are demonstrating a new alkali-resisting primer (8638 KZ) for application to fresh lime plaster, cement, and any mixtures containing cement.

Messrs. Cellon (84 E) are making a feature of fast Monastral blues and greens. Monastral fast blue is absolutely fast to acids, alkalis and lime, and withstands temperatures up to 390° F. (C. 200°). This Monastral blue, incidentally, was chosen for the Architectural Press stand.

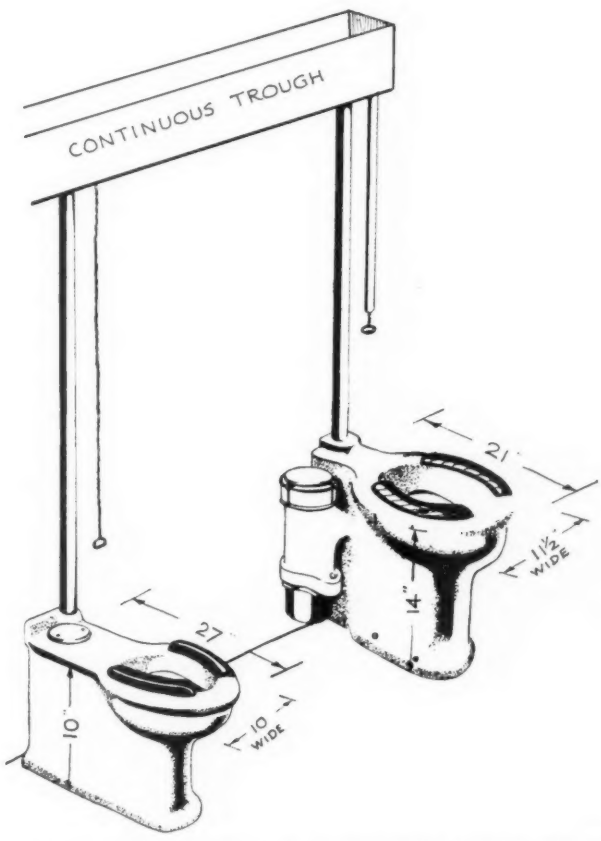
In the cooking and heating section there is a new stove by Smith and Wellstood (224 M) called the B. J. Esse (see sketch on page 432). The exterior has been designed by Betty Joel, and the result is a welcome change from the usual fruit and flowers generally to be found on slow combustion stoves. Various coloured finishes are available and prices vary from £11 to £15.

From heating to cooling. Here there is a new built-in type of Axia fan shown on Stand 245 O by Utilities (London), Ltd. : the same firm is also showing air conditioning units and a heating unit in which the warm air is directed sideways by fans instead of upwards by simple convection. A new refrigerator is also on the market : the Express (311 T). A particularly interesting fitting is the built-in 5 cu. ft. model with a 5 cu. ft. storage space above it, the complete unit selling at £30 retail. The rest of the range is remarkably low-priced, and the finish seems good and durable.

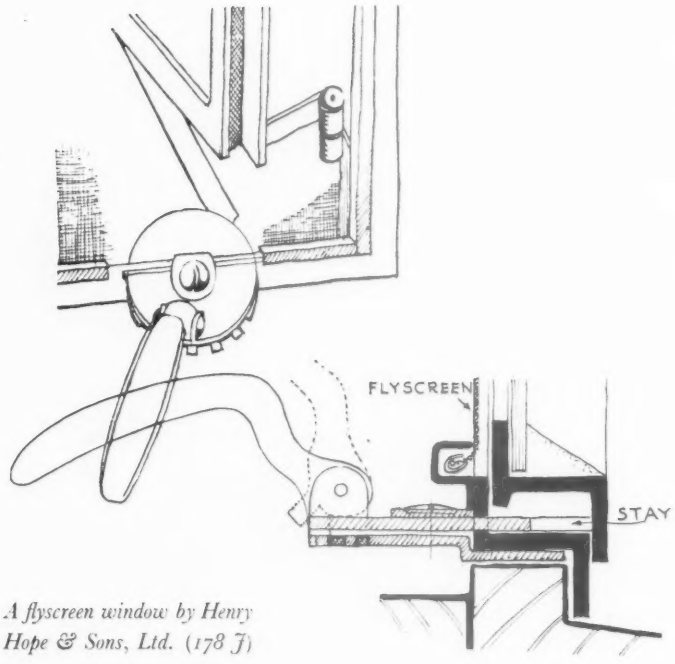
Invisibly fixed metal mouldings are shown by Metal Mouldings, Ltd., the sketch on page 429 showing how this is arranged. The moulding is pinned or screwed down, and the two wings are then closed down with a special tool.



Kitchen store cabinet with glass containers ; Kandya, Ltd. (315 V).



A range of miniature w.c.'s for nursery schools shown by John Knowles & Co. (124 G).



A flyscreen window by Henry Hope & Sons, Ltd. (178 J)

EXHIBITION NOTES

Adamsez, Ltd. (190 K) are showing sanitary fireclay goods, including a continuous flushing trough (Epic), W.C. pans, basins, etc., for schools, public and municipal works, etc.; also drainage purification plants for country houses.

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Brockhouse Heater Co., Ltd. (221 M) have a display of coke fires with gas igniting burners adaptable for existing grates; the C.C. two-in-one fire combining a gas fire for occasional use and a gas-ignited coke fire and a C.C. boiler unit designed for use with coke fires. Thermidair central heating units, comprising unit heaters, air batteries and convectors with or without cabinets, are also shown for steam, hot water, and electricity. For installation in houses, flats, schools, cinemas, hotels, etc.

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The Clay Products stand (83 A Gal.) takes the form of an information bureau where visitors can obtain information about the best type of work in brick and burnt clay tiles. There are many photographs showing good examples of various types of brick building and roof construction carried out in clay tiles, and a staff is in attendance to answer inquiries and deal with technical queries.

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Downham & Co. (238 N) are showing a comprehensive range of bathroom and sanitary furnishings and fittings for all types of use from housing schemes to luxury equipment. A speciality is made of colour work, furnishings being accurately matched to sample tiles and shades. "Special" furnishings, electrically illuminated fittings, cabinet-ware and all allied articles are made to architects' specifications.

•

The Geo. H. Gascoigne Co., Ltd. (76 E) are showing their patent tubular clamp, designed for use with tubular construction for scaffolding, cattle stalls and portable buildings generally.

•

Jones and Attwood, Ltd. (191 K) are showing a range of boilers for central heating and domestic hot water, and sewage disposal machines, in operation, including a small type "N" rotary sewage distributor, suitable for private houses and mansions, and a series of typical drawings of complete sewage disposal plants for private houses, etc., with photographs of large and small installations.

•

Langley London, Ltd. (113 F) are displaying various colours and types of clay roofing tiles in glazed, matt and sand-faced finishes. Small model roofs and panels have been arranged on the main stand to give some idea of the appearance of the different colours and textures on an actual roof, whilst a model of a housing estate, the houses of which are interchangeable, shows the effects which can be obtained.

•

Ronuk, Ltd. (134 G) have a stand, the oak woodwork of which has been stained with Colron wood dye and polished with Ronuk by the company's own Polishing Contract Department. The full range of Colron colours is shown on a wide variety of timbers.

•

Sharp Bros. and Knight, Ltd. (280 R) have a full range of joinery exhibited on this stand, the outstanding features being a flight of stairs in a Japanese oak, and an office constructed with a circular bay window, combined door frames with oak and Columbian pine panelling to the interior. A special display is made of Enjo SBK doors, which are made from kiln-dried red deal and or Columbian pine. Flush doors in various finishings are also shown.

•

Stonehenge Bricks, Ltd. (194 K) are showing calcium silicate bricks which are white throughout and with exceptional light reflecting properties, low porosity and with strength considerably in excess of British Standard Specification for external walls.

•

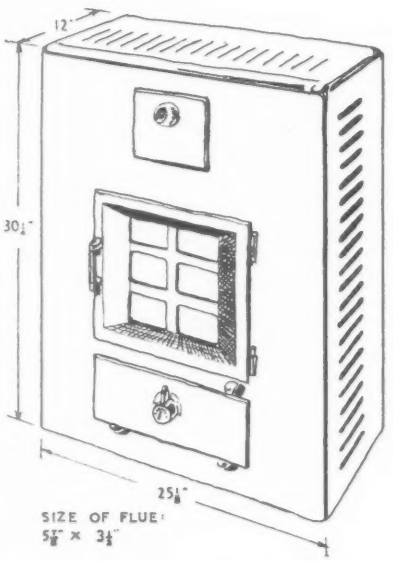
John Thompson Beacon Windows, Ltd. (156 H) have a comprehensive range of metal windows; on the ground floor are windows, doors and side lights of all types, including curved on plan corner windows which illustrate the attractive effect that this type of window gives when substituted for the usual type of square corner.

•

Wood, Russell & Co., Ltd. (243 N) are exhibiting the Sentry hot water boilers and cooking ovens to suit any size of household; these are shown in attractive grey and green mottled porcelain enamel finishes which eliminate any external cleaning. A special feature of this exhibit is the new Sentry inset hot water boiler, which can be fitted in a living-room fireplace or kitchen corner.

•

Associated Clay Industries (303 T) have a display of Stonite one-piece fireplace



A new stove, the B. J. Esse, the exterior of which has been designed by Betty Joel. Smith & Wellstood (224 M.)

surrounds, sanitary porcelain enamelled fireclay ware, sanitary earthenware, and salt glazed drain pipes.

•

Berry's Electric, Ltd. (28 C) are showing the latest types of Magicoal and Haloberry fires specially constructed for easy fitting for the modern type of house and flat, water heating apparatus, a range of new lighting fittings, and the Coldspot refrigerator under operating conditions.

•

Belling & Co., Ltd. (74 E) show a wide range of Belling electric built-in fires and fireplaces, of which there are many different designs in various finishes.

•

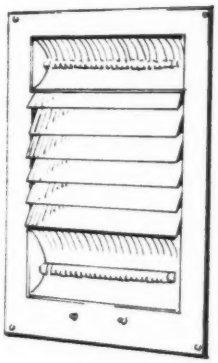
Claygate Brickfields, Ltd. (308 T) have been working for over 300 years and supplied many bricks for the construction of Hampton Court Palace. It is with bricks made in an identical manner that the Claygate old English fireplaces are built. All bricks are hand-made, from the smallest fireplace briquette to the largest building brick.

•

Crane, Ltd. (314 V) are again displaying examples of their complete range of heating and hot water supply appliances for all kinds of building, particular attention being given to radiators and boilers for private house installation.

•

Dryco-Rensec, Ltd. (232 M) are exhibiting Dricotine waterproofing polish, Anti-rust, a liquid for the cure and prevention of rust,



A built-in electric fire with heater bars top and bottom and illuminated louvres in the centre. L. G. Hawkins (9 B).

Rensec filler, waterproofed filler for making good holes and cracks in brickwork and pointing, and Rensec waterproofing liquid.

•

Greenwood and Hanson (52 D) are exhibiting the Greenwood Antivak, also the Antivak Junior bath trap, in various metals and finishes.

•

The Interoven Stove Co., Ltd. (127 G) are showing the Super Interoven convertible cooking and heating stove and the new Selfix Interoven for economical cooking and hot water supply for domestic purposes, also the Cheerio wrought steel domestic boiler with a novel sliding door, open or closed fire, fitted with shaking bottom-grate.

Kelvinator, Ltd. (261 P), have a comprehensive display, including standard domestic models, from 2 to 13 cub. ft. food storage capacity.

•

Manor Tiles, Ltd. (277 Q) are showing modern fireplaces, various sizes, composed of tiles and hand-made plastic faience; eggshell, mottle and Dutch glaze; in bright and dull finish.

•

William Oliver and Sons, Ltd. (2 A) draw visitors' attention to various timbers, including Austrian wainscot oak, teak, African mahogany, Jap figured and plain oak, and African whitewood.

•

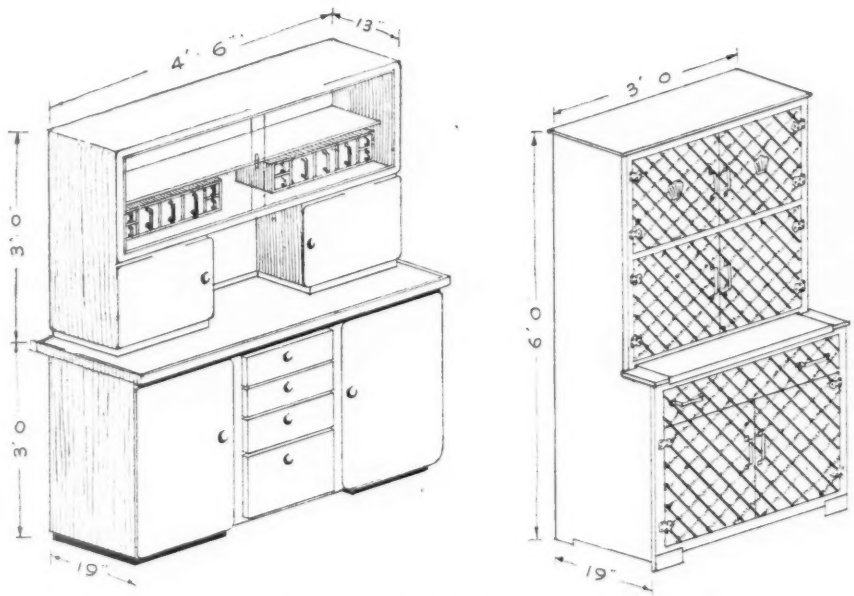
Peerless Kitchen Cabinets, Ltd. (294 S) have a comprehensive exhibit showing the more popular models of the 130 different units of built-in kitchen furniture which are manufactured by this firm. Generally speaking, the exhibits are so arranged as to convey an impression of the method in which modern kitchens are equipped.

•

Powell Duffryn Associated Companies, Ltd. (184 K) have a range of by-products manufactured by Powell Duffryn Associated Collieries, Ltd., from their South Wales coal, which are particularly applicable to the building industry.

•

Slate Slab Products, Ltd. (305 T) have a varied exhibit which includes an ultra modern shopfront constructed of Texelate, a new treatment for slate which reveals the natural beauty of the stone.



Different solutions to the same problem. Kitchen cabinets by Kandya Ltd., left, and by Lusty and Sons, right.

IN THAT CONTINGENCY

The following abstracts of inquiries represent a number of those recently submitted to the Building Research Station. The information given in the replies quoted is based on available knowledge. It has to be borne in mind that further scientific investigations may in the course of time indicate directions in which the replies might be supplemented or modified. Moreover, the replies relate to the specific subject of each inquiry, and are not necessarily suitable for general application to all similar problems. [Crown Copyright Reserved.]

Cracking of Brickwork due to Shrinkage of Masonry

¶ *A FIRM of brickmakers asked for an investigation of the cracking of some work in which their facing bricks had been used. The building was three years old, with walls 9 ins. thick, backed with common bricks. The windows had cills and lintols in local sandstone.*

Cracks had developed running from the cills and heads of the windows and in several cases extending up through the parapet. The cracks above the lintols were wider than those below the cill. An inspection of the building was made, and samples of bricks left over from the job were taken for examination.

On examination of the building no distortion of the horizontal and vertical straight lines was visible, and for this reason it is thought that, in considering possible causes of cracking, thermal expansion of the roof slab and unequal settlement of foundations can be dismissed as improbable. Attention has therefore been paid more particularly to the possibility of shrinkage or expansion of the materials comprising the wall, i.e. the bricks and mortar and the stone used in lintols, cills and parapet coping.

Experimental data are unfortunately lacking regarding the particular materials used in this case, but a superficial examination of the bricks selected from those stated to be left over from the job does not suggest that these specimens would have abnormal properties in respect of moisture movement, i.e. expansion and contraction with changes in moisture content. A rich cement mortar such as has been used in this work would certainly have a greater tendency to produce moisture movements in the brickwork as a whole than would a weaker mixture, but it is not common experience that the stresses set up in this way are alone sufficient to cause fracture of brick masonry.

Shrinkage of the stonework in cills, lintols and coping appears to offer a more likely explanation of the external cracking, since it is known that in general sandstones have a moisture movement between three and four times as great as that of clay bricks. Such shrinkage would occur during drying out, and it is significant that erection of the building took place during the winter and early spring of 1933, thus affording little opportunity for adequate drying out until after completion. It is impossible, however, to be precise regarding the behaviour of the particular stone used without a laboratory examination of a specimen, and while shrinkage of the stone seems a likely cause of cracking it must be borne in mind that this would be accompanied by a similar, though probably comparatively slight, shrinkage of the brickwork, which would also contribute towards failure.

It might be suggested that the use of a less rich and strong mortar throughout the construction of the wall would have at least reduced the severity of the cracking since in this way stresses would have been more uniformly distributed and there would be a greater tendency for failure to occur at joints rather than in the bricks themselves. A suitable mortar for work of this kind, where the load on the brickwork is not high, consists of 1 part (by volume) Portland cement : 3 parts dry hydrated lime : 10–12 parts sand.

The building has now been subjected to three exceptionally warm and dry summers, and it is improbable that further cracking will occur. If it is desired to make good the existing cracks it would probably be safe therefore to cut out and replace the cracked bricks.

Failure of Gypsum Plaster on "Cement" Rendering

¶ *A CITY surveyor asked that an examination should be made of what was described as a cement rendering and finishing coat of hard gypsum plaster. The specification called for an undercoat of washed sand and cement 3 : 1 with an addition of an integral waterproofer. The work was carried out in rather wet weather and the floating coat of calcium sulphate plaster and sand was applied while the rendering was in a very damp condition.*

Five months later it was found that the floating coat over a considerable area had lifted and the rendering behind was quite friable.

It would appear that the sample of undercoat sent for examination consisted of a lime and sand mix and was not specified. If any Portland cement had been used, the quantity was very small or the set had been completely killed. The undercoat was very friable and, therefore, quite an unsuitable backing for a strong plaster finish, affording little or no restraint to movements caused by the setting of the plaster. Lack of adhesion and failure of the finishing coat under such circumstances is almost inevitable.

It might also be noted that a permanently or intermittently damp wall, if used as a backing for the type of plaster in question, might cause delayed expansion resulting in buckling and cracking.

To ensure successful renewal of the plaster, it should be ascertained that the wall is and will remain reasonably dry. An undercoat of Portland cement and sand should then be applied, a proportion of lime being added to the mix if desirable for the sake of workability. The undercoat should be allowed to dry out thoroughly until all shrinkage movement has ceased. The plaster finish should then be applied in the ordinary way, after the suction of the undercoat has been regulated if necessary by wetting.

Decay of Reinforced Concrete Building

¶ *A FIRM of contractors asked for advice on the treatment of a reinforced concrete building erected 16 years earlier, which now showed the following defects :—*

1. The window cills at the lower edges were broken away exposing one of the reinforcing bars which was flaking with rust.

2. Parapet copings were similarly affected.

3. The vertical faces of piers and walling around dormer windows had pieces of concrete 3 ins. and 4 ins. in diameter falling away and exposing the reinforcing bars.

4. Cracks and flaking had been noticed in a beam acting as a stay to a high chimney. The reinforcing bars were not yet exposed in this position.

Where flaking had occurred, the steel reinforcement appeared never to have had more than ½ in. to ¾ in. of cover and there was no external rendering. The surface of the concrete was decaying generally, showing the rough surfaces of the large broken stone aggregate.

The decay and corrosion are considered to be due to a lack of adequate concrete covering the steel, with the likelihood also that a poor quality concrete was used. It is not possible to be quite definite without an inspection of the building in question, but comparison with similar cases of failure previously investigated affords grounds for the expression of this opinion.

With regard to remedial treatments, it is suggested that the parts affected be hacked out, and made good with new concrete. The steel need not be thoroughly cleaned though loose rust flakes should be removed. In applying the new concrete it is suggested that the suggestions put forward in Bulletin No. 9 of this Station, "Bonding New Concrete to Old," should be adopted.

It is probable that trouble will continue at other parts of the building unless it is rendered with a good mortar rendering which will afford further protection to the steel reinforcement. If such a rendering is adopted, it is considered that a Portland cement : lime : sand mortar should be used. The proportions by volume which have been found most satisfactory in work at the Building Research Station are 1 part cement, 2–3 parts dry hydrated non-hydraulic lime, 8–10 parts sand. After the cement has been added to the mixture of sand and lime, the mortar should be used within two hours. The rendering should be applied in two coats, finished with a wood float, and the undercoat should be allowed to dry thoroughly before the second coat is applied.

THE WEEK'S BUILDING NEWS

LONDON AND DISTRICT (15 Miles Radius)

BROCKLEY. *Extensions.* The managers of the R.C. Schools, Howson Road, Brockley, are to enlarge the premises for another 80 children.

HAMPTON. *Houses, etc.* Plans passed by Hampton U.D.C.: Alterations, Westminster Wine Stores, Priory Road, Messrs. Johnson-Baker & Co.; three houses, Westbank Road, Mr. W. Alexander; bungalow, Buckingham Road, Mr. F. Ralph; house, Ormond Drive, Messrs. W. Greville Collins, Ltd.; depot and shop, High Street, Messrs. T. Wall and Sons, Ltd.; seven houses, Percy Road, Mr. F. Sneller; house, Ormond Avenue, Mr. F. C. Jackson Willis.

HORNSEY. *Elementary School.* Hornsey Education Committee is to reconstruct the Highgate Elementary School at a cost of £22,270.

ISLINGTON. *Houses.* Islington B.C. has approved plans by Mr. E. C. P. Monson, Architect, for the erection of 209 dwellings on a site in Hornsey Lane and Hazellville Road, and 100 dwellings, comprising 35 three-room and 65 four-room flats, each with a scullery, bathroom and lavatory, at Warltersville Road.

MIDDLESEX. *Secondary School.* Middlesex Education Committee has obtained sanction to borrow £47,306 for the erection of a secondary school at Carlton Avenue, Wembley.

WANSTEAD. *Houses, etc.* Plans passed by Wanstead U.D.C.: 20 flats, Woodford Road; 14 houses, South View Drive; six houses, Grenville Gardens; 52 flats, Lechmere Avenue; eight shops and two flats, Southend Road; 31 houses, Buxton Close and Glastonbury Avenue; additions to Jubilee Hospital, Broomhill Walk; classroom and dormitory, St. Catherine's Convent, Cambridge Park; eight houses, Spring Gardens.

WILLESDEN. *Elementary School.* Willesden Education Committee has approved plans by Mr. F. E. Wilkinson for the erection of an elementary school at Gladstone Park.

EASTERN COUNTIES

NORWICH. *Flats.* Norwich Corporation has prepared schemes for the erection of 92 flats of two-storeys and 246 flats of three-storeys, making a total of 338 flats on the clearance areas.

NORWICH. *Municipal Offices.* Norwich Corporation proposes that the present building scheme for the new Municipal Offices be extended to include the erection of a tower at the St. Giles Street end of the building, in accordance with the plans prepared by the architects, Messrs. C. H. James and S. Rowland Pierce, at an estimated additional cost of £7,913.

SUFFOLK. *Bungalows.* Mr. A. James is to erect three bungalows at Brantham, Suffolk.

THETFORD. *Houses.* Plans passed by Thetford Corporation: Four houses, near the Railway Bridge, Norwich Road, Mr. W. J. Boughton; bungalow, Vicarage Road, Guildhall Street, Mr. W. J. Boughton; alterations and additions to warehouse, The Thetford Co-operative Society, Ltd.

MIDLAND COUNTIES

BIRMINGHAM. *Extensions.* Birmingham Education Committee has obtained sanction to borrow £12,675 for extensions at Kingsland Road School, Perry Barr.

BIRMINGHAM. *Houses.* Birmingham Corporation is to consider a suggestion that in view of the shortage of houses for the purpose of slum clearance and overcrowding, and the inability to meet the normal needs of the City, the Public Works Committee be directed to report as to the steps necessary to produce at least 5,000 houses per year.

NOTTINGHAM. *Hall.* Notts Education Committee has obtained sanction to borrow £6,980 for the erection of a hall at King Edward Grammar School, Retford.

NOTTINGHAM. *Extensions.* Notts Education Committee has obtained sanction to borrow £7,050 for the purpose of alterations and extensions at Carlton Higher Council School.

NOTTINGHAM. *Sports Pavilion.* Notts Education Committee has obtained sanction to borrow £1,133 for the provision of a sports pavilion and the laying out of playing fields at West Bridgford County Secondary School.

NOTTINGHAM. *Tuberculosis Dispensary.* Notts C.C. has purchased a site at Worksop for the erection of a tuberculosis dispensary.

NOTTINGHAM. *Extensions.* Notts C.C. reports that consequent upon a visit to the sanatorium of a Ministry of Health Inspector it has been necessary to revise the plans for the new buildings at Ransom Sanatorium. It is proposed that an entirely new kitchen be included and that the treatment rooms at present provided in the original plan should be taken out and provision made in a separate block of hospital buildings in such a way as to provide a complete and separate hospital unit. This unit will be placed in front of the new administrative block. A further eight beds will thus be provided making a total of 20 extra beds to the present accommodation of 150.

NOTTINGHAM. *Extensions.* Notts C.C. is to extend the boiler plant and installation of new heating and domestic hot water service at the Kilton Hill Hospital at a cost of £3,085.

RUGBY. *Automatic Telephone Exchange.* H.M. Office of Works is to erect an automatic telephone exchange at Rugby.

SEDGLEY. *Houses.* Sedgley U.D.C. is to erect 70 houses on land being acquired at North Springfield.

SEDGLEY. *Houses.* Plans passed by Sedgley U.D.C.: House, Redhall Road, Mr. W. T. Edwards; 20 houses, Straits Road, The Earl of Dudley's Baggeridge Colliery, Ltd.; house and shop, Tudor Place, Mr. J. Darby; bungalow, Brookdale, Mr. W. Wimmins; additions to shop, Redhall Road, The Dudley Co-operative Society, Ltd.; 20 houses, Summer Lane, Messrs. A. & J. Mucklow; four houses, Honor Avenue, Mr. R. A. Brookes; two houses, Himley Cresent, Messrs. Timmins and Davis; extensions to brickworks, Gospel End, The Earl of Dudley's Baggeridge Colliery, Ltd.; house, Ednam Road, Mr. D. Everall; two houses, Ward Road, Mr. L. C. Sutton; six houses, Queen's Road, Mr. A. B. Tomlinson.

WALSALL. *Houses.* Walsall Corporation has acquired 4 acres at Lichfield Road, Little Bloxwich, for the erection of houses.

WARWICKSHIRE. *Police houses.* Warwickshire C.C. is to erect a pair of police houses at Dunchurch.

WARWICKSHIRE. *Council School.* Warwickshire Education Committee has prepared revised plans for the proposed Council junior and infants' school at Rugby Hillmorton.

WARWICKSHIRE. *Police houses.* Warwickshire C.C. has acquired sites for three police houses and is negotiating for another 15 sites in various parishes.

WARWICKSHIRE. *Senior Girls' School.* Warwickshire Education Committee is to obtain a site in Rugby for the erection of a senior girls' school.

NORTH-WESTERN COUNTIES

LIVERPOOL. *Administrative Buildings.* Liverpool Corporation is to erect administrative buildings at Speke Aerodrome at a cost of £11,065.

SOUTH-EASTERN COUNTIES

KENT. *Extensions.* Kent C.C. is to proceed with the extension of the nurses' home at the Dartford County Hospital.

SOUTH-WESTERN COUNTIES

SOMERSET. *Police Station, etc.* Somerset C.C. has obtained sanction to borrow £19,112 for the erection of a police station and court house.

SWINDON. *Municipal Offices.* Swindon Corporation has obtained sanction to borrow £61,361 for the erection of municipal offices.

TRURO. *Houses, etc.* Plans passed by Truro Corporation: Bungalow, Bodmin Road, Mr. Thompson; house, Falmouth Road, Mr. Edwards; 44 houses, Hill Crest, Dobbs Lane, The Devon and Cornwall Estates, Ltd.; six houses, Redannick Lane, Messrs. P. Williams and Son.

THE BUILDINGS ILLUSTRATED

CAR DEPOT, NORTHFIELDS, MIDDLESEX (pages 407-410). The general contractors were Sir Robert MacAlpine and Sons, Ltd., and the principal sub-contractors and suppliers included: Limmer and Trinidad Lake Asphalte Co., Ltd., asphalt; Sussex Brick Co., Ltd., plinths; Stoneware (1928), Ltd., facings; Leeds Fireclay Co., Ltd., glazed bricks and facings; Malcolm McLeod & Co., Ltd., artificial stone; E. C. and J. Keay (1926), Ltd., structural steel; Turner's Asbestos Cement Co., slates; D. Anderson and Son, Ltd., special roofings; Williams and Williams, Ltd., partitions, casements and window furniture; Pilkington Bros., Ltd., glass; British Challenge Glazing Co., Ltd., patent glazing; Hollis Bros. & Co., Ltd., woodblock flooring; Caxton Floors, Ltd., patent flooring; Sturtevant Engineering Co., Ltd., central heating, boilers and ventilation; George Wright & Co., Ltd., gas fixtures; London Passenger Transport Board, electric wiring, telephones, light fixtures, etc.; Tylors, Ltd., sanitary fittings; New Destructor Co., Ltd., incinerator; Steel and Hampton, Ltd., door furniture; Mather and Platt, Ltd., rolling shutters; Light Steelwork, Ltd., steel fireproof doors; Charles Walker & Co., tiling; Metropolitan Water Board, water supply; Hadfields (Merton), Ltd., paint; Walpamur Co., Ltd., distemper.

CITY OF BRADFORD CO-OPERATIVE SOCIETY LTD., NEW CENTRAL PREMISES (pages 419-424). The general contractors were the Building Department Co-operative Wholesale Society, Ltd., and the principal sub-contractors and suppliers included: The Trussed Concrete Steel Co., Ltd., concrete floors; Richard Crittall & Co., Ltd., heating and ventilating; Crittall Manufacturing Co., Ltd., metal windows; Leonard Stead and Son, fibrous plasterwork; Shaw's Glazed Brick Co., Ltd., faience wall lining to stairs; J. and H. Patteson, Ltd., marble floors; Empire Stone Co., Ltd., stonework to circular towers; Mather and Platt, Ltd., sprinkler installation and hydrants, roller shutters; Lamson's Pneumatic Tube Co., Ltd., cash tube system; W. F. S. Holt, Ltd., roller shutters; J. A. King & Co., Ltd., laylights to restaurant roof; W. Walker & Co., Ltd., wrot iron balustrades, etc.; J. W. Swift, wall tiling; Doulton & Co., Ltd., sanitary fittings; J. and E. Hall, Ltd., escalators and refrigerators; Haskins, Ltd., sunblinds; Benham and Sons, Ltd., kitchen equipment; Higginbotham and Sons, Ltd., electric light and power; W. S. Hodkinson & Co., floor coverings; C.W.S., Ltd., carpets; C.W.S. Shopfitting Department, shop fronts and shop fittings; C.W.S. Engineering Department, electric goods and passenger lifts.

H

RATES OF WAGES

The initial letter opposite every entry indicates the grade under the Ministry of Labour schedule. The district is that to which the borough is assigned in the same schedule. Column I gives the rates for craftsmen; Column II for labourers. The rate for craftsmen working at trades in which a separate rate maintains is given in a footnote. The table is a selection only. Particulars for lesser localities not included may be obtained upon application in writing.

			I s. d.	II s. d.
A_1	ABERDARE ...	S. Wales & M.	1 5½	1 1½
A	Aberdeen ...	Scotland	1 6½	1 2
A_1	Abergavenny ...	S. Wales & M.	1 6	1 1½
A_2	Abingdon ...	S. Counties	1 5	1 0½
A	Accrington ...	N.W. Counties	1 6½	1 2
A_2	Addlestone ...	S. Counties	1 5	1 0½
A	Adlington ...	N.W. Counties	1 6½	1 2
A	Airdrie ...	Scotland	*1 6½	1 2
C	Aldeburgh ...	E. Counties	1 2½	11
A	Altrincham ...	N.W. Counties	1 6½	1 2
B_2	Appleby ...	N.W. Counties	1 3	11½
A	Ashton-under-Lyne	N.W. Counties	1 6½	1 2
B_1	Aylesbury ...	S. Counties	1 4	1 0
	BANBURY ...	S. Counties	1 4	1 0
B_1	Bangor ...	N.W. Counties	1 4	1 0
A_2	Barnard Castle ...	N.E. Coast	1 5	1 0½
A	Barnsley ...	Yorkshire	1 6½	1 2
B	Barnstaple ...	S.W. Counties	1 4½	1 0½
A	Barrow ...	N.W. Counties	1 6½	1 2
A	Barry	S. Wales & M.	1 6½	1 2
B_1	Basingstoke ...	S.W. Counties	1 4	1 0
A_2	Bath	S.W. Counties	1 5½	1 1½
A	Batley ...	Yorkshire	1 6½	1 2
A_2	Bedford ...	E. Counties	1 5½	1 1½
A_2	Berwick-on-Tweed	N.E. Coast	1 5½	1 1½
A_2	Bewdley ...	Mid. Counties	1 5½	1 1½
B_2	Bicester ...	S. Counties	1 3	11½
	Birkenhead ...	N.W. Counties	*1 7½	1 2½
A	Birmingham ...	Mid. Counties	1 6½	1 2
A_1	Bishop Auckland	N.E. Coast	1 6	1 1½
A	Blackburn ...	N.W. Counties	1 6½	1 2
A	Blackpool ...	N.W. Counties	1 6½	1 2
A	Blyth	N.E. Coast	1 6½	1 2
B_1	Bognor ...	S. Counties	1 4	1 0
A	Bolton ...	N.W. Counties	1 6½	1 2
A_2	Boston ...	Mid. Counties	1 5	1 0½
A_2	Bournemouth...	S. Counties	1 5½	1 1½
B_2	Bovey Tracey	S.W. Counties	1 3½	11½
A	Bradford ...	Yorkshire	1 6½	1 2
A_1	Brentwood ...	E. Counties	1 6	1 1½
A	Bridgend ...	S. Wales & M.	1 6½	1 2
B	Bridgwater ...	S.W. Counties	1 4½	1 0½
A_1	Bridlington ...	Yorkshire	1 6	1 1½
A	Brighouse ...	Yorkshire	1 6½	1 2
A_2	Brighton ...	S. Counties	1 5½	1 1½
A	Bristol ...	S.W. Counties	1 6½	1 2
B	Brixham ...	S.W. Counties	1 3½	11½
A	Bromsgrove ...	Mid. Counties	1 5½	1 1½
B	Bromyard ...	Mid. Counties	1 3	11½
A	Burnley ...	N.W. Counties	1 6½	1 2
A	Bursiem ...	Mid. Counties	1 6½	1 2
A	Burton-on-Trent	Mid. Counties	1 6½	1 2
A	Bury	N.W. Counties	1 6½	1 2
A	Buxton ...	N.W. Counties	1 6	1 1½
A_1	CAMBRIDGE	E. Counties	1 6	1 1½
B_1	Canterbury ...	S. Counties	1 4	1 0
A	Cardiff ...	S. Wales & M.	1 6½	1 2
A	Carlisle ...	N.W. Counties	1 6½	1 2
B	Carmarthen ...	S. Wales & M.	1 4½	1 0½
B	Carnarvon ...	N.W. Counties	1 4½	1 0½
A	Carnforth ...	N.W. Counties	1 6½	1 2
A	Castleford ...	Yorkshire	1 6½	1 2
A_2	Chatham ...	S. Counties	1 5	1 0½
A	Chelmsford ...	E. Counties	1 5	1 0½
A	Cheltenham ...	S.W. Counties	1 5	1 0½
A	Chester ...	N.W. Counties	1 6½	1 2
A	Chesterfield ...	Mid. Counties	1 6½	1 2
B_1	Chichester ...	S. Counties	1 4	1 0
A	Chorley ...	N.W. Counties	1 6½	1 2
B_1	Cirencester ...	S. Counties	1 4	1 0
A	Clitheroe ...	N.W. Counties	1 6½	1 2
A	Clydebank ...	Scotland	1 6½	1 2
A	Coalville ...	Mid. Counties	1 6½	1 2
A_2	Colchester ...	E. Counties	1 5½	1 1½
A	Colne	N.W. Counties	1 6	1 1½
A_2	Colwyn Bay ...	N.W. Counties	1 5½	1 1½
A_1	Consett ...	N.E. Coast	1 6	1 1½
A_2	Conway ...	N.W. Counties	1 5½	1 1½
A	Coventry ...	Mid. Counties	1 6½	1 2
A	Crewe	N.W. Counties	1 5½	1 1½
A	Cumberland ...	N.W. Counties	1 5	1 0½
A	DARLINGTON	N.E. Coast	1 6½	1 2
A	Darwen ...	N.W. Counties	1 6½	1 2
B	Deal	S. Counties	1 4	1 0
A_2	Denbigh ...	N.W. Counties	1 5	1 0½
A	Derby	Mid. Counties	1 6½	1 2
A	Dewsbury ...	Yorkshire	1 6½	1 2
B	Didcot ...	S. Counties	1 4½	1 0½
A	Doncaster ...	Yorkshire	1 6½	1 2
B_1	Dorchester ...	S.W. Counties	1 4	1 0
A	Driffield ...	Yorkshire	1 5	1 0½
A_2	Droitwich ...	Mid. Counties	1 5½	1 1½
A	Dudley ...	Mid. Counties	1 6½	1 2
A_2	Dumfries ...	Scotland	1 6	1 1½
A	Dundee ...	Scotland	1 6½	1 2
A	Durham ...	N.E. Coast	1 6½	1 2
A_2	EASTBOURNE	S. Counties	1 5½	1 1½
A_1	Ebbw Vale ...	S. Wales & M.	1 6	1 1½
A	Edinburgh ...	Scotland	1 6½	1 2
A_2	Exeter ...	S.W. Counties	*1 5½	1 1½
B	Exmouth ...	S.W. Counties	1 4½	1 0½
A_2	FELIXSTOWE	E. Counties	1 5	1 0½
A	Filey	Yorkshire	1 5	1 0½
A	Fleetwood ...	N.W. Counties	1 6½	1 2
B_1	Folkestone ...	S. Counties	1 4	1 0
A	Frodsham ...	N.W. Counties	1 6½	1 2
B_2	Frome ...	S.W. Counties	1 3½	11½
	GATESHEAD	N.E. Coast	1 6½	1 2
B	Gillingham ...	S. Counties	1 4½	1 0½
A_1	Glamorgan-shire, Rhondda Valley District	S. Wales & M.	1 6	1 1½
A	Glasgow ...	Scotland	1 7	1 2½
A_2	Gloucester ...	S.W. Counties	1 5½	1 1½
A_2	Goole ...	Yorkshire	1 5½	1 1½
A_2	Gosport ...	S. Counties	1 5½	1 1½
A_2	Grantham ...	Mid. Counties	1 5	1 0½
A_1	Gravesend ...	S. Counties	1 6	1 1½
A	Greenock ...	Scotland	*1 6½	1 2
A	Grimsby ...	Mid. Counties	1 6½	1 2
B	Guildford ...	S. Counties	1 4½	1 0½
A	HALIFAX ...	Yorkshire	1 6½	1 2
A	Hanley ...	Mid. Counties	1 6½	1 2
A	Harrogate ...	Yorkshire	1 6½	1 2
A	Hartlepools ...	N.E. Coast	1 6½	1 2
B	Harwich ...	E. Counties	1 4½	1 0½
B_1	Hastings ...	S. Counties	1 4	1 0
A_2	Hatfield ...	S. Counties	1 5½	1 1½
B	Hereford ...	S.W. Counties	1 4½	1 0½
A_2	Hertford ...	E. Counties	1 5½	1 1½
A	Heysham ...	N.W. Counties	1 6½	1 2
A	Howden ...	N.E. Coast	1 6½	1 2
A	Huddersfield ...	Yorkshire	1 6½	1 2
A	Hull	Yorkshire	1 6½	1 2
A	ILKLEY ...	Yorkshire	1 6½	1 2
A	Immingham ...	Mid. Counties	1 6½	1 2
A	Ipswich ...	E. Counties	1 5½	1 1½
B_2	Isle of Wight ...	S. Counties	1 4½	1 0½
A	JARROW ...	N.E. Coast	1 6½	1 2
A	KEIGHLEY ...	Yorkshire	1 6½	1 2
A_1	Kendal ...	N.W. Counties	1 5	1 0½
A_2	Keswick ...	N.W. Counties	1 5	1 0½
A_1	Kettering ...	Mid. Counties	1 6	1 1½
A_2	Kidderminster	Mid. Counties	1 5½	1 1½
B_1	King's Lynn ...	E. Counties	1 4	1 0
A	LANCASTER ...	N.W. Counties	1 6½	1 2
A_1	Leamington ...	Mid. Counties	1 6	1 1½
A	Leeds	Yorkshire	1 6½	1 2
A	Leek	Mid. Counties	1 6½	1 2
A	Leicester ...	Mid. Counties	1 6½	1 2
A	Leigh	N.W. Counties	1 6½	1 2
B	Lewes	S. Counties	1 3	11½
A_1	Lichfield ...	Mid. Counties	1 5½	1 1½
A	Lincoln ...	Mid. Counties	1 6½	1 2
	Liverpool ...	N.W. Counties	*1 8	1 3
A_2	Llandudno ...	N.W. Counties	1 5½	1 1½
A	Llanelly ...	S. Wales & M.	1 6½	1 2
	London (12-miles radius)		1 8	1 3
	Do. (12-15 miles radius)		1 7½	1 2½
A	Long Eaton ...	Mid. Counties	1 6½	1 2
A	Loughborough	Mid. Counties	1 6½	1 2
A_1	Luton	E. Counties	1 6	1 1½
A	Lytham ...	N.W. Counties	1 6½	1 2
A_1	MACCLESFIELD	N.W. Counties	1 6	1 1½
A_2	Maidstone ...	S. Counties	1 5	1 0½
A_2	Malvern ...	Mid. Counties	1 5	1 0½
A	Manchester ...	N.W. Counties	1 6½	1 2
A	Mansfield ...	Mid. Counties	1 6½	1 2
B_1	Margate ...	S. Counties	1 4	1 0
A	Matlock ...	Mid. Counties	1 5	1 0½
A_1	Merthyr ...	S. Wales & M.	1 6	1 1½
A	Middlesbrough	N.E. Coast	1 6½	1 2
A_2	Middlewich ...	N.W. Counties	1 5½	1 1½
B_2	Minehead ...	S.W. Counties	1 3½	11½
B_2	Monmouth & S. and E. Glamorganshire	S. Wales & M.	1 3½	11½
A	Morecambe ...	N.W. Counties	1 6½	1 2
A_2	NANTWICH ...	N.W. Counties	1 5½	1 1½
A	Neath	S. Wales & M.	1 6½	1 2
A	Nelson ...	N.W. Counties	1 6½	1 2
A	Newcastle ...	N.E. Coast	1 6½	1 2
A	Newport ...	S. Wales & M.	1 6½	1 2
A	Normanton ...	Yorkshire	1 6½	1 2
A	Northampton...	Mid. Counties	1 6½	1 2
A	North Shields...	N.E. Coast	1 6½	1 2
A	North Staffs ...	Mid. Counties	1 6½	1 2
A_1	Norwich ...	E. Counties	1 6	1 1½
A	Nottingham ...	Mid. Counties	1 6½	1 2
A	Nuneaton ...	Mid. Counties	1 6½	1 2
A	OAKHAM ...	Mid. Counties	1 5	1 0½
A	Oldham ...	N.W. Counties	1 6½	1 2
A_2	Oswestry ...	N.W. Counties	1 5	1 0½
A_1	Oxford ...	S. Counties	1 6	1 1½
A	PAISLEY ...	Scotland	*1 6½	1 2
B_2	Pembroke ...	S. Wales & M.	1 3	11½
A	Perth	Scotland	*1 6½	1 2
A_1	Peterborough	E. Counties	1 6	1 1½
A	Plymouth ...	S.W. Counties	*1 6½	1 2
A	Pontefract ...	Yorkshire	1 6½	1 2
A_1	Pontypridd ...	S. Wales & M.	1 6	1 1½
A_2	Portsmouth ...	S. Counties	1 5½	1 1½
A	Preston ...	N.W. Counties	1 6½	1 2
A	QUEENSFERRY	N.W. Counties	1 6½	1 2
A_2	READING ...	S. Counties	1 5½	1 1½
B	Reigate ...	S. Counties	1 4½	1 0½
A	Retford ...	Mid. Counties	1 5	1 0½
A_1	Rhondda Valley	S. Wales & M.	1 6	1 1½
A	Ripon	Yorkshire	1 5	1 0½
A	Rochdale ...	N.W. Counties	1 6½	1 2
B	Rochester ...	S. Counties	1 4½	1 0½
A_1	Ruabon ...	N.W. Counties	1 6	1 1½
A	Rugby ...	Mid. Counties	1 6½	1 2
A_2	Rugeley ...	Mid. Counties	1 5½	1 1½
A	Runcorn ...	N.W. Counties	1 6½	1 2
A_1	ST. ALBANS ...	E. Counties	1 6	1 1½
A	St. Helens ...	N.W. Counties	1 6½	1 2
B_2	Salisbury ...	S.W. Counties	1 3½	11½
A_1	Scarborough ...	Yorkshire	1 6	1 1½
A	Scunthorpe ...	Mid. Counties	1 6½	1 2
A	Sheffield ...	Yorkshire	1 6½	1 2
A	Shipley ...	Yorkshire	1 6½	1 2
A_2	Shrewsbury ...	Mid. Counties	1 5½	1 1½
A_2	Skipton ...	Yorkshire	1 5½	1 1½
A_2	Slough ...	S. Counties	1 5½	1 1½
A_1	Solihull ...	Mid. Counties	1 6	1 1½
A_2	Southampton ...	S. Counties	1 5½	1 1½
A_1	Southend-on-Sea	E. Counties	1 6	1 1½
A	Southport ...	N.W. Counties	1 6½	1 2
A	S. Shields ...	N.E. Coast	1 6½	1 2
A_1	Stafford ...	Mid. Counties	1 6	1 1½
A	Stirling ...	Scotland	1 7	1 2½
A	Stockport ...	N.W. Counties	1 6½	1 2
A	Stockton-on-Tees	N.E. Coast	1 6½	1 2
A	Stoke-on-Trent	Mid. Counties	1 6½	1 2
B	Stroud ...	S.W. Counties	1 4½	1 0½
A	Sunderland ...	N.E. Coast	1 6½	1 2
A	Swansea ...	S. Wales & M.	1 6½	1 2
A	Swindon ...	S.W. Counties	1 5	1 0½
A_1	TAMWORTH ...	N.W. Counties	1 6	1 1½
B	Taunton ...	S.W. Counties	1 4½	1 0½
A	Teesside Dist....	N.E. Counties	1 6½	1 2
A_2	Teignmouth ...	S.W. Coast	1 5½	1 1½
A	Todmorden ...	Yorkshire	1 6½	1 2
A_1	Torquay ...	S.W. Counties	1 6	1 1½
B_2	Truro	S.W. Counties	1 3½	11½
A_2	Tunbridge Wells	S. Counties	1 5	1 0½
A	Tunstall ...	Mid. Counties	1 6½	1 2
A	Tyne District	N.E. Coast	1 6½	1 2
A	WAKEFIELD	Yorkshire	1 6½	1 2
A	Walsall ...	Mid. Counties	1 6½	1 2
A	Warrington ...	N.W. Counties	1 6½	1 2
A_1	Warwick ...	Mid. Counties	1 6	1 1½
A_1	Wellingborough	Mid. Counties	1 6	1 1½
A	West Bromwich	Mid. Counties	1 6½	1 2
A_2	Weston-s.-Mare	W. Counties	1 5½	1 1½
A_2	Whitby ...	Yorkshire	1 5½	1 1½
A	Widnes ...	N.W. Counties	1 6½	1 2
A	Wigan ...	N.W. Counties	1 6½	1 2
B	Winchester ...	S. Counties	1 4½	1 0½
A_2	Windsor ...	S. Counties	1 5½	1 0½
A	Wolverhampton	Mid. Counties	1 6½	1 2
A_2	Worcester ...	Mid. Counties	1 5½	1 1½
A_2	Worksop ...	Yorkshire	1 5	1 0½
A_1	Wrexham ...	N.W. Counties	1 6	1 1½
A	Wycombe ...	S. Counties	1 5	1 0½
B	YARMOUTH ...	E. Counties	1 4½	1 0½
B	Yeovil ...	S.W. Counties	1 4½	1 0½
A	York	Yorkshire	1 6½	1 2

* In these areas the rates of wages for certain trades (usually painters and plasterers) vary slightly from those given.

The rates for every trade in any given area will be sent on request.

CURRENT PRICES

The wages are the standard Union rates of wages payable in London at the time of publication. The prices given below are for materials of good quality and include delivery to site in Central London area, unless otherwise stated. For delivery outside this area, adjustment should be made for the cost of transport. Though every care has been taken in its compilation, it is impossible to guarantee the accuracy of the list, and readers are advised to have the figures confirmed by trade inquiry. The whole of the information given is copyright.

WAGES

		s.	d.
Bricklayer	per hour	1	8
Carpenter	"	1	8
Joiner	"	1	8
Machinist	"	1	8
Mason (Banker)	"	1	8
" (Fixer)	"	1	9
Plumber	"	1	8
Painter	"	1	7
Paperhanger	"	1	7
Glazier	"	1	7
Slater	"	1	8
Scaffolder	"	1	4
Timberman	"	1	4
Navvy	"	1	3
General Labourer	"	1	3
Lorryman	"	1	5½
Crane Driver	"	1	7
Watchman	per week	2	10

MATERIALS

EXCAVATOR AND CONCRETOR

		£	s.	d.
Grey Stone Lime	per ton	2	2	0
Blue Lias Lime	"	1	16	6
Hydrated Lime	"	3	0	9
Portland Cement, in 4-ton lots (d/d site, including Paper Bags)	"	1	19	0
Rapid Hardening Cement, in 4-ton lots (d/d site, including Paper Bags)	"	2	5	0
White Portland Cement, in 1-ton lots	"	8	15	0
Thames Ballast	per Y.C.		6	6
¾" Crushed Ballast	"		7	0
Building Sand	"		7	6
Washed Sand	"		8	6
2" Broken Brick	"		8	0
¾" "	"		10	3
Pan Breeze	"		6	6
Coke Breeze	"		8	9

DRAINLAYER

BEST STONEWARE DRAIN PIPES AND FITTINGS

		4" s.	4" d.	6" s.	6" d.
Straight Pipes	per F.R.	0	9	1	1
Bends	each	1	9	2	6
Taper Bends	"	3	6	5	3
Rest Bends	"	4	3	6	3
Single Junctions	"	3	6	5	3
Double "	"	4	9	6	6
Straight channels	per F.R.	1	6	2	6
¾" Channel bends	each	2	9	4	0
Channel junctions	"	4	6	6	6
Channel tapers	"	2	9	4	0
Yard gullies	"	6	9	8	9
Interceptors	"	16	0	19	6
IRON DRAINS:					
Iron drain pipe	per F.R.	1	6	2	6
Bends	each	5	0	10	6
Inspection bends	"	9	0	15	0
Single junctions	"	8	9	18	0
Double junctions	"	13	6	30	0
Lead Wool	lb.		6		—
Gaskin	"		5		—

BRICKLAYER

		£	s.	d.
Fletton	per M.	2	15	0
Grooved do.	"	2	17	0
Phorpres bricks	"	2	15	0
" Cellular bricks	"	2	15	0
Stocks, 1st quality	"	4	11	0
" 2nd "	"	4	2	6
Blue Bricks, Pressed	"	8	17	6
" Wirecuts	"	7	17	6
" Brindles	"	7	0	0
" Bullnose	"	9	0	0
Red Sand-faced Facings	"	6	18	6
Red Rubbers for Arches	"	12	0	0
Multicoloured Facings	"	7	10	0
Luton Facings	"	7	10	0
Phorpres White Facings	"	3	17	3
" Rustic Facings	"	3	12	3
Midhurst White Facings	"	5	0	0
Glazed Bricks, Ivory, White or Salt glazed, 1st quality:				
Stretchers	"	21	0	0
Headers	"	20	10	0
Bullnose	"	27	10	0
Double Stretchers	"	29	10	0
Double Headers	"	26	10	0
Glazed Second Quality, *Less*	"	1	0	0
" Buffs and Creams, *Add*	"	2	0	0
" Other Colours	"	5	10	0
2" Breeze Partition Blocks	per Y.S.		1	7
2½" " " "	"		1	10
3" " " "	"		2	1
4" " " "	"		2	6

MASON

The following d/d F.O.R. at Nine Elms:		s.	d.
Portland stone, Whitbed	F.C.	4	4½
" " Basebed	"	4	7½
Bath stone	"	2	10
York stone	"	6	6
" " Sawn templates	"	7	6
" " Paving, 2"	F.S.	1	8
" " " 3"	"	2	6

SLATER AND TILER

First quality Bangor or Portmadoc slates d/d F.O.R. London station:

		£	s.	d.
24" × 12" Duchesses	per M.	28	17	6
22" × 12" Marchionesses	"	24	10	0
20" × 10" Countesses	"	19	5	0
18" × 10" Viscountesses	"	15	10	0
18" × 9" Ladies	"	13	17	6
Westmorland green (random sizes)	per ton	8	10	0
Old Delabole slates d/d in full truck loads to Nine Elms Station:				
20" × 10" medium grey per 1,000 (actual)		21	11	6
" " green " "		24	7	4
Best machine roofing tiles " "		4	5	0
Best hand-made do. " "		4	17	6
Hips and valleys	each			9
" hand-made	"			9½
Nails, compo	lb.		1	4
" copper	"		1	6

CARPENTER AND JOINER

		£	s.	d.
Good carcassing timber	F.C.		2	2
Birch	as 1" F.S.			9
Deal, Joiner's	" "			5
" " 2nds	" "			4
Mahogany, Honduras	" "		1	3
" African	" "		1	1
" Cuban	" "		2	6
Oak, plain American	" "		1	0
" Figured "	" "		1	3
" plain Japanese	" "		1	2
" Figured "	" "		1	5
" Austrian wainscot	" "		1	6
" English	" "		1	11
Pine, Yellow	each		1	0
" Oregon	"			4
" British Columbian	"			4
Teak, Moulmein	"		1	3
" Burma	"		1	2
Walnut, American	"		2	3
" French	"		2	3
Whitewood, American	"		1	1
Deal floorings, ¾"	Sq.		18	6
" 1"	"	1	1	6
" 1¼"	"	1	2	0
" 1½"	"	1	5	0
" 1¾"	"	1	10	0
Deal matchings, ¾"	"		14	0
" 1"	"		15	6
" 1¼"	"	1	4	0
Rough boarding, ¾"	"		16	0
" 1"	"		18	0
" 1½"	"	1	6	0

Plywood, per ft. sup.

Thickness	¼"			⅜"			½"			⅝"		
Qualities	A	B	BB	A	B	BB	A	B	BB	A	B	BB
	d.	d.	d.	d.	d.	d.	d.	d.	d.	d.	d.	d.
Birch 60 × 48	4	2½	2	5	3	2½	7	5	4	8	6	5
Cheap Alder	–	2	1½	–	3½	2	–	–	–	–	–	–
Oregon Pine	–	2½	–	3	2½	–	4	3½	–	5	4½	–
Gaboon Mahogany	4	3½	–	5	4½	–	7	6½	–	8	7	–
Figured Oak	6½	5	–	7½	5½	–	10	8	–	1/–	9	–

		d.
Scotch glue	lb.	8

SMITH AND FOUNDER

Tubes and Fittings

(The following are the standard list prices, from which should be deducted the various percentages as set forth below.)

		¼"	½"	1"	1¼"	2"
Tubes, 2'-14' long	per ft. run	4	5½	9½	1/1	1/10
Pieces, 12"-23" long	each	10	1/1	1/11	2/8	4/9
" 3"-11½" long	"	7	9	1/3	1/8	3/–
Long screws, 12"-23½" long	"	11	1/3	2/2	2/10	5/3
" " 3" M-1½" long	"	8	10	1/5	1/11	3/6
Bends	"	8	11	1/7½	2/7½	5/2
Springs not socketed	"	5	7	1/1½	1/11½	3/11
Socket unions	"	2/–	3/–	5/6	6/9	10/–
Elbows, square	"	10	1/1	1/6	2/2	4/3
Tees	"	1/–	1/3	1/10	2/6	5/1
Crosses	"	2/2	2/9	4/1	5/6	10/6
Plain sockets and nipples	"	3	4	6	8	1/3
Diminished sockets	"	4	6	9	1/–	2/–
Flanges	"	9	1/–	1/4	1/9	2/9
Caps	"	3½	5	8	1/–	2/–
Backnuts	"	2	3	5	6	1/1
Iron main cocks	"	1/6	2/3	4/2	5/4	11/6
" with brass plugs	"	—	4/–	7/6	10/–	21/–

Discounts

TUBES.

	Per cent.		Per cent.
Gas	65	Galvanized gas	52½
Water	61½	" water	47½
Steam	57½	" steam	42½

FITTINGS.

Gas	57½	Galvanized gas	47½
Water	52½	" water	42½
Steam	47½	" steam	37½

		s.	d.
Rolled steel joists cut to length	cwt.	12	9
Mild steel reinforcing rods, ¾"	"	10	6
" " ½"	"	10	3
" " ¾"	"	10	0

SMITH AND FOUNDER—*continued*

		s.	d.
Mild steel reinforcing rods, ⅞"	cwt.	9	6
" " 1"	"	9	6
" " 1¼"	"	9	6
" " 1½"	"	9	6
" " 1¾"	"	9	6
" " 2"	"	9	6
" " 2¼"	"	9	6
" " 2½"	"	9	6
" " 2¾"	"	9	6
" " 3"	"	9	6
" " 3¼"	"	9	6
" " 3½"	"	9	6
" " 3¾"	"	9	6
" " 4"	"	9	6

		F.R.	s.	d.
Cast-iron rain-water pipes of ordinary thickness metal			8	10
Shoes	each	2	0	3 0
Anti-splash shoes	"	4	6	8 0
Boots	"	3	0	4 0
Bends	"	2	7	3 9
" with access door	"		—	6 3
Heads	"	4	0	5 0
Swan-necks up to 9" offsets	"	3	9	6 0
Plinth bends, 4½" to 6"	"	3	9	5 3
Half-round rain-water gutters of ordinary thickness metal	F.R.		5	6
Stop ends	each		6	6
Angles	"	1	7	1 11
Obtuse angles	"	2	0	2 6
Outlets	"	1	9	2 3

PLUMBER

		s.	d.
Lead, milled sheets	cwt.	24	6
" drawn pipes	"	24	6
" soil pipe	"	30	0
" scrap	"	16	0
Solder, plumbers'	lb.		9½
" fine do.	"	1	0
Copper, sheet	"		8½
" tubes	"		11

L.C.C. soil and waste pipes:	3"	4"	6"
Plain cast F.R.	1 0	1 2	2 6
Coated "	1 1	1 3	2 8
Galvanized "	2 0	2 6	4 6
Holderbats each	3 10	4 0	4 9
Bends "	3 9	5 3	10 3
Shoes "	2 10	4 4	9 6
Heads "	4 8	8 5	12 9

PLASTERER

		£	s.	d.
Lime, chalk	per ton	2	5	0
Plaster, Coarse	"	2	10	0
" fine	"	4	15	0
Hydrated lime	"	3	0	9
Sirapite	"	3	6	0
Keene's cement	"	5	0	0
Gothite Plaster	"	3	6	0
Pioneer Plaster	"	3	6	0
Thistle plaster	"	3	6	0
Sand, washed	Y.C.		11	6
Hair	lb.			6
Laths, sawn	bundle		2	4
" rent	"		3	9
Lath nails	lb.			3

GLAZIER

		s.	d.	s.	d.
Sheet glass, 21 oz., squares n/e 2 ft.	F.S.				2½
" " 26 oz. " "	"				3
Flemish, Arctic, Figures (white)*	"				7
Blazoned glasses	"			2	6
Reeded: Cross Reeded	"				11
Cathedral glass, white, double-rolled, plain, hammered, rimpled, waterwite	"				6
Crown sheet glass (n/e 12" × 10")	"			2	0
Flashed opals (white and coloured)	"	1	0 and	2	0
¼" rough cast; rolled plate	"				5½
¼" wired cast; wired rolled	"				9½
¼" Georgian wired cast	"				11
¼" Polished plate, n/e 1 ft.	"	†10 to		‡1	1
" " 2	"	†1	2 "	‡1	4
" " 4	"	†2	3 "	‡2	6
" " 8	"	†2	9 "	‡3	2
" " 20	"	†3	1 "	‡3	9
" " 45	"	†3	3 "	‡4	0
" " 100	"	†4	0 "	‡4	10
Vita glass, sheet, n/e 1 ft.	"			1	0
" " " 2 ft.	"			1	3
" " " over 2 ft.	"			1	9
" " plate, n/e 1 ft.	"			1	6
" " " 2 ft.	"			3	0
" " " 5 ft.	"			4	0
" " " 7 ft.	"			5	0
" " " 15 ft.	"			6	0
" " " over 15 ft.	"			7	6
"Calorex" sheet 21 oz., and 32 oz.	"	2	6 and	3	6
" rough cast ¼" and ¾"	"		8½ "	1	0
Putty, linseed oil	lb.				3

* *Colours, 1d. F.S. extra.*

† *Ordinary glazing quality.* ‡ *Selected glazing quality.*

PAINTER

		£	s.	d.
White lead in 1 cwt. casks	cwt.	2	8	6
Linseed oil	gall.		2	3
Boiled oil	"		2	9
Turpentine	"		4	1½
Patent knotting	"		14	0
Distemper washable	cwt.	2	6	0
" ordinary	"	2	0	0
Whitening	"		4	0
Size, double	firkin		3	0
Copal varnish	gall.		13	0
Flat varnish	"		14	0
Outside varnish	"		16	0
White enamel	"	1	15	0
Ready mixed paint	"		13	6
Brunswick black	"		7	6

CURRENT PRICES FOR MEASURED WORK

The following prices are for work to new buildings of average size, executed under normal conditions in the London area. They include establishment charges and profit. While every care has been taken in its compilation, no responsibility can be accepted for the accuracy of the list. The whole of the information given is copyright.

EXCAVATOR AND CONCRETOR

		£ s. d.
Digging over surface n/e 12″ deep and cart away	Y.S.	2 9
,, to reduce levels n/e 5′ 0″ deep and cart away	Y.C.	8 6
,, to form basement n/e 5′ 0″ and cart away	,,	9 0
,, ,, 10′ 0″ deep and cart away	,,	9 6
,, ,, 15′ 0″ deep and cart away	,,	10 0
If in stiff clay	add ,,	6
If in underpinning	,, ,,	4 0
Planking and strutting to sides of excavation	F.S.	1 0
,, ,, to pier holes	,,	5
,, ,, to trenches	,,	5
,, ,, extra, only if left in	,,	3
Hardcore, filled in and rammed	Y.C.	10 0
Portland cement concrete in foundations (6–1)	,,	1 6 0
,, ,, (4-2-1)	,,	1 12 6
,, ,, underpinning	,,	1 16 0
Finishing surface of concrete, space face	Y.S.	7

DRAINLAYER

		4″ s. d.	6″ s. d.
Stoneware drains, laid complete (digging and concrete to be priced separately)	F.R.	1 6	2 3
Extra, only for bends	Each	2 8	3 9
,, ,, junctions	,,	3 9	4 6
Gullies and gratings		16 6	18 0
Cast iron drains, and laying and jointing	F.R.	4 9	6 9
Extra, only for bends	Each	10 6	15 6

BRICKLAYER

	£ s. d.
Brickwork, Flettons in lime mortar	Per Rod 26 10 0
,, ,, in cement	,, 27 12 6
,, Stocks in cement	,, 34 0 0
,, Blues in cement	,, 50 0 0
Extra only for circular on plan	,, 2 0 0
,, backing to masonry	,, 1 10 0
,, raising on old walls	,, 2 0 0
,, underpinning	,, 5 10 0½
Fair Face and pointing internally	F.S. 1½
Extra over fletton brickwork for picked stock facings and pointing	,, 8
,, ,, ,, red brick facings and pointing	,, 11
,, ,, ,, blue brick facings and pointing	,, 1 4
,, ,, ,, glazed brick facings and pointing	,, 3 6
Tuck pointing	,, 7½
Weather pointing in cement	,, 3
Slate dampcourse	,, 10
Vertical dampcourse	,, 1 1

ASPHALTER

	s. d.
½″ Horizontal dampcourse	Y.S. 4 9
½″ Vertical dampcourse	,, 7 9
¼″ paving or flat	,, 6 3
1″ paving or flat	,, 7 6
1″ × 6″ skirting	F.R. 1 0
Angle fillet	,, 2½
Rounded angle	,, 2½
Cesspools	Each 5 6

MASON

	£ s. d.
Portland stone, including all labour, hoisting, fixing and cleaning down, complete	F.C. 17 9
Bath stone and do., all as last	,, 13 6
Artificial stone and do.	,, 13 0
York stone templates, fixed complete	,, 10 6
,, thresholds	,, 13 6
,, sills	,, 1 0 6

SLATER AND TILER

	£ s. d.
Slating, Bangor or equal to a 3″ lap, and fixing with compo nails, 20″ × 10″	Sqr. 3 10 0
Do., 18″ × 9″	,, 3 7 0
Do., 24″ × 12″	,, 3 17 0
Westmorland slating, laid with diminished courses	,, 6 0 0
Tiling, best hand-made sand-faced, laid to a 4″ gauge, nailed every fourth course	,, 3 0 0
Do., all as last, but of machine-made tiles	,, 2 16 0
20″ × 10″ medium Old Delabole slating, laid to a 3″ lap (grey)	,, 2 16 0
,, ,, ,, ,, ,, ,, (green)	,, 4 15 0

CARPENTER AND JOINER

	£ s. d.
Flat boarded centering to concrete floors, including all strutting	Sqr. 2 2 6
Shuttering to sides and soffits of beams	F.S. 7
,, to stanchions	,, 7
,, to staircases	,, 1 6
Fir and fixing in wall plates, lintols, etc.	F.C. 3 9
Fir framed in floors	,, 4 6
,, ,, roofs	,, 6 6
,, ,, trusses	,, 7 6
,, ,, partitions	,, 8 6
⅞″ deal sawn boarding and fixing to joists	Sqr 1 14 6
1″ ,, ,, ,, ,, ,,	,, 1 17 6
1¼″ ,, ,, ,, ,, ,,	,, 2 3 0
⅞″ × 2″ fir battening for Countess slating	,, 9 6
Do., for 4″ gauge tiling	,, 12 0
Stout feather-edged tilting fillet	F.R. 4½
Patent inodorous felt, 1 ply	Y.S. 2 3
,, ,, ,, 2 ,,	,, 2 9
,, ,, ,, 3 ,,	,, 3 3
Stout herringbone strutting to 9″ joists	F.R. 10½
1″ deal gutter boards and bearers	F.S. 1 2
1½″ ,, ,, ,,	,, 1 6
2″ deal wrought rounded roll	F.R. 8
1″ deal grooved and tongued flooring, laid complete, including cleaning off	Sqr. 2 1 0
1¼″ do.	,, 2 10 0
1½″ do.	,, 2 17 0
1″ deal moulded skirting fixed on, and including grounds plugged to wall	F.S. 1 6
1¼″ do.	,, 1 9

CARPENTER AND JOINER—*continued*

	s. d.
1½″ deal moulded sashes of average size	F.S. 1 9½
2″ ,, ,, ,, ,,	,, 1 11½
1½″ deal cased frames double hung, of 6″ × 3″ oak sills, 1¼″ pulley stiles, 1¼″ heads, 1″ inside and outside linings, ⅝″ parting beads, and with brass faced axle pulleys, etc., fixed complete	,, 3 7
2″ ,, ,, ,, ,,	,, 3 10
Extra only for moulded horns ,, ,, ,,	Each 6
1½″ deal four-panel square, both sides, door	F.S. 2 0
2″ ,, ,, ,, ,,	,, 2 8
1½″ ,, but moulded both sides	,, 2 4
2″ ,, ,, ,, ,,	,, 3 0
4″ × 3″ deal, rebated and moulded frames	F.R. 1 0
4½″ × 3½″ ,, ,, ,,	,, 1 4
1¼″ deal tongued and moulded window board, on and including deal bearers	F.S. 1 9
1¼″ deal treads, 1″ risers in staircases, and tongued and grooved together on and including strong fir carriages	,, 2 6
1½″ deal moulded wall strings	,, 2 1
1½″ ,, outer strings	,, 2 4
Ends of treads and risers housed to string	Each 1 9
3″ × 2″ deal moulded handrail	F.R. 1 3
1″ × 1″ deal balusters and housing each end	Each 2 0
1½″ × 1½″ ,, ,, ,,	,, 2 9
3″ × 3″ deal wrought framed newels	F.R. 1 3
Extra only for newel caps	Each 6 0
Do., pendants	,, 6 0

SMITH AND FOUNDER

	£ s. d.
Rolled steel joists, cut to length, and hoisting and fixing in position	Per cwt. 16 6
Riveted plate or compound girders, and hoisting and fixing in position	,, 1 0 6
Do., stanchions with riveted caps and bases and do.	,, 19 0
Mild steel bar reinforcement, ½″ and up, bent and fixed complete	,, 17 6
Corrugated iron sheeting fixed to wood framing, including all bolts and nuts 20 g.	F.S. 11
Wrot-iron caulked and cambered chimney bars	Per cwt. 1 10 0

PLUMBER

	£ s. d.
Milled lead and labour in flats	cwt. 1 18 6
Do. in flashings	,, 2 2 0
Do. in covering to turrets	,, 2 7 6
Do. in soakers	,, 1 13 3
Labour to welted edge	F.R. 3½
Open copper nailing	,, 3
Close ,, ,,	,, 4

		½″ s. d.	¾″ s. d.	1″ s. d.	1½″ s. d.	2″ s. d.	4″ s. d.
Lead service pipe and fixing with pipe hooks	F.R.	10	1 0	1 3	2 0	2 10	—
Do. soil pipe and fixing with cast lead tacks	,,	—	—	—	—	—	5 6
Extra, only to bends	Each	—	—	—	—	2 0	6 9
Do. to stop ends	,,	6½	8	9	11	1 0	—
Boiler screws and unions	,,	3 3	3 9	5 0	8 0	—	—
Lead traps	,,	—	—	—	6 3	8 9	—
Screw down bib valves	,,	6 9	9 6	11 0	—	—	—
Do. stop cocks	,,	7 0	9 6	12 6	—	—	—

	£ s. d.
4″ cast-iron ½-rd. gutter and fixing	F.R. 1 0
Extra, only stop ends	Each 1 0
Do. angles	,, 1 6
Do. outlets	,, 2 9
4″ dia. cast-iron rain-water pipe and fixing with ears cast on	F.R. 1 2
Extra, only for shoes	Each 1 3
Do. for plain heads	,, 5 6

PLASTERER AND TILING

	£ s. d.
Expanded metal lathing, small mesh	Y.S. 2 0
Do. in n/w to beams, stanchions, etc.	,, 2 9
Lathing with sawn laths to ceilings	,, 1 3
½″ screeding in Portland cement and sand or tiling, wood block floor, etc.	,, 1 5
Do. vertical	,, 1 7
Rough render on walls	,, 1 2½
Render, float and set in lime and hair	,, 1 9
Render and set in Sirapite	,, 1 11
Render, backing in cement and sand, and set in Keene's cement	,, 2 9
Extra, only if on lathing	,, 4
Keene's cement, angle and arris	F.R. 6
Arris	,, 1½
Rounded angle, small	,, 3
Plain cornices in plaster, including dubbing out, per 1″ girth	,, 1½
1″ granolithic pavings	Y.S. 3 6
1½″ ,, ,,	,, 4 6
6″ × 6″ white glazed wall tiling and fixing on prepared screed	,, 17 6
9″ × 3″ ,, ,, ,, ,,	,, 1 2 6
Extra, only for small quadrant angle	F.R. 8

GLAZIER

	s. d.
21 oz. sheet glass and glazing with putty	F.S. 6½
26 oz. do. and do.	,, 7½
Flemish, Arctic Figured (white) and glazing with putty	,, 1 1
Cathedral glass and do.	,, 1 2
Glazing only, British polished plate	,, 7
Extra, only if in beds	,, 2
Washleather	F.R. 4

PAINTER

	s. d.
Clearcolle and whiten ceilings	Y.S. 6
Do. and distemper walls	,, 9
Do. with washable distemper	,, 1 1
Knot, stop, prime and paint four coats of oil colour on plain surfaces	,, 3 3
Do. on woodwork	,, 3 6
Do. on steelwork	,, 3 0
Do. and brush grain and twice varnish	,, 5 6
Stain and twice varnish woodwork	,, 1 11
Stain and wax-polish woodwork	,, 4 6
French polishing	F.S. 1 2
Stripping off old paper	Piece 2 0
Hanging ordinary paper	from ,, 2 9

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·POILITE· RIGID RUBBER SLABS: (Composed of rigid asbestos-cement backing, rubber faced.)

STANDARD SIZES:

6'0" × 3'0"
5'0" × 3'0"
4'0" × 3'0"
3'4" × 3'4"
3'0" × 3'0"
3'0" × 2'0"

Standard thickness 5/16"

STANDARD COLOURS: For full range of mottled and self-coloured slabs see reverse side of this Information Sheet

FIXING: When used on walls the slabs should be screwed to wooden frames, or battens not exceeding 2'0" centres. Slabs for counters etc may be mechanically fixed.

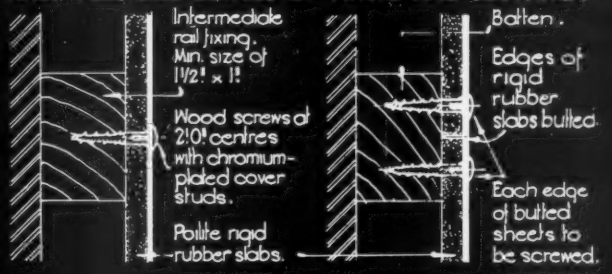
MAINTENANCE: Slabs may be polished to give a gloss surface, or washed to give an eggshell finish as desired.

TYPICAL FIXING OF SLABS TO MASONRY WALLS:

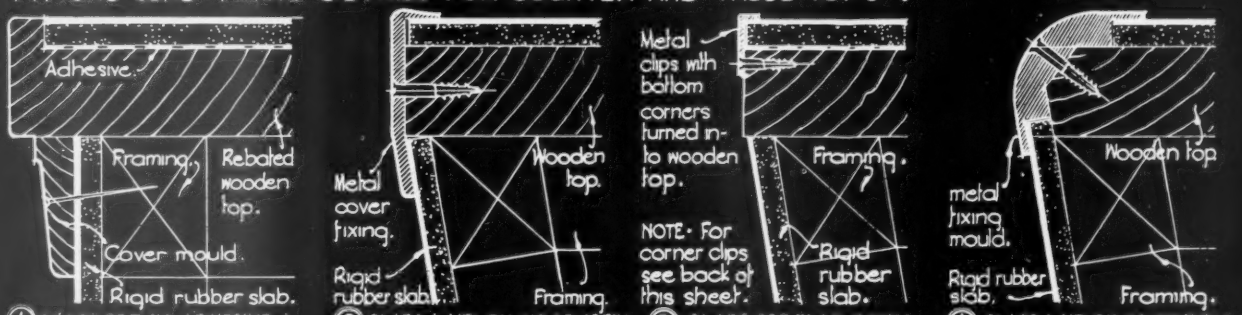
TABLE SHOWING SPACING OF BATTENS:

LENGTH OF SLAB.	SPACING OF VERTICAL BATTENS.	SPACING OF HORIZONTAL BATTENS.
3'0"	18" centres. ..	18" or 24" depending on width of slab.
3'4"	20" " . .	20" centres.
4'0"	16" " . .	18" " .
5'0"	20" " . .	18" " .
6'0"	18" " . .	18" " .

HALF FULL SIZE DETAILS OF FIXING AND JOINTING:



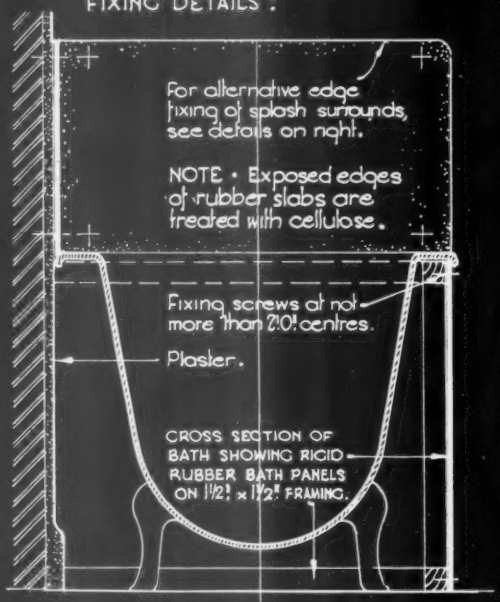
TYPICAL SLAB-FIXING DETAILS FOR COUNTER AND TABLE TOPS:

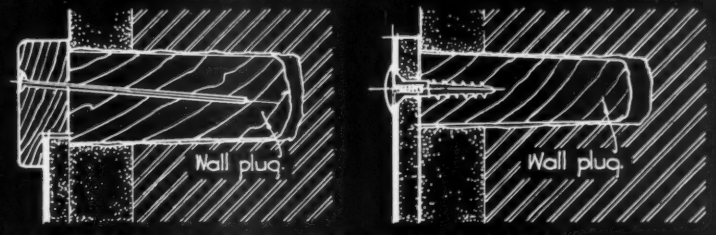


① SLABS SET IN ADHESIVE: ② SLABS LAID ON WOODWORK: ③ SLABS SET IN ADHESIVE: ④ SLABS LAID ON WOODWORK:

·POILITE· RIGID RUBBER SLAB BATH PANELS AND SPLASH PANELS:

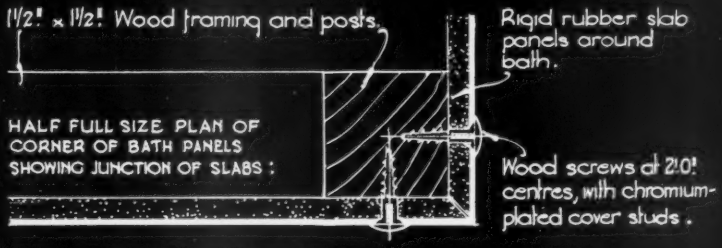
FIXING DETAILS:





ALTERNATIVE EDGE FIXING FOR SPLASH SURROUNDS:

Surrounds may be fixed direct to wall plugs by wood screws or may be supported in rebated wood or metal strips nailed or screwed to plugs.



Information from Turners Asbestos Cement Co.-Branch of Turner & Newall Ltd.

INFORMATION SHEET: RIGID RUBBER BUILDING SLABS:
SIR JOHN BURNET TAIT AND LORNE ARCHITECTS ONE MONTAGUE PLACE BEDFORD SQUARE LONDON WC1· Orea A. Bayes.

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INFORMATION SHEET

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RUBBER - FACED BUILDING SLABS

Description :

" Poilite " rigid rubber slabs are composed of a rigid asbestos-cement backing, rubber-faced. The rubber surfacing is approximately $\frac{1}{8}$ in. thick, and attached to the asbestos-cement base in a manner which eliminates the risk of creeping or lifting. The slabs are designed to provide a permanent form of waterproof and decorative panelling to walls, counter tops and fronts, etc.

Fixing :

When fixed to walls the slabs are screwed to wooden frames, or to battens spaced up to a maximum of 2 ft. centres, to suit the length of the slab used.

A variety of methods are shown for fixing to counter and table tops. The slabs may be set in adhesive or mechanically fixed, while metal cover moulds or clips may be used along the front edges. Cappings are also available in the form of $\frac{3}{8}$-in., 1-in. and 2-in. quadrants for dado work, etc.

Another method of fixing, not shown in the illustrations, is to cut small discs of rubber from the face of the slabs with a hollow punch. These discs should be slightly larger than the heads of the screws which are to be employed for fixing. After careful removal of the discs, the slabs are drilled and countersunk, and fixed with ordinary countersunk screws. Finally, the rubber discs are stuck back in position, by the use of Certus or other suitable adhesive over the heads of the screws. This method provides a nearly invisible fixing.

Properties :

The rubber facing forms an easily cleaned and washable surface, not readily damaged. The slabs give considerable insulation against sound and heat.

Colours :

The surfacing is obtainable in a range of forty patterns, including plain and mottled effects.

Size and Thickness :

The standard slab thickness is $\frac{5}{16}$ in., and sizes from 3 ft. by 2 ft. up to 6 ft. by 3 ft. are obtainable.

Price :

12s. per square yard.

Name of Manufacturer :

Turners Asbestos Cement Co., Branch of Turner and Newall, Ltd.

Address (Head Office) :

Trafford Park, Manchester, 17.

Telephone : Trafford Park 2181 (8 lines).

London Office :

Asbestos House, Southwark Street, S.E.1.

Telephone : Waterloo 4041.

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CALCULATION OF NUMBER AND WIDTH OF EXITS:

The formulae which follow have been devised to enable the responsible authority to determine the provision which ought to be made as regards number and width of exits in any part of a building.

(1.) For determination of total width of exits required from each portion of a building (e.g., auditorium at ground level, circle, gallery, etc.) in premises with closely seated audience, & in dance halls, restaurants, etc.

$$A. = \frac{Z \times \text{FLOOR AREA IN SQUARE FEET.}}{E \times B \times C \times D.}$$

NOTE: When a fraction of 0·3 or over results, take next higher whole number. When less than 0·3, take next lower whole number.

WHERE:

A.= NUMBER OF UNITS OF EXIT WIDTH REQUIRED:
One unit is 22!. Exits should be in multiples of this width, with no exit less than two units in width.

In existing buildings:
Doors 40! to 55! wide count as 2 units.
" 56! to 75! " " " 3 " .
" 76! to 100! " " " 4 " .
" 101! to 125! " " " 5 " .

B.= CONSTRUCTION OF BUILDINGS:
'Class A' Buildings . . . . B. = 6.
'Class B' Buildings . . . . B. = 5.
'Class C' Buildings . . . . B. = 3.
For explanation of types, see Sheet No 3. of this series.

C.= ARRANGEMENT & PROTECTION OF STAIRS:
For places not more than 21 inches above or below ground level. C. = 6.
Stairs from places on a single floor not more than 5 feet above or below ground level. C. = 5.
Enclosed stairs from circle or gallery or stairs leading down to vestibule or direct to open air. C. = 4.
Stairs from circle or gallery unprotected & coming down into main floor of building. (NOTE - In such cases the exits from ground floor must be of sufficient width to handle persons from circle or gallery. C. = 3.

D.= EXPOSURE HAZARD:
Places of public assembly will usually be rated as Medium Hazard.
This factor for High Hazard is provided to cover a situation where exposure hazard may be serious. (See list of risks on Sheet No 1 of this series.)
High Hazard . . . . D. = 1.
Medium Hazard . . . . D. = 2.

E.= A FACTOR DEPENDENT UPON HEIGHT OF FLOOR ABOVE OR BELOW GROUND LEVEL:
Each circle, balcony or tier to be considered separately. If height or depth is intermediate, take nearest figure; when height is precisely midway between two values, take the lower value of the factor. Height above ground level is to be taken as mean height of a circle, gallery, etc.

WHERE HEIGHT
= 80. Feet . . . E. = 260.
= 70. " . . . E. = 280.
= 60. " . . . E. = 310.
= 50. " . . . E. = 340.
= 40. " . . . E. = 370.
= 30. " . . . E. = 400.
= 20. " . . . E. = 440.
= 10. " . . . E. = 470.

AT GROUND LEVEL . . E. = 500.

WHERE DEPTH
= 5. Feet . . . E. = 470.
= 10. " . . . E. = 440.
= 15. " . . . E. = 370.
= 20. " . . . E. = 340.

Z. CLASS OF USER OF BUILDING:
User for closely seated audience Z. = 50.
User as dance hall, restaurant, etc. Z. = 30.

(2.) For determination of number of exits required.

$$N. = \frac{A}{4} + 1.$$

WHERE:
N. = NUMBER OF EXITS REQUIRED.
A. = NUMBER OF UNITS OF EXIT WIDTH REQUIRED AS DETERMINED BY THE USE OF FORMULA 1.

NOTE: When a fraction of 0·5 or over results, take next higher whole number: when a fraction less than 0·5 results, take next lower whole number.

The following figures will be found useful in connection with these formulae:

(a.) About 40 persons per minute can pass an exit or move down a stairway per unit of exit width.

(b.) To ascertain the number of persons in a closely seated audience and allowing for, say, an additional 10 per cent. standing, divide the number of square feet of floor area by 6.

(c.) To ascertain the number of persons in a dance hall or similar place divide the number of square feet of floor area by 10.

NOTE: The formulae described above may appear complicated, but will not be found difficult to apply in practice. In the application of these formulae Recommendation 13 should be borne in mind. (See back of Sheet No 1. of this series).

Extract from the "Manual of Safety Requirements in Theatres & other Places of Public Entertainment" (Home Office) 1934.

INFORMATION SHEET: PLANNING DATA: PLACES OF PUBLIC ENTERTAINMENT. 2.

SIR JOHN BURNET TAIT AND LORNE ARCHITECTS ONE MONTAGUE PLACE BEDFORD SQUARE LONDON WC1. Oscar A. Bayne

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INFORMATION SHEET

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PLACES OF PUBLIC ENTERTAINMENT—II

Subject : Calculation of number and width of exits

The material given on this sheet is taken from the Manual of Safety Requirements in Theatres and other places of Public Entertainment, published by the Home Office, 1935. The recommendations given in this Manual and here quoted form a code of minimum requirements for the guidance of Local Authorities.

Exits :

The primary need in an emergency, when the audience is assembled, is ability to evacuate the premises as quickly as possible. The requirements of space outside the building have already been considered on Sheet No. 1 of this series. In this sheet consideration is given to the important question of the number and size of the exits in the building itself. Unless these are adequate no other precautions, taken by themselves, may prevent a disaster.

Any adequate consideration of the question of exits must also embrace all the arrangements which enable members of the audience to move quickly from their seats to the street. The width between seats, width of gangways whether between, behind or flanking the seating, dimensions and planning of stairways and corridors, arrangement and width of exit doors, emergency lighting, the provision and lighting of exit notices, and the types of fastenings permitted on exit doors—all these factors have a direct bearing on the speed with which the building can be cleared. These matters are dealt with in the Manual, and to obtain a true estimate of the safety of any audience they should be considered together.

Unit of Exit Width :

It has been decided to use, in the calculation of the exits necessary in the buildings under consideration, a "unit of exit width" of 22 ins. Information obtained from abroad, and experiments carried out at the British Empire Exhibition and elsewhere in this country, prove that this is about the minimum width which will allow the largest person, or even a woman leading a child, to pass in comfort. With this knowledge and with knowledge of the approximate speed at which persons move when clearing a building, the time taken for a given number of persons to move through an exit two or more units in width can be estimated or, to put it the other way, the number of units of exit width required to empty a building in a given time can be stated.

This unit of exit width should be used for exit doors, corridors, stairways, passages and so on, in all new buildings, and it will be seen that in existing buildings an exit not less than 40 ins. wide may be allowed to be reckoned as two units, an exit not less than 56 ins. wide as three units, and so on.

Other Factors :

In working out the units of exit width required in any building, new as well as old, it is considered essential to take into account certain factors which have a direct bearing on the number of exits required. These factors include :

(B) The construction of the building concerned, for it cannot be considered unreasonable to require in a "Class C" building just double the amount of exit width which would be considered adequate in a building rated as "Class A"; and

(C) The arrangement and protection of stairs, for if stairs from galleries are unprotected and come down into the body of the hall, it is quite possible that at least half such stairways may be rendered impassable, making the provision of extra stairs a necessity.

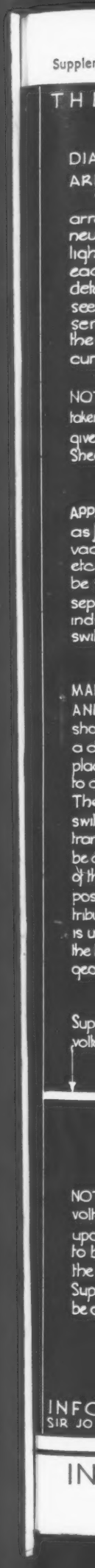
Factor (D) covers the question of exposure hazard or risk arising from neighbouring premises. (See Sheet No. 1 of series.)

The height above ground level (E) should also have some bearing on the question of exit facilities ; spectators occupying gallery seats have farther to travel than others.

The factor (Z) covers the class of user of the building, for it is not necessary to provide quite the same exit facilities from a dance hall or restaurant, where the density of occupation is rarely more than one person to every ten square feet, as are required with a closely seated audience where the density amounts to about one person to every six square feet. These factors, with the floor area in square feet of the part of the building concerned, are used in a simple formula which gives the number of units of exit width required. Having found this, an equally simple formula will indicate the number of exits required ; this precludes the provision of a small number of large exits instead of a greater number of smaller exits. For instance, if 16 units of exit width are required, two 8-unit exits may not be allowed, but five exits (totalling 16 units) will be required.

Positioning of Exits :

The positioning of exits is a much more difficult matter, because questions of site and layout might make any hard and fast requirements as to placing of exits a real hardship. A minimum distance from any part of a gangway to an exit door, however, is laid down. This must not be more than 70 feet, 60 feet and 40 feet in buildings of "Class A," "Class B" and "Class C" construction respectively and, as persons move on the average at not less than 40 feet per minute, it will be clear that even those most distant from an exit will reach an area of comparative safety in about one minute in buildings of "Class C" construction and in about one minute forty-five seconds in a building of "Class A" construction.



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DIAGRAMMATIC LAYOUT OF SWITCHGEAR FOR DISTRIBUTING ELECTRICITY FOR LIGHTING AND POWER IN SINGLE OR MULTI-STOREY BUILDINGS

ARRANGEMENT OF DISTRIBUTION: The diagram below shows a typical arrangement of a three phase and neutral system of distribution, with the lighting load balanced between each phase and neutral. (For full details of this & other systems of wiring see Information sheet N° 2 of this series.) It has been assumed that the electrical energy is alternating current supplied at 11,000 volts.

INCOMING CIRCUIT BREAKERS: The incoming circuit breaker on the main low voltage distribution switchboard must be of sufficient current carrying capacity to take the full electrical load of the building.

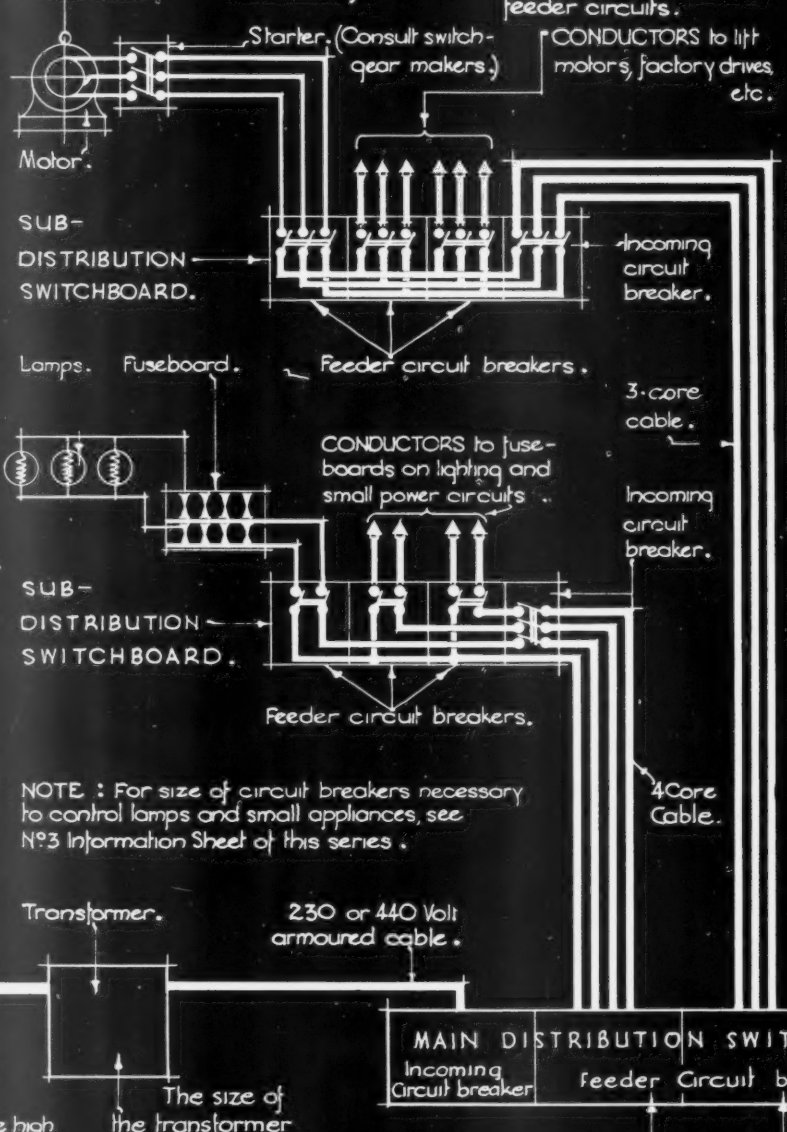
FEEDER CIRCUIT BREAKERS: The size of the individual feeder circuit breakers depends upon the full load of each feeder circuit. The number of circuit breakers required for the Main Distribution Switchboard depends upon the number of feeder circuits.

FULL ELECTRICAL LOAD: Full electrical load means the load imposed by all the apparatus likely to be in use simultaneously & not that imposed by all the apparatus installed.

NOTE: The current taken by motors is given on Information Sheet N°2 of this series.

APPLIANCES: Such as fans, washers, vacuum cleaners, etc., should each be served by a separate circuit with individual plug, switch and fuse.

MAIN SWITCHGEAR AND TRANSFORMERS should be housed in a dry, well ventilated place accessible only to authorised persons. The high voltage switchgear and transformers should be as near to the end of the service line as possible. The main distribution switchboard is usually housed with the high voltage switchgear & transformers.



NOTE: For size of circuit breakers necessary to control lamps and small appliances, see N°3 Information Sheet of this series.

NOTE: The size of the high voltage switchboard depends upon the total Kilo-Volt Amps. to be controlled and upon the requirements of the Supply Authority, who should be consulted as early as possible.

The size of the transformer expressed in kilo-volt-amperes (K.V.A.) is governed by the number of lamps, appliances & motors that are to be supplied.

SUB-DISTRIBUTION SWITCHBOARDS should be housed in a convenient place near the apparatus controlled, & the space required by SUB-DISTRIBUTION CIRCUIT BREAKER SWITCHBOARDS depends upon the number of circuit breakers & the current (amperage) to be controlled.

For tables giving the current equivalent of watts and kilo-watts i.e. the consumption of energy by various appliances at various voltages, see Information Sheets numbers 2 and 3 of this series.

NOTE: For tables giving sizes & space required by electric switchgear & transformers, see N°3 Information Sheet of this series.

Information from George Ellison Limited.

INFORMATION SHEET • ELECTRIC SWITCHGEAR • 1 • GENERAL ARRANGEMENT •

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INFORMATION SHEET

• 411 •

ELECTRIC SWITCHGEAR

The Distribution of Electrical Energy in Buildings :

Distribution of electrical energy in medium or large buildings is usually arranged in the following manner.

The Supply Authority provides alternating current at 3,300 or, more generally, 11,000 volts. As it is not practicable to use these pressures for service in the building a transformer is used to convert the energy to a lower working pressure.

The most usual pressure is 230 volts for lighting, heaters and domestic motors, but 440 volts is often used for larger motors.

This low-pressure current must be distributed to the various floors or sections of the building from a main switchboard. Cables from this switchboard will serve sub-distribution boards on each floor.

The general scheme is shown on the front of this sheet.

Loading of Electrical Appliances :

Except for motors, it is convenient to express the loading of electrical appliances, such as lamps, heaters, cookers, etc., in watts (the product of volts and amps).

1 000 watts is a kilowatt (kW).

The information given on the front of Sheet No. 2 of this series is designed to give the current (amps) taken by any load on any of the systems of supply shown.

Tables 7, 8 and 9 on Sheet No. 3 show the number of lamps or other appliances that can be controlled by standard circuit breakers.

Motors are referred to as X horse-power, which is the output. Tables Nos. 1-4 on Sheet No. 2 give the current taken by alternating and direct current motors.

Transformer Sizes :

These are expressed in kilo volt amperes (kVA) and Table No. 11 on Sheet No. 3 shows kVA converted into amperes and the nearest size of circuit breaker required to control the main incoming supply from the transformer.

Table No. 10 shows the number of lamps or appliances which a 100-kVA transformer will supply ; larger transformers will supply a proportionately larger number of appliances. Approximate dimensions of transformers are given in Table No. 5 on Sheet No. 3.

Space Required by the Switchboards :

This will depend upon the size of each circuit breaker and the size of each circuit breaker is in turn dependent upon the current (amperage) to be controlled.

Dimensions of the several sizes of circuit breakers which may be assembled together to form a switchboard are given in Table No. 6 on Sheet No. 3.

Figs. 1, 2 and 3 at the foot of this page show three ways of arranging a switchboard, depending upon the space available.

Name of Switchboard Manufacturers : George Ellison, Ltd.
Address : Perry Barr, Birmingham, 20
Telephone : Birchfields 4562

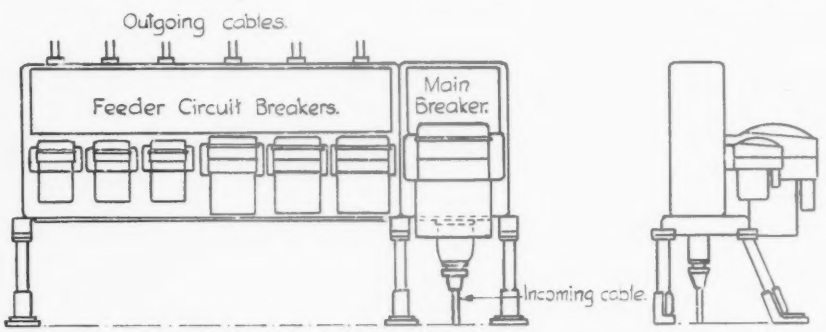

FIG. 1: Single tier switchboard with one main and six feeder circuit breakers.

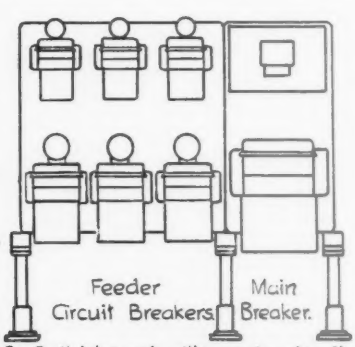

FIG. 2: Switchboard with main circuit breaker over 300 amps. and six feeder circuit breakers arranged in two tiers.

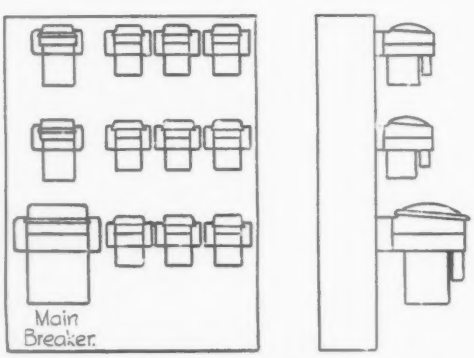

FIG. 3: Switchboard with circuit breakers arranged in three tiers.