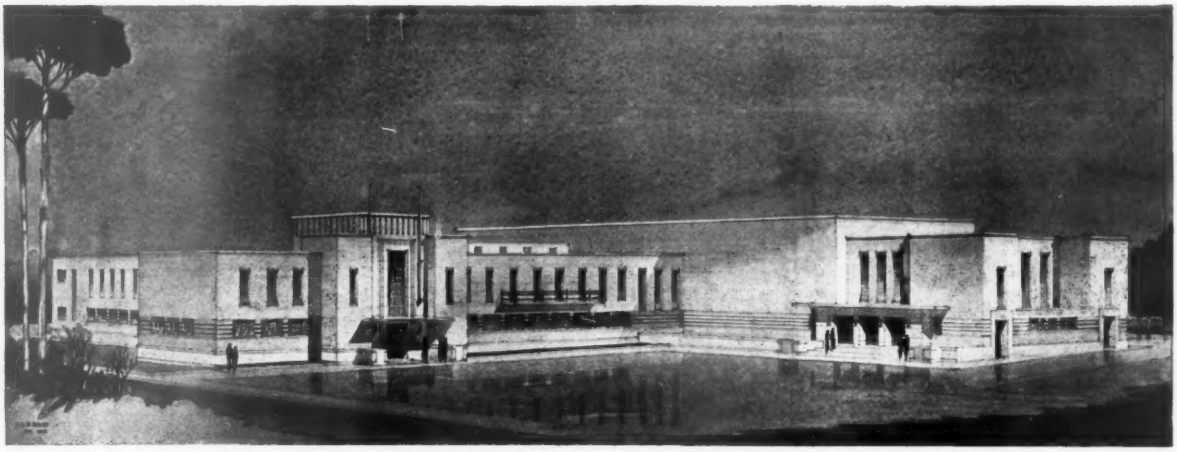
PROPOSED MUNICIPAL BUILDINGS, ROMFORD

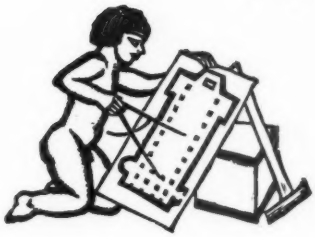
BY H. R. COLLINS AND A. E. O. GEENS



PERSPECTIVE, by Mr. A. E. O. Geens, of the winning design in the competition for proposed municipal offices and assembly hall for the Romford Urban District Council. Elevations and plans of the buildings were published in our issue for August 8 last.

RECONSTRUCTION

The fifteenth-century Hurstmonceux Castle in Sussex, the reconstruction of which is now nearing completion, under the supervision of Mr. Walter H. Godfrey.



THE NEW HOUSING ACT

WE commented in our issue for August 8 on the system of differential renting now in force at Leeds, under which subsidies are entirely separated from dwellings, and every tenant who can afford to pay the full municipal economic rent (reckoned as the averaged cost of the dwelling to the city council) has to pay it.

The Housing Act, 1935, provides for the consolidation of local authorities' income and expenditure on State-aided housing schemes and for the unification of conditions affecting local authorities' houses. That is to say, it makes possible the application of a full system of differential renting. The Act lays down that "in fixing rents the authority shall take into consideration the rents ordinarily payable by persons of the working classes in the locality, but may grant to any tenant such rebates from rent, subject to such terms and conditions, as they may think fit."

The rents of working-class dwellings of the same type in the same area often vary widely, and in areas where sub-letting is common, or where a large proportion of the inhabitants are living in council houses built under different Acts, the conception of "the rents ordinarily payable by persons of the working classes" becomes exceedingly complex. Does the Act intend local authorities to "take into consideration" the rents actually paid, regardless of whether they are paid for back-to-backs, new dwellings on estates developed by private enterprise (for which there is generally no such thing as paying rent), two-room tenements, single rooms, or other accommodation? And if so, and if not, what is to be understood by the words, "take into consideration"?

Are we to presume that the words represent a veiled appeal to local authorities not to "undercut" private enterprise? Or that it is intended that the average rent at present paid in a particular area shall serve as an average for the rents to be fixed in the future for houses under the control of the local council? Or that the rents paid at present for houses of different types are to be taken as representing the maximum amounts that their inhabitants can be expected to pay?

We cannot answer these questions, but we trust that some official explanation of the first 22 words of Section 51 (5) of the Act will soon be forthcoming.

It is important to remember that there is no legal obligation under the Act to grant any rebates at all, though there is an implicit obligation to remove differences at present existing between the rents of similar houses in the same area where these are merely the result of the different economic conditions prevailing at the time of their erection and the different Acts under which they were completed.

Information as to the level of rents paid will obviously have to be obtained by local authorities in order properly to comply with the first 22 words of the sub-section, which are compulsory. Whether information as to incomes and the type of accommodation represented by each rent-figure will have to be obtained depends on the interpretation of those words. It is certain, however, that details of rents and incomes will have to be collected by local authorities intending to fulfil their obvious social duty under the permissive words of the Section. And the inspections to be made under Section 1 of the Act should be used to gather details as to type of accommodation.

All this goes to show, incidentally, the necessity for local authorities, wherever possible, to make their inspections under Section 1 as complete a record of the housing conditions in their areas as they can. This does not contradict—indeed, it reinforces—our conviction that the duty of undertaking these surveys should not have been laid upon the local authorities by the Act.

The principle firmly laid down in connection with the 1930 Act, that rent relief should be given only to those who need it and only for so long as they need it, is obviously the only one likely to bring us to the ideal of a decent dwelling for every person at a rent he can afford to pay. In order that the rent relief available for those who need it shall be as large as possible, it is necessary to assure that no rent relief is given to those who do not need it. The principle of using the averaged cost of the dwelling to the council as the normal rent, payable by those who can afford it, seems to us to produce a fair datum-line. When introduced in Leeds, it resulted, of course, in many rents being raised. That is a factor which local authorities must be induced to face, and a sacrifice which council-tenants of comparatively comfortable means owe to those who, owing to their poverty, have lived, all too long, either in municipal dwellings or in less satisfactory accommodation paying rents in excess of their means.

The Architects' Journal
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NOTES & TOPICS

TOWN PLANNING IN EXISTING CITIES

SINCE suggesting that an estimate should be made of the amount of space needed for the various activities carried on in existing cities, I have been looking at the 1931 Census for London. As it seems to be generally taken for granted that the most acute slum problem and the most acute overcrowding problem, both of housing and industry, occur in the East End of London, I thought it interesting to abstract a few particulars.

*

The population of the eight East London boroughs is 1,314,764, the number of families 333,279, and the area 13,365 acres. There is, therefore, just over ten acres of land (including that covered by water) for each 1,000 of the population for all purposes, and the question is—is 10 acres enough?

*

The National Playing Fields Association, I understand, aims at seven acres of open space per 1,000 population; American town planners estimate that more is needed. From the reports it appears that London County Council housing is at a density of about 1,000 persons to three acres.

*

If these are sound figures there is just enough space in the East End of London for the present inhabitants to live and play, but not to work. This would be, no doubt, an ideal arrangement, but at our present stage of civilization it is not exactly practicable.

*

Suppose, for the sake of illustration, that for each 1,000 persons the amount of space needed is three acres for housing, five acres for recreation, and five acres for other purposes, it would mean that about 300,000 people at present living in the East End of London would have to be provided for, with houses, work places, and recreational spaces elsewhere.

*

If some broad, but authoritative, estimate on these lines could be made for existing cities we would really begin to understand what the town-planning problem is, and decentralization and new towns, about which there has been a great deal of talk, would begin to have much more meaning.

HOUSE FAULTS

I was more than interested to read in Monday's issue of the *Daily Express* the results of their "House Faults" post card competition.

*

Out of several thousands of replies (the exact number is not given) the surprising thing is that only 5 per cent. complain of inadequate cupboard space, while the greatest number, 34 per cent., deplore bad planning or faulty construction.

*

Few complaints concern hygiene, but there are bitter and usually justifiable tears over kitchen planning and equipment.

*

The encouraging point about this contest is that the British housewife is shown to be decidedly plan-conscious, and that she is beginning to appreciate some of the essential needs of an economical house plan.

*

From the replies I have read I suspect that few of the houses complained of have been designed by architects. The contest would have been much more illuminating and far more authoritative if the post cards had stated whether the houses had been designed for living, or were merely the result of traditional jerry-building.

*

On the negative side the contest shows us that the average housewife is not yet noise-conscious. While several people complain of noisy joinery, rattling windows, and so forth, few fail to tolerate noisy floors and sound-transmitting walls and partitions.

*

Perhaps the modern housewife is temporarily regarding the noise nuisance as inevitable, just as at one time she accepted the wasteful and inconvenient plan.

*

But I predict that in a few years' time complaints against noise in houses will head the popular poll . . . for, by that time, there will be a sufficient number of properly designed houses erected to show convincingly that noise in buildings can be cured as readily as it has been cured in motor cars.

SCHOOLS AND IDEALS

A renewed enthusiasm among my youthful acquaintances reminds me that this week witnesses the reassembly of most of our schools of architecture.

*

Throughout the country, and especially in London, some hundreds of students this week apply their minds to the mastering of this exacting profession of ours, some for the first time and some with the humility (or, alas, conceit) of the 5th-year student.

*

Most of these students have a far greater opportunity of achieving this mastery than we of the old pupilage days had, but I wonder how many realize the opportunity? Now, if I had the guidance of an important year in a school, I would impress upon the sincerity of youth that their opportunity is immense—they have the means of acquiring deep and essential knowledge of the broadest possible field of architectural experience, of combining the essence of yesterday's work with the scientific and æsthetic outlook forecast for tomorrow.

*

Again, I wonder how many students realize this unique

Alvar Aalto. See note on this page.

opportunity? I have the greatest admiration for the enthusiasm and sincerity of my more youthful friends—but I *do* wish they would extend their architectural experience beyond the narrow groove cut into our social-economic fabric by concrete and glass, by steel and plastics.

*

In such materials they undoubtedly have access to structural freedom—what remains to be done is to humanize the resultant forms, to regain a more happy and joyous expression than the rigid simplicity which the purely intellectual use of new building methods suggests.

FINNISH ADVENTURE

A correspondent of mine who has just come back from a quick tour in Finland is full of praises for Aalto's Sanatorium at Paimio, but even more grateful that Aalto's charming imperturbability has survived his recent illness.

*

Faced with the most appalling mishaps, Aalto produces a gentle smile and the remark: "It is of *no* importance"—and this was done:—

(*a*) When Aalto's car caught fire and the party's luggage was just saved in time.

(*b*) When a small town, suggested for lunch after a map consultation, was found to have no physical existence at all. (The photograph on this page shows Aalto immediately before a 4 o'clock lunch on this particular day.)

(*c*) When my correspondent expressed a fear of catching tuberculosis on being offered a night's shelter at Paimio.

(*d*) When the Stockholm boat was found to be leaving on time while Aalto was assuming it would be late.

*

But in spite of it all my correspondent enjoyed himself immensely, and is now wanting to get back again as soon as he can.

ICELAND PAINTINGS

Yesterday at the Walker Galleries in Bond Street, I saw a remarkable show of drawings and paintings of Iceland, by Mr. Alan Sorrell.

*

Remarkable not only on account of the individual quality in their drawing and painting, but remarkable also for the precision with which they display the contrasting peculiarities of that northern country.

*

Iceland, Mr. Sorrell shows us quite calmly, has little building tradition but manages to excite the most cheerful moods in an architecture of brightly painted corrugated iron beneath great mounds of turf-covered roofs. High winds and depressions, crystal-clear atmosphere and thick fogs, glacial ice and natural hot-water springs, colourful corrugated iron and yet a long tradition of fine craftsmanship in jewellery and filigree work.

*

These paintings, and especially the interpretive drawings depict so knowledgeably these unusual contrasts that regret that one must await the spring to witness their delights in person.

IRISH TU-QUOQUE

I have been looking at some cuttings from recent issues of the *Irish Press* on the subject of modern architecture.

*

The contributions are not of any great originality—just the usual arguments for and against the Modern Movement (or, rather, in the case of "against" what those who are a little frightened of reality *imagine* to be the Modern Movement) such as appear from time to time in the popular Press—and, for that matter, in the technical Press.

*

But they represent so typical an example of the whole, often-repeated business of enlightenment, misconception, delusion and reiteration that the cuttings might be preserved in a museum as a concise specimen of the "traditional versus modern" fallacy. Some future philosopher might be very interested to learn what different things "tradition" can mean to different mentalities.

*

It all began with a harmless enough article by John O'Gorman, one of the youngest Dublin architects, in which he simply set out the genesis of the modern movement and mentioned some of its achievements. This was attacked in a later issue by another Dublin architect who, out of kindness and out of respect for his official position, shall be nameless. All the old phrases about Nudism, "the soap-box style so simple a child could . . . etc," the apeing of continental fashions and so on were pathetically trotted out.

*

This in turn was answered by a third architect, Mr. Ryan—and here we come to what raises this correspondence from the ruck: he had the splendid idea of explaining his point of view by enunciating a series of deliberately platitudinous statements—in antagonism to the modern idea—such as are used again and again by its opponents, and then demolishing them one by one.

*

His "die-hard's credo" is both lifelike and entertaining in detail, and almost self-destructive in the mass. I give a few examples: "(1) This modern stuff is a new fangled affair; a product of the war and on all fours with outboard motor-boating, slimming and dancing marathons."

"(2) These modern architects are cheap sensationalists; a lot of wild young men in polo sweaters and no hats. All they need is notice."

"(3) The grand old buildings of the past . . ."

You see the idea?—Granny to the life! A quit effective technique.

ASTRAGAL

NEWS

POINTS FROM THIS ISSUE

HOUSING EXHIBITION, GLASGOW

Yesterday, October 2, the Town Clerk of Glasgow, Mr. David Stenhouse, opened the Housing and Health Exhibition in the Kelvin Hall, Glasgow. The Exhibition, which will remain open until October 26, includes specimen cottages built to the designs of the first three prize-winners in the recent competition promoted by the Glasgow Corporation; and the "All-Scottish" House, designed by Lt.-Col. G. Gardner M'Lean, O.B.E., for the Scottish National Development Council.

HACKNEY MARSHES

After a long discussion, the Hackney Borough Council last week agreed, with regret, to the L.C.C.'s plan to appropriate 30 acres of Hackney Marshes for housing purposes.

An earlier meeting of the local preservation committee passed a resolution stating that the L.C.C.'s proposal was a deliberate breach of faith and a precedent that made every open space in London unsafe.

NEW WHITEHALL OFFICES

We understand that Mr. Vincent Harris, F.R.I.B.A., has now reached the final stages of his plans for the proposed new Government offices in Whitehall, and that the plans are expected to be in the hands of the Cabinet before Christmas. The buildings are estimated to cost £2,000,000 and are intended to house the Air Ministry, the Board of Trade and the Ministries of Labour and Agriculture.

END OF 11,000 LIVERPOOL HOUSES

The demolition of 11,000 houses in the centre of Liverpool is proposed by the Director of Housing, Mr. L. H. Keay, F.R.I.B.A., as a preliminary to the entire redevelopment of the area to the north of the civic buildings in William Brown Street. The Housing Committee has unanimously approved the plan.

THE ARCHITECTS' DIARY

Thursday, October 3

LONDON MUSEUM, *St. James's, S.W.1 Exhibition of photographs, "New London from the Air." Open until further notice.* 10 *a.m. to* 6 *p.m.*

BUILDING TRADES EXHIBITION. *At Liverpool. Until October* 5.

INTERNATIONAL EXHIBITION OF INVENTIONS. *At the Central Hall, Westminster, S.W.1. Until October* 12.

HOUSING AND HEALTH EXHIBITION. *At Glasgow. Until October* 26.

ELECTRICAL ASSOCIATION FOR WOMEN. *At* 20 *Regent Street, W.1. "The Problems of the Builder in the All-Electric House." By E. Vane.* 2.30 *p.m.*

LONDON COUNCIL OF SOCIAL SERVICE. *At the County Hall, S.E.1. "Town Planning and the Expansion of the Metropolis." By Sir Raymond Unwin.* 4 *p.m.*

Friday, October 4

ARCHITECTURAL ASSOCIATION, 36 *Bedford Square, W.C.1. First of a series of five non-technical lectures on Building London. "How it Began." By E. R. Jarrett, A.R.I.B.A.* 8 *p.m.*

INSTITUTION OF STRUCTURAL ENGINEERS, *Western Counties Branch. At the Merchant Venturers' Technical College, Bristol. Address by Dr. Oscar Faber, O.B.E.* 7.15 *p.m.*

TOWN-PLANNING INSTITUTE. *Annual Country Meeting. At Eastbourne. Until October* 6. 3 *p.m.: in the Town Hall: "Development and Town Planning of Eastbourne." By Major Leslie Roseveare, O.B.E. (President).* 5 *p.m.: Council Meeting at the Grand Hotel.* 7.45 *p.m.: Reception and entertainment at the Devonshire Park by invitation of the Mayor.*

Saturday, October 5

TOWN PLANNING INSTITUTE. *At Eastbourne.* 10.30 *a.m. and* 2.30 *p.m. Motor coach tours.* 7.15 *for* 7.30 *p.m.: Institute Dinner at the Grand Hotel.*

Sunday, October 6

TOWN PLANNING INSTITUTE. *At Eastbourne. Morning free.* 2 *p.m.: Motor coach tour.*

Tuesday, October 8

ROYAL SANITARY INSTITUTE, 90 *Buckingham Palace Road, S.W.1. Discussion on "The Housing Act, 1935," to be opened by James Fenton, M.D., and J. S. Wheeler.* 5.30 *p.m.*

ILLUMINATING ENGINEERING SOCIETY, 2 *Savoy Hill, W.C.2. Presidential address by A. W. Berriell.* 5.30 *p.m.*

ARCHITECTS' AND TECHNICIANS' ORGANIZATION. *At the Conway Hall, Red Lion Square, W.C.1. "The World Crisis." By John Strachey.* 8 *p.m.*

Wednesday, October 9

INSTITUTION OF STRUCTURAL ENGINEERS. *Lancashire and Cheshire Branch. At the Engineers' Club, Manchester. Address by W. B. McKay.* 7 *p.m.*

INSTITUTE OF FUEL. *At Burlington House, Piccadilly, W.1. Presidential Address by Sir John Cadman.* 11.30 *a.m. Melchett Lecture. By H. R. Ricardo.* 2.30 *p.m.*

NORTH LONDON EXHIBITION

The High Commissioner for Southern Rhodesia, Mr. S. M. Lanigan O'Keeffe, will open the tenth annual North London Home Life Exhibition at the Alexandra Palace, N., on Wednesday next, October 9, at 2 p.m. The Exhibition will remain open until October 26.

SHIPS FOR REHOUSING PURPOSES

A suggestion that Glasgow might acquire two ships now lying in the Gareloch for rehousing dispossessed tenants, while the work of reconstruction in the city's housing areas was proceeding, was made by Mr. T. Johnston at a luncheon last week, following the formal opening of the 40,000th house completed by the Corporation of Glasgow since the war.

Mr. Johnston asked: "Would it be possible to acquire a couple of ships from the Gareloch and anchor them down near some of our industrial areas, if our Medical Officer of Health could get round the problem of sewage disposal? We would have immediately a large provision of decent sleeping accommodation, with decent cooking facilities, bathroom accommodation, and all the rest of it, where we could house our people during the time that reconstruction was taking place."

Mr. Johnston added that he thought the ships could be used in such a way under the Public Health Act, 1897.

In Glasgow, he said, one of the many problems was the acquisition of sufficient land to enable them to build houses. If there were insufficient land within their boundaries, then perforce land must be got; no archaic division of administration could be permitted to stand in the way of proper sanitary and healthy rehousing of the people.

WEST YORKSHIRE SOCIETY OF ARCHITECTS

On September 26, members of the above Society, including the President, Mr. Victor Bain, F.R.I.B.A., paid a visit to Lincoln Cathedral. The party was conducted round the building by Mr. Robert S. Godfrey, Clerk of Works to the Cathedral, who not only gave an exhaustive explanation of its many features, but also explained the recent damage to the fabric which occurred owing to the falling of a number of stones from the vaulting of the Angel Choir.

ARCHITECTS' REGISTRATION COUNCIL

At the fourteenth ordinary council meeting of the Architects' Registration Council of the United Kingdom, held in the R.I.B.A. building on Friday last, Mr. Pembroke Wicks, C.B.E., LL.D., was appointed to the position of Registrar of the Council, as from December 1 next.

INSTITUTE OF FUEL

On Wednesday next, October 9, at 11.30 a.m., Sir John Cadman, G.C.M.G., D.SC., the President-Elect of the Institute of Fuel, will be installed in the Presidential Chair of the Institute by the outgoing President, Sir Harry McGowan, K.B.E., in the Lecture Theatre of the Geological Society of London, Burlington House, Piccadilly, London, W.1. His installation will be followed by the presentation of his address to the members.

A.T.O.

A series of open meetings, to be addressed by well-known speakers, is being arranged by the Architects' and Technicians' Organization.

The first of these meetings will take place on Tuesday next, October 8, at 8 p.m., in the Conway Hall, Red Lion Square, W.C.1, when Mr. John Strachey will speak on "The World Crisis." Mr. S. Chermayeff, F.R.I.B.A., will occupy the chair.

BRIGHTON IMPROVEMENTS

The Brighton Seafront Improvement Committee is to consider a £250,000 scheme of alterations. Plans prepared by Professor S. P. Adshead, F.R.I.B.A., and the Borough

Surveyor include a bathing pool between the two piers at a cost of £50,000, and a new sea wall to cost £70,000.

ARCHITECTS' WILLS

Mr. Charles Dunck, Architect and Surveyor, of Totteridge, left £13,540 (net personalty, £9,602).

Mr. J. M. Mitchell, F.R.I.B.A., of Ramsey, Isle of Man, left £13,288 (net personalty, £11,675).

CHANGE OF ADDRESS

Mr. J. Roger Preston, M.I.MECH.E., M.I.H.V.E., Consulting Engineer, has removed his offices to Dilke House, Malet Street, W.C.1. Telephone Nos. : Museum 8225 and 8226.

COMPETITION

NEWS

SECONDARY SCHOOL, BEDFORD

The Bedfordshire County Council invites architects willing to compete in a limited competition for a new Secondary School for Boys, proposed to be erected in Luton, to send in their names to Mr. J. B. Graham, Clerk of the County Council, Shire Hall, Bedford, before October 26. From the names sent in, six will be selected and invited to submit designs.

To the unsuccessful selected competitors an honorarium of £10 10s. each will be paid, provided they submit a *bona fide* competitive design.

PUBLIC BATHS, OFFICES AND CLINIC, COATBRIDGE

At a meeting of the Coatbridge Town Council last week, it was announced that architects in Scotland would be invited to submit competitive designs for the public baths and swimming pond, and for the new public health offices and minor ailments clinic proposed to be erected on the site of the Old Caledonian Tube Works in Main Street, Coatbridge. Mr. W. B. Whitie, F.R.I.B.A., has been appointed assessor; and premiums offered will be : £250, £150 and £75.

SUGGESTED COMPETITION FOR CARDIFF

A recommendation that the proposed development of the Wood Street site by the Cardiff Corporation should be thrown open to competition was embodied in a resolution adopted by the Executive Committee of the Cardiff Civic Society last week.

The resolution pressed for a public competition to be held for the complete lay-out of the Wood Street area before any buildings were decided upon, the Society being concerned not only with the individual buildings, but also with their disposition on the site, with the planning of the roads, and the general lay-out.

[*For Competitions Open see page 439 of last week's issue.*]

LETTERS FROM READERS

Whither the Whipsnade Zoo?

THOMAS BAGSHAWE, F.S.A., F.R.Hist.S.

MICHAEL TAPPER, F.R.I.B.A.

SIR,—Between holidays and my only just having secured a copy of your issue for September 5, I have been unable to reply before to Mr. J. R. Rodgers' letter. If this is intended as a defence for the work of "the more serious section of modern architects" it leaves me just as muddle-headed and unconvinced as before. It is as clear to my mind as the mainland is to a stranded jelly-fish.

I feel genuinely elated! Bouquets seldom come my way. To be classed in my tastes with the President of the Royal Institute of British Architects is an honour. I admire and agree with his words just as I respect God's handiwork. But to be called a "muddle-headed" Englishman makes my bosom swell with pride. I revel in it. I sing to myself :

For he might have been a Roosian,
A French, or Turk or Proosian,
Or perhaps Itali-an!
But in spite of all temptations,
To belong to other nations,
He remains an Englishman!
Hurrah!
For the true-born Englishman!

Gilbert here is my laudator. How well poor old England has muddled through! I have travelled a good deal but still have no great desire to "belong to other nations."

But "revenons à nos moutons" (to borrow something useful from abroad). It was always our idea hereabouts that the object of Whipsnade Zoo was that at the price of our disturbed peace we should be treated to the sight of animals and birds living in tolerably natural surroundings. The picture in your issue for September 5, page 334, reminds me more of the setting for a mannequin parade in a fashionable dressmaker's shop. Good gracious, if this sort of thing is countenanced, elephants will need lip-sticks and platinum blonde tails!

Mr. Rodgers unkindly credits me with Victorian ideas—a cruel cut since it is the one period (another is hatching) which produced architecture and more lowly things that I abhor. Had they only marked time and taken advantage of experienced gained in the past and been a little less creative we should not see quite so many Myrtle Villas with their atrocious extravagance of flower embellished stonework round windows, doorways and any other available spaces. The houses of the seventeenth and eighteenth centuries, for various reasons, do not harmonize badly with their surroundings. The Victorians did their best, poor souls, and they did at least stand on their own legs, and their architects did not lean on engineers to help them in their confusion.

Where now is their craft, their skill and their knowledge? Sacrificed to the altar of weird shapes of ⅜ in. and ½ in. round bar! Poor old bricks and tiles, the elephants will see you no more.

I notice Mr. Rodgers has a partiality for elephants. How about the extension to the restaurant and the cloakroom? Does he agree that the former has ruined the original group, and can he explain why the friends (some better, some worse educated) I have taken to Whipsnade have been puzzled as to what it is, and have passed by almost half scared in their own minds that it might be a Robot's sideboard?

It seems that Mr. Rodgers can be no real countryman, otherwise he would appreciate our point of view. Do all you can to improve our factories, hospitals and schools, keeping them in places where they belong, but please do leave us a little countryside unspoilt and not dotted with architecture that requires more than the "confused" Englishman's brain to appreciate. After all, it is what we like, not what we ought to like, that matters to us.

My children used to have a sandpit wherein they built queer and wonderful structures. Cannot our more enlightened and advanced modern architects who wish to practise in the country have a little plot of their own (preferably near Portsmouth) where they can indulge in straight lines, curves, cylinders and what not, until they have quietened down? We can then have our country in peace for a while.

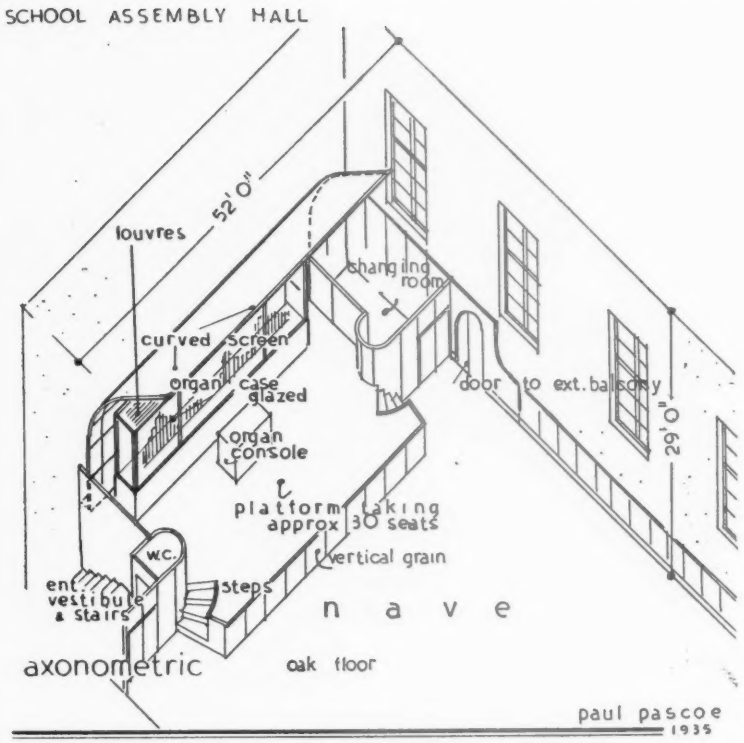
Thank goodness I shall be dead before many more elephant houses and the like are built, for they seem to take a longish time to disentangle themselves from bars, expanded metal, cement and ballast. Then I shall lie in my little bed of aspidistras. Cacti are so prickly!

T. W. BAGSHAWE
Berkhampstead

The late Sir Walter Tapper

SIR,—In your issue for September 26 you make reference to the late Sir Walter Tapper, and in the last sentence of your short article you state that he was created K.C.V.O. in the New Year Honours.

I would inform you that this is inac-



From a school at Stockholm. Designers : David Dahl and Paul Hedqvist.

curate, the facts being that the late Sir Walter was received in audience by His Majesty the King on July 23 last, when he received the honour of Knighthood and was invested with a K.C.V.O.

MICHAEL TAPPER
London

SEASIDE RESORTS

Following are some extracts from a paper entitled "The British Coast and its Seaside Resorts," read by Mr. Wesley Dougill, M.A., A.R.I.B.A., at the Conference of the British Health Resorts Association, held at Margate on Saturday last.

It is easy, of course, and customary, to criticize in a general way the holiday resorts for the way in which they have developed their towns, in particular the fronts of them. Even if one keeps in mind the handicap resulting from the original congested and unsatisfactory planning, the almost bewildering suddenness with which the new traffic conditions have arisen, and the fact that expansion must in the main be a slow, gradual growth following demand, it is not unjust to say that many, of the resorts deserve all the criticism that has been meted out to them, such as: lack of imagination in both architecture and planning, shoddy buildings steeped in Victorian mediocrity, bandstands, ornamental railings and seats lifted from old catalogues, general disorder and lack of cohesion caused very largely by temporary and semi-temporary structures which are properly related neither to others of their kind nor to the lay-out as a whole, shelters located where immediate circumstances rather than where ultimate requirements suggested, and lodgings which are entirely unsuited to their purpose. These are the real criticisms, and the grounds for them must be removed from all these places to which they apply if the resorts are to play their full part in the great movement seawards. It will be conceded, certainly by medical men, that change of environment is the essence of a holiday. If we exclude the sea itself, can it be claimed that the resorts give that change?

Nor will they be able to play their full part until the customary ten, twelve, or fourteen weeks' season has been considerably extended. Artificial stimulants like Cricket weeks, Illuminations, Music Festivals, and so on, help a little, but something more substantial and effective than these is needed. It is obvious that the vagaries of the British climate must be accepted. Because of them, a holiday or residence at the seaside during the late autumn, winter and early spring, is largely spent indoors. If the resorts wish to attract visitors, and if medical men are to have every confidence in sending their patients to them, during this colder period, far better provision than exists now must be made for indoor recreation and amusement, together with better and more comfortable living accommodation. The cultural buildings—art galleries, libraries, museums—must be at least equal in merit to those in the inland towns, and more sheltered outdoor facilities must be provided than those on the fronts, which, for many people, are often too bleak and cold during the winter months.

The carrying out of a long-term programme based on a comprehensive plan which foresees as far as possible the future requirements and caters for them, and on which, with the help of the best possible advice, there is exercised a proper meed of imagination, would eventually rid us of many of the defects and would give that cohesion and order which are essential qualities in any successful lay-out, whether formal or informal. Moreover, it would tend to eradicate what, to my mind, is probably the greatest danger confronting holiday resorts today, the replacing of their own individuality and distinctiveness, in other words their most valuable asset, by a monotonous sameness of character.

Never before have there been such opportunities for the resorts to adjust themselves to the demands made on them. Recent legislation, including the Town and Country Planning Act of 1932, and the various Housing Acts, the fortunate succession of three fine summers and the corresponding increases in revenue, the brightness and greater certainty of the future, are only a few of the factors contributing to this. They must not be allowed to go by default. Resorts today have the opportunity and the duty of playing the same rôle to this country as did the Great Exposition at Chicago in 1893 to America. Millions of people visited that Exposition, saw the ordered lay-out, the fine grouping of elements, and the attractive buildings, and returned imbued with a desire to improve the appearance of their own cities, towns and villages. It resulted in amazing repercussions on planning and architecture throughout America. Millions of people visit our holiday resorts for a few hours, days or weeks, but if we except a few of them, the simile largely ends there.

Yet, very fortunately, there are gratifying indications at some of our holiday and residential resorts of a growing desire to take advantage of the new opportunities, especially those of an architectural character. It is possible to mention only a few cases. Dreamland at Margate, the Pleasure Town at Blackpool and the Amusement Park at Eastbourne, are examples of how this type of lay-out, which hitherto has been an unsightly agglomeration of shanties, can be orderly and seemly. They prove, too, the truth of the old saying that order begets orderliness. The series of new shelters along the promenade at Bournemouth, the two new ones at Hastings and others at Brighton, the beach bungalows at Boscombe, the new structures in the Peaseholme Park area at Scarborough, the lay-out and equipment of the recently developed Western Parade at Worthing and those at Torre Bay, Torquay, the Pier Pavilion at Colwyn Bay, the Music Pavilions at Eastbourne and Morecambe, and, not by any means the least important, the four new types of electric tram at Blackpool, all show that beauty, economy and fitness for purpose and environment are not irreconcilable.

Holiday resorts, by their very nature, require a special technique of their own, both in planning and in architecture. The buildings and so forth which I have just mentioned—others could be included—show appreciation of that fact. When the understanding which has gone towards their creation is manifest throughout the whole series of resorts then will the grounds of criticism be removed.

●

Appointments

The Bolton Housing Committee last week appointed Mr. Vincent M. Hughes, Estates Manager to the York City Council, to be Housing Director for Bolton, at the salary of £700 per annum. There were 81 candidates for the position

Mr. John Bain has been appointed to the position of architect to the Monmouthshire Education Committee.

Mr. Adrien J. Sharp, L.R.I.B.A., has been appointed City Architect of Portsmouth. There were 85 applications for the position.

DARTINGTON HALL, TOTNES, DEVON

On this and the seven pages following we illustrate some of the new work at Dartington Hall, a co-educational school for children at Totnes.

I: TWO BOARDING HOUSES BY WILLIAM LESCAZE

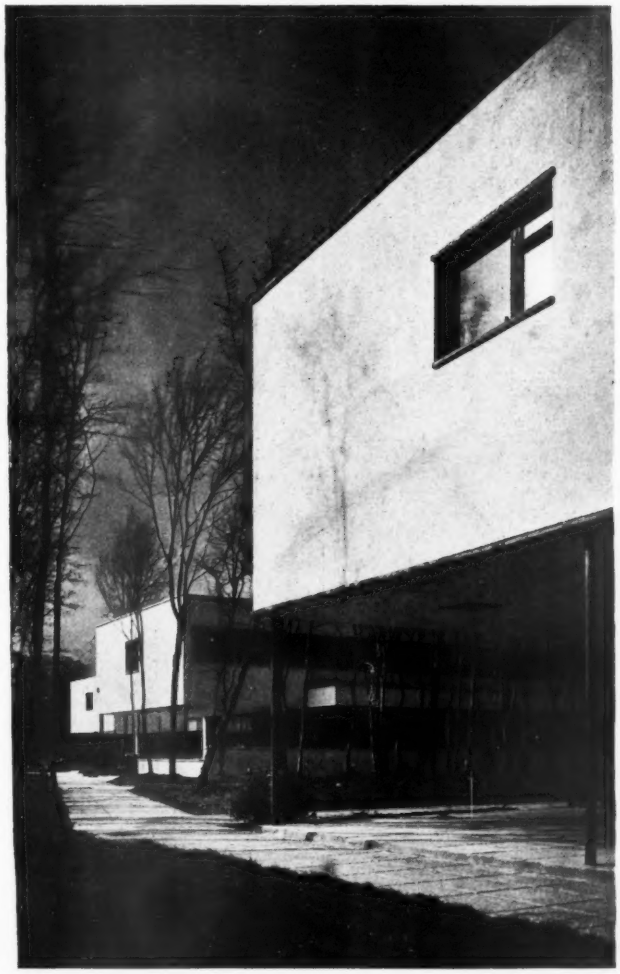
GENERAL.—*The two new boarding houses (B and C on the plan overleaf) form an elaboration of the principle aimed at in boarding house A of providing classroom and recreational accommodation for a group of children, in conjunction with sleeping quarters, living rooms, etc., for the resident staff.*

PLAN.—*The children's bedrooms are arranged on the east side to give morning sun in the bedrooms. The available sunshine is limited by the fact that two of the three houses are surrounded by trees which, however, have the advantage of providing a certain seclusion, although the distance of each house from its neighbour is not great. The ground floor plan of each house is a straightforward expression of the use to which each building will be put, and the first floor plan is built up around the single bedroom unit, while the staff quarters are placed at the north end of the corridor to give a fair amount of privacy. Each child's bedroom is complete with fitted wardrobe, space for trunk, bookshelves and desk.*

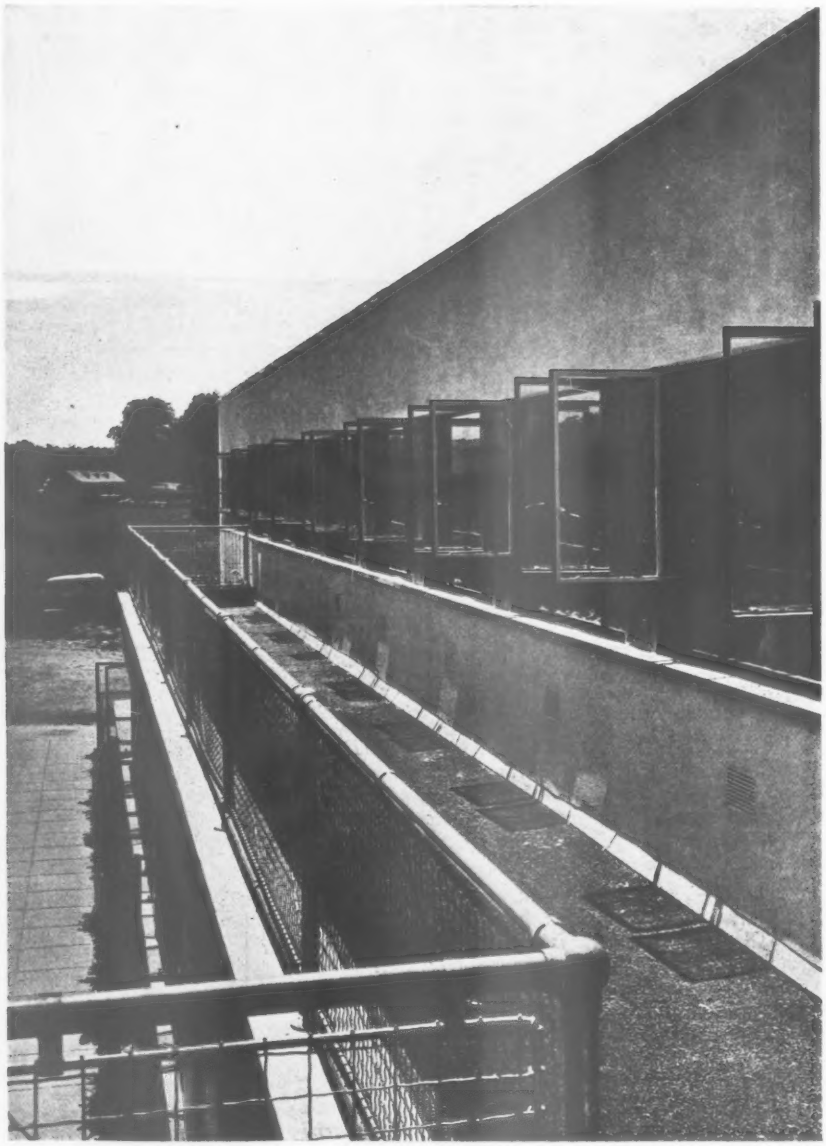
CONSTRUCTION.—*The overhanging south end, which forms the covered porch, is steel framed, and the remainder is built with 11 in. brick cavity walls. The exterior is faced with white cement, applied by a machine in the form of a spray. The flat roofs are of wood; internal partitions are breeze block; and the first floor is of wood, with the exception of the lavatories, bathrooms, etc., which are hollow tile construction. Metal windows are used throughout.*

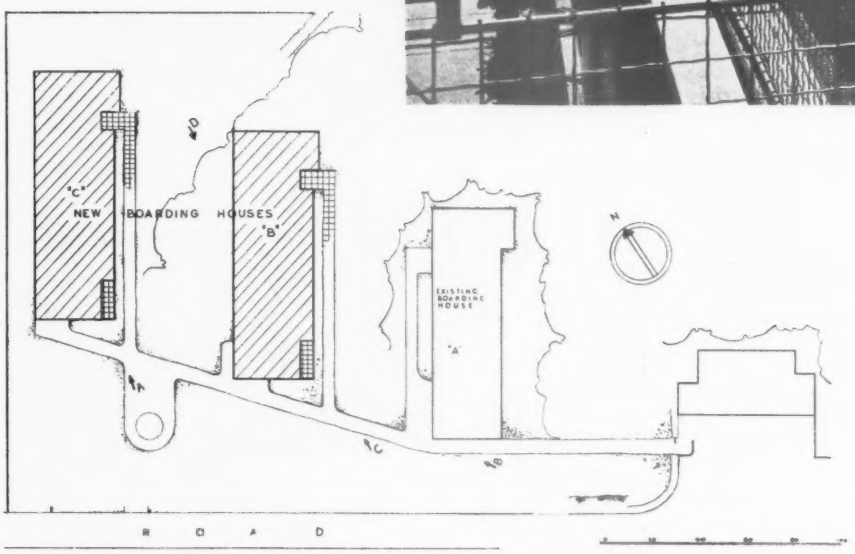
COST.—*The two houses form a single contract and were built in eight months. The price per cubic foot was 1s. 4d., including central heating, which is worked from a central boiler housed in the main school building.*

The photographs show: Above, house C seen from point **A**, *showing the covered porch which is used for handicrafts and recreation; right, the south end of house A from point* **B**.



DARTINGTON HALL, TOTNES, DEVON:

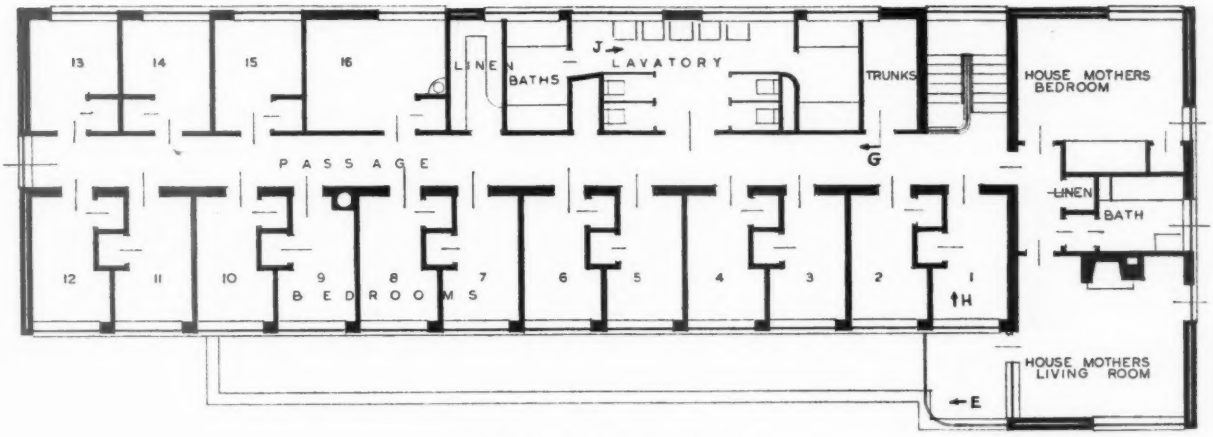




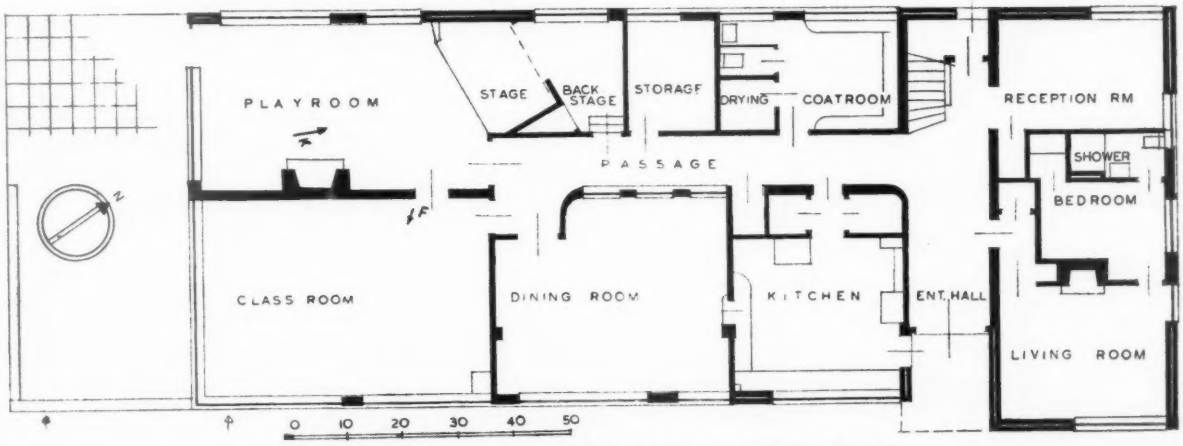
LAY-OUT PLAN OF BOARDING HOUSE BLOCKS

Above is a view from the housemother's room on the first floor, from point E, *looking along the balcony outside the children's bedrooms. The other photographs show: top, House B seen from point* C; *the west elevation of House B from point* D.

TWO BOARDING HOUSE BLOCKS



FIRST FLOOR PLAN



BLOCKS B & C: GROUND FLOOR PLAN

DESIGNED BY WILLIAM LESCAZE

A view through the window of the classroom in block C, taken from point F, *looking towards House B. The furniture is in polished cedar throughout the buildings.*

DARTINGTON HALL: 1. BOARDING HOUSE

Four views taken in one of the boarding house blocks : top, left, from G, *first floor corridor looking south, with the children's bedrooms on the left and lavatories, etc., on the right. In order to increase the apparent width of the corridor the west wall was painted a warm brown and the east wall primrose. The door frames and flushed coved skirtings are of metal. Left : the playroom, from* K, *looking towards the miniature stage set for a play, written, produced and acted by the children, who were also responsible for the setting. The floor is of cork, and the ceiling is acoustically treated. Top : the children's lavatory on the first floor, from* J ; *bottom, a detail of typical fitments in the children's rooms.*

BLOCKS. 2: THE GYMNASIUM BLOCK

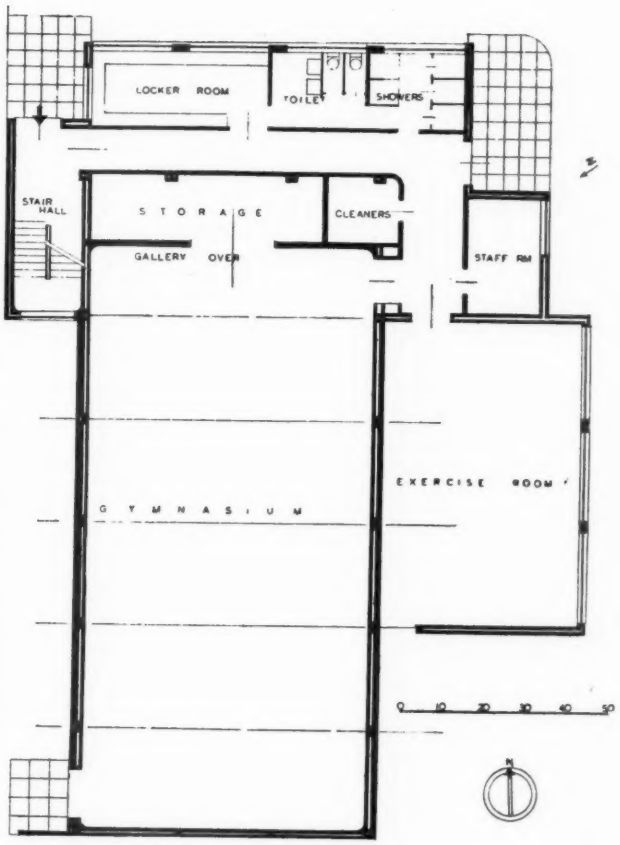
GENERAL.—*The gymnasium was built to supplement the accommodation in the existing Senior School and consists mainly of one large gymnasium for general purposes, and a small gymnasium for special exercises and training.*

SITE.—*The irregular site is surrounded by trees and it was possible to run heating and other services from the main school buildings a short distance away.*

PLAN.—*As sunlight is not of the first importance in a building such as this, which is occupied for short periods, the plan was dominated by ease of communication with the main school buildings. The cloakrooms are arranged so that children are obliged to pass them before reaching the gymnasium, and they are thus encouraged to change into suitable shoes so as not to damage the special gymnasium floor, as it is expected that the gymnasium will also be used as a centre for general recreation during wet weather. Access is provided to the roof, which is paved for use as a playground.*

CONSTRUCTION AND EQUIPMENT.—*The main gymnasium is all-steel frame construction with compound girders spanning the 37 ft. width, the stanchions being stiffened half-way up their height. The walls between stanchions are built in bays, with an outer skin of 4 in. concrete blocks. Overhanging canopies are of 4 in. reinforced concrete slabs. Heating is by means of radiators at high level to minimize obstruction round the walls and prevent down draught from the windows. The floor of the gymnasium is of Empire hardwood specially selected for its non-slip properties. The interior walls are lined with white facing bricks.*

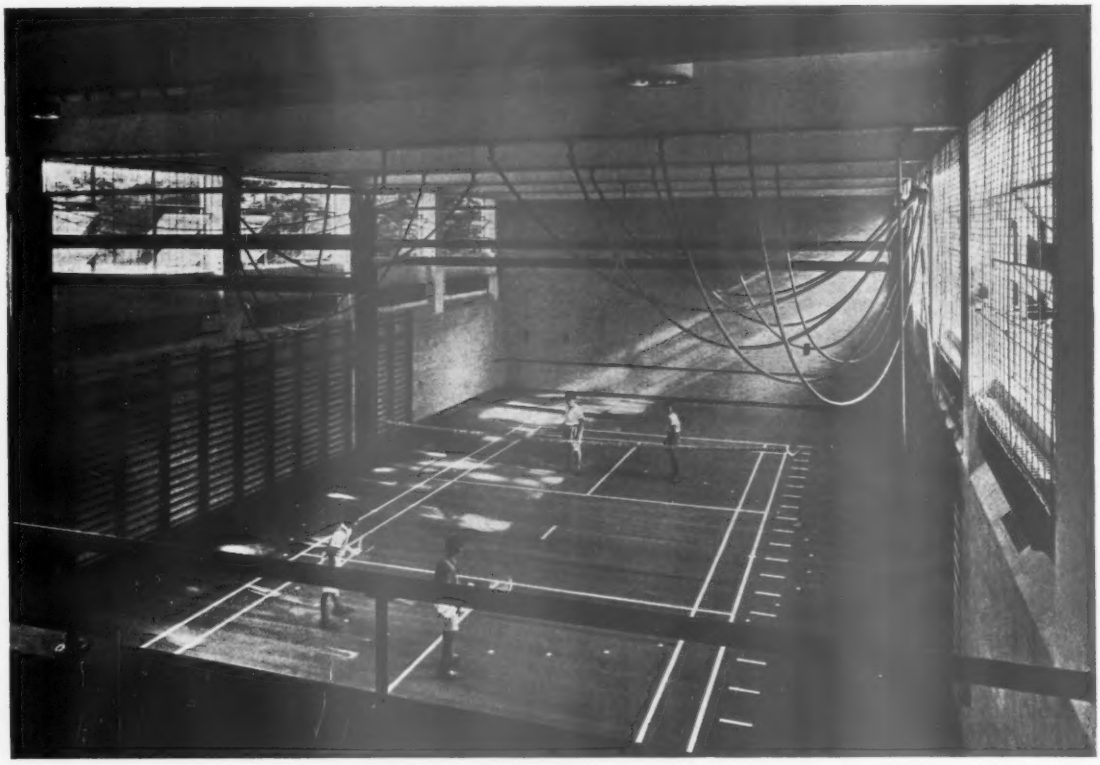
COST.—*1s. 2¼d. per cubic foot.*



The illustration on this page shows the exterior of the gymnasium from **N.**

DESIGNED BY WILLIAM LESCAZE

DARTINGTON HALL, TOTNES: 2. GYMNASIUM

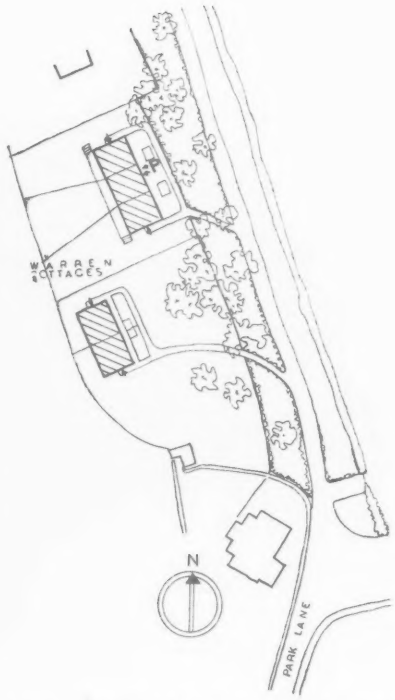


The gymnasium, seen from the gallery.

DESIGNED BY

WILLIAM LESCAZE

The north-east elevation of the block of two cottages. A photograph of the block of three cottages is given on page 484.

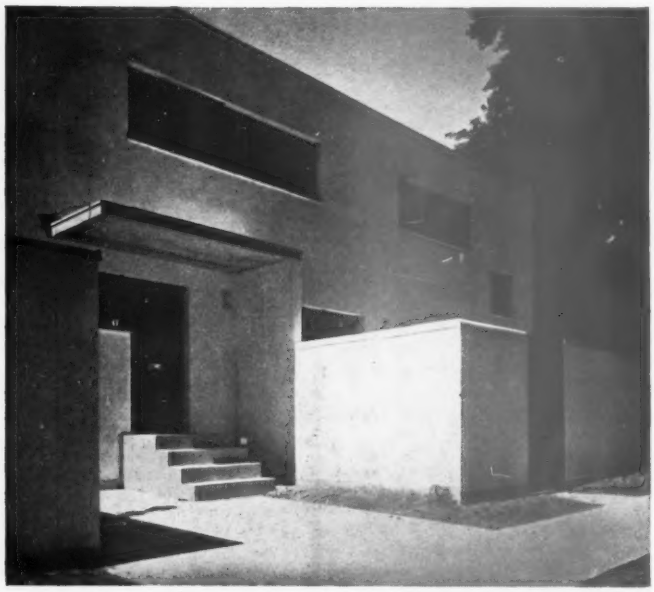


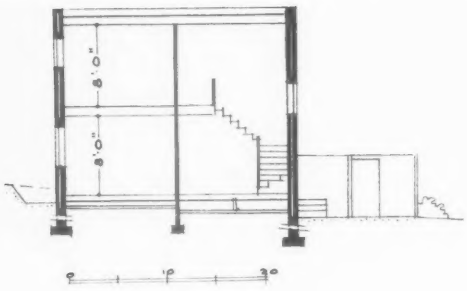
LAY-OUT PLAN OF COTTAGES

BLOCK. 3: TWO BLOCKS OF COTTAGES

A view of the south-west elevation of the block of three cottages, looking through one of the first floor windows in the block of two cottages.

DARTINGTON HALL, TOTNES, DEVON

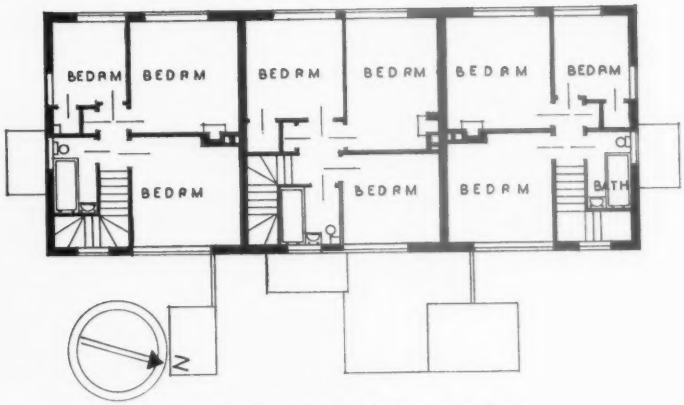




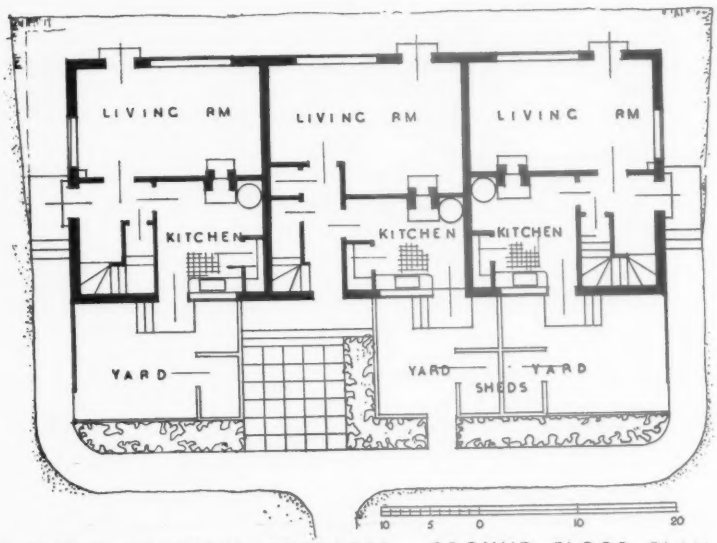
SECTION

3: COTTAGES

DESIGNED BY WILLIAM LESCAZE



FIRST FLOOR PLAN



BLOCK OF THREE COTTAGES. GROUND FLOOR PLAN

SITE.—*The site has a considerable slope from south to north, and on the north side a thick belt of trees obscures the view. The two blocks of cottages already built form part of a scheme which it is hoped to complete this year for housing different types of estate workers.*

CONSTRUCTION.—*11 in. cavity walls, with wood floors and flat roof.*

COST.—*1s. 0½d. per cubic foot, including all services.*

Above is a view of the entrance to the middle cottage in the block of three, taken from point P *in the lay-out plan on page 482.*

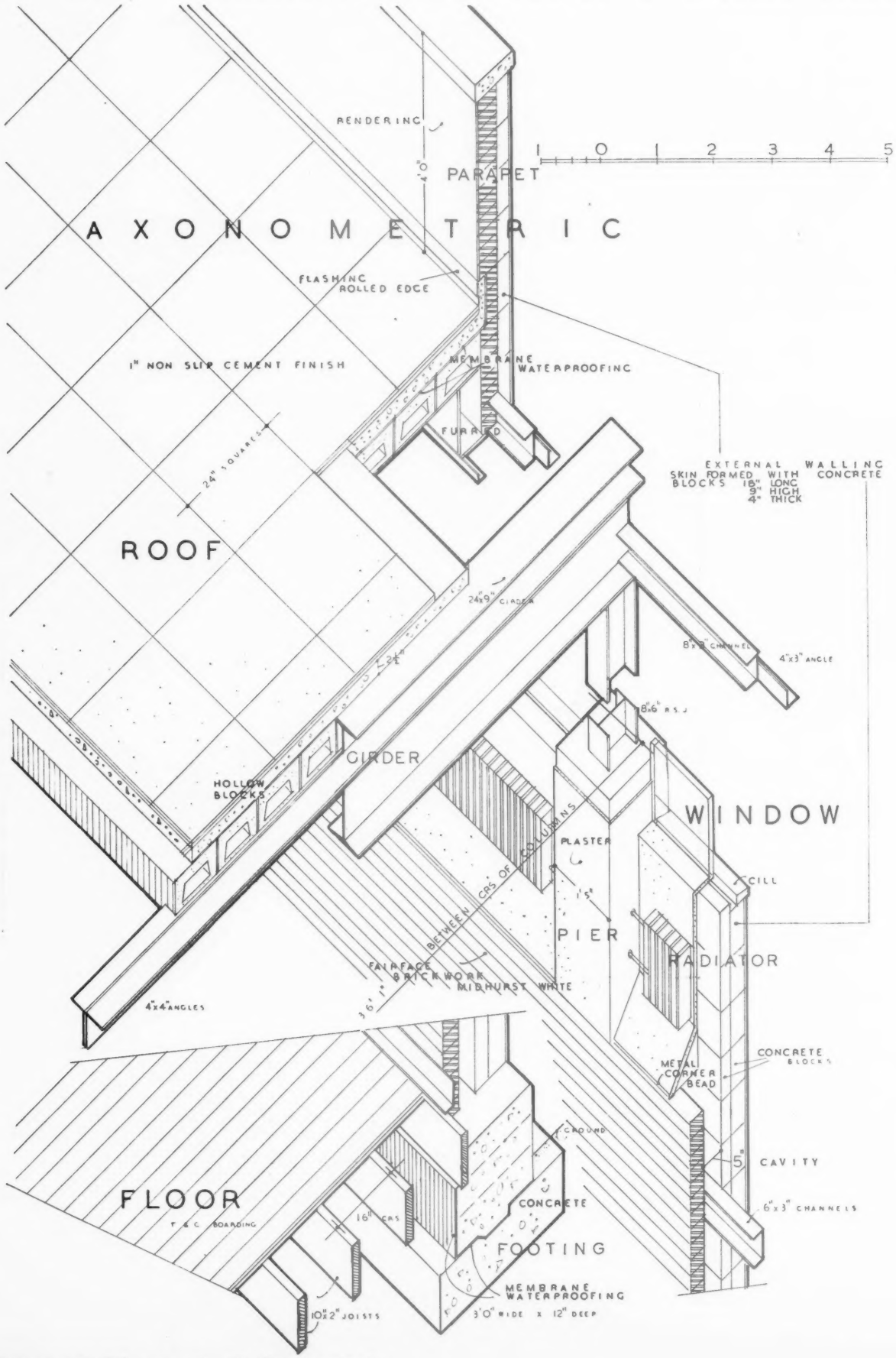
WORKING DETAILS : 335

GYMNASIUM • DARTINGTON HALL, TOTNES • WILLIAM LESCAZE

The gymnasium illustrated above is a steel-framed structure with compound girders spanning 37 ft.; the walls between the stanchions are built in bays, with an outer skin of 4 in. concrete blocks. The long range of windows is provided with a small electric motor which opens the whole range simultaneously. The roof playground is finished with 2 in. concrete slabs on a suspended hollow tile concrete roof. Axonometric and details are shown overleaf.

WORKING DETAILS : 336

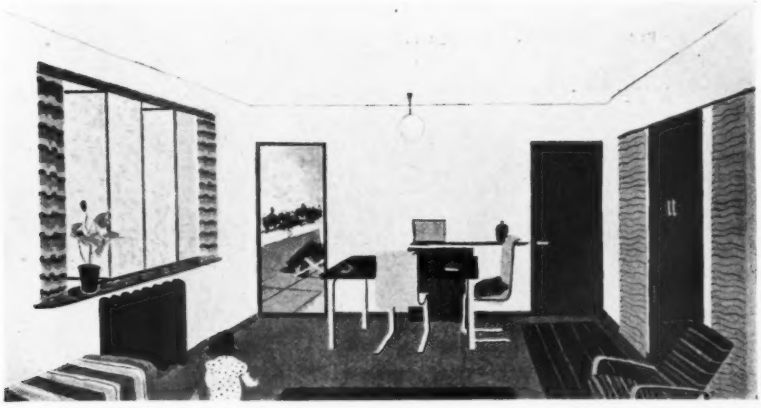
GYMNASIUM DARTINGTON HALL, TOTNES • WILLIAM LESCAZE



Axonometric of the gymnasium illustrated overleaf.

WORKING DETAILS : 337

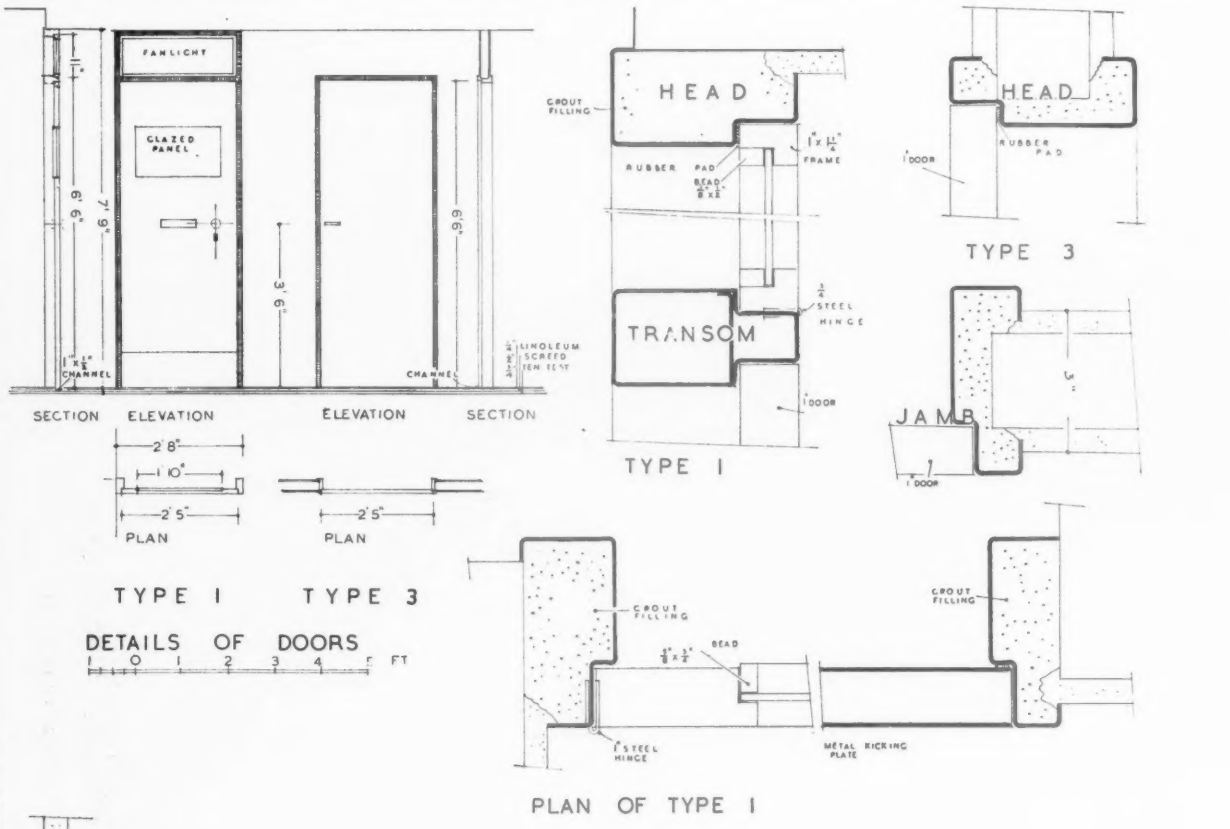
METAL TRIM ● REHOUSING SCHEME, ST. PANCRAS ● R. G. BROWN, R. A. KIRBY, B. A. LE MARE AND R. H. SHEPPARD

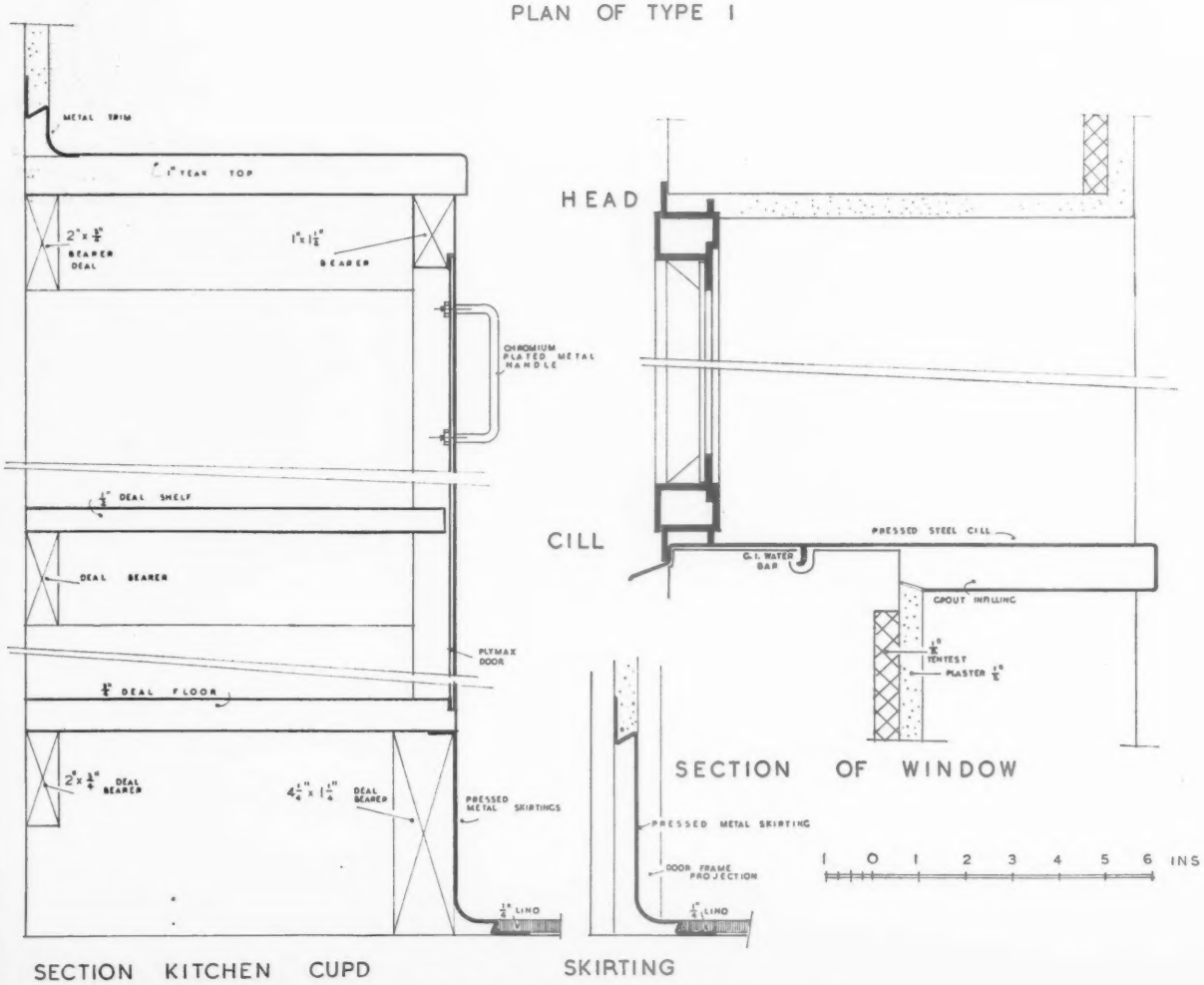


Exterior and a typical living room in a suggested rehousing scheme for St. Pancras. Overleaf are shown details of pressed steel door frames and skirting trim.

WORKING DETAILS : 338

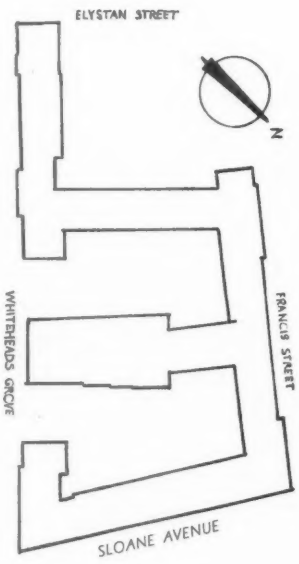
METAL TRIM ● REHOUSING SCHEME, ST. PANCRAS ● R. G. BROWN, R. A. KIRBY, B. A. LE MARE AND R. H. SHEPPARD





Metal trim details of the living room illustrated overleaf.

CRANMER COURT, CHELSEA



DESIGNED BY MESSRS. GORDON JEEVES.

This building has been designed to provide accommodation varying in area and aspect at rents from £135 for a bed-sitting room, to £460 for the four-bedroom type with two reception rooms. The photographs on this page show: top, the main elevation to Sloane Avenue; bottom, another view of the elevation to Sloane Avenue and (on the left) the Whiteheads Grove front, containing the entrances to the flats.

CRANMER COURT: BLOCK OF FLATS DESIGNED BY MESSRS. GORDON JEEVES

PLAN.—*Nine different types of flat have been grouped in an open courtyard lay-out, E-shaped, with a projecting wing, this lay-out having been adopted for ease of ventilation and to avoid the usual closed courts and light wells.*

CONSTRUCTION.—*Straightforward steel frame with hollow tile floors; elevations finished in brick with artificial stone dressings; walls waterproofed with a patent protective paint.*

KITCHEN EQUIPMENT.—*All kitchens are fitted with electric refrigerators and ventilated larders; deep porcelain sinks are fitted with teak draining boards, above which are heated swabrails. Points are available for cooking by either gas or electricity and a ventilated flue is provided to carry away all cooking smells.*

TELEPHONES.—*All flats are wired by the G.P.O., and two house telephone systems have been installed, one a tradesmen-kitchen service, the other a connection to the hall porter.*

STORAGE.—*Additional box rooms contained in the roof space and served by electric lifts, which are available at a moderate extra charge.*

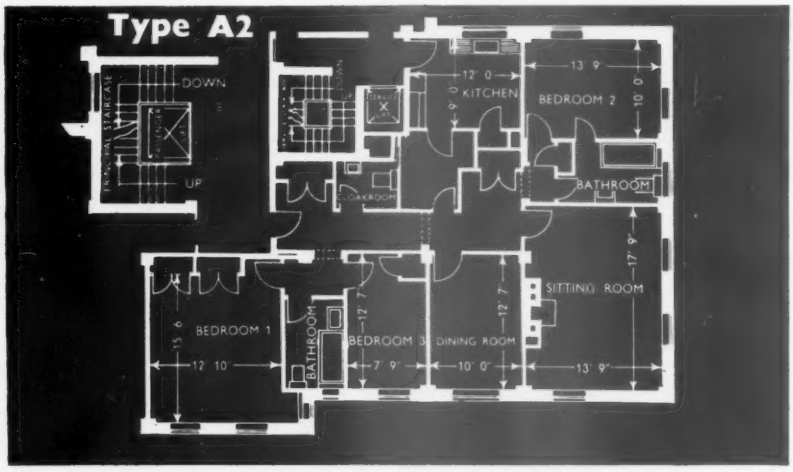
RADIO.—*The building has been specially wired for radio and has its own master set and control room giving tenants facilities for (a) reception of relayed programmes via a built-in loud-speaker, a simple 4-way switch giving a choice of programme or (b) connecting their own receiver to a special aerial on the roof.*

The photographs show: above, the front to Whiteheads Grove; right, one of the courtyards.

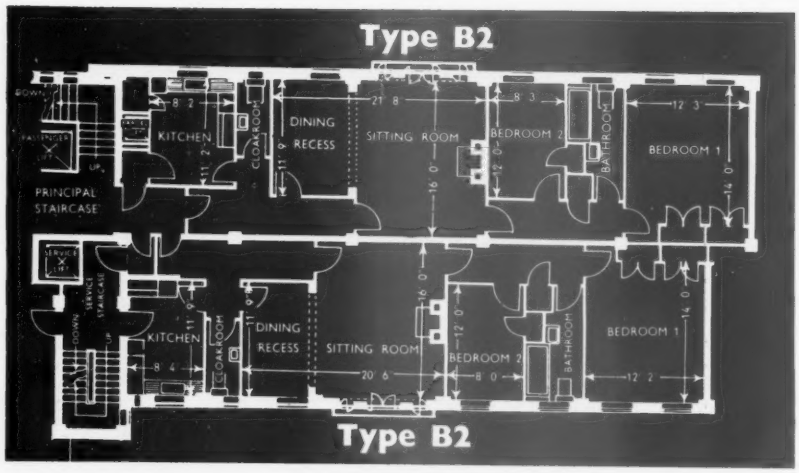
FLATS, SLOANE AVENUE, CHELSEA

The photographs on this page show typically furnished living rooms in the show flats.

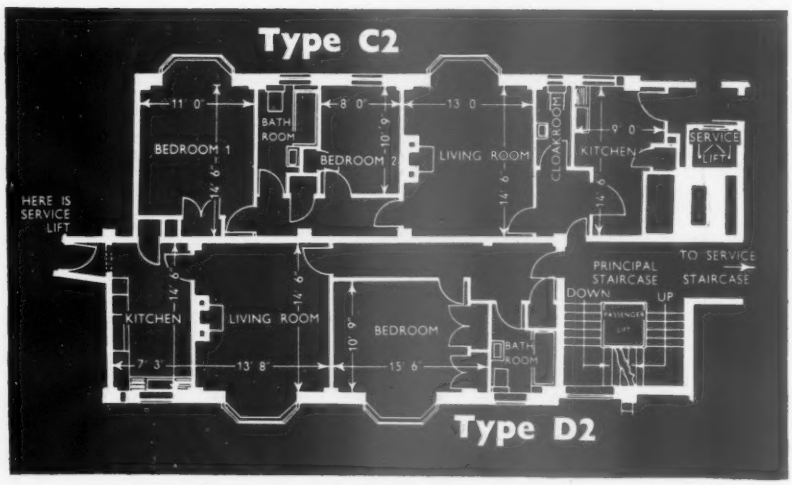
CRANMER COURT: BLOCK OF



TYPE A2



TYPE B2



TYPES C2 AND D2

On this and the facing page are reproduced seven typical flat plans. The various types, —there are two hundred and forty flats in all—with accommodation and rents, are given below.

Type A1. Accommodation : sitting room, dining recess, four bedrooms, kitchen, pantry, two bathrooms, cloakroom, entrance hall. Rent : £395 to £460 per annum.

Type A2. Accommodation : sitting room, dining recess, three bedrooms, kitchen, pantry, one and two bathrooms, cloakroom, entrance hall. Rent : £315 to £445 per annum.

Type A3. Accommodation : sitting room, dining recess, three bedrooms, kitchen, majority with pantry, bathroom, cloakroom, entrance hall. Rent : £300 to £380 per annum.

Type B1. Accommodation : sitting room, dining recess, two bedrooms, kitchen, pantry, bathroom, cloakroom, entrance hall. Rent : £280 to £310 per annum.

Type B2. Accommodation : sitting room, dining recess, two bedrooms, kitchen, bathroom, cloakroom, entrance hall. Rent : £235 to £280 per annum.

Types C1 and C2. Accommodation : living room, two bedrooms, kitchen, majority with pantry, bathroom, cloakroom, entrance hall. Rent : £200 to £275 per annum.

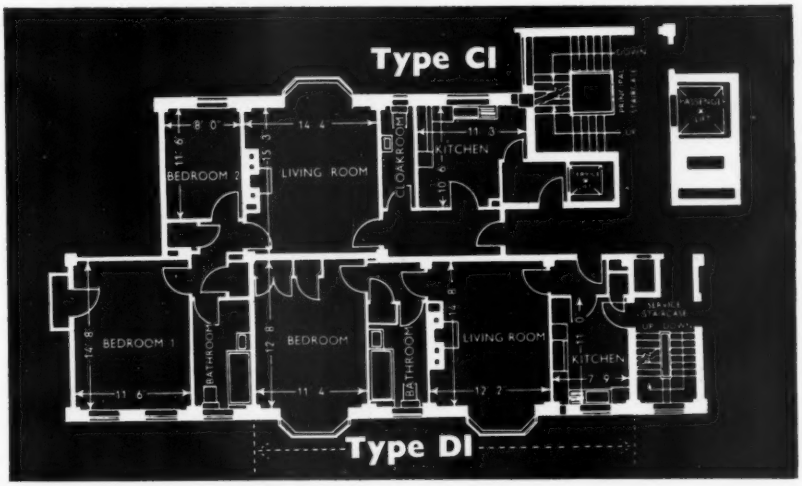
Types D1 and D2. Accommodation : living room, bedroom, kitchen, bathroom, entrance hall. Rent : £155 to £185 per annum.

Type E1. Accommodation : bed-sitting room, bed recess, kitchen, bathroom, entrance hall. Rent : £155 to £160 per annum.

Type E2. Accommodation : bed-sitting room, kitchen, bathroom, entrance hall. Rent : £135 to £140 per annum.

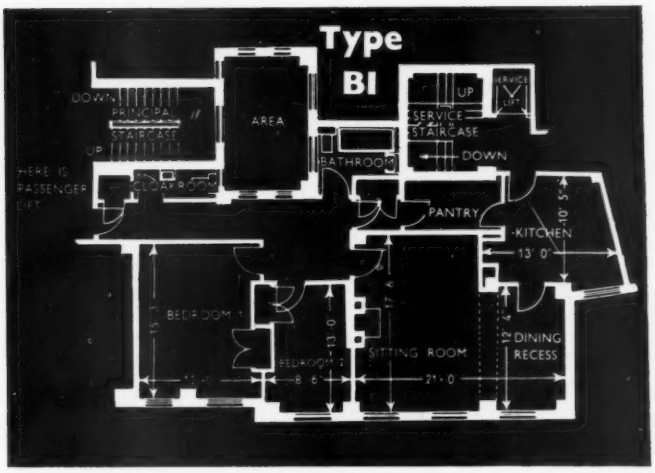
FLATS, SLOANE AVENUE, CHELSEA

DESIGNED BY MESSRS. GORDON JEEVES



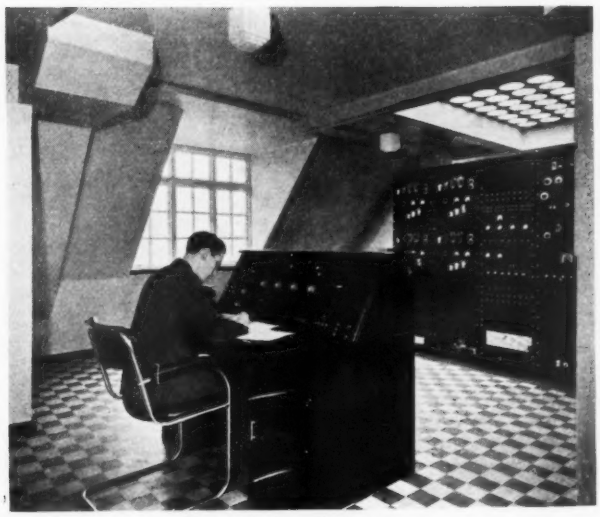
TYPES CI AND DI

A typical dining recess.



TYPE BI

A typical kitchen.



The radio installation room.

BUILDING TRADES EXHIBITION

LIVERPOOL

THE OPENING CEREMONY

ON Tuesday of last week Mr. Percy E. Thomas, P.R.I.B.A., opened the Building Trades Exhibition at Renshaw Hall, Renshaw Street, Liverpool. The Exhibition, which is the first of its kind to be held in Liverpool, will remain open until Saturday next, October 5, between the hours of 11 a.m. and 9 p.m. Lt.-Col. E. Gee, President of the Liverpool Architectural Society, presided at the opening ceremony, and those present included the Lord Mayor of Liverpool, the Mayors of Bootle and Wallasey, the Liverpool Director of Housing (Mr. L. H. Keay, F.R.I.B.A.), and Mr. T. E. Lescher, Chairman of the Liverpool Chamber of Commerce.

Mr. Thomas referred to the increasing interest of the general public in building methods and materials. In recent years, he said, there had been a great improvement in the design of accessories for the building trades. British quality had always been good, but for years there had been shortcomings in design. Now our manufacturers were becoming alive to the fact that it was as cheap to produce articles of good design, and that it was certainly very much better business. Liverpool had always set high standards in architecture—from St. George's Hall and the Cathedral to the magnificent office and bank blocks—and manufacturers would find that Liverpool clients not only appreciated fine materials but demanded them.

Lt.-Col. Gee said that to architects the Exhibition was a matter of intense interest, and he wondered if the idea behind it could not be carried to the extent of establishing a permanent exhibition to which they could take their clients, instead of, as at present, having to go from one showroom to another.

THE COMPETITION

The result of the competition, organized by the promoters of the Exhibition in conjunction with the Liverpool Architectural Society, for the lay-out or planning of 20 pairs of houses of semi-detached villas, was announced as follows: £50: Mr. J. A. Ashworth, of 5 Chester Avenue, Bury Road, Rochdale; £15: Mr. C. Entwistle, of 30 Abbey Gardens, 51 John's Wood, London, N.W.8; £15: Mr. H. Spence Sales, of Swan House, Swan Lane, London, E.C.4 (plus £10 for report); £10: Mr. E. M. Blundell, of 9 Chatsworth Road, Croydon; £10: Mr. H. Woodley, of 22 Park Lane, Bootle, Liverpool, 20. The assessors were: Lt.-Col. Ernest Gee, F.R.I.B.A., Professor L. P. Abercrombie, F.R.I.B.A., and Leonard Barnish, F.R.I.B.A.

THE EXHIBITS

In the Exhibition itself one of the few stands designed by architects is that of the Accrington Brick and Tile Co., which is the work of Mr. F. X. Velarde. Two walls are designed to intersect and form a tall cruciform shape in bricks of four different colours set in a warm grey mortar.

D. Anderson and Son, Ltd., are showing their usual roofings and a new Stoniflex plaster board, of which this stand is built. Macasfelt and Thermotile flat roofs are also shown.

Betonac concrete hardeners for producing a dustless and hard-wearing surface are shown by the François Cementation Co., who are also displaying two different types of glaze.

Patent stormproof wood casements are shown on the stand of F. Hills and Sons, who guarantee their product for a period of five years. The same firm is exhibiting a range of Clymax flush doors which are guaranteed for six months.

The kitchen planning service introduced by Modern Washways, Ltd., has a stand showing various types of kitchen plan, all of which are designed to reduce movement to a minimum.

John Stubbs and Sons have, for the last three years, been reviving the use of Quarzite as a building material and, having now overcome the difficulties of cutting and shaping it, are showing various treatments for which it is suitable: the decorative uses of marble are also shown in the form of fireplaces, etc.

Maxheat oval tubular electric heaters are shown by the Wardle Engineering Co., Ltd., who also have a large range of lighting units and Prismalux fittings.

Metal windows of all types are shown by Williams and Williams, Ltd., who are making a feature of their friction pivot type and of doors made up from standard sections.

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INSTITUTION OF STRUCTURAL ENGINEERS

Following is a list of the meetings arranged by the above Institution to take place this month.

London Meeting: Thursday, October 24.—Presidential address by Dr. Oscar Faber, O.B.E., at 10 Upper Belgrave Street, London, S.W.1, 6.30 p.m.

Branch Meetings: Friday, October 4.—Western Counties Branch. Address by Dr. Oscar Faber, O.B.E., M.INST.C.E., M.I.STRUCT.E., at the Merchant Venturers' Technical College, Bristol, 7.15 p.m. Monday, October 7.—Midland Counties Branch Junior Members' Section. Chairman's Address by Mr. A. L Percy, B.SC., at the James Watt Memorial Institute, Birmingham. 6.30 p.m. Wednesday, October 9.—Lancashire and Cheshire Branch. Chairman's Address by Mr. W. B. McKay, M.SC., M.I.STRUCT.E., at the Engineers' Club, Manchester, 7 p.m.

The stand of the Accrington Brick and Tile Company, designed by F. X. Velarde.

TECHNICAL SECTION: 33

HEATING, AIR CONDITIONING AND MECHANICAL EQUIPMENT

BY OSCAR FABER

O.B.E., D.C.L., D.Sc., M.Inst.C.E. Hon.A.R.I.B.A., A.M.I.E.E., F.C.G.I., M.I.H.V.E., M.Am.S.H.V.E.

AND J. R. KELL, M.I.H.V.E.

HEATING BY STEAM

THERE is, in this country, probably less than one steam heating system for a hundred hot water. In the United States of America and Canada the reverse is the case.

The reason is not difficult to find. Our weather in winter is often mild, and only rarely do spells of three or four weeks of frost occur when full heating is required. Their winters are generally severe with months of snow and temperatures well below zero.

For our climate the hot water system is the most suitable, because its temperature can be varied so simply and over such a wide range. For consistently cold climates the steam system is satisfactory, and often much more economical in first cost, though even then the Spring and Fall periods call for some degree of temperature adjustment.

In order to see steam heating at its best, therefore, it is necessary to review American practice.

The chief line of development has been in the matter of pressure. Plain low pressure steam systems, unless fired frequently, are intermittent—all on or all off—very unsatisfactory without automatic means of firing, but in any event grossly extravagant in mild weather. Any attempt to run on a lower pressure at such times only results in the more distant radiation going cold.

Low pressure steam radiators have air valves which are apt to make unpleasant hissing noises and to give off an objectionable smell like a combination of hot flat-irons and steam rollers.

As a result, this kind of system has gone out of favour and has been displaced by others. One of these is known as the Vapour system, in which the steam is only a few ounces above atmospheric pressure. There are a large number of proprietory names for this method, each including various patented devices for regulating the amount of steam entering the radiator and for holding a partial vacuum within the mains when the steam pressure falls below atmospheric. By these means an even distribution of heat and a measure of temperature variation is possible.

A second system, the Vacuum system, employs a mechanical pump for the removal of condensation and air from the radiators. As has already been mentioned (see article 9, page 421) water may be made to boil at temperatures less than 212 deg. F., when its pressure is brought below atmosphere. Thus a much wider temperature range is possible with this than with any other steam system, and it is applicable to all kinds of building, no matter how extensive. It is the only steam system which has been developed to any degree in this country.

It will be appreciated that both the Vapour and Vacuum systems strive to attain the result which is so simply achieved with hot water without any complications whatever. It is not to be wondered, therefore, that even the steam using countries are turning more and more to hot water for a solution of their difficulties.

A defect of all steam systems, including the vacuum system, is that no matter how carefully they are installed there is always some risk of noise, especially when warming up. This is due to globules of condensation being caught up in the steam and being banged violently against the wall of the pipe or radiator, emitting a loud crack. Or the noise may be due to drops of condensate flashing suddenly into steam.

Another disadvantage of any steam system when installed in small or medium sized buildings is that the boiler definitely requires some intelligent supervision. The water level of a steam boiler has to be kept steady within fairly narrow limits and, however many automatic devices are furnished to ensure this, they are liable to fail unless regularly overhauled. Too high a level will often cause water to fill the radiators, which as a result go cold. Too low a level may cause fracture of the sections, which is both costly and dangerous. If the solution of salts in the water becomes concentrated as a result of long use without proper flushing out, foaming or priming may result, again with the result of water being carried over with the steam into the radiators and causing erratic operation.

Steam traps, air release valves and the other more or less complicated accessories of steam systems in general all have their troubles and call for maintenance from time to time.

These are not items for which one can expect adequate attention from the domestic servants, gardeners and caretakers, who are expected to run the smaller heating systems.

The Vacuum system is the only steam

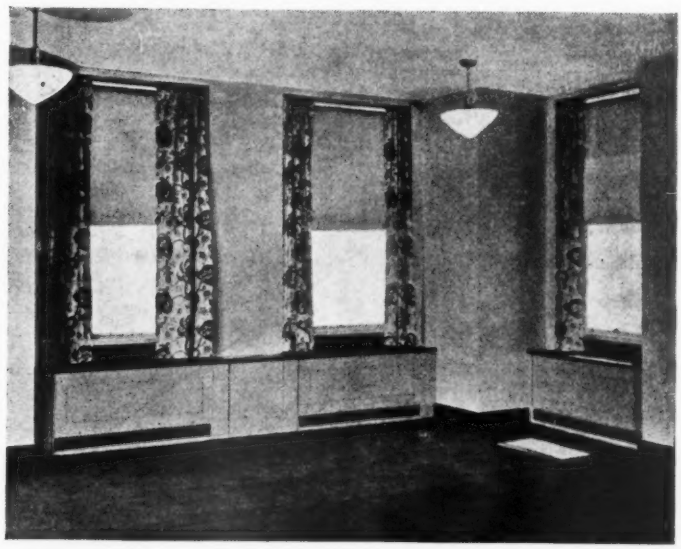


Figure 192. *Typical American aad Continental practice. Steam heated convectors under windows.*

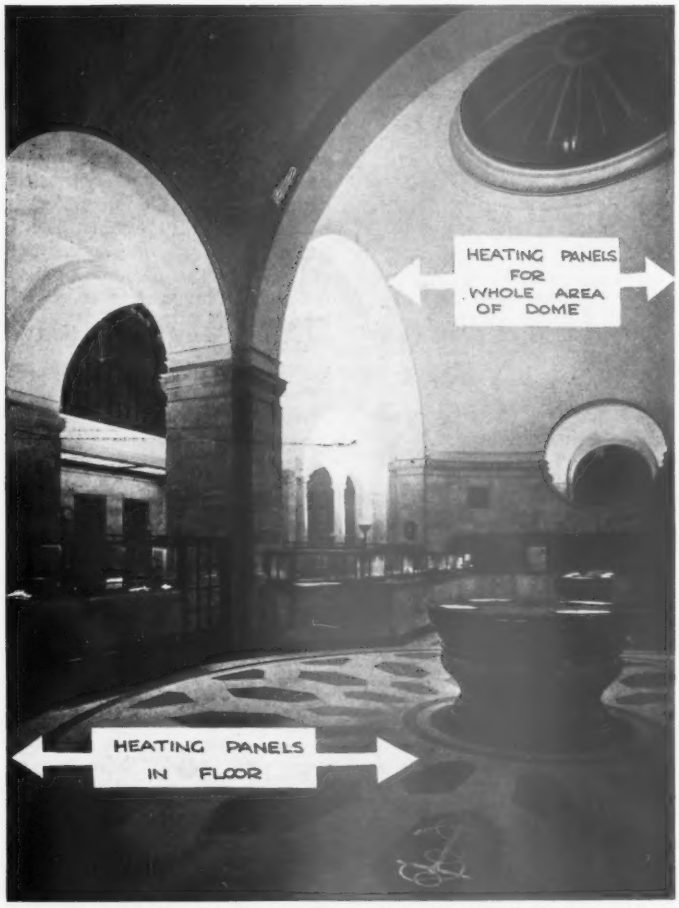


Figure 193. *Modern English practice. Concealed panel heating applied to extensive areas of floor and ceiling at the Head Office of Glyn Mills Bank, London.*

system in which radiators may be placed at the same level as the boiler, and even then this arrangement is better avoided. Otherwise all steam systems call for a basement boiler house if radiators are to be served at ground floor. Basements in British houses are becoming increasingly uncommon, and for this reason alone steam is generally unsuitable in residential work.

A further point to remember is that steam of any kind is unsuitable for use in the embedded panel systems, and whilst it has been used in the metallic plate and Ray-rad type the surface is much too hot for comfort. Ordinary radiators and convectors are the most suitable heating surface. The former need guards or grilles for protection against burning where children or hospital patients are liable to touch them. Convectors are more satisfactory and neater, though perhaps more difficult to clean. At any rate, convectors are displacing the ordinary radiator in the United States, just as in this country the various radiant systems are superseding it for the better work.

In passing, it is interesting to note that the tendency in the two countries is in opposite directions. The one (in America) towards smaller units using the principle of convection (Fig. 192), and the other (here) towards larger and more extended surfaces relying on the principle of radiation (Fig. 193). The causes leading up to this divergence may provide food for conjecture for those interested.

In view of the above considerations it is intended to do no more than touch upon the almost obsolete low pressure steam systems and to deal more fully with the vapour and vacuum systems.

1. *Low Pressure Steam, Single Pipe System (Fig. 194).*

The steam at 2 to 5 lbs. per sq. inch pressure enters the radiators, pushing the air before it through the air valves. The steam is condensed and falls to the bottom of the radiators, finding its way out through the same valve and pipe by which it entered. From here it returns to the boiler by flowing with the steam in the main to the far end, and back in the "wet return."

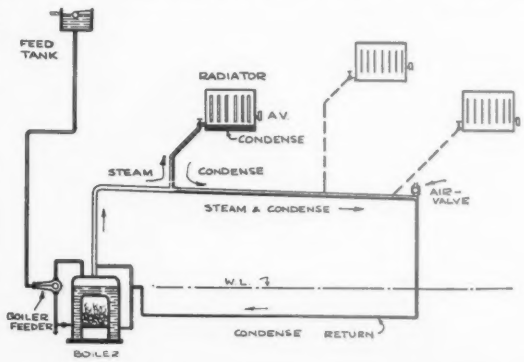
The system is easy and cheap to instal, but is often noisy in operation and gives trouble if the radiator valves are left partly opened due to water binding in the radiators.

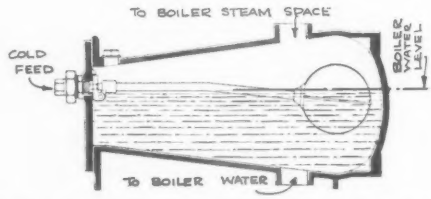
The piping may also be arranged as a drop system for serving a multi-storey building.

The boiler feeder shown on the above and following diagrams is given in detail in Fig. 195. It consists, in effect, of an inverted ball valve contained in a casing connected top and bottom direct to the boiler so that the water levels in both are the same. As the level drops the valve opens and water from the feed tank is admitted. The tank must, of course, be high enough for the water to overcome the pressure in the boiler. For instance, if the steam is at 5 lbs. per sq. in. pressure, the tank requires to be $5 \times 2{\cdot}32 = 11{\cdot}6$ ft. above water line; an allowance of 20 ft. would be suitable.

2. *Low Pressure Steam, Two Pipe System (Fig. 196).*

Steam at the same pressure as with the one pipe system is delivered to the radiators, air being discharged as before. After condensing it passes out through a separate valve to a separate return main; this return may be either "wet" as shown, or "dry," in which case it is above water level until close to the boiler, where it drops and





Left: **Figure 194.** *Low pressure steam heating, single pipe system.* *Above:* **Figure 195.** *Boiler feeder.*

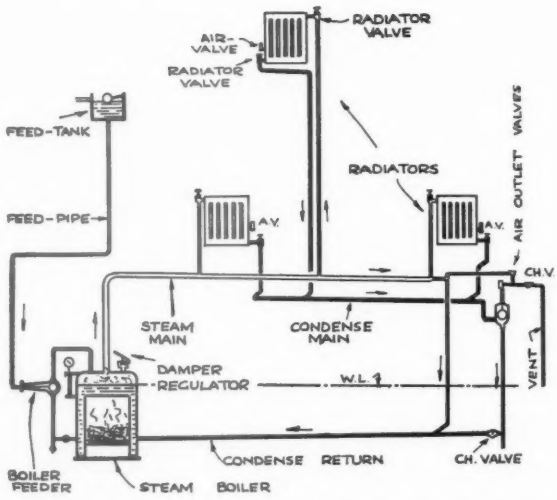
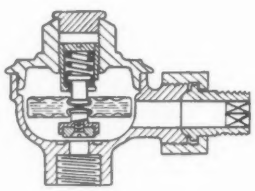


Figure 196. *Low pressure steam heating—two-pipe system.*



Left: Figure 198. *Thermostatic trap.*

Right: Figure 199. *Differential seal for vapour system.*

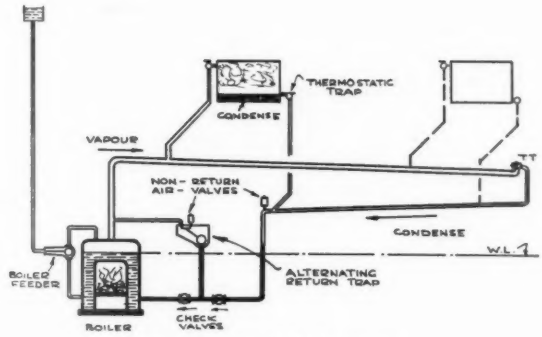
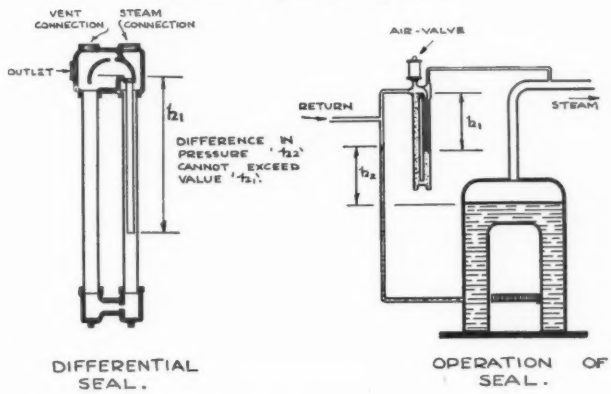


Figure 197. *Vapour heating system.*



enters at the bottom, as with the " wet" type.

The system may also be applied as a drop system for high buildings. Whilst more consistent in working than the single pipe system it has numerous shortcomings.

3. *Vapour System* (*Fig. 197*).

Steam at a few ounces per sq. inch pressure—just like steam from a boiling kettle, in fact—is delivered to the radiators through a system of pipes. The air, being more dense than the steam, falls to the bottom of the radiators and finds its exit with the water of condensation through a thermostatic trap into the return main. The latter may again be either " wet " or " dry."

The thermostatic trap shown in section in Fig. 198 remains open so long as the cool air and water are passing through, but the moment vapour reaches it the expansive element closes the port and keeps it closed until more water or air collect to allow it to cool and reopen.

As the condensate and air travel back in the return main to the boiler they are made to separate out before re-entering. This may be accomplished by a variety of patented devices, one of which is termed an alternating return trap shown in the diagram. This fills up with water, the air meantime escaping by the vent ; when the water level reaches a certain point the float quickly closes the vent and opens a valve in the equalizing pipe to the boiler. The water is then subjected to the same pressure as in the boiler, but, being at a higher level, flows down through the check valve next to the boiler until the trap is almost empty, when the cycle repeats.

A second device, shown in Fig. 199, is the differential seal which constantly balances the boiler pressure against the return condense so as to allow the latter to flow back at all times. The air escapes via the thermostatic vent valve, which closes when vapour reaches it from the boiler.

By using suitable fittings this system may be made to work with a banked fire at pressures below atmosphere for periods of four to eight hours, depending on the amount of inward air leaks into the system.

It should be noted that inward air leaks are much more difficult to locate than outward leaks of steam or water. Either of the latter will in time rust up any pinhole or may in fact evaporate on the surface before they are visible. Air will leak in, often where water will not leak out, and yet will not stop itself by rusting.

Ordinary valve spindles are found to allow air to leak in, thus packless valves have been designed wherein a metallic seal is maintained with a copper bellows.

Similarly the air vent devices and all similar fittings require to be made specially for sub-atmospheric working.

An advantage claimed for this system is that the radiator valves may be used as " modulators " for regulating the amount of heat in the room. When shut half off, only half the radiator may be filled with vapour. Whether this is of much use in practice is questionable, bearing in mind how little the average individual bothers about his radiator valve. It does, however, allow of thermostatic radiator control with the type of device shown in Fig. 200.

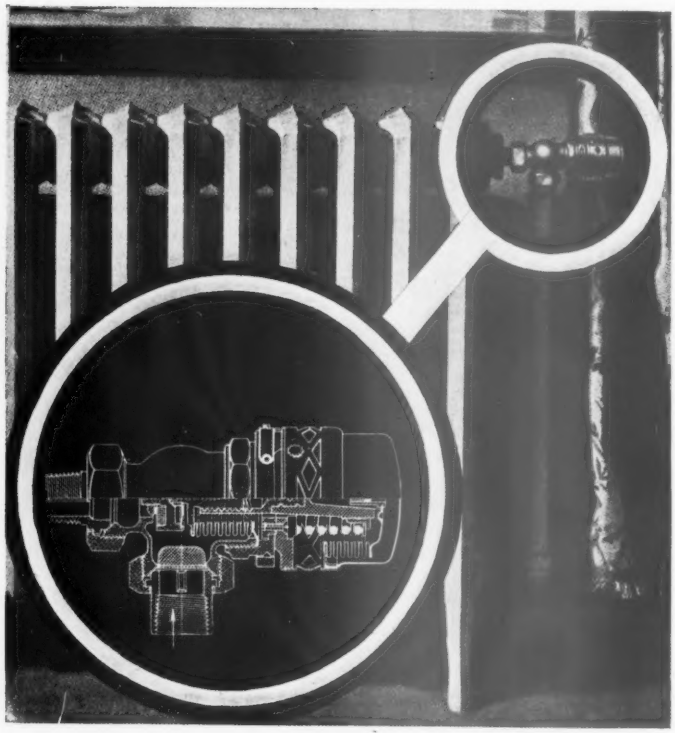
An alternative version of this system dispenses with thermostatic radiator traps, and limits the amount of steam admitted by means of a disc in the valve union. The disc has an orifice in the centre calibrated for various radiator sizes and admits no more steam than will condense completely before it reaches the outlet. In order to be sure of this, the heating surface is generally oversized by 10 or 20 per cent. above normal.

A further alternative version is the open type vapour system, in which the return line is left open to atmosphere and in which no partial vacuum is possible. This is obviously inferior to the above.

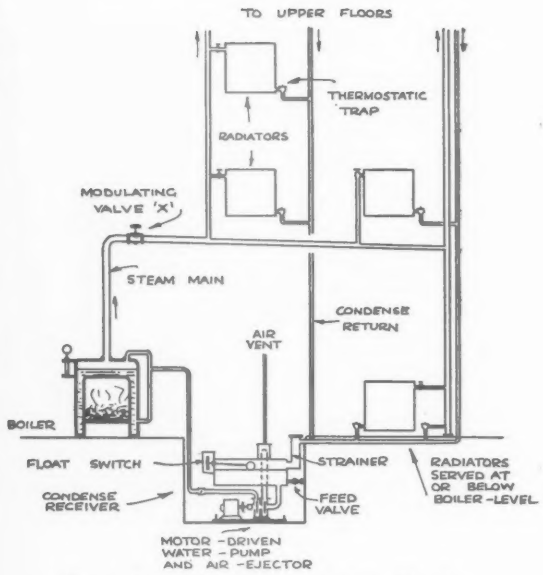
4. *Vacuum System. Fig. 201.*

The system is similar to the vapour type in utilizing steam at very low pressures, but differs in the method of handling condensation. The return line is connected to a receiver and vacuum pump which maintains a vacuum at all times, drawing all air and water out of the radiators whenever the thermostatic radiator traps open.

The pump has two impellers, one handling water in the ordin-



Left: Figure 200. *Packless thermostatic radiator valve.*



Above: Figure 201. *Vacuum system of heating.*

ary way, and the other air. The air impeller revolves in an oval housing partly filled with water so producing a pulsating effect which exhausts any air from the line and discharges it to atmosphere. An automatic control maintains a steady vacuum of 20 in. to 25 in. of mercury column, and also causes the pump to run whenever sufficient water has collected in the receiver, returning the condense to the boiler.

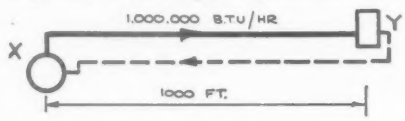
The vacuum carries right into the radiators and steam mains and a modulating control valve is fixed in the main steam flow (at point X of Fig. 201), controlled either by hand or automatically according to the weather.

Only during very cold weather will the full steam pressure be held in the radiators. At all other times the pressure will be sub-atmospheric, giving steam temperatures down to 160 deg. F. if 20 in. of vacuum is held. Further, if each radiator is fitted with a modulating valve and orifice disc or alternatively with thermostatic control, partial filling of the radiators with vapour is possible, giving still greater reduction of output for mild weather.

The thermostatic radiator and drip traps must be suitable for sub-atmospheric conditions, and the utmost care has to be taken to prevent inward air-leaks at these high vacua. Only those who have tried to maintain these systems leak-proof for any length of time know how difficult this is.

A great virtue of any steam system, but particularly the vacuum system, is its exceedingly rapid heating up and responsiveness. This is due to the high velocity with which steam travels, and to its high heat content per unit of weight, due to its latent heat.

One pound of steam at 1 lb. per sq. inch initial pressure, temperature 215 deg. F., occupies 25 cu. ft., and carries a latent heat of 970 B.T.U.'s per lb. For conveying, for example, 1,000,000 B.T.U.'s per hour from point X to point Y 1,000 ft. apart, we get the comparative table in column 2.



	Vacuum System (at 20 in. mercury column vacuum).	Hot Water System.
Weight to be passed per hour ..	1,030 lbs. steam	40,000 lbs. water (at 25 deg.drop)
Flow pipe size	5 in. steam	3½ in.
Return pipe size ..	2 in. condense	3½ in.
Velocity of flow	53 ft./sec.	3 ft./sec.
Heat input to steam or water contents of flow pipe heated from cold (50 deg.)	6,400 B.T.U.	400,000 B.T.U. (raised to 150 deg.).

(The above figures are approximate, and ignore radiation.)

The enormous difference in time lag is clearly shown by the last figures; in fact, if the heater at X has an output of no more than the 1,000,000 B.T.U. to be passed, it will take, in the case of hot water, half an hour before the flow pipe is brought up to temperature (allowing for radiation loss), and a further half hour before the return is fully heated. With steam only a few minutes are necessary.

With the vacuum system any leakage is inward, and there is no danger with a burst joint or fitting. This also facilitates repairs, as a radiator can, for instance, be taken away with the system at work, the open ends of the pipes drawing in air can be temporarily plugged after its removal.

When exhaust steam is available from engines the vacuum system may be used, consuming the steam direct without the calorifiers necessary with hot water heating. The connections are then as shown in Fig. 202. The vacuum pump may be of centrifugal type with a receiver driven by a small steam turbine, exhausting into the low pressure line. When this is done the power consumption of the pump costs nothing.

Alternatively, a reciprocating direct acting steam pump may be used without a receiver, as shown in Fig. 202. A diaphragm-operated vacuum con-

troller may be fitted as shown to maintain a steady vacuum. Such pumps handle the condense, vapour and air in the same cylinder and need to be of large size working at very low speed. On each exhaust stroke there is a risk of the condense flashing back into steam as the pressure in the cylinder is reduced. This may be overcome by fitting a cold water connection immediately on the pump suction supplying just enough to prevent re-evaporation.

Reciprocating vacuum pumps cannot be used to feed direct into boilers, as the air is still entrained with the water. A separating vessel or hot well is necessary to receive the discharge, followed by a boiler feed pump of ordinary type as shown in Fig. 202. This type of pump is only used where high pressure steam is available (50 lbs. per sq. in. or over), and in such cases the hot well or boiler feed tank is generally necessary for other reasons.

The above system is sometimes described as the *Sub-atmospheric Vacuum System.** The *plain vacuum* system is substantially the same except that a lower vacuum (8 or 10 in.) is held, and this applies only in the return mains, the steam mains being always slightly above atmospheric pressure. No modulator is used in the main supply.

This system obviously does not possess many of the better features of the sub-atmospheric vacuum system, and does not need further discussion.

It is not proposed to delve into the technical problems of sizing pipes, radiators, etc., for steam systems, because, as has already been made clear, these articles are intended to deal with heating primarily suited to British practice and conditions, and for the reasons given, we consider that while eminently suitable in some climates, it is not so suitable for ours.

* Though this is an unhappy name, as the word vacuum, of course, implies sub-atmospheric.

TRADE NOTES

[*EDITED BY PHILIP SCHOLBERG*]

A Welded Bridge

THE new bridge between the Building Centre and its Grafton Galleries extension, the main trusses of which were placed in position last week, has produced an interesting solution to an unusually rigid set of conditions.

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Provision had to be made for a future doorway in one panel of the truss ; limitations of ceiling light at this point and of roadway clearance under the bridge dictated the vertical height of the trusses, the depth of the booms being made appropriate to the door opening and the floor depth, and the panel spacing adjusted to suit the width of the door and the skew at one end of the bridge.

•

These conditions made it impossible to use the ordinary lattice truss or plate girders and a solution has been found in a truss without diagonals in which the shear usually carried through the diagonals is transferred to the abutment by virtue of the stiffness of the chord and vertical members, and the rigid joints by which they are connected. This type of truss has been popularised on the Continent by the work of Professor Vierendeel, by whose name it has come to be known, and was used for the main beams over the Henry Florence Hall of the R.I.B.A. building.

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When used in buildings the chord members may be set at floor level, and the vertical web members appear merely as stanchions. The trusses are particularly adapted to carrying glazing, and if steel window frames are fitted directly into the rectangular openings a minimum of obstruction to light is achieved.

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The bridge is of arc-welded construction. The members of the trusses, which are all of H section, are built up of flat plates assembled in such a way that they are continuous past the corners, where the stresses are high, and the joints are made at points of minimum stress.

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The plates are curved at the corners of the rectangular openings, since square corners would lead to heavy concentrations of stress. The making of these shapes, which would be very costly, if not altogether impracticable, in riveted construction, is carried out quite simply in welded construction.

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The diagram on the following page shows the general lay-out of the bridge, which was designed by Mr. L. H. Bucknell, Mr. E. S. Needham being responsible for the steelwork.

Ideas from the Building Industry

The building industry is so often reproached for not knowing what other industries are doing that it is amusing to find the motor industry (always ready to run a new piece of publicity jargon) coming out with another epoch-making discovery.

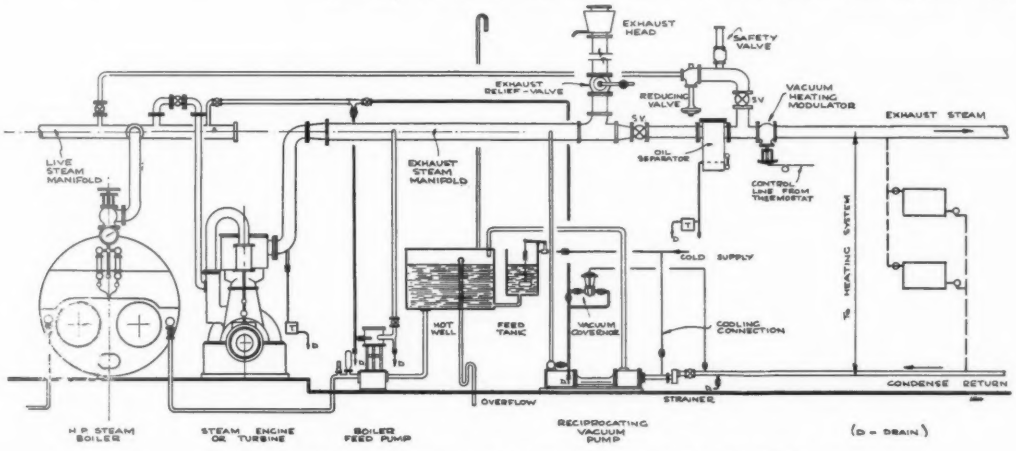
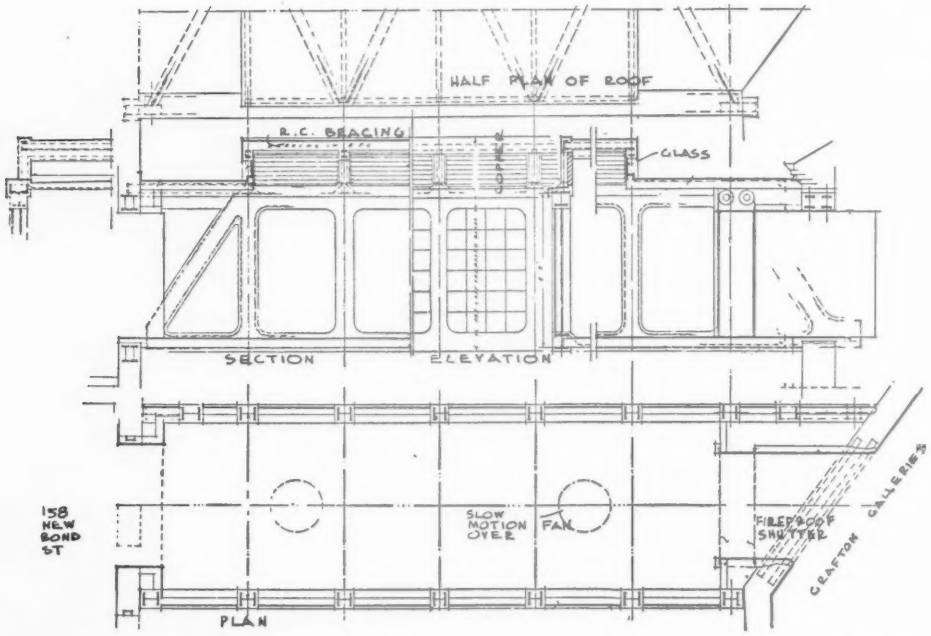


Figure 202. *Vacuum steam system operated from exhaust steam supply.*



Plan and section of the welded steel bridge recently erected at the Building Centre (see accompanying note).

"Vauxhall designers have revolutionized driving comfort in the new 'Body Conformity' front seats on this Big Six Saloon. They have developed a softly sprung seat that moulds itself to the form and supports both knees and back comfortably. The springs are arranged *horizontally* instead of vertically, and they are interconnected to give a softly sprung seat which can neither bounce nor 'bottom.' The springs in the back rest are arranged on a similar principle and shaped to match the contour of the back." See headpiece to these notes.

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And how long is it since this system has been quite usual for ordinary furniture? I remember it at the 1931 Swedish Exhibition at Dorland Hall, where the springs were made of rubber covered with silk braiding. Since then Parker-Knoll have made I know not how many chairs in almost the same way, only using spiral steel springs instead of rubber.

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But the real point seems to be that headroom is increased by 1 in. and leg-room by 2 in., presumably because the springing and upholstery is shallower than the usual spiral type. So a feature which did not matter very much for furniture can make all the difference where space is limited.

Publications Received

Electric Wiring—for Complete Installations or Extensions. Issued by W. T. Henley's Telegraph Works Company, Ltd., Holborn Viaduct, E.C.1. The three Henley wiring systems described, with illustrations of various types of building where they have been employed.

Dunlopillo Cushioning. Issued by the Dunlop Rubber Co., Ltd., St. James's Street, S.W.1. Latex cellular upholstery as applied to public buildings.

Modern Steel Equipment. Issued by Rubery, Owen & Co., Ltd., Darlaston, S. Staffs. Steel filing cabinets, storage bins, shelving and lockers.

Unity Systems of Electric Warning. Issued by Unit Heating, Ltd., Vincent House, Vincent Square, S.W.1. Low temperature electrical heating apparatus.

Gas in Maternity Home and Clinic. Issued by the British Commercial Gas Association, of 28 Grosvenor Gardens, S.W.1. Illustrations and a description of the Christiana Hartley Maternity Home at Colne.

THE BUILDINGS ILLUSTRATED

Following are the names of some of the general and sub-contractors for the buildings illustrated in this issue :—

Dartington Hall School, Totnes (pages 477-484).

Boarding Houses 2 and 3. General Contractors, Staverton Builders, Ltd. Sub-contractors : Dorman Long & Co., Ltd., structural steel ; Carter & Co., Ltd., tiles ; J. C. Edwards Ltd., tiles ; Standard Flat Roofing Co., Ltd., special roofings ; Mundet Cork Products, Ltd., cork flooring ; Marbolith Flooring Co., Ltd., patent flooring ; G. N. Haden and Sons, Ltd., central heating ; Devon Electric and General Services, Ltd., electric wiring ; Troughton and Young, Ltd., electric light fixtures ; Matthew Hall & Co., Ltd., plumbing ; Shanks & Co., Ltd., sanitary fittings ; Wm. Brock & Co., stairtreads ; Wm. J. Dibben and Sons, and J. M. Pirie & Co., Ltd., door furniture ; Henry Hope and Sons, casements.

School Gymnasium. General contractors, Staverton Builders, Ltd., Sub-contractors ; Caxton Floors, Ltd., reinforced concrete ; Edward Wood & Co., Ltd., structural steelwork ; Standard Flat Roofing Co., special roofing ; Acme Flooring and Paving Co., Ltd., hard-wood flooring ; Cement Marketing Co., Ltd., patent flooring—Cullamix ; G. N. Haden and Sons, Ltd., central heating ; Devon Electric and General Services, Ltd., electric wiring ; Troughton and Young, electric light fixtures ; Twyfords, Ltd., sanitary fittings ; Adamite Co., Ltd., stair treads ($6 \times 4 \times \frac{1}{2}$ round-nosed grey-white Alundum tiles) ; Comyn Ching & Co., Ltd., door furniture ; Henry Hope and Sons, Ltd., casements ; Niels Larsen & Co., Ltd., gynmasium fittings.

Warren Cottages. General Contractors, Staverton Builders, Ltd. ; Sub-contractors : J. C. Edwards, Ltd., floor tiles ; Standard Flat Roofing Co., special roofings ; Eagle Range and Grate Co., Ltd., back-to-back grates ; Devon Electric and General Services, electric wiring ; Troughton and Young, electric light fixtures ; J. Palmer and Son, plumbing ; Wm. Dibben & Co., sanitary fittings ; Parker Winder and Achurch, Ltd., door furniture ; Henry Hope and Sons, and John Williams, Ltd., casements.

Cranmer Court, Chelsea (pages 489-493). General contractors, E. D. Winn & Co., Ltd., Sub-contractors : Dorman Long & Co., Ltd., steelwork ; Caxton Floors, Ltd., floors ; Le Grand Sutcliffe and Gell, Ltd., artesian wells ; Thomas W. Ward, Ltd., ketton cement ; Websters, Ltd., brickwork and facing bricks ; T. Clarke & Co., Ltd., electrical work ; Girling's Ferro Concrete Co., Ltd., granostone staircases ; Burn Bros. (London), Ltd., C.I. drain and soil pipes ; Allied Guilds, Ltd., guildstone ; Ragusa Asphalte Paving Co., Ltd., asphalt ; Horsley Smith & Co. (London), Ltd., oak flooring ; Etchells Congdon and Muir, Ltd., lifts ; Chase & Co., Ltd., heating and domestic hot water ; Lenscrete, Ltd., paving and roof lights ; W. James & Co., Ltd., metal windows ; Gas Light and Coke, Ltd., gas installation for cooking and heating ; W. B. Simpson and Sons, Ltd., wall tiling ; Huntley and Sparks, Ltd., cabot quilt ; Potter Rax Gate Co., Ltd., lifts and gates ; T. W. Palmer & Co., wrot and cast iron ; R.I.W. Protective Products, Ltd., damp-proofing exterior walls ; Vine and Wright, Ltd., roofing contractors ; Carbo Plaster, Ltd., plaster ; Constable Hart & Co., Ltd. concrete foundations and asphalt surfaces ; Radio Furniture and Fittings, Ltd., radio facilities ; Ideal Boilers and Radiators, Ltd., boilers and radiators ; W. N. Froy and Sons, Ltd., fireplaces throughout ; Electrolux, Ltd., 256 air-cooled refrigerator cabinets.

THE WEEK'S BUILDING NEWS

LONDON & DISTRICTS (15-MILES RADIUS)

ADDINGTON. *Schools.* The Croydon Education Committee has acquired three school sites on the First National Housing Estate, Addington.

BARKING. *Flats.* The Corporation is to erect flats on vacant sites in Red Lion Place, Tanner Square and Upton Lane at a cost of £25,450.

BARKING. *Isolation Block.* The Corporation is to erect another isolation block at the hospital.

BECKENHAM HILL. *Houses.* Messrs. Spencer and Kent are to erect 26 houses at Southend Road, Beckenham Hill.

BERMONDSEY. *Housing Scheme.* Bermondsey B.C. has purchased a large site at Neckinger for £35,000 for a housing scheme.

BERMONDSEY. *Health Centre.* Bermondsey B.C. is to reconstruct health premises in Rotherhithe New Road at a cost of £13,397.

BERMONDSEY. *Flats.* Bermondsey B.C. is to erect 31 flats and a shop on the Arnolds Place area at a cost of £17,327.

BERMONDSEY. *Clinic.* Bermondsey B.C. proposes the erection of a tuberculosis clinic on the Silver Street area.

BERMONDSEY. *Shops.* The Royal Arsenal Co-operative Society is to erect shops in Long Lane, Bermondsey.

BERMONDSEY. *Shops, etc.* Messrs. C. V. Stevens & Co. have prepared a scheme for the erection of shops and flats on a site at Snowsfield and Rowley Buildings, Bermondsey.

CROYDON. *Homes.* A scheme for the reconstruction of the Queen's Road Homes, at a cost of between £25,000 and £30,000, is shortly to be considered by the Corporation.

EAST HAM. *Public Hall.* The Corporation is considering the provision of a public hall in the north of the borough.

EAST HAM. *Alterations and Extensions, etc.* Plans passed by the Corporation: Alterations, 163 High Street, for Bata Shoe Co.; extensions, 407 Barking Road, for Mr. R. J. Slater; additions, 179 Plashet Grove, for Mr. F. H. Buen; workshop, 139 Ranelagh Road, for Mr. F. J. Marris; alterations, 406 Katherine Road, for Messrs. Bartlett and James; alterations, 954 Romford Road, for Mr. S. Bairstow; extensions, Trebor Works, Katherine Road, for Messrs. J. C. Mellis & Co.; factory, 636 Romford Road, for Messrs. T. W. Palmer & Co.; additions, 176 High Street, for Mr. G. Seigerts; workshop, 78 Elsenham Road, for Mr. A. Talbot; rebuilding, 331-3 Green Street, for Mr. W. Braxton Sinclair.

HAMMERSMITH. *Flats.* Hammersmith B.C. has approved a scheme for the erection of 274 flats in Emlyn Road.

HAMMERSMITH. *Flats.* Hammersmith B.C. has approved a scheme for the erection of 85 tenements and five shops on the Becklow Place area at a cost of £59,920.

HAMMERSMITH. *Flats, etc.* Plans passed by the B.C.: Buildings, Addison Gardens and Richmond Road, for Sir Aston Webb and Son; extensions, Godolphin and Latymers Girls' School, Iffley Road, for Mr. V. O. Rees; block of flats, 353-367, Goldhawk Road, for Messrs. Roy Gibson, Ltd.; office extensions, 31, The Grove, for Messrs. Geo. Wimpey & Co., Ltd.; second section, Queen Charlotte's Hospital, Goldhawk Road, for Messrs. Stanley Hall and Easton and Robertson; factory extensions in Aldine Place and Queen Street for Mr. L. O. Woodward.

HAMPTON. *Flats, etc.* The U.D.C. has approved the following plans: Mr. F. G. Hughes (for Mr. A. J. Shorthouse), cold storage building, Oldfield Road; Messrs. M. E. and O. H. Collins (for Mr. D. Ainslie), 16 flats, High Street; Mr. G. Whittaker (for Mr. M. Cowen), three shops and dwelling houses corner of Percy Road; Messrs. W. Greville Collins, Ltd., 12 houses, Ormond Drive; Mr. W. M. Burt (for Mr. Pecover), four shops and flats and two houses, Station Road.

KENTON. *Church.* Work has now commenced upon the erection of the Church of St. Mary the Virgin. The plans were prepared by Mr. J. Harold Gibbons; while the contractors are Messrs. Nelson and Rosier.

POPLAR. *Factory.* Steel Ceilings, Ltd., propose to erect a factory in Old Ford Road, Poplar.

POPLAR. *Town Hall.* Poplar B.C. has decided in connection with the erection of the new town hall in Bow Road to so arrange the auditorium as to enable its use as a cinema.

ST. PANCRAS. *Subway.* The Hospital Governors are to construct a subway under Huntley Street, St. Pancras, to connect University College Hospital with new premises to be erected opposite.

ST. PANCRAS. *Hospital Students' Accommodation.* The Dominion Students' Hall Trust has arranged for the closure of Mecklenburgh Mews in connection with the erection in Doughty Street, St. Pancras, of the main hall of premises for the accommodation of students from the Dominions.

SYDENHAM. *Housing Estate.* Messrs. Brett and Son are to construct five streets on the Peak Hill Garden estate, Sydenham Park Road, Sydenham.

TWICKENHAM. *Extensions.* Messrs. F. W. Woolworth & Co. are to have extensions made to their premises, 20-22 King Street.

TWICKENHAM. *Shops and Flats.* The T.C. has given consent to an application by Mr. G. McLean, on behalf of Mr. Lewis Jones, for the proposed erection of 14 shops with 14 flats over at the junction of Hanworth Road and Powder Mill Lane.

TWICKENHAM. *Houses.* Messrs. Wates (Malden), Ltd., are to erect 34 houses on the east side of Hospital Bridge Road and six shops with living accommodation over at the junction of Staines Road and Hospital Bridge Road.

TWICKENHAM. *Houses.* Messrs. Couch and Coupland, architects, Richmond, have prepared plans for the erection of 32 semi-detached houses between Craneford Way and Court Way.

TWICKENHAM. *Welfare Centre and School Clinic.* The Forty Acre Field at the junction of Hospital Bridge Road and Powder Mill Lane, is the suggested site for a proposed maternity and child welfare centre and school clinic proposed to be erected by the T.C. Plans are to be prepared by the Borough Surveyor.

UPPER NORWOOD. *Flats.* Mr. C. W. Bowles is to erect a block of flats at the corner of Central Hill and Essex Grove, Upper Norwood.

WHITTON. *Cinema and Shops.* Consent has been given to an application by Mr. W. J. King for the proposed erection of a cinema, 16 shops with 15 flats over, and 12 lock-up garages at the junction of Nelson and Percy Roads and Cypress Avenue.

WOOD GREEN. *Day Nursery.* Wood Green Corporation has approved plans for the erection of a day nursery and clinic in White Hart Lane at a cost of £10,000.

SOUTHERN COUNTIES

AMERSHAM. *Slum Clearance.* The R.D.C. is to apply to the M.H. for sanction to borrow £3,780 for the purchase of sites for rehousing purposes at Amersham and Gore Hill, Coleshill, Chalfont St. Peter, Great Missenden and Little Missenden.

BLETCHLEY. *Swimming Pool.* The U.D.C. has approved a scheme prepared by Mayor John Chadwick, F.R.I.B.A., for the provision of a swimming pool, a children's paddling pool, tennis courts and bowling greens.

LYDDEN. *School.* Kent Education Committee is to erect a school at Lydden to replace the church school which is to be closed.

NORTH TONBRIDGE. *School.* Kent Education Committee is to acquire a site at North Tonbridge for the erection of a junior school.

ORPINGTON. *School.* Kent Education Committee is to erect an elementary school in Warren Road, Orpington.

PETHAM. *School.* Kent Education Committee is to purchase a site at Petham for the erection of the school to replace the church school, which is to be closed.

SEVENOAKS. *School.* Kent Education Committee is to erect a school for 720 at Mill Pond Wood, Sevenoaks.

SIDCUP. *School.* Kent Education Committee is to erect an elementary school in Footscray Lane, Sidcup.

SLOUGH. *School.* The Bucks C.C. has now purchased a site of 925 acres at Twinches Lane for the proposed erection of a Girls' High School.

SOUTHAMPTON. *Swimming Pools.* A comprehensive scheme for the provision of open-air swimming pools in outlying districts is now being prepared by the Baths Committee. The condition of the Turkish bath is to be considered in the Western Shore baths reconstruction scheme.

SOUTH-WESTERN COUNTIES

EXETER. *School.* Exeter Corporation is seeking sanction to borrow £23,150 for the erection of a senior school in Ladysmith Road.

EXETER. *Houses.* Exeter Corporation has obtained sanction to borrow £120,090 for the erection of 296 houses at St. Loyes and Tollards estates.

EXETER. *Hospital.* Exeter Corporation is to consider the provision of isolation hospital accommodation.

EXETER. *Police Headquarters.* Exeter Corporation is to prepare a scheme for the reconstruction of the police headquarters.

SOUTH MOLTON. *Houses.* The R.D.C. are to purchase sites at Kingsnympton and Bishopsnympton for housing purpose. The Minister of Health has approved the purchase of sites at Molland and North Molton by the Council.

EASTERN COUNTIES

ONGAR. *Houses.* The R.D.C. propose to erect 64 houses on various sites in the district. Sanction to a loan of £20,000 is to be applied for.

MIDLAND COUNTIES

COVENTRY. *School.* Coventry Education Committee is acquiring a site at Keresley for the erection of an elementary school.

COVENTRY. *School.* Coventry Education Committee is acquiring land for the extension of Foxford council school.

COVENTRY. *Power Station.* Coventry Corporation is to enlarge the power station at a cost of £306,000.

NORTHERN COUNTIES

BLIDWORTH. *Cinema.* Plans passed by Blidworth, Notts, U.D.C.: Cinema, Mansfield Road, for Rainworth Theatres Ltd.

DUDLEY. *Houses.* Dudley Corporation has approved plans by the borough engineer for the erection of 350 houses on the Wren's Nest estate.

DUDLEY. *School.* Dudley Education Committee is to erect a junior school on the Wren's Nest housing estate.

DUDLEY. *Church.* Dudley Corporation has now arranged with the Rev. H. H. Hill for a site for the erection of a Baptist Church to replace that in New Street.

MORECAMBE. *Omnibus Station.* The Ministry of Health has allowed the appeal of the Ribble Motor Services against the refusal of the Morecambe Corporation to sanction the provision of a bus station in Euston Road.

OLDHAM. *Bank.* Ashton-under-Lyne Trustee Savings Bank is to erect branch premises in King Street, Oldham.

SHIREMOOR AND NEWBIGGIN. *Welfare Centre.* Northumberland C.C. is to erect welfare centres at Shiremoor and Newbiggin.

WARRINGTON. *Houses, etc.* Plans passed by the Corporation: Nine houses, Egerton Avenue, Messrs. T. and C. Rigby; four houses, Cowdell Street, for Mr. C. Gornal; offices, Thelwall Lane, for Messrs. Pierpoint and Bryant, Ltd.; foundry extensions, Dallam Lane, for Whyman's Foundry, Ltd.; revised plans for Odeon cinema, Buttermarket Street, for Messrs. Drury and Gomersall.

WARRINGTON. *Bathing Pool.* Warrington Corporation is considering the construction of an open-air bathing pool in Orford Park.

WARRINGTON. *Slum Clearance.* Warrington Corporation has instructed the borough engineer to prepare a lay-out plan for the James Street clearance area.

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 5	1 0½
A	Aberdeen ..	Scotland	1 6	1 1½
A_1	Abergavenny ..	S. Wales & M.	1 5	1 0½
A	Abingdon ..	S. Counties	1 4	1 0
A	Accrington ..	N.W. Counties	1 5½	1 1½
A	Addlestone ..	S. Counties	1 4	1 0
A	Adlington ..	N.W. Counties	1 5½	1 1½
A	Airdrie	Scotland	*1 5½	1 1½
C	Aldeburgh ..	E. Counties	1 1½	10½
A	Altrincham ..	N.W. Counties	1 5½	1 1½
B	Appleby ..	N.W. Counties	1 2	10½
A	Ashton-under-Lyne	N.W. Counties	1 5½	1 1½
B_1	Aylesbury ..	S. Counties	1 3	11½
B_1	BANBURY ..	S. Counties	1 3	11½
B_1	Banger ..	N.W. Counties	1 3	11½
A_2	Barnard Castle	N.E. Coast	1 4	1 0
A	Barnsley ..	Yorkshire	1 5½	1 1½
B	Barnstaple ..	S.W. Counties	1 3½	11½
A	Barrow	N.W. Counties	1 5½	1 1½
A	Barry	S. Wales & M.	1 5½	1 1½
B_1	Basingstoke ..	S.W. Counties	1 3	11½
A_2	Bath	S.W. Counties	1 4½	1 0½
A	Batley ..	Yorkshire	1 5½	1 1½
A_2	Bedford ..	E. Counties	1 4½	1 0½
A_2	Berwick-on-Tweed	N.E. Coast	1 4½	1 0½
A_2	Bewdley ..	Mid. Counties	1 4½	1 0½
B	Bicester ..	S. Counties	1 2	10½
	Birkenhead ..	N.W. Counties	*1 7	1 2½
A	Birmingham ..	Mid Counties	1 5½	1 1½
A_1	Bishop Auckland	N.E. Coast	1 5	1 0½
A	Blackburn ..	N.W. Counties	1 5½	1 1½
A	Blackpool ..	N.W. Counties	1 5½	1 1½
A	Blyth	N.E. Coast	1 5½	1 1½
B_1	Bognor ..	S. Counties	1 3	11½
A	Bolton	N.W. Counties	1 5½	1 1½
A	Boston	Mid. Counties	1 4	1 0
A_2	Bournemouth ..	S. Counties	1 4½	1 0½
B_2	Bovey Tracey	S.W. Counties	1 2½	11
A	Bradford ..	Yorkshire	1 5½	1 1½
A_1	Brentwood ..	E. Counties	1 5	1 0½
A	Bridgend ..	S. Wales & M.	1 5½	1 1½
B	Bridgwater ..	S.W. Counties	1 3½	11½
A_1	Bridlington ..	Yorkshire	1 5	1 0½
A	Brighouse ..	Yorkshire	1 5½	1 1½
A_2	Brighton ..	S. Counties	1 4½	1 0½
A	Bristol	S.W. Counties	1 5½	1 1½
B	Brixham ..	S.W. Counties	1 2½	11
A	Bromsgrove ..	Mid. Counties	1 4½	1 0½
B	Bromyard ..	Mid. Counties	1 2	10½
A	Burnley ..	N.W. Counties	1 5½	1 1½
A	Burslem ..	Mid. Counties	1 5½	1 1½
A	Burton-on-Trent	Mid. Counties	1 5½	1 1½
A	Bury	N.W. Counties	1 5½	1 1½
A	Buxton ..	N.W. Counties	1 5	1 0½
A_1	CAMBRIDGE ..	E. Counties	1 5	1 0½
B_1	Canterbury ..	S. Counties	1 3	11½
A	Cardiff	S. Wales & M.	1 5½	1 1½
A	Carlisle ..	N.W. Counties	1 5½	1 1½
B	Carmarthen ..	S. Wales & M.	1 3½	11½
B	Carnarvon ..	N.W. Counties	1 3½	11½
A	Carnforth ..	N.W. Counties	1 5½	1 1½
A	Castleford ..	Yorkshire	1 5½	1 1½
A_2	Chatham ..	S. Counties	1 4	1 0
A	Chelmsford ..	E. Counties	1 4	1 0
A	Cheltenham ..	S.W. Counties	1 4	1 0
A	Chester	N.W. Counties	1 5½	1 1½
A	Chesterfield ..	Mid. Counties	1 5½	1 1½
B_1	Chichester ..	S. Counties	1 3	11½
A	Chorley	N.W. Counties	1 5½	1 1½
B_1	Cirencester ..	S. Counties	1 3	11½
A	Clitheroe ..	N.W. Counties	1 5½	1 1½
A	Clydebank ..	Scotland	1 5½	1 1½
A	Coalville ..	Mid. Counties	1 5½	1 1½
A_2	Colchester ..	E. Counties	1 4½	1 0½
A	Colne	N.W. Counties	1 5½	1 1½
A_2	Colwyn Bay ..	N.W. Counties	1 4½	1 0½
A_1	Consett ..	N.E. Coast	1 5	1 0½
A_2	Conway ..	N.W. Counties	1 4½	1 0½
A	Coventry ..	Mid. Counties	1 5½	1 1½
A_2	Crewe	N.W. Counties	1 4½	1 0½
A	Cumberland ..	N.W. Counties	1 4	1 0
A	DARLINGTON ..	N.E. Coast	1 5½	1 1½
A	Darwen ..	N.W. Counties	1 5½	1 1½
B_1	Deal	S. Counties	1 3	11½
A_2	Denbigh ..	N.W. Counties	1 4	1 0
A	Derby	Mid. Counties	1 5½	1 1½
A	Dewsbury ..	Yorkshire	1 5½	1 1½
B	Didcot ..	S. Counties	1 3½	11½
A	Doncaster ..	Yorkshire	1 5½	1 1½
B_1	Dorchester ..	S.W. Counties	1 3	11½
A	Driffield ..	Yorkshire	1 4	1 0
A_2	Droitwich ..	Mid. Counties	1 4½	1 0½
A	Dudley	Mid. Counties	1 5½	1 1½
A_2	Dumfries ..	Scotland	1 5	1 0½
A	Dundee	Scotland	1 5½	1 1½
A	Durham	N.E. Coast	1 5½	1 1½
A_2	EASTBOURNE ..	S. Counties	1 4½	1 0½
A_1	Ebbw Vale ..	S. Wales & M.	1 5	1 0½
A	Edinburgh ..	Scotland	1 5½	1 1½
A_1	E. Glamorganshire, Rhondda Valley District	S. Wales & M.	1 5	1 0½
A_2	Exeter	S.W. Counties	*1 4½	1 0½
B	Exmouth ..	S.W. Counties	1 3½	11½
A_3	FELIXSTOWE	E. Counties	1 4	1 0
A	Filey	Yorkshire	1 4	1 0
A	Fleetwood ..	N.W. Counties	1 5½	1 1½
B_1	Folkestone ..	S. Counties	1 3	11½
A	Frodsham ..	N.W. Counties	1 5½	1 1½
B_2	Frome	S.W. Counties	1 2½	11
A	GATESHEAD	N.E. Coast	1 5½	1 1½
B	Gillingham ..	S. Counties	1 3½	11½
A	Glasgow ..	Scotland	1 6	1 1½
A_3	Gloucester ..	S.W. Counties	1 4½	1 0½
A_2	Goole	Yorkshire	1 4½	1 0½
A_2	Gosport ..	S. Counties	1 4½	1 0½
A_2	Grantham ..	Mid. Counties	1 4	1 0
A_2	Gravesend ..	S. Counties	1 5	1 0½
A_1	Greenock ..	Scotland	*1 5½	1 1½
A	Grimsby ..	Yorkshire	1 5½	1 1½
B	Guildford ..	S. Counties	1 3½	11½
A	HALIFAX ..	Yorkshire	1 5½	1 1½
A	Hanley ..	Mid. Counties	1 5½	1 1½
A	Harrogate ..	Yorkshire	1 5½	1 1½
A	Hartlepools ..	N.E. Coast	1 5½	1 1½
B	Harwich ..	E. Counties	1 3½	11½
B_1	Hastings ..	S. Counties	1 3	11½
A_2	Hatfield ..	S. Counties	1 4½	1 0½
B	Hereford ..	S.W. Counties	1 3½	11½
A_2	Hertford ..	E. Counties	1 4½	1 0½
A	Heysham ..	N.W. Counties	1 5½	1 1½
A	Howden ..	N.E. Coast	1 5½	1 1½
A	Huddersfield ..	Yorkshire	1 5½	1 1½
A	Hull	Yorkshire	1 5½	1 1½
A	ILKLEY ..	Yorkshire	1 5½	1 1½
A	Immingham ..	Mid. Counties	1 5½	1 1½
A_2	Ipswich ..	E. Counties	1 4½	1 0½
B_2	Isle of Wight ..	S. Counties	1 2½	11
A	JARROW ..	N.E. Coast	1 5½	1 1½
A	KEIGHLEY ..	Yorkshire	1 5½	1 1½
A_3	Kendal ..	N.W. Counties	1 4	1 0
A_3	Keswick ..	N.W. Counties	1 4	1 0
A_1	Kettering ..	Mid. Counties	1 5	1 0½
A_2	Kidderminster	Mid. Counties	1 4½	1 0½
B_1	King's Lynn ..	E. Counties	1 3	11½
A	LANCASTER ..	N.W. Counties	1 5½	1 1½
A_1	Leamington ..	Mid. Counties	1 5	1 0½
A	Leeds	Yorkshire	1 5½	1 1½
A	Leek	Mid. Counties	1 5½	1 1½
A	Leicester ..	Mid. Counties	1 5½	1 1½
A	Leigh	N.W. Counties	1 5½	1 1½
B	Lewes	S. Counties	1 2	10½
A_2	Lichfield ..	Mid. Counties	1 4½	1 0½
A	Lincoln	Mid. Counties	1 5½	1 1½
	Liverpool ..	N.W. Counties	*1 7	1 2½
A_2	Llandudno ..	N.W. Counties	1 4½	1 0½
A	Llanelly ..	S. Wales & M.	1 5½	1 1½
	London (12-miles radius)		1 7½	1 2½
	Do. (12-15 miles radius)		1 7	1 2½
A	Long Eaton ..	Mid. Counties	1 5½	1 1½
A	Loughborough ..	Mid. Counties	1 5½	1 1½
A_1	Luton	E. Counties	1 5	1 0½
A	Lytham ..	N.W. Counties	1 5½	1 1½
A_1	MACCLESFIELD	N.W. Counties	1 5	1 0½
A_3	Maidstone ..	S. Counties	1 4	1 0
A_3	Malvern ..	Mid. Counties	1 4	1 0
A	Manchester ..	N.W. Counties	1 5½	1 1½
A	Mansfield ..	Mid. Counties	1 5½	1 1½
B_1	Margate ..	S. Counties	1 3	11½
A	Matlock ..	Mid. Counties	1 4	1 0
A_1	Merthyr ..	S. Wales & M.	1 5	1 0½
A	Middlesbrough	N. E. Coast	1 5½	1 1½
A_2	Middlewich ..	N. W. Counties	1 4½	1 0½
B_2	Minehead ..	S.W. Counties	1 2½	11
B_2	Monmouth & S. and E. Glamorganshire	S. Wales & M.	1 2½	11
A	Morecambe ..	N.W. Counties	1 5½	1 1½
A_2	NANTWICH ..	N.W. Counties	1 4½	1 0½
A	Neath	S. Wales & M.	1 5½	1 1½
A	Nelson ..	N.W. Counties	1 5½	1 1½
A	Newcastle ..	N.E. Coast	1 5½	1 1½
A	Newport ..	S. Wales & M.	1 5½	1 1½
A	Normanton ..	Yorkshire	1 5½	1 1½
A	Northampton	Mid. Counties	1 5½	1 1½
A	North Staffs ..	Mid. Counties	1 5½	1 1½
A	North Shields ..	N.E. Coast	1 5½	1 1½
A_1	Norwich ..	E. Counties	1 5	1 0½
A	Nottingham ..	Mid. Counties	1 5½	1 1½
A	Nuneaton ..	Mid. Counties	1 5½	1 1½
A	OAKHAM ..	Mid. Counties	1 4	1 0
A	Oldham ..	N.W. Counties	1 5½	1 1½
A_3	Oswestry ..	N.W. Counties	1 4	1 0
A_1	Oxford ..	S. Counties	1 5	1 0½
A	PAISLEY ..	Scotland	*1 5½	1 1½
B_2	Pembroke ..	S. Wales & M.	1 2	10½
A	Perth	Scotland	*1 5½	1 1½
A_1	Peterborough ..	E. Counties	1 5	1 0½
A	Plymouth ..	S.W. Counties	*1 5½	1 1½
A	Pontefract ..	Yorkshire	1 5½	1 1½
A_1	Pontypridd ..	S. Wales & M.	1 5	1 0½
A_2	Portsmouth ..	S. Counties	1 4½	1 0½
A	Preston ..	N.W. Counties	1 5½	1 1½
A	QUEENSFERRY	N.W. Counties	1 5½	1 1½
A_3	READING ..	S. Counties	1 4½	1 0½
B	Reigate ..	S. Counties	1 3½	11½
A	Retford ..	Mid. Counties	1 4	1 0
A_1	Rhondda Valley	S. Wales & M.	1 5	1 0½
A	Ripon	Yorkshire	1 4	1 0
A	Rochdale ..	N.W. Counties	1 5½	1 1½
B	Rochester ..	S. Counties	1 3½	11½
A_1	Ruabon ..	N.W. Counties	1 5	1 0½
A	Rugby	Mid. Counties	1 5½	1 1½
A_2	Rugeley ..	Mid. Counties	1 4½	1 0½
A	Runcorn ..	N.W. Counties	1 5½	1 1½
A_1	ST. ALBANS ..	E. Counties	1 5	1 0½
A	St. Helens ..	N.W. Counties	1 5½	1 1½
B_2	Salisbury ..	S.W. Counties	1 2½	11
A_1	Scarborough ..	Yorkshire	1 5	1 0½
A_1	Scunthorpe ..	Mid. Counties	1 5½	1 1½
A	Sheffield ..	Yorkshire	1 5½	1 1½
A	Shipley ..	Yorkshire	1 5½	1 1½
A_2	Shrewsbury ..	Mid. Counties	1 4½	1 0½
A_2	Skipton ..	Yorkshire	1 4½	1 0½
A_2	Slough	S. Counties	1 4½	1 0½
A	Solihull ..	Mid. Counties	1 5	1 0½
A_2	Southampton ..	S. Counties	1 4½	1 0½
A_1	Southend-on-Sea	E. Counties	1 5	1 0½
A	Southport ..	N.W. Counties	1 5½	1 1½
A	S. Shields ..	N.E. Coast	1 5½	1 1½
A_1	Stafford ..	Mid. Counties	1 5	1 0½
A	Stirling ..	Scotland	1 6	1 1½
A	Stockport ..	N.W. Counties	1 5½	1 1½
A	Stockton-on-Tees	N.E. Coast	1 5½	1 1½
A	Stoke-on-Trent	Mid. Counties	1 5½	1 1½
B	Stroud	S.W. Counties	1 3½	11½
A	Sunderland ..	N.E. Coast	1 5½	1 1½
A	Swansea ..	S. Wales & M.	1 5½	1 1½
A	Swindon ..	S.W. Counties	1 4	1 0
A_1	TAMWORTH ..	N.W. Counties	1 5	1 0½
B	Taunton ..	S.W. Counties	1 3½	11½
A	Teesside Dist. ..	N.E. Counties	1 5½	1 1½
A_2	Teignmouth ..	S.W. Coast	1 4½	1 0½
A	Todmorden ..	Yorkshire	1 5½	1 1½
A_1	Torquay	S.W. Counties	1 5	1 0½
B_2	Truro	S.W. Counties	1 2½	11
A_2	Tunbridge Wells	S. Counties	1 4	1 0
A	Tunstall ..	Mid. Counties	1 5½	1 1½
A	Tyne District ..	N.E. Coast	1 5½	1 1½
A	WAKEFIELD	Yorkshire	1 5½	1 1½
A	Walsall ..	Mid. Counties	1 5½	1 1½
A	Warrington ..	N.W. Counties	1 5½	1 1½
A	Warwick ..	Mid. Counties	1 5	1 0½
A_1	Wellingborough	Mid. Counties	1 5	1 0½
A	West Bromwich	Mid. Counties	1 5½	1 1½
A_2	Weston-s.-Mare	W. Counties	1 4½	1 0½
A_2	Whitby ..	Yorkshire	1 4½	1 0½
A	Widnes ..	N.W. Counties	1 5½	1 1½
A	Wigan ..	N.W. Counties	1 5½	1 1½
B	Winchester ..	S. Counties	1 3½	11½
A_2	Windsor ..	S. Counties	1 4½	1 0½
A	Wolverhampton	Mid. Counties	1 5½	1 1½
A_2	Worcester ..	Mid. Counties	1 4½	1 0½
A_2	Worksop ..	Yorkshire	1 4	1 0
A_1	Wrexham ..	N.W. Counties	1 5	1 0½
A	Wycombe ..	S. Counties	1 4	1 0
B	YARMOUTH ..	E. Counties	1 3½	11½
B	Yeovil ..	S.W. Counties	1 3½	11½
A	York	Yorkshire	1 5½	1 1½

* 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	7½
Carpenter	,,	1	7½
Joiner	,,	1	7½
Machinist	,,	1	8½
Mason (Banker)	,,	1	7½
,, (Fixer)	,,	1	8½
Plumber	,,	1	7½
Painter	,,	1	6½
Paperhanger	,,	1	6½
Glazier	,,	1	7½
Slater	,,	1	7½
Scaffolder	,,	1	3½
Timberman	,,	1	3½
Navvy	,,	1	2½
General Labourer	,,	1	2½
Lorryman	,,	1	5½
Crane Driver	,,	1	6½
Watchman	per week	2	10 0

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)	,,	2	0	0
Rapid Hardening Cement, in 4-ton lots (d/d site, including Paper Bags)	,,	2	6	0
White Portland Cement, in 1-ton lots	,,	8	15	0
Thames Ballast	per Y.C.		6	3
½" Crushed Ballast	,,		6	9
Building Sand	,,		7	3
Washed Sand	,,		8	3
2" Broken Brick	,,		8	0
½" ,, ,,	,,		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
½" 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.
Flettons	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	10	0
Best hand-made do.	,,	5	0	0
Hips and valleys	each			9½
,, hand-made	,,			10
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	,, ,,	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, ½"	Sq.	18	6
,, ¾"	,,	1	1	6
,, 1"	,,	1	2	0
,, 1¼"	,,	1	5	0
,, 1½"	,,	1	10	0
Deal matchings ½"	,,		14	0
,, ¾"	,,		15	6
,, 1"	,,	1	4	0
Rough boarding ½"	,,		16	0
,, 1"	,,		18	0
,, 1½"	,,	1	6	0

Plywood, per ft. sup.

Thickness	¼" A	¼" B	¼" BB	½" A	½" B	½" BB	¾" A	¾" B	¾" BB	1" A	1" B	1" BB
Qualities	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	0	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.)

		½"	¾"	1"	1½"	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-½" 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.

	Per cent.		Per cent.
Gas	57½	Galvanized gas	47½
Water	52½	,, water	42½
Steam	47½	,, steam	37½

SMITH AND FOUNDER—*continued.*

		s.	d.
Rolled steel joists cut to length	cwt.	12	9
Mild steel reinforcing rods, ½"	,,	10	6
,, ,, ¾"	,,	10	3
,, ,, ⅞"	,,	10	0
,, ,, 1"	,,	9	6
,, ,, 1¼"	,,	9	6
,, ,, 1½"	,,	9	6
,, ,, 1¾"	,,	9	6
,, ,, 2"	,,	9	6

		4" s.	4" d.	6" s.	6" d.
Cast-iron rain-water pipes of ordinary thickness metal	F.R.	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.	22	6
,, drawn pipes	,,	21	6
,, soil pipe	,,	24	6
,, scrap	,,	13	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	,,	1	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.			s. 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 in. x 10 in.)			,,	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 7 ,,	‡4	2
,, ,, 45		†3 11 ,,	‡4	7
,, ,, 100		†5 0 ,,	‡5	7
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 ½"			,, 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 6
" " (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 6
" 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 6
½" Vertical dampcourse	"	6 9
½" paving or flat	"	4 0
1" paving or flat	"	5 6
1" × 6" skirting	F.R.	1 0
Angle fillet	"	2
Rounded angle	"	2
Cesspools	Each	5 0

MASON

		s. d.
Portland stone, including all labours, 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, laid 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
½" deal sawn boarding and fixing to joists	Sqr.	1 14 6
1" " " " "	"	1 17 6
1½" " " " "	"	2 3 0
1" × 2" fir battening for Countess slating	"	9 0
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
8" 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
1½" 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, 1½" 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
1½" deal tongued and moulded window board, on and including deal bearers	F.S.	1 9
1½" 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 15 6
Do. in flashings	"	1 19 0
Do. in covering to turrets	"	2 6 6
Do. in soakers	"	1 11 0
Labour to welted edge	F.R.	3½
Open copper nailing	"	3
Close " "	"	4

		½" s. d.	¾" s. d.	1" s. d.	1¼" 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	"	
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 beads	"	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

06.

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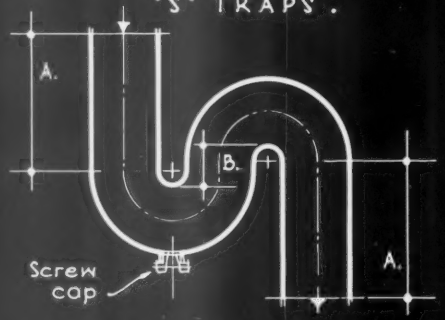
For full detail see British Standard Specification No. 504, 1933.

BRITISH STANDARD DRAWN LEAD TRAPS :

NOTE - each trap is supplied with a brass access screw cap of British Standard Whitworth thread & provided with washer.

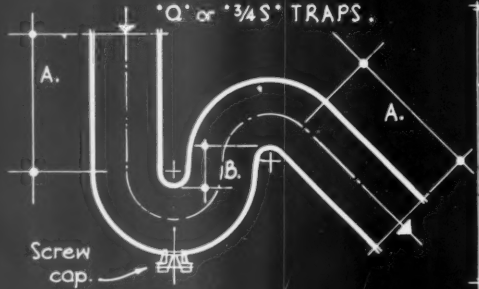
"S" TRAPS.



TABLES · GIVING DIMENSIONS & WEIGHTS.

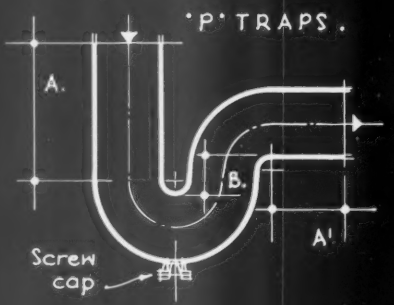
Internal Diameter of trap. ins.	mms.	Weight of lead per foot super. lbs.	Length of inlet and outlet A. ins.	Depth of water Seal B. ins.	Minimum weight of Trap, inclusive of screw cap but exclusive of washer. lbs.	kgs.
1	25·40	6	5	1½	2·24	1·106
1¼	31·75	6	5½	1½	3·02	1·370
1½	38·10	6	5½	1½	3·73	1·692
2	50·80	7	6	1½	6·78	3·075
2½	63·50	7	6	1½	8·77	3·978
3	76·20	7	6½	2	12·30	5·579
3½	88·90	7	7	2	15·06	6·831
4	101·60	7	7	2	18·78	8·518

"Q" or "¾S" TRAPS.



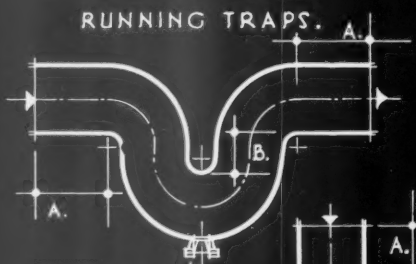
Internal Diameter of trap. ins.	mms.	Weight of lead per foot super. lbs.	Length of inlet and outlet A. ins.	Depth of water seal B. ins.	Minimum weight of Trap, inclusive of screw cap but exclusive of washer. lbs.	kgs.
1	25·40	6	5	1½	2·14	·971
1¼	31·75	6	5½	1½	2·89	1·311
1½	38·10	6	5½	1½	3·58	1·624
2	50·80	7	6	1½	6·30	2·858
2½	63·50	7	6	1½	8·58	3·892
3	76·20	7	6½	2	11·60	5·262
3½	88·90	7	7	2	14·59	6·618
4	101·60	7	7	2	17·50	7·938

"P" TRAPS.



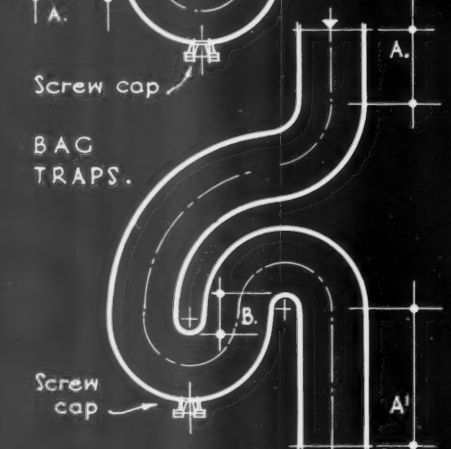
Internal Diameter of trap. ins.	mms.	Weight of lead per foot super. lbs.	Length of inlet A. ins.	Length of outlet A¹ ins.	Depth of water seal B. ins.	Minimum weight of Trap, inclusive of screw cap but exclusive of washer. lbs.	kgs.
1	25·40	6	5	2¼	1½	1·71	·776
1¼	31·75	6	5½	2½	1½	2·24	1·016
1½	38·10	6	5½	3	1½	2·92	1·324
2	50·80	7	6	3½	1½	5·28	2·395
2½	63·50	7	6	3½	1½	6·93	3·143
3	76·20	7	6½	3½	2	9·52	4·318
3½	88·90	7	7	3½	2	11·89	5·393
4	101·60	7	7	3½	2	14·42	6·541

RUNNING TRAPS.



Internal Diameter of trap. ins.	mms.	Weight of lead per foot super. lbs.	Length of inlet and outlet A. ins.	Depth of water Seal B. ins.	Minimum weight of Trap, inclusive of screw cap but exclusive of washer. lbs.	kgs.
1	25·40	6	2¼	1½	1·63	·739
1¼	31·75	6	2½	1½	2·15	·975
1½	38·10	6	3	1½	2·96	1·343
2	50·80	7	3½	1½	5·56	2·522
2½	63·50	7	3½	1½	7·36	3·338
3	76·20	7	3½	2	10·21	4·631
3½	88·90	7	3½	2	12·68	5·752
4	101·60	7	3½	2	15·40	6·985

BAG TRAPS.



Internal Diameter of trap. ins.	mms.	Weight of lead per foot super. lbs.	Length of inlet A ins.	Length of outlet A¹ ins.	Depth of water seal B. ins.	Minimum weight of Trap, inclusive of screw cap but exclusive of washer. lbs.	kgs.
1	25·40	6	2¼	5	1½	2·84	1·288
1¼	31·75	6	2½	5½	1½	3·89	1·764
1½	38·10	6	3	5½	1½	5·08	2·304
2	50·80	7	3½	6	1½	9·70	4·400
2½	63·50	7	3½	6	1½	13·50	6·123
3	76·20	7	3½	6½	2	17·52	7·947
3½	88·90	7	3½	7	2	22·63	10·265
4	101·60	7	3½	7	2	28·93	13·122

Information from the Lead Sheet & Pipe Development Council.

INFORMATION SHEET · THE USES OF LEAD IN BUILDING CONSTRUCTION · 11

SIR JOHN BURNET TAIT AND LORNE ARCHITECTS ONE MONTAGUE PLACE BEDFORD SQUARE LONDON WC1 · Oliver G. Bayne.

Supplement to THE ARCHITECTS' JOURNAL for October 3, 1935

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INFORMATION SHEET

• 261 •

LEAD

Type of Product : Lead Traps

The traps set out in this Sheet are the types of trap and the sizes of each as established by the British Standards Institution in the British Standard Specification No. 504, 1933.

Jointing.

Methods of jointing lead pipe to lead and to other materials have been given on Sheets Nos. 157 and 167.

Previous Sheets of this series :

Sheets already published in this series, "Lead in Building Construction" are :

No. 148. Parapet gutters, cesspools, etc. (1).

No. 149. Leadwork to flat roofs (2).

No. 157. Types of joint for lead pipes (3).

No. 161. Methods of supporting lead pipes (4).

No. 167. Junctions of lead pipe with other materials (5).

No. 182. Insulation to X-ray departments (6).

No. 195. Leadwork to wood-framed dormer windows (7).

No. 207. Insulation against sound and structural vibration (8).

No. 235. Insulation against sound transmission (9).

No. 245. The insulation of Buildings from Vibration (10).

Source of Information : The Lead Sheet and Pipe Development Council

Address : Golden Cross House, Duncannon Street, W.C.2

Telephone : Whitehall 3715

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PERMEABILITY • THE INFLUENCE OF SUBSEQUENT TREATMENT OF CONCRETE.

(1.) AGE •

TABLE SHOWING EFFECT OF CURING CONDITIONS:
1 : 2 : 4 concrete mix, water & air cured.

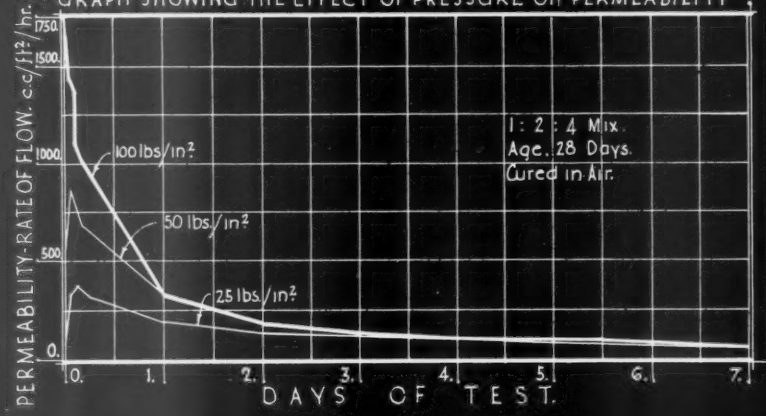
AGE.	PERMEABILITY. Test pressure 100 lbs. in.² Rate of flow, c.c./hr./ft.²		CRUSHING STRENGTH. lbs./in.²	
	Water cured.	Air cured.	Water cured.	Air cured.
7 days	240	•	920	750
14 days	39	510	•	•
1 month	12	490	2400	1850
3 months	10	495	2700	2200
6 months	10	500	•	•
12 months	5	•	•	•

NOTE •

The effect of age on permeability is one which is depenaent upon the composition of the concrete & upon the conaitions of curing. In the case of water curing the effect is very marked at short periods after mixing but diminishes gradually until after the age of one month the changes which occur are comparatively small. It will be seen that in this respect age has similar effects both on strength and on permeability.

(2.) PRESSURE •

GRAPH SHOWING THE EFFECT OF PRESSURE ON PERMEABILITY:



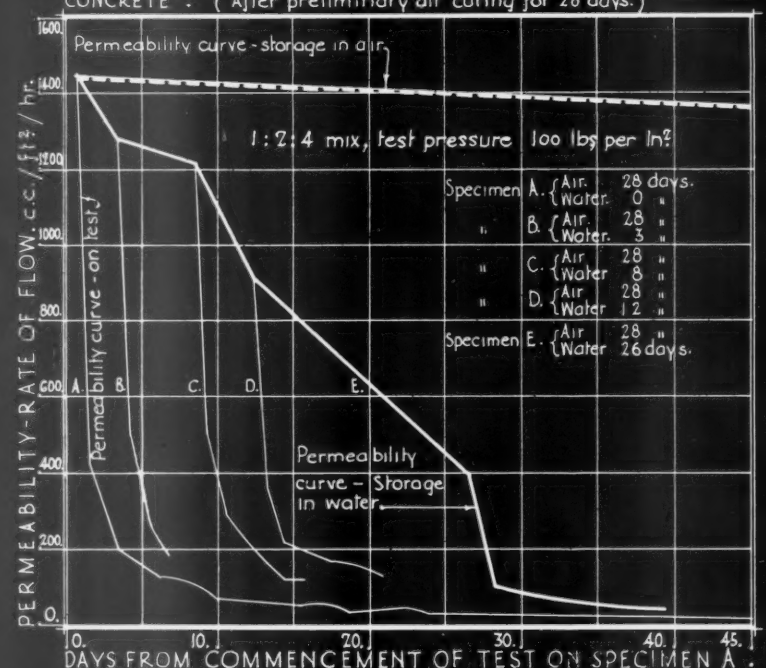
NOTE ON PRESSURE •

The test pressure of 100 lbs. per in² is much greater than is likely to occur in practice.

Permeability is proportional to pressure, at the point of maximum permeability only (generally almost coincident with the initial permeability.) It should be noted that, after a period of seven days the flow at all three pressures shown reaches approximately the same figure.

(3.) CURING •

GRAPH SHOWING COMPARATIVE EFFECTS OF AIR & WATER STORAGE ON CONCRETE: (After preliminary air curing for 28 days.)



NOTE ON CURING •

Due to the fact that permeability is closely dependent upon the conaition of the cement, curing conditions play a fundamental part in determining the permeability of a mix.

The ideal treatment is curing in water, hence storage in damp sand or occasional sprinkling with water gives a much less permeable concrete than curing entirely in air. The days immediately following the mixing are the most important.

The lower the percentage of cement in the mix the greater is the influence of the curing condition.

The effects of curing conditions however decrease slightly as the thickness of the concrete is increased.

Data from B.R.S. Technical Paper No 3.
By permission of the Controller, His Majesty's Stationery Office.

Issued by A.H. Rawnsley
Associated Building Products (Leicester) Ltd.

INFORMATION SHEET: FACTORS IN THE WATERPROOFING OF CONCRETE·3·

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

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INFORMATION SHEET

• 262 •

WATERPROOFING OF CONCRETE

Type of Product : Aquex Waterproofing Powder and Liquid

This Information Sheet is the third of a series dealing with the subject of waterproofing concrete.

The first Sheet of this series (No. 244) dealt with "The Influence of Constituent Materials." The second Sheet (No. 257) dealt with "The Effect of the Method of Preparing Concrete" and this Sheet deals with "The Influence of Subsequent Treatment on Concrete."

Aquex Powder and Waterproofing Liquid :

Full details of the characteristics of Aquex waterproofing powder and the proportions in which it should be used for various purposes were dealt with on Information Sheet No. 244.

The Use of Waterproofing Powder and Liquid :

In cases where the water/cement rates are fixed and where strict control is exercised it is usually more convenient to use Aquex liquid in preference to Aquex powder, the cost per yard in both cases being practically the same.

Hydralex Surface Waterproofing Liquid :

This series of Information Sheets has been devoted to a study of the integral waterproofing of concrete work. Various other materials, such as brick stucco, and renderings also have to be waterproofed, and for this purpose Hydralex waterproofing has been especially designed.

Hydralex is a liquid which may be brushed or sprayed on to the surface requiring to be waterproofed. The liquid is colourless, and forms no visible coating or glaze on the surface. One coat only is required in all except severe cases.

Guarantee :

The Company is prepared to give a five year writing on all work waterproofed with Hydralex, provided the work is carried out strictly in accordance with the Company's instructions.

Manufacturers :	Associated Building Products (Leicester) Ltd.
Address :	19 Albion Hill, Leicester
Telephone :	Leicester 59209
London Office :	109 Kingsway, W.C.2
Telephone :	Holborn 7670