THE ARCHITECTS' JOURNAL

THE ARCHITECTS' JOURNAL
WITH WHICH IS INCORPORATED THE BUILDERS' JOURNAL AND THE ARCHITECTURAL ENGINEER IS PUBLISHED EVERY THURSDAY BY THE ARCHITECTURAL PRESS (PUBLISHERS OF THE ARCHITECTS' JOURNAL, THE ARCHITECTURAL REVIEW, SPECIFICATION, AND WHO'S WHO IN ARCHITECTURE) FROM 45 THE AVENUE, CHEAM, SURREY

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The Editor will be glad to receive MS. articles and also illustrations of current architecture in this country and abroad with a view to publication. Though every care will be taken, the Editor cannot hold himself responsible for material sent him.

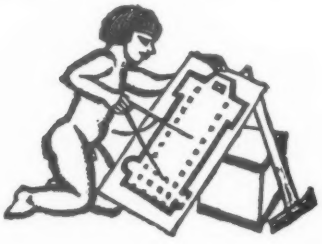
THURSDAY, FEBRUARY 12, 1942. NUMBER 2455: VOLUME 95

PRINCIPAL CONTENTS

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this JOURNAL *should not be taken as an indication that they are necessarily available for export.*

Owing to the paper shortage the JOURNAL, *in common with all other papers, is now only supplied to newsagents on a "firm order" basis. This means that newsagents are now unable to supply the* JOURNAL *except to a client's definite order.*

★*In common with every other periodical and newspaper in the country, this* JOURNAL *is rationed to a small proportion of its peace-time requirements of paper. This means that it is no longer a free agent printing as many pages as it thinks fit and selling to as many readers as wish to buy it. Instead a balance has to be struck between circulation and number of pages. A batch of new readers may mean that a page has to be struck off, and conversely a page added may mean that a number of readers have to go short of their copy. Thus in everyone's interest, including the reader's, it is important that the utmost economy of paper should be practised, and unless a reader is a subscriber he cannot be sure of getting a copy of the* JOURNAL. *We are sorry for this but it is a necessity imposed by the war on all newspapers. The subscription is £1 3s. 10d. per annum.*



from AN ARCHITECT'S *Commonplace Book*

"When thou buildest a new house, then thou shalt make a battlement for thy roof, that thou bring not blood upon thine house, if any man fall from thence."

Deuteronomy, chap. 22, verse 8.

Here are some of the exhibits on view at the Exhibition opened by Mr. A. V. Alexander, First Lord of the Admiralty, at the Ford Showrooms in Regent Street, W.1. The Exhibition shows you how war weapons are made from waste paper.

NEWS

IN BRIEF

R.I.B.A.

Reconstruction Committee's Interim Report, just issued, deals with legislation affecting town and country planning. Recommendations from Report are printed on page 131.

POST WAR PLANNING

Statement on post-war planning and reconstruction is to be made by Lord Reith in the House of Lords during its next series of sittings. He will reply to a motion by Viscount Samuel, calling for early legislation extending Town and Country Planning Acts and the establishment of a central planning authority. This motion was originally tabled some weeks ago and had been postponed pending Government consideration of the whole problem.

SCRAP METAL

M.O.W.B. has been given powers, under new Defence Regulation, to make an Order calling upon owners and occupiers of specified categories of premises to disclose any metal suitable for scrap which is on those premises at a specified date. An Order is now being drafted which will provide for compulsory returns to be made of all disused machinery, plant and other types of unwanted metal.

WAGES

Resolution carried at meeting of Join Council for Building Industry. "That, having reviewed the wages payments in force under the War-Time Emergency Agreement of November 22, 1939, and finding that a Variation Amendment of the Current Standard Rates is due to be made under that Agreement as from February 1, 1942, this Council decides that on and from February 1, 1942, the current standard rates of wages shall be adjusted by an *increase* of one halfpenny per hour, and that the same *increase* of one halfpenny per hour shall also be made in labourers' rates."

MEETING

Friday, February 27, Institution of Mechanical Engineers, Storey's Gate, S.W.1 "Proneness to Damage of Plant Through Enemy Action." By Hal. Gutteridge, 2.30 p.m. Meeting open to R.I.B.A. members : apply to Secretary of R.I.B.A. for admission ticket.

A.A.S.T.A.

Meeting and film show, Saturday, February 21. 2.30 p.m. Lecture Theatre, School of Architecture, Liverpool University. Speaker: Bertram Hayward. Subject: "Building Technician and the War." Film : Housing (Progress and Problems), Scientific Research in Buildings. Admission 6d.

Director-General, M.O.W.B.

Hugh Eyre Campbell Beaver joined the Ministry of Works and Buildings in 1940 as Controller of Building Materials and Building Priority Officer; later, he was appointed Director-General, Works and Buildings, took over the chairmanship of the Central Council for Works and Buildings on its formation in August last year. Son of Hugh Edward Beaver, of Bryn Glas, Montgomeryshire, he was born in 1890 and educated at Wellington College. He is a member of the Institution of Civil Engineers and Institution of Chemical Engineers. At the time of his appointment to the Ministry he was a partner in the firm of Sir Alexander Gibb and Partners. To-day he might be described, luridly but not inaccurately, as the lynch-pin of the national building organization.

I.A.A.S. COMPETITION

A competition for the design of a model housing estate, complete with housing and communal buildings, has been announced by the Incorporated Association of Architects and Surveyors.

Full details of the competition, which will be open for a period long enough to enable architects and surveyors serving away from their offices to compete, are obtainable from the Secretary of the I.A.A.S., 75, Eaton Place, London, S.W.1.

ALL-PLY HOSTEL

A new war-time economy hostel designed by the Ministry of Works is made entirely of wood, yet less wood material is used in its construction than was used in a pre-war hut of the same size classed as a "non-timber" building.

This has been achieved by attention to design so as to economize timber in every way, and by the increased use of plywood. Walls, roof, doors and furniture fitments are all of plywood on a light timber frame. They are made in sections in the factory and the pre-fabricated parts are then transported to the site and erected in a few hours on a cement base previously laid down. Hostel is roughly 72 ft. by 18 ft. 6 in. by 7 ft. 2 in. (height to the eaves), with cubicles for 24 agricultural or munition workers. Cubicles are arranged 12 on each side of a central corridor.

Walls and roof are made in standard sections 6 feet wide, of 1½ in. square timber framing divided into a lattice by ⅜ in. thick

slats faced both sides with ¼ in. plywood bringing the overall thickness of the walls up to 2 in. From the point of view of heating it will be an extremely comfortable hut.

As is well known, ordinary plywood will not stand up if wet, and hence must not be exposed to weather. How then can walls and roof be made of plywood? The answer is resin-bonding, a process by which the veneers are bonded together with Urea formaldehyde resins. The resultant ply acquires additional strength and can stand up to wet weather. Even if resin-bonded ply is soaked in water, the layers will not come apart. As to strength, Ministry of Works tests have shown that ¼ in. resin-bonded plywood can be made to do the work of 1 in. or 1¼ in. solid timber.

In this hostel therefore, walls and roof sections are faced on the exposed side with resin-bonded ply. Ordinary dry-cemented ply may be used for the inner sides.

Joints are made by means of mild steel plates in the case of adjoining sections in the same line; and by interlocking screw-eyes and screws for right-angle joins. Joints are made watertight with scrim and mastic. External walls are anchored to the concrete foundation by mild steel straps grouted into holes left in the concrete.

Timber-saving is ingeniously demonstrated in the construction of the furniture "built in" as part of the partition wall separating cubicles. Nearest the cubicle door comes a section consisting of two wardrobes fitted side by side, the doors facing opposite ways to give access to adjoining cubicles. The space between this wardrobe fitment and the outer wall is taken up by a chest of drawers fitment. This consists of two sets of drawers (three drawers in each set) built in one fitment, each set of drawers opening into one of the cubicles. Above the chest a plywood panel extends to the top panel of the cubicle partition, and the top of the drawer fitments forms a dressing table. Beds, chairs, etc., are supplied separately.

Black-out shutters are fitted as standard in the finished hut.

INSTITUTION OF STRUCTURAL ENGINEERS

Candidates elected to membership of Institution of Structural Engineers:—

Studentship.—Robert Gordon Allaway, of Norton, Stockton-on-Tees; Harold Anthony Edwards, of Bristol; Kenneth David Lewis, of London.

Graduateship.—Paul Wilfrid Bott, of Crewe, Cheshire; Norman Allan Ellis, of Sale, Manchester; Charles McDermid Forsyth, of Glasgow; Frank Rankin Fraser, of Glengarnock; Peter Frederick Hodges, of Reading, Berks*; Derrick Bernard Lumley, of Stretford, Manchester; James Young Milne, of Emsworth, Hants; Arthur Raymond Moseley, of Wednesbury, Staffs; Wilfred Rowe, of Winton, Manchester.

Associate Membership.—Wouter de Vos, of Johannesburg†; Walter Fridolin Haeusler, of Durban†; Henechas Kaganas, of Johannesburg†; Morris Philip Kingsley, B.SC., of Harrow-on-the-Hill‡†; John Owen Arthur Lake, of Norwich‡†; Arthur George Spicer Lance, of London†; Leonard Suggitt Mead, of Johannesburg†; Ernest Starkey Powers, of Durban†; Aubrey Augustus Robinson, of Pretoria.‡†

Membership.—Eric John Lawson Gibson, M.INST.C.E., of Melbourne, Australia; Thomas McIntyre, M.SC., A.M.INST.C.E., of Calcutta.

* Transfer from Studentship.

‡ Transfer from Graduateship.

† Passed Associate Membership Examination.

Circumstances have turned this issue into something very like a survey of the BUILDING FRONT *for the New Year of 1942. Some of the important problems discussed are summarized in the leading article below.*

BUILDING POLICY

P.E.P., assisted by members of the Architectural Science group, has, in Broadsheet No. 183, outlined a policy for the Building Industry. These suggestions are interesting because they come at a time when pressure of work is relaxed in a way that makes reorganization possible—the wartime building programme if not yet complete is at any rate drawing to a close. They are doubly interesting because although B.I.N.C. has to some extent been relieved (by the creation of a central Council for Works and Buildings), from its self-appointed task of reorganizing the industry so that two bodies now exist capable of fulfilling the rôle, neither has yet outlined a system capable of serving as an alternative to the existing system of profit-making qualified by cut-throat competition, with professional direction uneasily grafted on to it.

There has been a good deal of talk about how the professions can be fitted into the industry as it stands. This report turns the tables; it attempts to show how industry itself can be professionalized. How technical excellence as opposed to money can be made the chief standard of value for labourer, contractor and technician alike in a way that makes genuine co-operation possible, without radically altering the structure of the industry. According to P.E.P. most friction can be traced to one root cause—present systems of tendering—which oppose the interests of the contractor to those of the client right from the start. They suggest that the best method of steering between muddle and regimentation is to evolve a really accurate system of costing.

The report does not ignore the importance of other reforms; It stresses the importance of education and of a proper system of apprenticeship worked out in collaboration with

the trades unions; of harnessing the energies of trades unions to the work of increasing output by intelligent propaganda, by securing for shop stewards and key men a responsible share in management, and by removing the risk of unemployment; of proper preparation of particulars in advance of building; of group work for technicians; of prompt payment for contractors; of technical and consumer research. But the main emphasis of the report is on the need to elaborate a system of costing which will eliminate risk. This in their view would involve setting up a central statistical department which would collect and collate information provided by bills of quantities taken out for similar work in different parts of the country under different sets of conditions, in a way that would take not only quantity but quality into account. Such a background of statistical information they suggest would make it possible for men experienced in this type of work to estimate costs with much greater accuracy than is possible at present, and to formulate national standards of cost control.

Whatever the merits or demerits of this particular scheme the National Council is at present pursuing a somewhat different idea. In the interests of simplicity they have drawn up a schedule which gives standard prices worked out by experts on a comparable basis, for about a hundred and seventy different types of work. It is hoped that a fair contract price can be arrived at on the basis of this schedule by merely measuring and multiplying; and that allowance for varying conditions can be made by agreeing a percentage to be added or deducted before signing the contract or after completing the work, whichever is most convenient.

The Ministry's schedule of standard prices should certainly do away with one evil; it should put an end to the favourite trick of quoting low rates for work which does not figure largely in the contract and high rates for more important items. But on the face of it the system as a whole is likely to appeal more to builders than to those whose duty it is to control quality, speed or cost. The extent to which variations in quality and speed affect cost cannot be measured with a tape. Local conditions and conditions on the site are apt to differ widely and there is at present no real basis for comparison. Deviations from the average we are told will be covered by an agreed percentage variation in the basic price. What this percentage should be however remains purely a matter for argument which is just what everybody is anxious to avoid. It is assumed that the matter will be easily settled because a small percentage either way makes very little difference to anybody. But in fact variations due to these causes are often likely to account for a considerable proportion of total costs because building work is executed under varying conditions.

The standard rates will almost certainly be accepted as a minimum. But they cannot be enforced as a maximum as they are not sufficiently accurate.

The Architects' Journal
45, The Avenue, Cheam, Surrey
Telephone: Vigilant 0087-9

NOTES & TOPICS

COST PLUS V. THE REST

In a letter published some time ago, Mr. Gilbert T. Gardner agreed with the JOURNAL that Cost Plus is the most efficient means of executing war building work. But this agreement was conditional. And when one read his conditions —honesty of purpose on the part of all; clear definition of cost; speedy preparation of drawings; first-class organizing abilities of contractor, and so on—one began to wonder whether Cost Plus was, after all, a suitable method of building for those who have only a humanly reasonable share of intelligence and probity.

*

But if we abandon Cost Plus, what is the alternative? In most cases nowadays it is a Schedule of Prices. And a job being executed under a Schedule of Prices is apt to show signs of "occupational diseases" quite as distinct as, though different from, those of a Cost Plus job.

*

Let us look at both these groups of diseases. Job A (Cost Plus) is expected to cost £1,000,000 and to be complete in a year. Job B is exactly similar, but is under a Schedule of Prices. Both begin on the same day.

If we examine both these jobs at the end of the sixth month, we find in one the following characteristics: money expended, one-third more

than the other, labour strength one-half more, and progress a little less than a half more. And we can bet our life that that is the Cost Plus job.

★

Job B will have equally distinct characteristics. If will be suffering from a chronic inability to raise its labour strength by a quarter, and the architect will tell you that it has proved next door to impossible to push forward one section of the work at the expense of the rest—even though that section was entirely self-contained. In the opinion of the contractors, he says, such a concentration destroys the proper sequence of labour and is extremely unwise. This may seem funny to you because the contractors on Job A (Cost Plus) were only too ready to concentrate three-quarters of their labour on a quarter of the job—so much so that they insisted on trying to do so even when told not to.

★

An architect who has both an A and B job under his control requires from the outset a robust belief in his own sanity. For if, as usually happens, he goes to A from B in a B-minded condition everything at A will seem a little squiffy ; and the awful thing is that everyone at B regards squiffiness as normality. The architect may arrive *determined* that labour strength and expenditure are going to go DOWN and progress is going to go UP. But somehow or other they don't—at least not for long and not much. And if the architect is unlucky by the time he gets back to B, things *there* will have begun to look peculiar.

★

Possibly, as Mr. Gardner suggests, we either have not high enough ideals or else some of us are not living up to them.

PRESENT AND POSSIBLE WORLDS

Two current surveys of the present state of the building industry invite contrast with one another. The first is Mr. Hugh Beaver's*. The second is P.E.P.'s new broadsheet, No. 183, *Building for the Nation*. The contrast is, perhaps inevitably, that between practice and principle, expediency *v.* root and branch reform.

Mr. Hugh Beaver, Director General of the Ministry which is now called the Ministry of Works, begins with some statistics. He says that in September, 1941, 86,969 building, civil engineering and allied firms employed 1,056,818 persons. Of these firms, 820,240 employed an average of less than 3 people each and only 1,257 firms employed over 100 each. Mr. Beaver adds that it is proving very difficult to bring into the war building effort the fifth part of the industry's strength which is still deployed in three or four man firms. He thus shows his agreement with P.E.P.'s statement in *Building for the Nation* that the industry's two great evils are the vast number of wobbly small firms which have sprung to life during days of one-house-at-a-time speculative building, and the scarcity of first-rate building organisers or technical administrators.

★

Mr. Beaver says that his Ministry will consider any reasonable scheme for spreading equitably the loss which the falling volume of war building will inflict on the industry. In default of such a scheme he implies that it will probably be a case of the weakest going to the wall.

★

Further on he lists the Ministry's very considerable efforts to level out and improve conditions of labour, and to prevent labour hoarding and labour enticement, and one has no doubt that the Ministry is vigorously trying to prevent the big fish swallowing the sprats. But supposing a scheme " for spreading the losses more equitably over the whole industry " is not forthcoming ? Two years of little work will find the Ministry facing an industry composed of a 100 or 200 big fish who will have a lively sense of their value to the nation. And it would seem, at present, that very vigorous measures will have to be taken by the Ministry if this is not to occur.

★

Building for the Nation believes that the industry's set-up will have to be re-organized in a most sweeping way if it is to be ready for its post-war job. It advocates : (1) Much more closely co-ordinated professional groups including all designers and consultants ; (2) quantity surveyors who alone will be concerned with cost ; (3) contractors who will be concerned only with building administration ; and (4) operatives with much more secure labour conditions and more up to date trade subdivisions.

★

Building for the Nation is reviewed elsewhere in this issue. Some of its statements are open to challenge, but it does put forward a scheme which would rid the industry of its worst evils.

THE ARTS OF DESTRUCTION

A copy of *Die Kunst im Deutschen Reich* came my way last week, having been on its travels since May last year (Reich Minister Fritz Todt* and our old friend Hitler's architect, Albert Spee, are amongst the great names on the superintending committee).

★

Architecture is reduced to models and shows the clock is still going cheerfully backwards. In plan a Neo-Nordic Beaux Arts style has official approval with plenty of vaulting, patterned-marble floors and courtyards. In elevation, Führer's Doric has yielded to a Berlin-Regency of peculiarly avid type. Internally, space, marble floors, huge murals, a few low seats and tremendous candelabra still carry on the Goering march to Valhalla.

★

One closes the review filled with a new astonishment at our principal opponent.

ASTRAGAL

* See page 122.

* German News Agencies announced last week-end that Major-General Fritz Todt had been killed in an air crash while on military duty on the Eastern Front. Aged 51, Todt was the architect of the famous German autobahnen and the Siegfried Line. He also formed the Pioneer Corps of the Reichswehr, the amazing army of super road, railway and bridge builders (an army running into millions, it is said) conscripted from men in the occupied countries which followed up the advance of the fighting men in Russia with a complete system of communications.

IN war time changes follow each other so fast that it is sometimes difficult to grasp their significance. The Journal from time to time attempts to get the better of events by devoting a whole issue to a single subject and dealing with it fully. Now appears to us to be the time to survey recent developments in the building industry in this way.

During the last year (the first year in the life of the Ministry of Works and Buildings) events have been working up to a climax. Total war has made it clear that a well organized building industry with a sense of public responsibility is essential for our survival. It will be even more essential when the time comes to make the life we are now fighting for worth living for the majority of people. But in spite of this, conditions which have given rise to many scandals continue to exist.

However, interest in reconstruction is becoming increasingly realistic. The public, the professions and the government are beginning to be aware that castles in the air cannot be brought to earth except by a great effort of co-operation centering round a building industry capable of working without friction. This change of mind is reflected in a number of letters, reports and speeches dealing with the industry which together provide a picture of the whole.

The first question when reviewing a changing situation is "Where are we now?" Mr. Beaver's recent speech to the Federation of Greater London Master Builders provides an answer. This speech was made in reply to an open letter which asked him what he intended to do to prevent the extinction of small and medium sized firms. His frank reply‡ must have made the majority of them realize that unless they combine to help themselves their life will be short.*

Where are we NOW

Hugh Beaver's reply to the open letter of the Federation of Greater London Master Builders to the Prime Minister

However much we have in mind the necessity of planning for to-morrow, it is the grim, stark, unforgiving present with which we have to deal. In July, 1939, there were in the building and civil engineering industries about 1,390,000 males between 16 and 64. Of that total some 200,000 were unemployed. By July, 1941, there had been a total drop of over 350,000, but the unemployed figure was less than 15,000.

We are past the peak of our building programme. It would indeed be tragic were it not so. Our need now is to produce munitions, and not for ever to be building munition factories. The time approaches when to keep our war factories at full output will take all available labour. So long as we have still to build factories, we are a long way off the maximum of our war effort. It is, then, the policy of the Government to curtail building, and to do that continuously and increasingly.

We have by no means yet reached complete co-ordination of the different departments' building activities, but we are making for that goal. Before we can secure a really balanced programme, or a balanced industry, we must have reliable data; and one of the earliest actions of the Ministry of Works was to attempt to rectify the complete absence of information regarding the numbers and nature of the many units of the building industry. Last autumn we introduced compulsory registration. It has taken a long time to sift and collate the returns. At the end of Sept.:

CLASSIFICATION OF BUSINESS.

		Employing
General builders ..	44,940	391,843
Building and civil engineering contractors	1,705	411,964
Civil engineering contractors ..	1,280	110,186
Plumbers	10,446	30,805
Joiners and carpenters	10,526	30,597
Painters	12,752	30,543
Miscellaneous ..	5,320	50,880
Total ..	86,969	1,056,818

It is interesting to note that in Greater London and South-Eastern England there were 20,326 firms—a quarter of the whole—employing 432,556.

It is also of interest to note that 80,240 firms employ less than 20 people—actually an average of less than three employees each—while only 1,257 firms employ over 100 persons.

We have unfortunately no really comparable pre-war figures; but so far as one may judge from the Census of Production, and by other means, there has yet been no equivalent reduction in the number of firms, parallel with the fall in labour. In some form or other such reduction must come. From now on, the total amount of new work will be ever contracting. Moreover, the whole character of building has largely changed as a result of the war; house-building, which was responsible for over half the total pre-war building, has disappeared, and the size of works has greatly increased, and the time for their completion shortened. So that to a large extent these war works have in fact been beyond the capacity of many competent builders. The far-reaching effects of air raid damage concealed (for a long time) the true state of affairs by providing a vast amount of work in many areas, but that is no longer the case.

The Ministry of Works, which after all still deals with only a fifth or a sixth of the Government's programme, and employs only 11 per cent. or 12 per cent. of the building labour force, has always striven for the maximum efficient use of the smaller and medium-sized builder. All our contracts can keep but a small portion of the building industry occupied.

We have given much thought to the idea of grouping small builders and in some cases with success. But on the whole we are not optimistic in this direction. The builder is an individualist and does not escape ordinary human frailties. We have found few groups able satisfactorily to continue so as to meet the competition of individual firms, either in efficiency or cost. But we have always been ready to help a group to form, when it has seemed justified; and we have had prepared a suitable legal form of group agreement as a guide to a solution of one of the major

* *Page 124.* ‡ *This page.*

The next question is "Where do we go from here?" Building For the Nation, *a P.E.P. broadsheet (No. 183) (page 125), sets out to answer this question. It defines the problem before us as that of establishing "a relationship between the Ministry and the building industry which will yield the maximum benefit from long term planning guidance and control without stifling enterprise or stereotyping outmoded practice"; it analyses the causes of present weakness and also shows how various aspects of this confusing problem hang together.*

Among improvements suggested by P.E.P. is a better method of selecting and training recruits for trades and professions connected with the building trade. This question has also attracted the attention of one of the committees of the central Council, which is about to consider a memorandum drawn up for it by G. D. H. Cole, summarized on page 129. Training and recruitment for the building industry is a question that needs to be dealt with at once. After the war an unprecedentedly rapid expansion will be necessary. This means sending boys of 13 to Junior Technical Schools (which do not yet exist) right now. Another point stressed in Broadsheet No. 183 is the importance of group work at a level which makes it possible for technicians to influence each other's work and co-operate in the design of a whole building, instead of working independently on the design of separate parts. This point is dealt with at length by Professor Reilly on page 130. Efforts made by the Ministry to co-ordinate research, and to secure the co-ordination of codes of practice were dealt with in the Journals for January 29 and February 5. It is not yet clear exactly where we will arrive but the direction in which we are now moving is gradually becoming plain.*

difficulties in the formation of groups.

We have further laid down within our own Ministry a procedure to secure preference to local firms in respect of all contracts up to £25,000, which I would add carries with it the counter-obligation that these firms shall give us truly competitive and reasonable prices and adequate service. We have considered — and are considering — a proposal for the introduction into all major contracts of a clause imposing a certain minimum amount of building sub-contracting. And, finally, we have, in the regional emergency organisations and in the more recent scheme for the preservation of a fixed labour force for maintenance work throughout the country, two measures which, while primarily designed for war purposes, must affect and benefit the great bulk of builders such as your Federation represents.

These are actions which must have notable effect ; but nothing can secure that there will be sufficient work for all firms. What then are we to do ? Obviously there are at least two alternatives before us. We might let the laws of supply and demand operate, unchecked and untempered as they have always hitherto in the building industry ; or we might attempt to find some means of spreading more equitably over the whole industry the losses that otherwise must fall on the individual. It lies with you and the industry, rather than with the Government.

We are certainly going to invite the Federations to discuss with us whether any form of concentration, or of controlled contraction is practicable ; and, if not, what steps should be taken to secure that the industry will be able rapidly to expand again, and that all these thousands of registered builders can play their part, when the need once more arises. Meanwhile let me make it quite clear that, in spite of allegations and rumours to the contrary, there is no such official, or unofficial, scheme in existence, or as yet under consideration.

May I now turn for a few minutes to some of the other problems of the industry. While aimed primarily at increased war-time efficiency, the Ministry of Works and Buildings has taken various steps in the last year which cannot but have—at least so I hope—a permanent beneficial effect on the industry, in one way or another.

The policy which the Ministry of Works and Buildings has mapped out and which it has been steadily working to, falls more or less into four divisions.

The co-ordination and control of the Government Building Programme.

The mobilisation and direction of the building industry.

The general improvement of conditions of work and contracts.

The provision of the necessary building materials.

It would take much more time than I have to deal with all of them ; and I will not refer further to the first, other than to say that when a year ago we were investigating the new works then in hand or about to be started, we found that the total Government Building Programme was nearly double the country's capacity. Now the excess in hand, I believe to be not more than 10 per cent., and we are at last in sight of a rational programme.

Nor will I refer to building materials, except to say that with a minimum of interference, we have secured that shortage of the materials that we control has at no time restricted the building programme.

In regard to conditions of working, for employer and employed alike, we can, I think, claim to have done a great deal in a short time. With the Ministry of Labour we have established the Essential Work Order, carrying with it the guaranteed work, restriction of movement of labour, and payment by results. In this last, we had to disregard the views of the unions, and of many employers ; but they have nevertheless loyally accepted the position. At the same time the Government prohibited on all Government works all those other types of bonus—not all very satisfactory—which were rife though never admitted. Everyone must pay testimony to the good relations that have so long subsisted in the industry ; but I am sure that peace and confidence will be on all the surer foundations, if those irregular activities which no one had the courage to avow in the open, are never reinstated.

Again, with the Ministry of Labour we have done much to improve welfare conditions. In fact, I quote one of the operatives' leaders in saying, that they have been revolutionised. We have accepted and propose to put into force official recognition of union representatives as part of the organisation of major works of construction. At the same time we hope that stronger powers will be taken to deal with the small class of labour which is not yet pulling its weight.

Finally, in regard to the building industry as a whole, the registration of builders has imposed on builders

* *See page* 127.

and contractors the obligation to observe one standard of conditions of employment—at the risk of de-registration. That, at one blow, puts an end to undesirable practices which in the hands of a few brought discredit and distrust. We are establishing a panel of the industry to which we shall refer all alleged breaches.

We have recently, with the Ministry of Labour, put a stop to the practice of labour-hoarding and labour-hiring, which again in certain directions seemed as if it might become a scandal. We are not going to permit big firms, or small, to buy contracts with promises of labour in hand ; and we have refused to recognise the standing armies that were being created by some people. We have, too, controlled plant-hire rates. In all these we have, I am confident, the support of the great majority of builders and contractors ; and you will observe we have imposed a statutory control of the industry.

Then through the Central Council of Works and Buildings we have dealt with a number of major problems—one of the most important of which is that of sub-contracting. The Central Council has, too, just produced a standard priced schedule which I am convinced will be found to be of the greatest benefit. It is now being printed. It will be put into force on our own contracts, but should have much wider application—for all ordinary building contracts, for sub-contracts and as a substitute for the "cost form of contracts."

This is the LETTER *from the Federation of Greater London Master Builders, dealt with by Mr. Hugh Beaver in the above statement.*

This Federation, representing nearly 1,000 Master Builders, and is, we believe, the largest organization of its kind, asks your serious consideration of the following matters which vitally affect the industry. We represent the medium and smaller-sized builders, which are the backbone of the industry : registration figures and the expressed opinion of Ministers have proved this. It is therefore virtually for the whole industry that we plead.

It cannot be denied that the industry has been and is being exploited to a disgraceful extent since the outbreak of war by people who were, in some cases, outside its confines and have since hostilities commenced seen an outlet for capital energies and profit inside the industry, quite irrespective of trade experience.

The policy adopted and the lack of co-operation by the Ministries concerned (namely, the Ministry of Health, Ministry of Works and Buildings and other interested Ministries) has tended to cripple the backbone of the industry. If this policy is pursued there cannot be any doubt that the control of the operatives will pass into the hands of the large concerns, with the ultimate destruction of the firms we represent, thus creating a monopoly which we are all anxious to avoid, especially in post-war years.

Recent enactments which have been thrust upon the industry have been drawn up by responsible Government officials in conjunction with the representatives of the large contracting firms, and the opinion of the industry as a whole has never been sought.

May we trouble you to consider the following facts. From January 1 no builder can carry out any work whatever on any one building in excess of £100 (which is retrospective for twelve months) without a licence. This means, in many cases, virtual cessation of business, with consequent dismissal of staff ; this staff will find its way to such large firms who hold the whole of Government contracts, and, therefore, for a firm employing from 20 to 50 operatives to attempt to obtain, either individually or collectively, a Government contract is a hopeless proposition. Is this state of affairs to continue in the second largest industry in the country ?

Again, the Ministry of Health has recently issued instructions to all local authorities considerably to reduce operatives employed by them through contractors. The decision as to how this reduction is to be effected is left with the responsible official of the local authority, and he is in a position to please himself as to what course he adopts. As an example of the serious position arising, we would bring to your notice the following :

(*a*) In one Borough about twenty-four contractors, each employing up to and in excess of 20 men, have been given notice to terminate their contracts in ten days, to remove their plant, and leave such material as they have on the site, for which the local authority will reimburse them. In this particular Borough there is a considerable amount of work to be executed.

(*b*) The Ministry have issued instructions to the local authorities to select firms, together with a certain number of operatives to form a garrison, and guarantee such firms work. Selection again is left to the discretion of the local official—which is tantamount to the Ministry of Health dictating through a borough employee as to which firms in the industry shall be preserved irrespective of the exigencies of the trade within the Borough. Is such treatment just or equitable ?

May we now bring to your notice the activities of the War Damage Commission ? Many builders have sunk their available capital in carrying out repairs to property damaged by enemy action, relying on the Commission for payment. The Commission is getting further and further behind with settlements, and we have cases where payments are outstanding for many months. The capital of many builders is exhausted, and they are unable to undertake further work until they obtain some settlement from the Commission. There is a vast volume of this type of work to be carried out, and the builder will finance it for the customary trade period ; but his capital is locked up and he can go no further. Here again exploiters are stepping in to the industry's detriment.

Generally, in our opinion, the industry is being forced into an impossible position, and we are quite confident that you, perhaps, are not aware or appreciative of the bureaucratic manner in which the industry is being handled by the responsible departments. A man who has been in the industry all his life, whose business has been handed down from father to son and may have been established for over 100 years, is surely entitled to fair treatment.

We submit that the time has arrived when an enquiry is of paramount importance to save the oldest industry from disintegration and the total collapse of those who, we consider, form the major part of the industry, especially having regard to post-war conditions and the National interest.

We look to you to interest yourself in this vitally important matter and bearing in mind our democratic views to bring this question before the House.

PEP says

The British building industry to-day is the product of centuries of evolution, speeded up during the last twenty-five years as a result of revolutionary changes in technique and the stimulus of large-scale Government assistance to house-building. At the outbreak of war the general contracting side of the industry covered over 100,000 *firms catering for an extremely varied building demand, ranging in size from large contractors engaged on enormous civil engineering projects to the small jobbing builder primarily engaged on repairs and minor extensions to existing properties. The industry was highly competitive but, in the absence of reliable methods of assessing the comparative efficiency of work undertaken, the competitive system frequently operated imperfectly and, although the achievements of the industry were remarkable, they were often realized at an unnecessarily high cost in terms of labour and materials. The contribution which has been made by thousands of building firms to the physical equipment of Britain during the inter-war period has been highly creditable to them and of the utmost value to the community. On the other hand the character of tendering systems and the small amount of capital needed made it possible for successive waves of poorly qualified persons to set themselves up as building contractors and to blaze a trail of shoddy workmanship, bad debts, and ill-feeling before their ranks were thinned by bankruptcy.*

PEP says

The rapid growth of the building industry, its uneven technical development, and the persistence of many traditional forms and practices side by side with new techniques and procedures are reflected in the professional organization of the industry. In former days the client or, as he is technically known, the building owner, gave his orders to a master builder who represented the professional services and the building contractor all in one. In the case of thousands of small contracts this practice still obtains, but elsewhere varied degrees of specialization have resulted in much more complex contractual relationships. The building owner (who may be anything from a private individual seeking an investment in house property, a commercial concern needing a new store, to a municipality creating a new civic centre) may now set on foot an enterprise involving many different executive groups performing specialized functions—certainly including a building contractor (with sub-contractors) and a firm of architects, and possibly firms of quantity surveyors, valuation surveyors, and consulting engineers.

PEP says

The advantages of functional specialization are obvious, but the way in which specialization has developed has also led to weaknesses which are at the root of many of the industry's troubles to-day. There has been a failure to define responsibilities, to prevent overlapping of functions, and to co-ordinate specialized activities. As a result, the interests of

the building owner are often submerged, the work itself suffers, inefficiency and waste creep in, and the high standards of particular specialist groups may be undermined by the low standards of others. Part of the difficulty on the contracting side may be attributed to the ease with which poorly qualified persons can enter the industry and undertake tasks for which they are ill-equipped. But this is no excuse for the failure of the leading specialist groups in the industry to realize the plain implications of their inter-related functions, and to approach their task as a constructive partnership—calling for a clear definition of responsibilities, for appropriate professional standards in every branch of the industry, including the contracting side, for a common policy with regard to scientific research and technical training and, above all, for co-ordination of effort in the preparation of "proper particulars."

The double-column notes are quotations from the PEP broadsheet No. 183, 'Building for the Nation' *which deal more fully with the points referred to in the accompanying review. The numbers refer to the references in the review.*

1

They include the mobilization and training of a large army of professional workers and skilled operatives, the production and distribution of vast quantities of building materials, the planning of large-scale projects over long period of years, the systematic exploration of new technical methods and the use of new materials, and the development throughout the industry of exceptionally high standards of professional service, good workmanship, and public responsibility. These things will depend for their realization, partly on the wisdom and understanding with which the Ministry of Works and Buildings plans its long-term policy and conducts its relations with the building industry, but even more on the courage and foresight with which the industry faces its new tasks and shapes its organization to meet them.

2

In considering long-term policy for the building industry three things must be recognized. In the first place, it is plain that there can be no return to unco-ordinated private enterprise. On the other hand, the bureaucratic administration of an industry such as the building industry would certainly involve a loss of flexibility, enterprise, and initiative. Thirdly, industrial self-government, while it has many advantages over both unco-ordinated private enterprise and bureaucratic administration, has some features likely to endanger consumer interests. It is evident that no simple formula will meet the case.

3

The weaknesses which have been diagnosed in the professional organization of the building industry call for action on the following lines :—

(i) Responsibility for design and for co-ordination of services involved in the preparation of plans and other necessary documents for subsequent general supervision

Where do we go from HERE

[*A Review of P.E.P. broadsheet No. 183* 'Building for the Nation.']

THE post-war building programme is likely to put an even greater strain on the building industry than that already placed on it by the war. If reconstruction is to realize hopes widely held at present it will involve :

(i) Planning and executing large-scale projects over long periods of years ;

(ii) producing and distributing vast quantities of building materials and fittings ;

The scale of operations will be comparable only to the production of armaments for the present war.[1] If this work is to be carried through successfully it is essential that all foreseeable causes of friction should be eliminated as the technical difficulties will in any case be great. P.E.P. in a recent broadsheet (No. 183) draws attention to a fact too often overlooked, that "the haphazard methods of 1939, already inadequate for the needs of that time, must be recognised as entirely unsuited to the huge task in prospect," and makes some interesting and constructive suggestions on the lines that reorganisation should take.[2] They aptly define the problem confronting us as that of "establishing a satisfactory relationship between the Ministry (of Works and Buildings) and the industry which will yield the maximum benefits from long-term planning without stifling enterprise or stereotyping outmoded practice."

The starting point of their recommendations is an analysis of the functions involved in building, a process which makes clear that responsibility for them is not at all clearly defined at present. Rapid growth during the last half-century and uneven technical development have made it possible for the building industry, once a craft, to develop into a highly technical process based on scientific specialisation, without the change being reflected in the organisation of the industry. The days when a master builder could embody in his person or satisfactorily represent all the professional services involved in building has passed, and the time has now come to define and regularise a new and complex type of contractual relationship ; lay down a procedure that is appropriate to modern methods ; and secure its general adoption.

Functions now involved[3] in any build-

should rest upon the architect or engineer according to the nature of the project.

(ii) Responsibility for measurement services—quantities and costs—on the basis of the particulars provided, should be placed entirely on the quantity surveyor. The quantity surveyor is responsible for advising the architect, with whom he co-operates closely in the preparation of the original particulars and in relation to the subsequent variations. The quantity surveyor, however, also exercises a judicial function when accounts are settled, and in this capacity should remain independent of the other members of any professional group.

(iii) Responsibility for co-ordinating work in the progress of erection should be clearly defined, whether co-ordination comes under the general supervision of the architect or whether a new profession of specialized co-ordinators comes into being. If it remains a responsibility of the architect co-ordination must be provided much more efficiently than is possible at the clerks of works or general foreman's level.

(iv) The threefold service of co-ordination, design, and measurement can be provided either (i) by the architect and individual specialists, (ii) by groups of architects, (iii) by an inter-professional group. The suitability of these three chief types of professional organization in particular cases depends upon the scale and complexity of the work in hand. For small work there is no reason why the single architect should not carry out all these services. But the building programmes of the war are, and of the post-war period will be, both large in scale and complex in character.

(v) Responsibility and payment for design, measurement, and professional co-ordination services should be kept completely distinct from the provision of building materials and from contracting and sub-contracting work. It should be the subject of a distinct agreement with the building owner, and the services and fee or fees should be fully and plainly specified. It is desirable to review the comparative scales and methods of remuneration among the various professions and to place them on a more equitable common basis. It is essential that the salaries offered to technicians in public services should compare favourably with those carrying out similar work in private employment, and every effort should be made to enlist the best brains available. Further scope should be provided for the recruitment of a proportion of senior officials at a more mature age after varied experience of normal private, industrial and professional conditions.

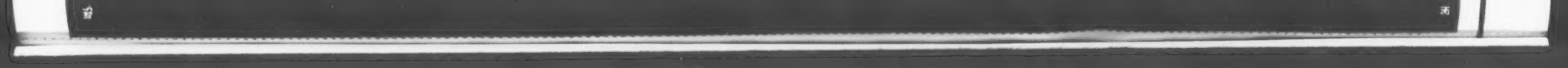
ing operation of importance are as follows (for the sake of clarity they are grouped under these heads) :

1. Launching the enterprise : this includes determining the need for building ; reconciling the position and character of the building with national, regional and local requirements and with planning regulations when they exist ; obtaining site ; arranging finance ; engaging architects, contractors, etc., and providing particulars on which detailed plans can be prepared.

2. Planning : this includes reconciling the often contradictory requirements of the client and translating them into three dimensions to compose an agreeable whole ; working out a suitable system of construction ; designing specialist installation (heating, light, lifts, etc.), preparing drawings ; preparing particulars necessary to form a basis for estimating costs.

3. Building : this involves time scheduling ; co-ordinating the work of various specialists employed ; and executing the contract as a whole according to plan and specifications provided. When, as is usual at present, responsibility for these various functions is not clearly defined the result is confusion which gives rise to unforeseen delay, financial loss and risk and in many cases also results in buildings that are badly botched.

To start at the beginning. There is little information available at present to enable building owners to place their buildings in a way that coincides with national, regional and local planning requirements. Building is still speculative even when not officially called so and invariably involves considerable financial risks. Hence the premium on a central position, where further building is from other points of view undesirable, which causes an unnatural inflation of land values, and limits the number of building owners for most purposes, to people with large financial resources. The difficulties connected with finding a site distract the building owner from his real work—that of interpreting the needs of the community and providing proper particulars to form the basis of detailed planning. In fact, once the site is bought loss of possible profit at compound interest puts a premium on hasty and ill-considered planning. This point is, perhaps, not directly stressed in this particular report, which is mainly concerned with building, but it is obviously impossible to carry out the suggestions put forward unless the functions of the building owner are also defined and his work also professionalised in a way that can only be



GENERAL CONSIDERATIONS & PRINCIPLES OF DESIGN IN WELDED STEEL, Nº 14.

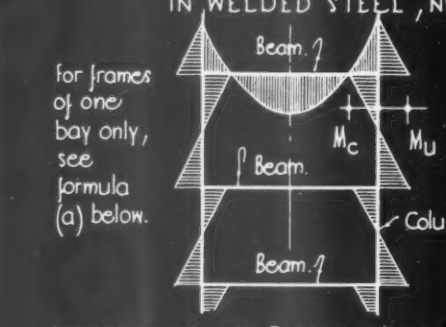


FIGURE 1 : COLUMN & BEAM BENDING MOMENT DIAGRAM FOR SINGLE PANEL FRAMES.

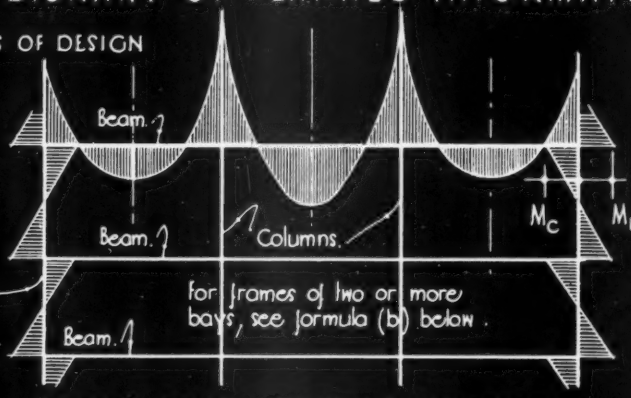


FIGURE 2 : COLUMN AND BEAM BENDING MOMENT DIAGRAM FOR FRAMES OF SEVERAL PANELS.

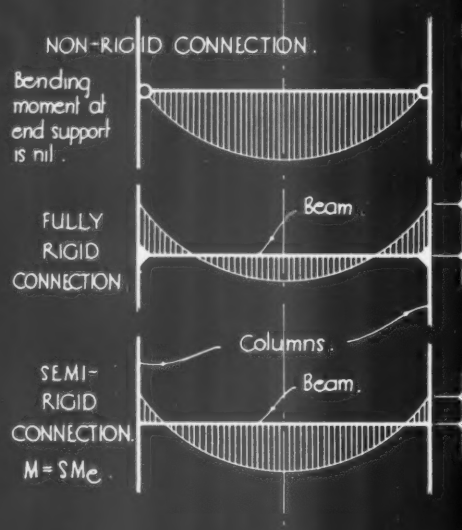


FIGURE 3 : BENDING MOMENT DIAGRAMS FOR DIFFERENT TYPES OF BEAM-COLUMN CONNECTIONS.

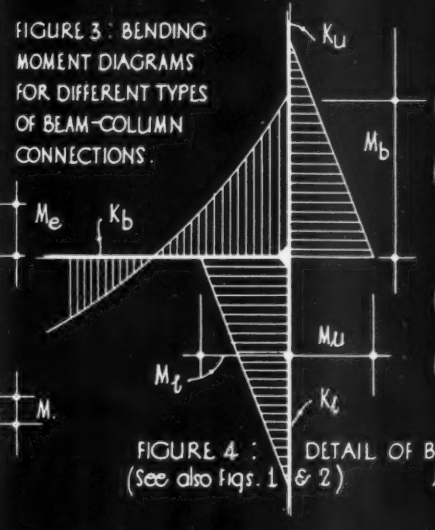


FIGURE 4 : (See also Figs. 1 & 2) DETAIL OF BENDING MOMENTS AT RIGID CORNER.

Formulae for calculation of total rigidity.

(a) $S = S_u + S_b = \dfrac{K_u + K_l}{K_u + K_l + K_b}$

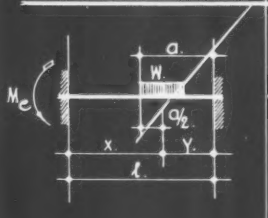
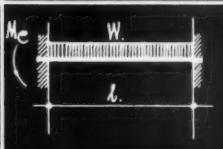
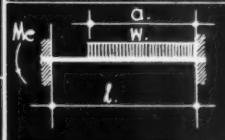
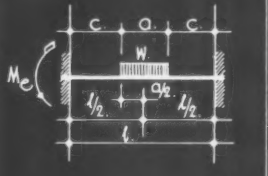
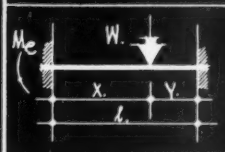
(b) $S = S_u + S_b = \dfrac{K_u + K_l}{K_u + K_l + 0{\cdot}5K_b}$

Formulae for calculation of negative bending moment.

(c.) $M = SM_e$

(d.) $\begin{cases} M_u = M_b \dfrac{K_u}{K_l + K_u} \\ M_c = M_b \dfrac{K_l}{K_l + K_u} \end{cases}$

TABLE GIVING FORMULAE FOR M_e FOR SEVERAL COMMON LOADINGS :

LOADING DIAGRAM.	FRAMES OF TWO OR MORE BAYS : M_e	FRAMES OF ONE BAY : M_e	LOADING DIAGRAM.	FRAMES OF TWO OR MORE BAYS : M_e	FRAMES OF ONE BAY : M_e
	$-\frac{W}{l^2}\left(y^2x + \frac{a^2}{12}(x-2y)\right)$.	$-\frac{W}{2l}\left(xy - \frac{a^2}{12}\right)$.		$-\frac{Wl}{12}$.	$-\frac{Wl}{12}$
				$-\frac{Wa^2}{12l^2}(4l-3a)$.	$\frac{Wa}{12l}(3l-2a)$.
	$-\frac{W}{24l}(3l^2-a^2)$. For $\frac{a}{l} < 0{\cdot}1$:- $-\frac{W}{12}(l+2c)$ approx.	$-\frac{W}{24l}(3l^2-a^2)$. For $\frac{a}{l} < 0{\cdot}1$:- $-\frac{W}{12}(l+2c)$.		$-\frac{Wxy^2}{l^2}$.	$-\frac{Wxy}{2l}$.

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INFORMATION SHEET

• 853 •

STRUCTURAL STEELWORK

Subject : Welding 24 : General Considerations and Principles of Design in Welded Steel : No. 14, Welded Frames (D).

General :

This series of Sheets on welded steel construction is a continuation of a preceding group dealing with riveted and bolted construction, and is intended to serve a similar purpose—namely to indicate the way in which economical design as affected by general planning considerations may be obtained.

Both the principles of design and the general and detailed application of welded steelwork, are analysed in relation to the normal structural requirements of buildings. The economies in cover and dead weight resulting from lighter and smaller steel members are taken into consideration in the preliminary arrangement of the building components in order to obtain a maximum economy in the design of the steel framing.

This Sheet is the fourteenth of the section illustrating the general considerations and principles of design in welded steel, and is the fourth Sheet on the subject of welded steel frame construction.

Application :

The approximate calculations shown on this Sheet for multi-storey frames are applicable where the spans and loads of the different beams are approximately equal. In this case it is justifiable to assume that the centre columns will not be stressed in bending, but will get only vertical loads. The following approximation thus refers to the end columns only, and is similar to that which is finally accepted by the London County Council for reinforced concrete structures.

In the formulæ K defines the stiffness of any member, as explained in sheet 23 $\left(K=\frac{I}{l}\right)$

The member is defined by the suffix (e.g. K_b for Beams, K_u for Upper column, K_l for Lower column).

Formulæ :

The formula is based upon the determination of the degree of rigidity which the column gives to the end of the beam. Part of this rigidity, S_u is provided by the upper column, and part S_l, by the lower column, and the total rigidity is $S=S_u+S_l$. This rigidity is defined by formulæ (*a*) and (*b*) on the front of this Sheet ; (*a*) referring to buildings with only one panel, and (*b*) referring to buildings with several panels. The actual bending moment at the corner is only a proportion of what it would be if the corner were absolutely rigid, i.e., if the columns were so stiff that no deflection was possible.

As the negative bending moment at the corner increases with the stiffness S, it is given by the formula (*c*) $M=SM_e$, where M_e is the bending moment which would occur if the beam were held in position with 100 per cent rigidity, see Figure 3. The formulæ for M_e for several common loadings are given in the table on the front of this Sheet. If different loadings of this type occur together, they can be combined.

The bending moment at the corner of the beam is balanced by the bending moments at the top of the lower, and the bottom of the upper column, the sizes of which are proportional to their stiffness and given by formula (*d*). If there is no upper column (e.g. for a roof) the same formula can be applied assuming that K_u (stiffness of upper column)$=0$.

Bending moments are created in the columns and beams as explained by Figure 1 for a frame of one panel, and by Figure 2 for a frame of several panels. In Figure 4 one corner is given to a larger scale.

Previous Sheets :

Previous Sheets of this series on structural steelwork are Nos. 729, 733, 736, 737, 741, 745, 751, 755, 759, 763, 765, 769, 770, 771, 772, 773, 774, 775, 776, 777, 780, 783, 785, 789, 790, 793, 796, 798, 799, 800, 801, 802, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 816, 819, 821, 822, 823, 824, 826, 827, 828, 830, 832, 836, 837, 838, 839, 840, 842, 843, 845, 847, 848, 849, 850, 851 and 852.

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made possible by co-ordinated research into planning requirements at a higher level. Detailed plan requirements should be stated in a way that leaves architects as much freedom as possible in their proper job of allocating space. This involves a careful analysis of the functions which are to be fulfilled by the building. At present particulars are too often given in the form of a jumble of sizes and dimensions taken over without examination from out-of-date buildings about to be replaced.

The next stage after securing the proper preparation of particulars and securing a reasonable period of time in which to plan, is to see that the work of various specialists involved is properly co-ordinated during the process of planning by the architect or engineer in charge of the work. At present, particularly in Government departments under what is called the pool system, it is common to separate the various types of specialist work and assign each to a different department " to the architect the design, to the sanitary engineer the sanitary work, to the heating engineer the heating work. No doubt there is co-ordination from on high, but there is no co-ordination at the level of the draughtsman or architect who prepares the particulars." This arrangement is the negation of planning and bound to produce at the best mechanistic buildings; at the worst a wasteful and inconvenient disposition of parts which fit badly together and may even have to be altered. Much more satisfactory is the group system, in which a small band of specialists collaborating closely are together responsible for the execution of a whole building.

Even worse confusion exists at present at the third stage: the stage when the building is executed. The financial responsibility of the building owner is too often shuffled off on to the contractor in the form of delayed payments, which puts a premium on financial resources and leaves technical skill and ability at a discount. The contractor is moreover seldom provided with accurate information on which to base his estimate of costs. When no bill of quantities is included in the contract each contractor has either to take out his own quantities, without payment, or to tender on the basis of a rough-and-ready calculation which obviously results either in an unnecessary duplication of work (where several contractors are invited to tender) or a rather speculative tender. And in cases where no contract price is agreed in advance the difficulties of assessing a correct basis for payment are even more serious and the risks correspondingly greater. Other difficulties arise out of the fact that, at the executive stage, there is no one profession even in theory responsible for the difficult job of co-ordinating the work of different specialists and sub-contractors. In

(vi) The co-ordination achieved through the above reorganization of design and measurement services should be directed to ensure proper particulars as the basis of building policy and of national standards of cost control.

(vii) The organization of the services of contractors calls for a similar critical analysis. The contractor is the third party in the building executive control, but his responsibilities are not always clearly defined, nor is it normally possible, under present conditions, for him to have the professional status of the other parties. In view of their importance it is highly desirable that the services of the building contractor should be governed by professional standards comparable to those governing the services of the other parties.

4.

At present there is no definite pattern of professional relationships throughout the building industry. The Government is already using two patterns in its departmental organization, one known as the pool system and the other as the group system. The pool system, which is by far the most common, assigns to every department its particular job. To the architect, the design; to the sanitary engineer, the sanitary work; to the structural engineer, the structural work; to the heating engineer, the heating work. No doubt there is co-ordination from on high, but there is no co-ordination at the level of the draughtsman or architect who prepares the particulars. Much more satisfactory is the group system, where the small group which prepares the drawings, specifications, and other documents for a particular contract are responsible for seeing it through and for co-ordination with all other interests. In large undertakings this group system leads to incentive and competition between groups and, provided that there is a good relationship between the groups, this system stimulates interest and initiative as well as securing effective co-ordination.

Building organization inside and outside government is suffering from a dearth of technical administrators, but this is specially marked in government service where the " group " method of professional organization is seldom found. The pool system can never make administrators. The group system encourages them in the making. As they show their ability to co-ordinate they get the opportunity. As they get the opportunity they gradually throw off their specialist bias and, with sympathetic knowledge of the various specialist interests, blend them together in their due proportions to the common end in view—in this case, efficient building. Such administrators, unlike those who have never been trained to a specialization or passed through specialist occupations, speak the language of the industry they serve and gain the appreciation and respect of those whom they direct. Education is at present directed too much either towards the training of the specialist or to the production of the academic administrator. The new task of education is to educate the technical administrator, and the new task of organization is to encourage him and to give him his proper status.

some cases it is undertaken by the architect or engineer; in others, by the general contractor. This work probably ought to be a specialist job: it certainly needs to be done more efficiently than is possible at the level of a clerk of works or general foreman, to whom the work usually falls at present.

The most hopeful way out of the present muddle on the building industries side lies in the direction of defining responsibility. This would make possible a very much higher standard of technique in each sphere, specially if backed up by a more comprehensive system of education related to such a framework.

Reorganisation of the industry from within, however, requires certain assistance from without. It will be difficult for the industry alone to secure the general adoption of a satisfactory system, and to impose strict professional standards so long as "successive waves of poorly qualified persons" are free to set up in any branch of the industry they may choose without the public being so much as warned of the dangers of employing them. There are, moreover, certain fields in which direct intervention by the State is necessary.

If best possible use is to be made of materials available and of new techniques, steps must be taken to expand research activities, direct them onto problems connected with the execution of the building programme and see that the results are made available in a readable form to all the people concerned. In this field a beginning has already been made by the Directorate for Economy of Design. Research work also needs to be directed not only to the solution of technical problems but on to methods of applying them. This branch of research differs from the other in that it is chiefly concerned with methods of combining different techniques and must have regard for consumer preference. It is in fact architectural as opposed to scientific research. So far there is nothing of this kind. And, lastly, there is scope for a central technical statistical service which could in course of time accumulate data to form the basis of a national standard of cost control[5] better able to protect both building owners and contractors against profiteering, price cutting and inferior work than any method available at present.

Developments of the kind together with the co-ordination of building development by Town Planning Regulations on a national regional and local basis would P.E.P. suggests help the industry to reconcile conflicting interests by a "psychology[6] more concerned with efficient building than with taking risks."

P.E.P. broadsheets are published in fortnightly intervals from No. 16 Queen Anne's Gate, London, S.W.1.

5.

Non-competitive methods of controlling work as it proceeds are open to obvious abuses, and they have been subjected to much damaging criticism in recent months. Much of this criticism, however, has been misdirected. It is the way in which the system has been used rather than the principle upon which it is based which has been responsible for the abuses which have been revealed. The system provides the means whereby any measure of check considered desirable can be applied during the progress of the work. Provided that proper particulars are available, and that it is possible to make accurate comparisons with other work of a similar character, there is no reason why a cost plus system should not work well. The system has been widely used in recent years, and if the information derived from its use were properly examined future work of a similar character could be very easily costed on the basis of past experience.

The schedule of prices pre-determines, as the basis for subsequent measurement, unit prices of construction based upon accurate descriptions of work likely to be required on the project. This system provides a fairly satisfactory basis for competition. It offers a speedy means of settlement, though it is often necessary to supplement the schedule by authorized adjustments or hardship claims in order to meet the contractor's ultimate cost. The weakness of the system is the absence of original measurements and pre-determined costs, which renders it difficult to determine the efficiency-cost ratio of the resulting building, and to collect and collate information readily for future reference.

6.

If the building industry is fully to carry out its responsibilities the workers in the industry must have a more intelligent understanding of their job and a more responsible attitude to it. This implies that trade unions must develop, as some already have done, more on the lines of professional bodies, concerning themselves more with the education and ability of their entrants, and with their opportunities for gaining wider qualifications—for example, by training schemes and a more constructive approach to apprenticeship.

Incentives for labour offer a further problem. The introduction of piecework is not easy in the building industry, and if achieved is not likely to be effective. Universal piecework achieves little when there is full employment. There are always some men who are uninterested in increased rewards for extra exertions, and the expense of measuring and checking piecework is considerable. In the long run bonus systems are bound to fail for under conditions of full employment the maximum bonus soon becomes the rate for the job, and competition between firms in bonus-paying then becomes inevitable. The obvious way appears to make good use of propaganda—the rebuilding of our homes is not an unattractive theme. If the interest of the key men and the shop stewards is engaged a notable increase in output is certain.

THE ESSENTIALS OF AMERICAN BUILDING POLICY

(from P.E.P. Broadsheet No. 183).

The essentials of American building policy summarized in the following statement, reproduced from the Architectural Forum of July, 1941, are strikingly parallel to many of the general principles outlined in this and other recent P.E.P. broadsheets.

BUILDING MUST

work to a plan—each house to its neighbours, the neighbourhood to its community, the community to its region, and ultimately the regions to the nation.

IT MUST

adopt rational standardization to gain economies.

IT MUST

further integrate and enlarge operations to bring about a responsible leadership and a more intelligent collaboration of those who plan, those who build, those who finance, those who deal in land, and those who make and supply materials and equipment.

IT MUST

solve the problem of the really low cost house, not by producing a stripped down, compressed shell, but by affording complete modern living amenities at decreasing cost of purchase and maintenance or of rent.

IT MUST

remove every unnatural restraint practised by any branch of building. This purge must include obsolete codes and ideas quite as completely as illegal practices.

IT MUST

face the fact that Building continues low in public opinion, and carry out a large scale programme of constructing a new and favourable national concept of Building. Building must not only live right, but must make sure the public knows it does.

IT MUST

expose the entire building process to intensive, broadminded research covering not only technology but thorough exploration of the major factors which will improve the quality of its services to the public and the stability of Building itself.

IT MUST

work for an effective control of land use. Zoning ordinances must be made adequate.

IT MUST

work for a rationalization of taxation to attract capital interested in a secure, reasonable return.

IT MUST

encourage the further study of planned public works as a means of shock-proofing depressions and providing continuous employment of men, materials and money.

IT MUST

recognize that technological advances will come more rapidly in the future, and it must therefore provide lower cost and more flexible buildings. The approach must gradually shift to the most modern standards attainable. Building must advocate what industry has long practised—a willingness to depreciate structures before the period of physical obsolescence has been reached. The facilities, existing and to be created, recently described by the President as "Democracy's Arsenal," may be converted to constructive post-war use in this programme.

Training is NEXT

Points from a memorandum on training and recruitment for the Building Industry prepared by G. H. D. Cole on behalf of the Nuffield College Social Reconstruction Survey.

"AFTER the last war it took about seventeen years to add half a million workers to the building industry, and the total addition in 1929-30, when the public housing programme was at its peak, was only about 350,000. It seems necessary to contemplate both a much greater and a much more rapid expansion at the end of the present war. How large this expansion will need to be depends on major issues of social and economic policy.

It is, however, necessary to make some assumption for the purpose of this memorandum. I have ventured to assume that the basic problem will be that of getting into the building industry as many skilled, or fairly skilled, workers as can be made available by extensive measures of training, and that the actual volume of post-war building activity will depend at least as much on the success achieved in expanding the skilled labour force as on any other factor."

Methods of recruiting and training discussed by Mr. Cole are not all equally important. For instance, schemes for meeting the needs of workers whose training has been interrupted by the war, for shortening apprenticeship in approved cases, for upgrading and for training disabled soldiers, though very necessary, are unlikely to bring about a rapid expansion. The most hopeful suggestions deal with :—

APPRENTICESHIP IN GENERAL

"It is necessary to ask how far apprenticeship of the traditional kind still remains the best method of recruiting skilled workers for the building industry. It is obviously very deficient in providing for the training of workers in new or expanding processes ; and increasing specialization of firms and mass production methods in house-building both make it harder for the apprentice to pick up a satisfactory training under a single employer. Training on the job needs more and more to be supplemented by work in technical schools or classes ; and there is a greater need than there used to be for freedom to move from one firm to another in search of varied experience.

These conditions suggest that a form of apprenticeship to the trade as a whole rather than to an individual employer may have much to recommend it, if adequate safeguards can be devised, and that any satisfactory scheme must include a much larger element of formal technical instruction in schools or classes than is usual in practice at the present time.

Apprenticeship to the trade as a whole plainly involves complications. It requires much more supervision than has usually existed hitherto. This could hardly be given except under a national scheme, administered by inter-connected local and regional joint committees subject to a central co-ordinating body. This seems to be on all accounts highly desirable ; and I think the industry should be strongly pressed to agree upon a national scheme. The whole question is bound up with the future of education in general. A school-leaving age of 16, with part-time education up to 18 and opportunity in the new secondary schools to pursue some sort of vocational specialization from 12 or 13, would evidently alter the entire background for systems of apprenticeship, and would make it a very much easier matter to devise a satisfactory scheme.

TRAINING EX-SERVICE MEN

At the end of the war the Air Force and the Army will both release large numbers of men who have been given a simplified mechanical training during their period of service. Large numbers of these Service trainees should be excellent material for training in the building crafts : and it is highly desirable that, well before the war ends, measures should be concerted between the building industry, the Ministries of Labour and Works and Buildings, and the Service Departments for a comprehensive scheme in which full use will be made of Service training facilities adaptable for use as training centres for the building industry.

It will not serve to devise Utopian projects for expanding the skilled personnel of the industry exclusively or mainly by means of long apprenticeship, when what will be imperatively needed is a rapid and very great expansion in the total supply of labour. The need for builders after the war will be comparable in intensity with the need for munition workers during the war, and will call for some means of dilution, though doubtless to a smaller extent.

"HANDY MAN" TRAINING

It has been estimated (in Nuffield Memorandum No. 10) that for every year of war the demand for repair work, exclusive of war damage, is piling up at the rate of from 100 to 150 thousand man-years of normal intensity. This is on the assumption that the war has caused about half the normal repairs and decorations to be postponed. A three-years' war would thus call for a year's service on arrears of from 300 to 450,000 men, over and above the demand for another 200 to 300 thousand who would be needed for current repairs.

The building industry has hitherto not recognized the "handyman" in any

way. His practice cuts right across Trade Union rules governing demarcation of trades; and, partly as a consequence of this fact, this type of labour is almost entirely unorganized. The industry can, of course, if it wishes, continue to turn its back on this problem; but there would seem to be a strong case for deliberately training "handymen" as well as craftsmen, and for endeavouring to raise the standards in this class of work.

EXPANSION OF TECHNICAL INSTITUTIONS

Existing technical institutions are clearly important in providing for the higher type of training, especially for recruitment to the managerial and commercial sides of the industry; but they are not at present equipped in most places for training more than a tiny proportion of those entering the manual crafts. Great expansion is evidently needed, if attendance at institutional courses in the day-time is to be made a regular part of apprentice training, and if the technical institutions are to play a significant role in emergency schemes of training for ex-service men, including disabled men, and in the upgrading of less skilled workers.

There seems to be general agreement that the existing provision for the training of managerial and technical personnel is in most places entirely inadequate, and that a serious problem will confront the industry when it is called upon to expand owing to lack of competent managers and technicians, as well as of skilled craftsmen.

Fortunately, expansion of facilities need not be hampered by difficulties of equipment, which is a relatively simple problem. Much more serious is the prospective shortage of competent instructors; and this is a matter which ought to receive prompt attention if plans of training are not to be held up at the end of the war.

TEACHING OF BUILDING IN SECONDARY SCHOOLS

It is clearly desirable to have as soon as possible a clear declaration of Government policy both on the question of post-war school-leaving age, and on the policy to be followed in respect of part-time continued education. The development of vocational education in secondary schools and of part-time continued education up to 18 would clearly affect very greatly the structure of apprenticeship system and of recruitment generally for the building industry. A higher leaving age, with the opportunity of vocational specialization from the age of 12+ or 13+, would make possible a co-ordination of apprenticeship arrangements with school teaching; and this connection would become still closer at the continuation school stage. It would become the rule for apprentices, starting, say, at 16, to spend a part of their time in employment and a part in the continuation school; and the closest possible connection would have to be established between the schools and the authorities responsible for operating the schemes of trade apprenticeship.

The advantage of abolishing the gap between school education and the institutional side of technical training is obvious. It follows that the utmost effort should be made, if compulsory continued education is to be introduced after the war, to bring it into operation at the earliest possible moment, and to link it up from the outset with the revised apprenticeship regulations to be adopted by the building industry.

TRAINING IN NEW PROCESSES

It should be recognized that neither navvies, nor builders' labourers, are in truth unskilled workers, and that the relative importance of workers who do not belong to the traditional crafts is bound to increase as methods of construction change, even if the older groups of tradesmen retain their preponderant importance in cottage-building. The need for special measures to expand the size of the industry affords a highly favourable opportunity, in connection with training schemes, for giving proper recognition to new trades and forms of skill and dexterity."

In summing up Mr. Cole emphasises that the possibility of bringing about a rapid expansion by any or all of the means described, depends on convincing the trade unions that building activity will be maintained at a high level for a considerable period of years, and that they have no need to fear unemployment.

The Importance of GROUP Work

[By Professor C. H. REILLY]

It is proposed to deal first with the organization of design which must necessarily precede any material reconstruction. Certain assumptions must be made.

(*a*) That a Central Planning Authority has been established with the necessary powers and that it has determined such major points as to which of the larger towns are to be restricted and where the new towns are to be.

(*b*) That under this Central Planning Authority Regional Authorities, perhaps about a dozen, have been established and have determined the main lines of development within their areas.

It is only after this has taken place that the town planner and architect, as designers, can set to work and even then further assumptions must be made. It must be assumed that towns will have the powers suggested by the Uthwatt Report to control the development of all land within their boundaries.

Assuming then this freedom of planning within the lines of the main and regional plans, how is the designing ability of the country to be best used? Clearly we must depart from the practice of town planning in the immediate past which has left neither the towns nor the countryside better places to live in or better ones to look at. There must be a simplification of town planning procedure, but the most important point is that the actual design of the town plan, which determines such things as vistas as well as the shape of the building sites and therefore largely the shape of the buildings upon them, must be in the hands of a trained designer. Too often in the past the bones of the town plan, as far as it has had any, have been determined by the Borough Surveyor or Engineer. Very rarely is there a Borough Architect and even where there is and a very good one, as at Liverpool, it is often, as there, the Borough Engineer, the excellent man of drains, with the help of a politician, who determines these major æsthetic questions. Of course there are exceptions. The Birmingham Engineer is a town planner anyone would be glad to work with or under.

The first point then is that an architect, trained in town planning, should from the outset be associated with the town plan. I say "associated with." I do not say he should be the absolute master. My view is that he should be the leader among a group of colleagues, the man of vision and ideas, who will have the imagination to synthesize all the sociological, industrial, geographical and engineering data and out of them construct something noble.

As few towns and counties to-day have official architects and less still of the standing suggested, what is to be done? Is the Borough Engineer or Surveyor to engage an unco-ordinated crowd of architectural assistants and undertake with their help all the planning and designing of the new districts as well as the replanning which the old ones may need? That does not seem to me the way to successful results. I do not feel either that the general employment of established outside architects who would have to enlarge their staffs in the same way, would be likely to achieve much more. If such an architect conscientiously designed all the work himself he would soon tire and unconsciously bring out his box of tricks. If paid

FACTS ABOUT GLASS FOR ARCHITECTURAL STUDENTS

No. 9—"Armourlight" Toughened Lenses

These are translucent glass units specially designed for fixing into concrete.

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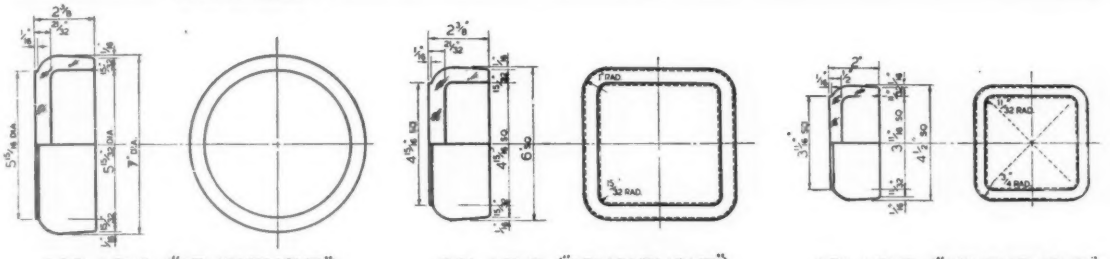

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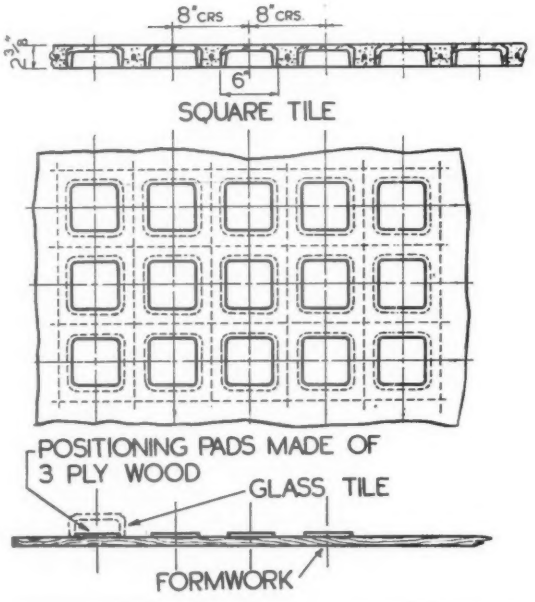

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"ARMOURLIGHT" Toughened Lenses have the same characteristic fracture as "ARMOURPLATE," and if broken they expand and exert a lateral thrust on the concrete in which they are fixed, and remain in position.

USES: Roof lights and vertical lights.

FIXING: In designing the glass and concrete structures allowance must be made for expansion.

The formwork for casting the concrete and tiles is first made and the tiles are then placed in position and suitably held until the concreting is finished. The slab is cast to the height of the reinforcing rods, which are then set in position, great care being taken that they are clear of the tiles; the casting is then proceeded with and completed.

Great care should also be taken to see that the sides of the tiles making contact with the concrete are quite clean and free from grease, dirt or foreign matter of any kind, to ensure complete adhesion of the concrete to the glass.

We consider a suitable mixture for this class of work to be a 3 : 2 : 1 "Mix" consisting of three parts ¼″ down to ⅛″ granite free from dust, 2 parts washed pit or river sand (not more than 20% passing a 50-mesh sieve), and 1 part cement.

Use clean water in mixing the concrete, which should be of a sufficiently plastic consistency to permit even flow of the material into all parts of the formwork and around reinforcement.

The concrete must be well "punned" so as to be solid and free from air bubbles.

The top of the tiles can be cleaned when the surface of the concrete is smoothed over, which is best done a few hours after the initial set has been taken.

Water curing in the initial stages is strongly advised. This is best carried out by covering with hessian or other suitable material, which can be kept continuously damp. This is done to ensure slow maturing of the concrete and should be carried out for at least four days.

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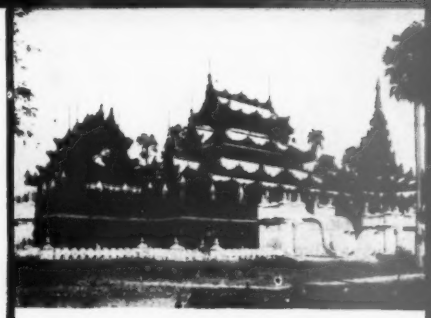
TEAK CAN TAKE IT!



The Queen's Golden Monastery at Mandalay is also built of Teak. Though it is gilded, this is solely for decorative purposes. Neither in Burma, nor in any other part of the world, does Teak require any paint or other preservative covering to prevent deterioration under exposure.
In this country, as in Burma, architects and builders can depend upon the superlative durability and steadiness of Teak.

ABOUT 100 years ago a new Royal Palace was built at Amarapoora, then the capital of Burma. Twelve years later the capital, and the Palace, were moved to Mandalay. Though the city has lost its royal status, the Palace stands to-day in all its strength and picturesqueness. Its architecture is interesting. Like many buildings of Burmese design, the Palace has no walls, and the interior is therefore exposed to all the extremes of a tropical climate. This is an exceedingly severe test for a building almost entirely constructed of wood, but the wood is TEAK. The designers and builders had at hand the most trustworthy timber in the world, the one on which they could rely for supreme durability and steadiness. Point is lent to this by the fact that many of the Teak pillars came from a still older Palace, built some 500 years earlier, so that they have stood for 6 centuries and are still perfect. *Teak endures.* *Teak can take it!*

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too at the ordinary professional rate of 6 per cent. on the cost of, say, even one important street, he would be open to the charge of profiteering out of the national emergency, and yet professionally, as things stand, he could not charge less. Besides the ordinary established architects of the country will all be full up with work for their private clients restoring buildings and rebuilding on individual sites unaffected by the new town plans.

My suggestion is that to embrace these new and larger opportunities, and at the same time to make a gesture to the nation on behalf of the architectural profession, the R.I.B.A. should advise on the selection of men possessed of the necessary personality, with organizing as well as with designing power, to form groups of sympathetic and like-minded younger colleagues who would be willing for a definite period to live and work on a salary basis anywhere in the kingdom, and to be moved, if necessary, from place to place. Such groups of varying size should have their own engineering consultants, quantity surveyors and draughtsmen, and their Miss Elizabeth Denby—that is very important if there are any replicas of that invaluable lady—and should be employed as units in order that the individuality of the group and its enthusiasm be maintained and a large measure of unity imparted to the work. During the war one such group of some fifty architects with allied technicians under the leadership of Professor W. G. Holford has already designed and superintended in a very short time the erection of four and a half million pounds worth of building in war factories and hostels at salaries ranging from £80 to £40 a month, the total cost of their services amounting to rather less than 2½ per cent. on the cost of the buildings.

Owing to developments in recent years in architectural education there is in the country at the present time a greater number of young trained architects and planners, who have each presented at least one big scheme involving groups of buildings for their qualifying thesis, than ever before. The majority of these young men and women have not yet established large and fixed practices of their own. They are indeed often employed as draughtsmen on minor work which gives them no opportunity for the use of the knowledge and skill they have acquired. Here then is the heaven-sent—sent anyhow from the skies—opportunity for them to be more suitably employed. It is clearly the duty of the R.I.B.A. to see that full use, and on the proper scale, is made of their services. It will indeed be mainly by so doing that a contemporary direction will be given to the resulting buildings.

With the Government control of materials and licensing which must be in force for some time to come, the new areas to be built over should have a continuity of design contrasting strongly with the individualistic character of urban building before the war. Most people would agree that this is a thing to be desired. Our new streets for instance should be far more streamlined and elegant. Such a state of affairs, however, is more likely to be brought about by groups of like-minded architects working together than by individual architects working either in private practice or as salaried officials. We know from past experience how the work of the best private architects among others, working for individual clients, may spoil a fine thoroughfare, as for instance Aldwych and Kingsway, while the extreme of monotony might well be brought about by an official architect working on a great scale as a dictator as in some of the Nazi Government Buildings or even in the Rue de Rivoli, Paris, where a small unit, beautiful in itself, is reproduced over several miles of street. On the other hand the old Regent Street, now swept away and generally recognized when too late to have been the finest street in Europe, achieving as it did diversity within an over-riding unity, was the work of a group of like-minded architects working under a skilful leader. The group under a good leader would appear therefore to have a great deal to offer. The new areas should by their architecture express the happier and pleasanter civilization we hope for. That it will have to be a more co-operative civilization is generally accepted. A more co-operative method of design, partnership on a larger scale, would seem therefore the right method to adopt.

I suggest that under some such scheme for them a similar mobile army of operatives will have to be formed for carrying out a large part of the work. No doubt such an army would have to consist in the first instance of a few highly-skilled artisans and foremen and a mass of unskilled labourers. The established contractors will all be as fully employed as the established architects on what may be called restoration work. The great temporary housing schemes, however, which will be necessary immediately after the war while the permanent schemes are being got under way, will provide opportunities where this army of dilutees could be usefully employed, some in factories making prefabricated sections of houses and others on buildings where, as in those made of concrete, a large amount of unskilled labour can be used. It seems clear, however, that just as the architects with their Schools of Architecture have fortunately, if not intentionally, prepared their younger members for the coming emergency so the technical schools up and down the country, with the consent of the Trades Unions, will have to train a new army of craftsmen. Training schemes with this end in view should therefore be set up directly peace is in sight. The Unions will be right in demanding security of employment for their members over a fixed number of years before they agree to this, but with the amount of work ahead there should be no difficulty in granting that to suitable men. For far too long have building operatives had to walk the streets in search of the next job when the present one was finished. If a university professor of architecture can have a life appointment and a pension I see no reason why a qualified bricklayer should be engaged by the hour.

R.I.B.A.

Reconstruction Committee's Report No. 5

The R.I.B.A. Reconstruction Committee's Interim Report No. 5 has just been published. It deals with "Legislation Affecting Town and Country Planning." Below are the recommendations made in Part II of the Report; Part I will be published in *next week's issue.*

PART II.

RECOMMENDATIONS.

Machinery.

1. That there shall be set up forthwith one National Planning Authority with a Minister to lay down the main lines of the National Plan, including trunk roads and other means of transport, assisted by such expert planners, research and advisory committees as he may consider necessary.

2. That there shall be Regional Offices of the Ministry to prepare and extend the National Plan from time to time to meet the needs of the Region, and to deal promptly with decisions and approvals.

3. That in each Region, the Local Authorities shall be required to group themselves for planning purposes in such sub-regions or groups as may be required for efficient planning.

Planning Control.

4. That planning control shall include all land, and the objects of a Scheme shall include the preservation of land essential for agriculture and public reservations for any purpose.

5. That there shall be no exemptions for Government lands, railways or other public utilities or for agricultural buildings.

6. That the existing control of all development by licence shall extend for a fixed period until the constructive proposals of the National Plan are worked out (as recommended by the Uthwatt Committee).

7. That such control by licence shall include control over the extension of

existing industry as well as the location of new industry.

8. That a period of not more than 20 years should be fixed for the continuation of non-conforming uses.

9. That detailed improvements should be effected in town-planning legislation on the lines already recommended by the Town Planning Institute, subject to adjustments necessary to fit in with the National and Regional Administration, and to the insistence in every case of the employment of a suitable architect.

Financial.

10. That the acquisition of land for public purposes shall be simplified, and the price of acquisition stabilized at a figure not exceeding the value at March, 1939 (modified, if necessary, to meet changed money values).

11. That the price of land acquisition, as between private persons, should be similarly stabilized and be subject to an Arbitration Court or a Court of Building specially set up.

12. That there shall be in each district a local improvement and open spaces fund provided partly by Government grant, partly by a limited local rate and partly by contributions payable by all developers, thus providing for essential widenings, open space reservations and proper maintenance, as and where development takes place. This is a development of the recommendation contained in the R.I.B.A. Interim Report No. 1.

National Finance.

13. That the necessary finance on a new national basis should be available for the preparation and implementing of the National Plan, including :—

(i) The encouragement of agriculture and proper marketing facilities and the provision of rural water supply and electricity.

(ii) The encouragement of the proper location of industry and the provision of new industrial centres ; the building of suitable new towns and trading estates, including the utilization of mineral and natural resources, and the extension of public utility services.

(iii) The improvement of transport.

(*a*) by railway, electrification, elimination or reconstruction ;

(*b*) by trunk roads and motorways, including the acquisition of land up to ¼ mile strip for the provision of parkways, as provided for in the Development and Road Funds Act, 1909, and the Restriction of Ribbon Development Act, 1935 ;

(*c*) by canals, waterways, ports and rivers ;

(*d*) by a national system of civil aviation and the provision of sites for aerodromes.

(iv) The reservation of national and regional open spaces for recreation including :—

(*a*) National parks and coastal reserves, camping grounds, etc. ;

(*b*) regional open spaces and playing fields, riverside reservations, etc. ;

(*c*) preservation of buildings of national or historic importance.

14. Land Nationalization, in the ordinary acceptance of the term, is not a matter on which the R.I.B.A. desires at present to express any opinion, but the R.I.B.A. agrees that the control of all land is essential to any National Plan. At the same time it urges that private initiative must be maintained within the framework of this control.

TRADE NOTES

Messrs. Banister, Walton and Company, Ltd., constructional steel engineers, of Trafford Park, Manchester, have declared an interim dividend for the year ending March 31, 1942, of 3d. per 5s. ordinary share, equivalent to 5 per cent. actual interim less income tax at the rate of 10s. in the £.

Callender's Cable and Construction Co., Ltd., have opened a new sales office and cable stores at Finkle Street, Carlisle, under the management of Mr. G. H. Parker, formerly of their Sheffield office.

The most recent publication of the Timber Development Association deals with the sizes and availability of imported hardwoods and softwoods. In the foreword it is pointed out that great care has been taken in compiling the tables of sizes given and they are as accurate as the present circumstances allow. It must be realized, however, that the availability of certain sizes, and even of the timbers themselves, changes very rapidly. Thus a timber marked "A" (i.e. "plentiful") may become "B" or "C" within a few months, or weeks, if a sudden demand for them for important work occurs. Even under normal, peace-time conditions many people, when specifying and ordering timber, overlook or are ignorant of several important factors. This results in wasted time and sometimes necessitates major alterations in the design of structures. An example occurred early in the war, when 20 ft. lengths of American ash were specified for certain important structures ; such lengths were not available in this country at any time, and the whole structure had to be re-designed.

The Rt. Hon. R. McKenna, in a statement presented to the annual meeting of shareholders of the Midland Bank, said : "The natural predisposition to get rid of all restrictions as soon as the war is over must be resisted. We must profit by experience in using to the full the essential driving force of individual enterprise in the post-war conditions the general shape of which experience may help us to foresee. If we are wise in our perception of the proper limits within which freedom and control should respectively operate, a financial system can be evolved which will be a powerful factor in the creation and maintenance of national well-being."

UNPLANNED PLANNING

Professor Sargent Florence, the Economist, spoke at a luncheon of the Housing Centre last week. After pointing out that with very few exceptions people have to live where they work, he expounded on his well-known geographical classification of industries into three groups, namely :

1. "Extractive" Industries (such as mining and processing of the extracted ores, or agriculture and canning). The location of these industries is geographically fixed.

2. "Residentiary" Industries (in which category are included, besides the services, employing approximately 50 per cent. of the working population, some industries such as bakeries, bottling, etc., which are more economically carried out nearest the consumer). Industries the location of which is demographically determined.

3. "Footloose" Industries (about 30 per cent. of the industries in this country.).

These are the only plannable industries in the geographical sense.

It must be understood that although the footloose industries themselves represented only a proportion of the total industries of the country, they had a considerable bearing on the location of the residentiary industries which automatically followed the people where they lived. He went on to explain that the job assigned to the economist was to plan for *security*, which he defined as "wealth evenly distributed over years."

Difficulties to be overcome include booms and slumps, declining industries, seasonal fluctuations, etc. Cures suggested were (i) geographical diversification of industry, mainly by the introduction of "stable industries" (such as the food industry) ; and (ii) employment of women. Both these, but more particularly the latter, had a bearing on town and country planning that should not be ignored.

NEW BOOKLET

The Computation of Heat Requirements for Buildings has just been issued by the Institution of Heating and Ventilating Engineers. The booklet is a section extracted from the *Guide to Current Practice* which was issued to its members in 1941 by the Institution. It is divided into the following sections.

Part I. Temperature Rise and Rates of Air Change. Recommended temperatures and rates of air change are tabulated for buildings ranging from Aircraft Sheds to Warehouses.

The air change and temperature requirements of Factories are dealt with in detail.

Part II. Heat Transmittance Coefficients. Overall coefficients for walls, floors and roofs are tabulated on pp. 18-20, with allowances for Height and for Intermittent Heating.

Part III. Conductivity Data. Calculation of Overall Coefficients is given on pp. 27-30, while pp. 31-41 cover tables of Thermal Conductivity of Building and Insulating Materials.

The publication can be obtained from the temporary offices of the Institution of Heating and Ventilating Engineers at No. 21, Tothill Street, London, S.W.1, price 1s. 9d., or post free 2s. 0d.

PRICES

BY DAVIS AND BELFIELD, CHARTERED QUANTITY SURVEYORS

The following table shows the increases in cost over pre-war prices of certain basic materials for each month of 1941. The prices are expressed as a percentage increase over the last pre-war prices published in the JOURNAL (and contained in the form of a Supplement with the issue of January 18, 1940). For actual market prices during 1941 readers are referred to the issues of March 13, July 10 and October 9.

BASIC MATERIALS	Increases over pre-war prices at end of											
	Jan., 1941	Feb., 1941	Mar., 1941	April, 1941	May, 1941	June, 1941	July, 1941	Aug. 1941	Sept., 1941	Oct., 1941	Nov., 1941	Dec., 1941
	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.
Portland cement	+35·37	+35·37	+35·37	+35·37	+35·37	+35·37	+35·37	+35·37	+35·37	+35·37	+37·8	+37·8
2-in. unscreened ballast	+47·8	+47·8	+47·8	+60·9	+60·9	+60·9	+60·9	+60·9	+60·9	+71·01	+71·01	+71·01
Fletton bricks (at station)	+11·89	+11·89	+11·89	+11·89	+11·89	+11·89	+11·89	+11·89	+11·89	+11·89	+11·89	+11·89
Stoneware drain-pipes (British Standard) 2 tons and over	+18¾	+18¾	+18¾	+18¾	+18¾	+18¾	+18¾	+18¾	+18¾	+18¾	+18¾	+28·13
Roofing tiles	+20	+20	+20	+20	+20	+20	+30	+30	+30	+30	+30	+30
Steel joists (basic sections) ex mills	+47·5	+47·5	+47·5	+47·5	+47·5	+47·5	+47·5	+47·5	+47·5	+47·5	+47·5	+47·5
Lime greystone	+29.76	+29·76	+29·76	+29·76	+33·33	+33·33	+33·33	+33·33	+35·29	+35·29	+35·29	+35·29
Sheet lead	+50	+50	+50	+50	+50	+54·35	+54·35	+54·35	+54·35	+54·35	+54·35	+54·35
Iron rainwater goods & soil pipes	+18	+18	+18	+21	+21	+21	+21	+21	+21	+21	+21	+26½
Copper tubes	+27.66	+27·66	+27·66	+27·66	+27·66	+27·66	+27·66	+27·66	+27·66	+27·66	+27·66	+27·66
White lead paint	+26½	+26½	+26½	+26½	+26½	+26½	+26½	+26½	+26½	+26½	+26½	+31·82
RATES OF WAGES (Central London Area)												
Labourers	+12·70	+15·87	+15·87	+15·87	+15·87	+19·05	+19·05	+19·05	+19·05	+19·05	+19·05	+19·05
Craftsmen	+ 9·52	+11·90	+11·90	+11·90	+11·90	+14·29	+14·29	+14·29	+14·29	+14·29	+14·29	+14·29

Notes on Price Changes during 1942.

The price increases for basic materials at the end of February remain the same as those given for December, 1941, except for Copper Tubes, which rose during January and are now 29.79 per cent. above the pre-war price.

Rates of wages rose by ½d. on February 1. The rates in the Central London area are, therefore, 2s. 0½d. for craftsmen and 1s. 7½d. for labourers. This represents an increase of 16.67 per cent. and 22.22 per cent. respectively over pre-war rates.

O. A. DAVIS.